I. Program Overview – A one to two-page summary of department’s vision and goals.

II. Graduate Curricula and Degree Programs
A. Scope of programs within the department
B. Number and types of degrees awarded
   - Degrees Awarded – Academic Year (chart)
   - Comparison of Degrees Awarded – Fall Data (Peer info table)
C. Undergraduate and Graduate semester credit hours
   - Semester Credit Hours – Academic Year (chart)
   - SCH compared to Budget - Academic Year (chart)
D. Number of majors in the department
   - Enrollment by Level – Fall Data (chart)
   - Comparison of Enrollment – Fall Data (Peer info table)
E. Course offerings and their enrollments over the past six years (enrollment trends by course)
   - Course Enrollments by Academic Year (table)
F. Courses cross listed

III. Faculty
A. Number, rank and demographics of the faculty (tenured and tenure track), GPTI’s and TA’s
   - Teaching Resources (chart)
   - Tenured and Tenure-Track by Rank - Fall Data (chart)
   - Comparison of Full-time Faculty (Peer info table)
B. List of faculty members (graduate and non-graduate) (table)
C. Summary of the number of refereed publications and creative activities (table)
D. Responsibilities and leadership in professional societies
   - Professional Leadership (table)
   - Committee service (table)
E. Assess average faculty productivity for Fall semesters only (use discipline appropriate criteria to determine)
   - Faculty Workload (table)
   - College SCH/FTE – Fall Data (chart)
   - Department SCH/FTE – Fall Data (chart)

IV. Graduate Students
A. Demographics of applicants and enrolled students
   - Graduate Student Summary by Category – AY (chart)
   - Graduate Student Summary by Year – AY (chart)
   - Graduate Applicants by Region – Fall/Summer Data (chart)
   - Graduate Applicants - Fall Data (table)
   - Admitted Graduate Students - Fall Data (table)
- Enrolled New Graduate Students - Fall Data (table)
- Demographics of Enrolled Graduate Students - Fall Data (table)
- Demographics of Enrolled Undergraduate Students - Fall Data (table)

B. Test scores (GRE, GMAT or TOEFL) of enrolled students
   - Average GRE Scores for Enrolled Graduate Students – Fall Data (chart)

C. GPA of new students
   - New Graduate Students GPA by Level – Fall Data (chart)

D. Time to Degree in Years (chart)

E. Provide a breakdown of how many enrolled graduate students are RA's. TA's or GPTI's (chart)

F. Initial position and place of employment of graduates over the past 6 years (table)

G. Type of financial support available for graduate students.

H. Number of students who have received national and university fellowships, scholarships and other awards - fellowships awarded (table)

I. Percentage (%) of full time students receiving financial support

J. Graduate Student Publications and Creative Activities (table) – number of discipline-related refereed papers/publication, juried creative/performace accomplishments, book chapters, books, and external presentations per year per student.

K. Programs for mentoring and professional preparation of graduate students.

L. Department efforts to retain students and graduation rates

M. Percentage of Full Time students per semester – Fall data

V. Department
   A. Department operating expenses
      - Department Operating Cost - Academic Year (chart)
      - Department Operating Cost as a Fraction of Employees - (table)

B. Summary of Proposals (Submitted)
   - Summary of Number of Proposals Written and Accepted (table)

C. External Research expenditures
   - Summary of Faculty Awards (table)
   - Research Expenditures (chart)
   - Peer Institution Info (if available) (table)

D. Internal funding
   - Source of Internal Funds (TTU) - (table)

E. Scholarships and endowments

F. Departmental resources for research and teaching (i.e. classroom space, lab facilities) - (table)

G. HEAF expenditures (table)

H. External Program Accreditation – Name of body and date of last program accreditation review including description of body and accreditation specifics.

VI. Conclusions – a one- to two-page summary of the observed deficiencies and needs identified by your review. Highlight areas of greatest need and areas of significant contributions.
VII. Appendices – should include, but not be limited to, the following:

Table of Contents
A. Strategic plan
   - Attachment from Strategic Planning website
B. Curriculum Map
C. 18 Characteristics of Doctoral Program
D. Graduate Course Offerings (table)
E. Graduate Student Handbook
F. Graduate Student Association(s) - Description and information
G. Graduate Faculty Information (from Digital Measures)
I. Program Overview - An Executive Summary of the report that includes the vision and goals of each program

The Texas Tech University (TTU) Department of Physics’ *mission* is to provide quality undergraduate education, graduate education, and physics and astronomy service courses for other departments at Texas Tech University, to produce high quality research, and maintain an environment where research and creativity in physics can flourish.

The *vision* of the Department is as follows:

The Department of Physics aspires to the highest standards of excellence in all aspects of teaching, research, and service. Teaching to science, engineering, and non-science majors will be of the highest quality. Research conducted by the Department’s faculty and students will be of importance nationally and internationally. Opportunities to render service to the University, to the surrounding community, and to the nation will be pursued.

The Department of Physics offers graduate research and educational programs that focus on both fundamental physics and its application to practical problems. Research programs within the department can be categorized into the broad areas of Astronomy and Astrophysics, Biophysics including bio-medical applications, Condensed Matter and Materials Physics including nanotechnology, High Energy Physics, and Physics Education. Interdisciplinary research is strongly encouraged and especially within the Applied Physics concentrations our graduate students have the option of working directly with faculty from other departments at TTU and the Health Sciences Center or to have internship-based projects in an industrial or a national laboratory setting. Several groups within the department have very strong international connections and collaborations, which offers students opportunities to work with, and regularly interact with researchers from many other parts of the world.

The Physics Department has shown significant growth over the last few years in terms of enrollment at both the graduate and undergraduate levels. Graduate student numbers have increased from an average of below 40 over the previous two program review periods to approximately 60 at present. Much of this growth has involved international students and increasing the fraction of well qualified domestic students is a high priority going forward. We are well ahead of rather conservative targets established in 2009 in the numbers of undergraduate majors after making changes aimed at increasing the admissions numbers, retention, and especially BS degree production, following a low point of less than 30 majors in 2007. We were under strong pressure from the Texas Higher Education Coordinating Board (THECB) due to low numbers of Physics BS degrees. The Physics BS program is off of the THECB’s low-producing program list as of Fall 2013, with approximately 90 majors, and is poised to be sustainable at roughly that level.

We currently have two Masters programs, Physics and Applied Physics, both of which have been marginal in terms of the THECB degree production targets. The department has opted to combine these two programs into a single program before the end of AY-2016 with the Applied Physics option to become a Concentration within the Physics MS Degree Program, which will effectively remove that pressure. During the two previous Program Review cycles the Applied Physics MS program was primarily internship-based and aimed at the
For a number of reasons, including decisions made by our primary industrial partner, we chose to refocus that program toward on-campus research of an applied nature, while retaining an internship option that did not have a particular thematic focus or any specific outside partners.

The current six-year review period saw significant changes in the Department in other ways as well. During this period, seven faculty members either retired or left the department for other reasons. We hired four new faculty in 2013, three starting in January and one for this fall. We still have several open positions and are conducting three searches this year. This turnover has offered the opportunity to explore new directions, and the department made a decision to add Astrophysics as a top priority. Two faculty were hired specifically in that area during 2013 and a third is expected for Fall 2014. The two other searches are for areas in which the department has traditionally been strong, Condensed Matter and Biophysics, and were high priority for growth, making it critical to replace faculty in these fields who have recently left TTU.

Suitable space is a major issue with respect to continued growth in the number of faculty and size of our graduate programs. We are currently saturated in terms of office space, and will have to find additional offices for new faculty and students. The quality of existing space, especially research labs in the Science Building, is seriously in need of attention. Renovating research laboratories for incoming faculty is the only way any significant improvements have been accomplished in the recent past. However, providing the necessary labs for new faculty will displace graduate students from space they currently occupy, adding to the office deficit. Finding a solution to these space problems is our number one goal for the near term future; however, this requires resources that are require decisions well above the departmental level.

Departmental goals for Physics graduate education moving forward include 1) focusing graduate recruiting efforts on quality domestic students, 2) working with the TTU administration to secure additional funding for Teaching Assistants, 3) obtaining increased funding of scholarships and fellowships for our graduate students, 4) improving preparation of students for the PhD Prelim Exam required to move from the Masters to Doctoral program, and 5) increasing advanced course options for the major research areas available within the department.
II. Graduate Curricula and Degree Programs

A. Scope of programs within the department

The Texas Tech University Department of Physics currently offers three graduate degrees; the Master of Science in Applied Physics, the Master of Science in Physics, and the Doctor of Philosophy in Physics. There are both thesis and non-thesis options for each of the MS degrees. For the Applied Physics MS program, the non-thesis option is based on an internship or a Master’s Exam and a departmental report, while the Physics MS also has an exam-based option (without the report). Both exam-based options are only intended for students pursuing a PhD and require satisfactory performance on the department’s PhD Preliminary Exam, which is treated as a Master’s Comprehensive Exam with a separate decision for this purpose.

We have made significant strides in enlarging and improving the MS and PhD programs in the last six years. The total number of students in the graduate program has nearly doubled in this review period compared to the previous one. Although the number of PhD degrees awarded is nearly the same (16 vs 18), the number of MS degrees awarded in Physics nearly doubled, increasing to 32 compared to 17 in each of the two previous review periods. The Information on the following page shows a longer term view of the department’s graduate programs, including the total program size and the number of new students entering each year, including those starting the previous January.

Until 2001, the Physics Department also offered a PhD in Applied Physics; however it was necessary to consolidate the two PhD degree programs into a single doctoral level program due to the small number of students in the separate programs. The single PhD student who was in the Applied Physics PhD program at that time completed his degree during 2003-2004. We continue to offer an applied physics option within the Physics PhD program, with the same departmental requirements as for the earlier official Applied Physics degree.

The internship option leading to the Applied Physics MS Degree was developed as a ‘Professional Science Masters’ program. This is a terminal MS Degree in terms of its design, although roughly 20% of the graduates have decided to continue toward a PhD in some field, either at Texas Tech or elsewhere. This Internship program was started during the 1996-1997 academic year and specifically targeted the semiconductor industry, although the option has always existed for an individual student to design a program aimed at some other outcome. The initial development of the Applied Physics MS Internship option was greatly enhanced by a large grant from the National Science Foundation that ended in 2001. Early in the previous review period (2001 to 2007) the Applied Physics semiconductor program was linked with a similar program based in the College of Engineering, known as the Program for Semiconductor Product Engineering and strongly tied to Texas Instruments. That link was severed in 2002 because the basic goals for the two programs proved to be incompatible in practice. A fairly large fraction of the Masters Degrees awarded by the Physics Department during the 2001 to 2007 review period were from this internship program. In this review period (2007 to 2013), these numbers have declined, for example, MS Internship program went down to 3 from 22. The main reason was that our primary internship partner, INTEL, terminated their internship programs in 2007 and we stopped recruiting students into the semiconductor focus area. The last two internship-based degrees have been in the medical field. We changed the focus of the Applied Physics program toward on-campus research and added an exam-based option that includes a departmental report as in the internship option. As a result, the overall Applied Physics MS production only decreased from 27 to 18.

Physics
GRADUATE DEGREES: PHYSICS and APPLIED PHYSICS

Physics graduate program history through three program review cycles, including number and type of degrees awarded (by degree options for MS degrees), the number of students enrolled each fall, and the number of graduate students entering each year.

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<td>17 8 9</td>
<td>29 23 6</td>
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* Includes one PhD in Applied Physics

1 Includes students starting in January of the previous academic year.
The specific requirements for each degree option are detailed in the Graduate Booklet (See Appendix D.). PhD core courses are offered every year and a two-year sequence for many of the other courses is outlined in that handbook. The PhD Preliminary Exam process is also detailed in the Graduate Booklet, along with critical steps for all of our other programs.

Research thesis or dissertation based degree options labeled as “applied” allow a student to have a physics-related research project that is based in another department, such as Chemistry, Mathematics, one of the Engineering departments, or in the TTU Health Sciences Center (medical school), under the direction of a faculty member from that department. Faculty from other departments who regularly direct applied physics research projects, or who collaborate extensively with physics faculty, may be offered a Joint Appointment in Physics to put such arrangements on a more official footing.

B. Number and types of degrees awarded

The following is a detailed listing of the graduate degrees awarded by the Physics Department during the six year review period with titles of PhD Dissertations, Masters Theses, and M.S. Reports. This list is separated into sections with respect to the program and, for MS degrees, the option under which the degree requirements were satisfied to match the above summary listing. We note that the official Table which follows this list differs by the one PhD awarded posthumously in 2009.

**Graduate Degrees Awarded**  
**December 2007 – August 2013**

**Ph.D. Dissertations (Physics):**

Mohammad Nazari, *Vibrational and Optical Properties of Vanadium Dioxide*, Aug 2013. (Holtz)

Liming Qiu, *Experimental and Computational Studies of Protein Interactions with Lipid Nanodomains*, May 2013. (Cheng)


Terrance Gibbons, *Thermal Conductivity of Silicon Nanostructures Containing Impurities*, May 2012. (Estreicher)

Jacob Ajimo, *Studies on Propagation, Diffraction and Interference of Surface Plasmon Polariton Beams by Plasmon Tomography*, Dec 2011. (Grave de Peralta)


John Como, *A Europium Complex Doped Silica Sol-Gel Thin Film for Detection of Trace Organophosphate Vapor*, Dec 2010. (Cheng)


Emmanuel Nenghabi, (*First Principles Study of the Properties of Si-Ge Clathrate Alloys*, awarded posthumously, May 2009. (Myles)


**Masters Theses (Physics):**


Lianci Liu, *Nano Fabrication of Silicon Fins*, Dec 2012. (Holtz)

Adam Houk, *Computerized Processing of Plasmon Tomography Images*, Aug 2012. (Grave de Peralta)


Robier Rodriguez, *Plasmon Tomography Far-Field Superlenses*, May 2012. (Grave de Peralta)

Jake R. Schwierking, *Double Resonance Spectroscopy of $n=4$ d and f Rydberg States of H$_2$O*, Aug 2010. (Glab)

Bahar Saremi, *Synthesis of Giant Unilamellar Vesicles (GUVs) from RSE Liposomes in High and Low Ionic Strength Buffers*, Aug 2010. (Huang)

Moses Marchante, *Quantum vs Classical Electrodynamics: Do photons move following lines of energy flux?*, May 2010. (Grave de Peralta)


**Comprehensive Exam-Based Masters (Physics):**

David Pattillo, May 2013.
Mohammed Alshehri, May 2012.
Bahadir Bebek, May 2012.
Huseyin Ekinci, May 2012.
Logan Hancock, May 2012.
Lawrence Hudy, May 2012.
Burcin Mutlu, May 2012.
Terence Libeiro, Dec 2010.
Umut Caglar, Dec 2010.
Chiyoung Jeong, Aug 2009.
Youn Roh, Aug 2009.
Masters Theses (Applied Physics):

Kamrul Alam,  *Double Slit Diffraction Experiment with Surface Plasmon Polaritons*, May 2013. (Grave de Peralta)


Daniel Dominguez,  *Quantum Plasmonics*, May 2012. (Grave de Peralta)

Hendra Tarigan,  *Study of Surface Plasmon - Polariton Propagation in Plasmonic Crystals*, May 2012. (Grave de Peralta)

Amy West,  *Study of the Photon Propagation Paradox*, May 2012. (Grave de Peralta)

Jesse Vernon,  *Characterization of Muonium Centers in Gallium Phosphide*, Dec 2011. (Lichti)


**Internship* or Exam / Report-based Masters (Applied Physics):**


Ebrahim Hassan-Zadeh,  *Diffusion in Cell Membranes*, May 2012. (Huang)

Cholpon Tilegenova,  *Diacylglycerol in Lipid Bilayers: Simulations*, May 2012. (Huang)


Sandeep Sohal,  *Magnetron Sputtered ZnO Studied by Resonance Raman and Photoluminescence*, Dec 2011. (Holtz)


Miranda Martin,  *Burn-In and Device Failure*, Aug 2008.* (Intel)
<table>
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<tr>
<th>University</th>
<th>Data</th>
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C. Undergraduate and graduate semester credit hours

**Semester Credit Hours - Academic Year (Physics Dept)**

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**AY SCH compared to Budget (Physics Dept)**

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<th>Operating Cost</th>
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The department admits students into our graduate programs, not separately into Physics or Applied Physics. We expect M.S. students to make the choice of major when they file their Masters Degree Plans rather than when they first enroll. The “official” graduate numbers are self reported, both regarding degree and major. The officially reported undergraduate enrollment numbers have never been reliable and in some years include students who were accepted and given credit based on work elsewhere, but never actually enrolled at TTU. Dual majors with Physics listed as the second major are always missing from the official TTU program enrollment counts.

The following Table is based on departmental accounting: graduate numbers are composite numbers including both Masters programs and reflect where a student is in their overall program. We make a distinction regarding how many students have completed each step in our two-level Ph.D. qualifying process consisting of passing the Ph.D. Preliminary Exam to be followed later by presentation of the PhD Research Proposal and acceptance by the students Research Advisory Committee.

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E. Course enrollments over the past six years (enrollment trends by course)

- Figures are totals – classes may be offered more than once a year

**Course Enrollments by Academic Year**

*Source: Institutional Research and Information Management*

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The four courses with zero enrollments during this six-year period are as follows:

- PHYS5315 Introduction to General Theory of Relativity (No enrollment in this period)
- PHYS5332 Advanced Semiconductor Processing (No enrollment in this period)
- PHYS5324 Classical Mechanics I (This course was removed from list in 2007)
- PHYS5380 Introduction to Microsystems (This course was removed from list in 2007)
F. Courses cross listed

The Physics department does not have any officially cross-listed courses. A few graduate courses are typically offered jointly with an undersized undergraduate course on the same subject in order to provide more choice of advanced topics for our BS students. The two Semiconductor Processing courses (Phys 5330 and 5332) have traditionally been offered in conjunction with Electrical Engineering courses covering the same topics, but were never officially listed as joint courses.
III. Faculty

A. Number, rank, and demographics of the graduate faculty

![Teaching Resources](image1.png)

![Tenured and Tenure-Track by Rank - Fall Data](image2.png)
Prior to the retirement of Prof. Hatfield as Department Chair in the summer of 2007, there were 22 tenured and tenure track faculty in Physics. The department chose to hire a professional staff member to be Director of Undergraduate Laboratories and to temporarily reduce the number of faculty by one. Since that time the number of faculty has decreased due to retirements and resignations and a hiring pace that failed to keep up. We have hired four new faculty during 2013, with three joining TTU in January and an additional one for the fall, while three faculty either retired or left TTU during that same period. We currently have 19 tenured and tenure track faculty and have three searches presently active. The status of an additional position remains unresolved.

The numbers of non-tenure track faculty and teaching assistants listed in the above Tables do not agree with departmental records in several instances. We have not been able to account for the temporary faculty numbers. Even when counting all professional staff, instructors and teaching post docs who were in the classroom in some capacity, our count is reduced by one in final three years in these Tables. The departments count for 2009-10 has 4 non-tenure track faculty and 30 TAs, rather than 17 of each, so apparently 13 grad student TAs were put in at the faculty level in the “official” count for that year. Departmental records indicate 28 TAs in both 2007-08 and 2008-09 to help fill out these Tables.
B. List of faculty members

*List all faculty who were employed by your department during the six years of this review*

<table>
<thead>
<tr>
<th>FACULTY NAME</th>
<th>JOB TITLE</th>
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<th>END DATE</th>
<th>Member of Grad Faculty? Y or N</th>
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<td>1988</td>
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<td></td>
<td>Y</td>
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<td>Wallace Glab</td>
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<td>Mark Holtz</td>
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<td>1991</td>
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<td>Juyang Huang</td>
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<td>M A K Lodhi</td>
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<td>1963</td>
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<td>2010</td>
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<td>Richard Wigmans</td>
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<td>Ronald Wilhelm</td>
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C. Summary of the number of refereed publications and creative activities.

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N = # of full time faculty contributing  F = # of full time faculty in department

D. Responsibilities and leadership in professional societies

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N = # of full time faculty contributing  F = # of full time faculty in department
E. Graduate Student Committee’s faculty have served for the past 6 years

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<th>Faculty Name</th>
<th>Committees Chaired</th>
<th>Committees Served in department</th>
<th>Committees Served outside department</th>
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<td>S Estreicher</td>
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<td>T Gibson</td>
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<td>M Holtz</td>
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<td>J Huang</td>
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<td>D Lamp</td>
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<td>S-W Lee</td>
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<td>I Volobouev</td>
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<td>R Wigmans</td>
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<td>R Wilhelm</td>
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* Portfolio based MS within the multi-disciplinary MSc program

F. Assess average faculty productivity for Fall semesters only (use discipline appropriate criteria to determine)

### Average Faculty Workload

<table>
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<tr>
<th>FACULTY WORKLOAD</th>
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<th>2008</th>
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<th>2010</th>
<th>2011</th>
<th>2012</th>
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<td>University</td>
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<td>15.35</td>
<td>19.49</td>
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</table>

Physics
College SCH/FTE - Fall Data
(Arts and Sciences)

Source: Institutional Research and Information Management
Chart prepared by the Graduate School

<table>
<thead>
<tr>
<th>Year</th>
<th>SCH/FTE for Total Faculty</th>
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<tbody>
<tr>
<td>07/08</td>
<td>235</td>
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<tr>
<td>08/09</td>
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<td>09/10</td>
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<td>11/12</td>
<td>257</td>
</tr>
<tr>
<td>12/13</td>
<td>257</td>
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</tbody>
</table>

Department SCH/FTE - Fall Data
(Physics)

Source: Institutional Research and Information Management
Chart prepared by the Graduate School

<table>
<thead>
<tr>
<th>Year</th>
<th>SCH/FTE for Total Faculty</th>
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<tbody>
<tr>
<td>07/08</td>
<td>207</td>
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<tr>
<td>08/09</td>
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<tr>
<td>09/10</td>
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<td>10/11</td>
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<td>11/12</td>
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<tr>
<td>12/13</td>
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Physics
IV. Graduate Students

A. Demographics of applicants and enrolled students

We note that application statistics for 2007 and 2008 appear not to be available from the University. This was prior to the changeover to the current student record system. The department also did not maintain accurate application records for that period under the assumption that was the responsibility of the university’s Graduate Admissions office.

Based on the demographic tables which follow, a number of observations can be made:
Other than the unusually large number (70!) of applicants to our graduate programs in 2009, the number of applicants for graduate admission to our department has remained in the range of 40 or so per year. This is consistent with several previous years also. The slight decrease in the number of applicants admitted from 2009 to 2012 is due, in part, to the fact that, in 2009 a change was made of the person who is assigned to handle recruitment and admission of graduate students. At the same time, the admission standards have also been slowly increasing during that time. This trend of increasing admission standards is clearly seen in the data tables of applicants GRE scores and undergraduate GPA’s, which are presented in Parts B and C below.

Starting in about 2009, the percentage of applicants to our graduate programs from outside the US significantly increased. It has remained at more than 50% since that time. From the tables, it is also clear that the vast majority of domestic applications have been from outside of Texas.

These demographic trends for physics graduate students at TTU are reasonably consistent with the nationwide trends for physics graduate students, obtained and reported by the American Institute of Physics Statistical Research Center. See: http://www.aip.org/statistics/. Their 2012 report “First Year Physics Graduate Students: Characteristics and Background”, is available at: http://www.aip.org/statistics/trends/reports/1styeargrad.pdf. That report finds that the number of students enrolling in physics graduate programs has remained relatively unchanged in recent years, just as we have seen (except for 2009!). It also points out that this period of stability follows steady increases in graduate-level enrollments at doctoral-granting departments during the late 1990’s and early 2000’s. This report also notes a national trend for Physics Departments that is not consistent with the demographics of the physics graduate students at TTU. Specifically, physics programs in the U.S. continue to attract students from all over the world, just as we have found. The report’s findings are, however, that recent incoming classes of physics graduate students were comprised of 43% non-U.S. citizens. As mentioned above, the percentage of Physics graduate students at TTU who are from outside the US has been greater than 50% for a few years now.
Physics
### Physics

#### Graduate Applicants - Fall Data

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Physics
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B. Test scores (GRE, GMAT and/or TOEFL) of enrolled students

Average GRE Scores for Enrolled Graduate Students - Fall Data (Physics)

Average GRE Scores for Enrolled Graduate Students - Fall Data (Applied Physics)

Physics
C. GPA of new students
D. Time to Degree in Years – Average years to graduate for all students graduating

**Time to Degree in Years**

*Physics*

Source: Institutional Research and Information Mgmt
Chart prepared by The Graduate School

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Average years to graduate for all students graduating each year

**Time to Degree in Years**

*Applied Physics*

Source: Institutional Research and Information Mgmt
Chart prepared by The Graduate School

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Average years to graduate for all students graduating each year

Physics
E. Number of RA’s, TA’s or GPTI’s, with total number of graduate students in the program.

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<th>Academic Year (Fall Data)</th>
<th>Number of Teaching Assistants</th>
<th>Number of Research Assistants</th>
<th>Total Number of Graduate Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
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<tr>
<td>2009</td>
<td>26</td>
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<tr>
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<td>2013</td>
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</tr>
<tr>
<td>2014</td>
<td>41</td>
<td>11</td>
<td>57</td>
</tr>
</tbody>
</table>

We have had to rely on TAs from outside the department in many years, typically using students who transferred to another TTU department after receiving an MS from us and with previous experience as a Physics TA.

F. Initial position and place of employment of graduates over the past 6 years

<table>
<thead>
<tr>
<th>Name</th>
<th>Initial Position</th>
<th>Initial Employer</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Physics Doctorate</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2012-2013</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mohammad Nazari</td>
<td>Research Associate</td>
<td>Texas State U.</td>
<td>San Marcos TX</td>
</tr>
<tr>
<td>Liming Qiu</td>
<td>Research Associate</td>
<td>U. of Missouri</td>
<td>Columbia Mo</td>
</tr>
<tr>
<td><strong>2011-2012</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Md. Alwarawrah</td>
<td>Teaching Post Doc</td>
<td>Texas Tech U.</td>
<td>Lubbock TX</td>
</tr>
<tr>
<td>Terrance Gibbons</td>
<td>Research Associate</td>
<td>Texas Tech U.</td>
<td>Lubbock TX</td>
</tr>
<tr>
<td>Jacob Ajimo</td>
<td>Instructor</td>
<td>Texas Tech U.</td>
<td>Lubbock TX</td>
</tr>
<tr>
<td>Chiyoung Jeong</td>
<td>Resident, Med Phys</td>
<td>National Cancer Ctr</td>
<td>Korea</td>
</tr>
<tr>
<td>Youn Roh</td>
<td>Research Associate</td>
<td>Ewha Womans U</td>
<td>Seoul Korea</td>
</tr>
<tr>
<td><strong>2010-2011</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jian Dai</td>
<td>Research Associate</td>
<td>U. South Florida</td>
<td>Tampa FL</td>
</tr>
<tr>
<td>John McCuin</td>
<td>Assistant Professor</td>
<td>Dallas Baptist U.</td>
<td>Dallas TX</td>
</tr>
<tr>
<td>John Como</td>
<td>Process Engineer</td>
<td>INTEL</td>
<td>Rio Rancho NM</td>
</tr>
<tr>
<td><strong>2009-2010</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Daniel Backlund</td>
<td>Systems Manager</td>
<td>TTUHSC</td>
<td>Lubbock TX</td>
</tr>
<tr>
<td>Brent Ross Carroll</td>
<td>Assistant Professor</td>
<td>Arkansas State U.</td>
<td>Jonesboro AR</td>
</tr>
<tr>
<td>Kenneth Carrell</td>
<td>LAMOST Fellow</td>
<td>Nat Astronomical Obs</td>
<td>Beijing China</td>
</tr>
<tr>
<td>Year</td>
<td>Name</td>
<td>Role</td>
<td>Institution</td>
</tr>
<tr>
<td>----------</td>
<td>-----------------------------</td>
<td>-----------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>2008-2009</td>
<td>Emmanuel Nenghabi</td>
<td>(Deceased)</td>
<td></td>
</tr>
<tr>
<td>2007-2008</td>
<td>Kazim Gumus</td>
<td>Research Associate</td>
<td>U. Hawaii</td>
</tr>
<tr>
<td></td>
<td>William Lee Powell</td>
<td>Assistant Professor</td>
<td>Texas Lutheran U.</td>
</tr>
<tr>
<td></td>
<td><strong>Physics Masters</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012-2013</td>
<td>Abdulaziz Al Mogeeth</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td></td>
<td>R Udugama Arachch.</td>
<td>PhD student</td>
<td>TTU, Chemistry</td>
</tr>
<tr>
<td></td>
<td>A. Jessica Wacheux</td>
<td>Student</td>
<td>TTU, ECE</td>
</tr>
<tr>
<td></td>
<td>Jeun Yoo</td>
<td>PhD student</td>
<td>LSU, Physics</td>
</tr>
<tr>
<td></td>
<td>Lianci Liu</td>
<td>PhD student</td>
<td>TTU, ECE</td>
</tr>
<tr>
<td></td>
<td>Vanalet Rusuryi</td>
<td>Instrumentation Engr</td>
<td>MD Anderson</td>
</tr>
<tr>
<td></td>
<td>Milinde Pattanayak</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td></td>
<td>David Pattillo</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td>2011-2012</td>
<td>Adam Houk</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>James Matthews</td>
<td>PhD student</td>
<td>TTU, ECE</td>
</tr>
<tr>
<td></td>
<td>Andris Docaj</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td></td>
<td>Robier Rodriguez</td>
<td>Field Engineer</td>
<td>? Oil Company</td>
</tr>
<tr>
<td></td>
<td>Mohammed Alshehri</td>
<td>Instructor</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bahadir Bebek</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td></td>
<td>Huseyin Ekinci</td>
<td>PhD student</td>
<td>TTU, ECE</td>
</tr>
<tr>
<td></td>
<td>Logan Hancock</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td></td>
<td>Lawrence Hudy</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td></td>
<td>Burcin Mutlu</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2010-2011</td>
<td>Umut Caglar</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td></td>
<td>Terence Libeiro</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td>2009-2010</td>
<td>Eda Baykal-Caglar</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td></td>
<td>Jake Schwierking</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td></td>
<td>Bahar Saremi</td>
<td>Pre-Med Student</td>
<td>TTU</td>
</tr>
<tr>
<td></td>
<td>Moses Marchante</td>
<td>Telescope Operator</td>
<td>Apache Point Obs.</td>
</tr>
<tr>
<td>2008-2009</td>
<td>Youn Roh</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td></td>
<td>Chiyounge Jeong</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td></td>
<td>Brittany Baker</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td></td>
<td>Patrick Mengyan</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td></td>
<td>Alicja Idziaszek</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year</td>
<td>Student Name</td>
<td>Title</td>
<td>Institution</td>
</tr>
<tr>
<td>-------------</td>
<td>----------------------</td>
<td>---------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>2007-2008</td>
<td>John Como</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td></td>
<td>Wei Wang</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td></td>
<td>Pankaj Pandit</td>
<td>PhD student</td>
<td>Florida International</td>
</tr>
<tr>
<td><strong>Applied Physics MS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012-2013</td>
<td>Kamrul Alam</td>
<td>PhD student</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mahmoud Yaqoub</td>
<td>PhD student</td>
<td>NI U, Physics</td>
</tr>
<tr>
<td><strong>2011-2012</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Gulten Karaoglan</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td></td>
<td>E. Hassan-Zadeh</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td></td>
<td>Cholpon Tilegenova</td>
<td>PhD student</td>
<td>TTUHSC</td>
</tr>
<tr>
<td></td>
<td>Mohammad Nazari</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td></td>
<td>Sandeep Sohal</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td></td>
<td>Ongard Thiabghoh</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td></td>
<td>Lyndon Bastatas</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Daniel Dominguez</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td></td>
<td>Hendra Tarigan</td>
<td>PhD student</td>
<td>TTU, ECE</td>
</tr>
<tr>
<td></td>
<td>Amy West</td>
<td>Design Engineer</td>
<td>Ludlum Inc.</td>
</tr>
<tr>
<td></td>
<td>Jesse Vernon</td>
<td>Demolition Engineer</td>
<td>? Construction Co</td>
</tr>
<tr>
<td><strong>2010-2011</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Denis Myasishchev</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td></td>
<td>Ali Mohammed</td>
<td>PhD student</td>
<td>Northeastern- MatSci</td>
</tr>
<tr>
<td><strong>2009-2010</strong></td>
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<td></td>
<td></td>
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<tr>
<td><strong>2008-2009</strong></td>
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<tr>
<td></td>
<td>Micah Gatz</td>
<td>US Military</td>
<td></td>
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<tr>
<td></td>
<td>Brent Ross Carroll</td>
<td>PhD student</td>
<td>TTU, Physics</td>
</tr>
<tr>
<td><strong>2007-2008</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Miranda Martin</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
G. Type of financial support available for graduate students

The department supports essentially all incoming graduate students as TAs for the first year unless they are fully supported by their home country. Each research group then supports their research students as allowed by their grants. The College has provided some RA support in a few years and occasionally during the summer. The Department has three Scholarship Endowments that are specifically for Graduate Students, which at present can provide approximately $25,000 in scholarships to be distributed each year. We make sure that any grad student that is not supported by any other means receives a sufficient scholarship to qualify for in-state tuition in order to minimize their costs. Several of our students have received federal work study support and various types of loans are available and are administered through the university’s financial aid office.

H. Number of students who have received national and university fellowships, scholarships and other awards

<table>
<thead>
<tr>
<th>AWARD</th>
<th>07/08</th>
<th>08/09</th>
<th>09/10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>AT&amp;T Chancellor’s</td>
<td>3,000</td>
<td>2,000</td>
<td>6,000</td>
</tr>
<tr>
<td>Hazlewood</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Helen Devitt Jones</td>
<td></td>
<td>3,500</td>
<td>3,500</td>
</tr>
<tr>
<td>HD Jones PT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summer Dissertation</td>
<td>2,300</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outside Fellowships</td>
<td>36,000</td>
<td>36,000</td>
<td>51,000</td>
</tr>
<tr>
<td>Total</td>
<td>41,300</td>
<td>41,500</td>
<td>60,500</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AWARD</th>
<th>10/11</th>
<th>11/12</th>
<th>12/13</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>AT&amp;T Chancellor’s</td>
<td>1,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazlewood</td>
<td></td>
<td></td>
<td>3,000</td>
</tr>
<tr>
<td>Helen Devitt Jones</td>
<td>3,500</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HD Jones PT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Summer Dissertation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outside Fellowships</td>
<td>24,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>28,500</td>
<td></td>
<td>3,000</td>
</tr>
</tbody>
</table>

Physics
I. Percentage of full time master and doctoral students who received financial support.

The Department of Physics only very occasionally admits graduate students with no support. In those few cases, assuming satisfactory performance we will pick up their support starting in their second semester. Currently about 10-12% of our graduate students are supported by their home countries; a few of these have additional support as TAs since we typically often need extra help in labs and discussion sections. We have provided at least one year’s worth of TA support for international students who do not initially pass the ITA workshop and thus cannot be placed in the classroom; they receive assignments as graders or in other support roles outside the classroom. Over the recent past, over 95% of our graduate students have financial support at the typical Assistantship level or are supported by their home governmants. The few remaining students have been provided with scholarship support of a minimum $1000 per year so that they can receive in-state tuition rates.

J. Graduate Student Publications and Creative Activities – Number of discipline-related refereed papers/publications, juried creative/performance accomplishments, book chapters, books, and external presentations by Master and Doctoral students in the department.

<table>
<thead>
<tr>
<th>Publication:</th>
<th>Refereed</th>
<th>Non-Refereed</th>
<th>Oral or Poster presentations</th>
<th>Other activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>9</td>
<td>63</td>
<td>8</td>
<td>45</td>
</tr>
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<td>2011</td>
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<td>2008</td>
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<td>18</td>
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<tr>
<td>2007</td>
<td>8</td>
<td>34</td>
<td>13</td>
<td>41</td>
</tr>
</tbody>
</table>

The numbers reported in this table are based on publications and presentations reported on Annual Faculty Reports. The publication count is number of graduate student co-authors rather than number of publications. This count includes an estimate for the HEP group based on number of papers for which TTU faculty had major input, since they did not list the full set of authors, just “CMS Collaboration” or “CDF Collaboration”, etc. The numbers of student presentations is certainly undercounted per faculty comments on AFRs. We have not kept any records related to non-refereed publications for graduate students, but those numbers are almost certainly very small and in the form of non-refereed conference proceedings. We typically do not include published Abstracts in faculty or student publication counts. There were at least 6 undergraduate co-authors on publications and 12 undergraduate presentations in this period.

Physics
K. Programs for mentoring and professional preparation of graduate students

A formal mentoring program does not exist. However, graduate students are strongly urged by the Graduate Advisor and others to affiliate with a research group early in their time at TTU. Once a student becomes part of a research group, the faculty research supervisor(s) then plays the role of professional mentor to the students in their group from this point until they graduate with an MS or a PhD. In addition to their research advisor, the Physics Graduate Advisor acts as the primary academic advisor and mentor (regarding coursework and curriculum) to each of the graduate students for their entire time at TTU.

Many faculty also act as informal mentors to the physics graduate students for their entire time at TTU. This occurs primarily in social settings. For example, the department provides drinks and snacks in our conference room 30 minutes before the weekly research colloquia. In that setting, graduate students and faculty can engage in conversation about many different topics. There are also other department related social events which are held during the year at which graduate students and faculty can have informal conversations. For example, near the end of each Spring semester, there is an annual banquet which features students who receive scholarship awards. It is in these social settings and the resulting conversations that considerable faculty mentoring of graduate student takes place.

Professional preparation and training of graduate students occurs during their entire time at TTU. For example, most research advisors require their graduate students to attend appropriate regional or national research conferences to present an oral or a poster on some of their recent research results. The department views this as an important part of a graduate student’s professional education and training. As a result, some departmental financial assistance usually is available to cover at least some of the associated travel expenses. Many research advisors also require their graduate students, before their graduation, to participate in writing one or more research papers and submit them to appropriate peer-reviewed journals for publication.
I. Department efforts to retain students and graduation rates.

A formal program aimed at retention of graduate students does not exist. However, the social interactions described in Section K can also have a strong effect on the graduate students’ perception of the department’s appreciation of the fact that they are important members of the department. While the retention effects of such interactions cannot be quantified, they certainly have a positive effect on the retention of students in our programs.

The graduation rates for our MS and PhD programs are enhanced by the timing and scheduling of our graduate course offerings. From the time a graduate student is admitted to our MS or PhD program, the Graduate Advisor and other faculty stress the fact that they should have a goal of graduation as soon as possible. To this end, the scheduling of our graduate core courses is designed to enable a graduate student to be prepared to take the PhD Preliminary Exam after they have been in the program for one year. Students in the PhD Program are, except under unusual circumstances, required to take this Exam as soon as it is offered after they have been in the department for one year. If a student does not pass this exam, they are allowed to take it, at most, a second time. Further, the second time must be the next time the exam is offered again.

The Physics Graduate Advisor also plays an important role in enhancing the graduation rates for the MS and PhD. Specifically, every graduate student is required to meet with the Graduate Advisor once each semester to discuss their progress towards graduation, as well as to be advised on the courses they should take during the next semester. The Graduate Advisor also requires each graduate student to file an official Degree Plan with the Graduate School after they have been in our program one semester. By this means, a student will have a definite idea exactly what remains for them to complete before they can graduate. This will enable them to assess for themselves how fast or slowly they are moving in their curriculum towards graduation.

M. Percentage of Full-Time Master and Doctoral students per year – Fall Data

Essentially 100% of Physics and Applied Physics graduate students are full time. The few who do not fall into that category are typically “on leave” and enrolled in a single hour per semester in order to stay on the student rolls, rather than taking any classes. This number has not exceeded 2 or perhaps 3 in any given semester.
V. Department

A. Department operating expenses

<table>
<thead>
<tr>
<th>Year</th>
<th>Dept Op. Cost</th>
<th>Faculty &amp; Staff</th>
<th>Dept Op Cost/FS</th>
</tr>
</thead>
<tbody>
<tr>
<td>07/08</td>
<td>$297,472</td>
<td>2,098,496</td>
<td>14.18 %</td>
</tr>
<tr>
<td>08/09</td>
<td>$335,837</td>
<td>2,142,810</td>
<td>15.67 %</td>
</tr>
<tr>
<td>09/10</td>
<td>$327,796</td>
<td>1,981,607</td>
<td>16.54 %</td>
</tr>
<tr>
<td>10/11</td>
<td>$396,252</td>
<td>1,910,393</td>
<td>20.74 %</td>
</tr>
<tr>
<td>11/12</td>
<td>$321,946</td>
<td>1,717,924</td>
<td>18.74 %</td>
</tr>
<tr>
<td>12/13</td>
<td>$343,904</td>
<td>2,012,456</td>
<td>17.09 %</td>
</tr>
</tbody>
</table>

A significant amount of staff salaries have been shifted away from state funded accounts over the displayed time period which distorts the year-to-year changes. There was also a substantial carryover from FY-10 to FY-11 in non-salary operating funds which skews the ratios for those years. The graph which follows demonstrate the shift in staff salaries from state funds to student fees and other sources. The second graph shows an even stronger transfer of Teaching Assistant stipends out of state funds onto student fees over the last few years.
Source of funds for Staff Salaries

Source of Funds for Teaching Assistant Stipends

Physics
B. Summary of Proposals (submitted)

**Summary of Number of Proposals Written and Accepted**

<table>
<thead>
<tr>
<th></th>
<th>Foundation</th>
<th>State</th>
<th>Federal</th>
<th>Others</th>
<th>Successfully funded</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>D</td>
<td>M</td>
<td>D</td>
<td>M</td>
<td>D</td>
</tr>
<tr>
<td>2011</td>
<td>2</td>
<td>2</td>
<td>9</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>2010</td>
<td>3</td>
<td>1</td>
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</tr>
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<td>2009</td>
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<td>2</td>
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<tr>
<td>2008</td>
<td>3</td>
<td>1</td>
<td>8</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>2007</td>
<td>2</td>
<td>2</td>
<td>8</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>2006</td>
<td>5</td>
<td>1</td>
<td>8</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

D = proposals written by CO-PI’s from your department only
M = proposals written by CO-PI’s from multiple departments

The numbers in this table are based on reports from ORS. In a few years the numbers of proposals with co-PIs from multiple departments may be under counted. Several proposals that were reported in Annul Faculty Reports do not show up in the ORS reports, and in some cases proposals that were actually funded also do not show up on the proposal reports. The proposal numbers were adjusted to account for all of those funded, but most likely under counts others.

**Source: Office of Research Services**

<table>
<thead>
<tr>
<th>BY CATEGORY</th>
<th>BY STATUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal</td>
<td>Federal Pass-Through</td>
</tr>
<tr>
<td>Years</td>
<td>D</td>
</tr>
<tr>
<td>2012</td>
<td>5</td>
</tr>
<tr>
<td>2011</td>
<td>11</td>
</tr>
<tr>
<td>2010</td>
<td>7</td>
</tr>
<tr>
<td>2009</td>
<td>13</td>
</tr>
<tr>
<td>2008</td>
<td>9</td>
</tr>
<tr>
<td>2007</td>
<td>6.99</td>
</tr>
<tr>
<td>Grand Total</td>
<td>51.99</td>
</tr>
</tbody>
</table>

* The number of proposals are calculated by summing up the percentage contribution of the faculty on the given proposal.

D = Disciplinary (internal)  M = Multidisciplinary (external)
C. External Research expenditures

**SUMMARY OF FACULTY AWARDS BY HOME DEPARTMENT**

*Source: Office of Research Services*

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Awards</th>
<th>Facilities &amp; Administrative</th>
<th>Award Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>07/08</td>
<td>19.02</td>
<td>226,878</td>
<td>2,445,824</td>
</tr>
<tr>
<td>08/09</td>
<td>14.53</td>
<td>192,338</td>
<td>1,865,025</td>
</tr>
<tr>
<td>09/10</td>
<td>16.93</td>
<td>581,231</td>
<td>3,424,456</td>
</tr>
<tr>
<td>10/11</td>
<td>13.88</td>
<td>225,347</td>
<td>1,608,860</td>
</tr>
<tr>
<td>11/12</td>
<td>12.05</td>
<td>120,260</td>
<td>1,107,672</td>
</tr>
<tr>
<td>12/13</td>
<td>9.64</td>
<td>119,338</td>
<td>1,001,507</td>
</tr>
</tbody>
</table>

**Totals:** 86.05 $1,465,393 $11,383,344

The amounts reported in this table are from grants received in each year. The 09-10 high value includes about $530,000 that that is a second year’s funding received just prior to the end of the fiscal year, but then appears in later expenditures. The low percentage of F&A generated is due to several large grants with off-campus F&A rates: two of the better funded research groups fall into this category.

### Research Awards (Physics)

*Source: Office of Research Services*  
*Chart prepared by The Graduate School*

<table>
<thead>
<tr>
<th>Year</th>
<th>Award Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>07/08</td>
<td>2,445,824</td>
</tr>
<tr>
<td>08/09</td>
<td>1,805,025</td>
</tr>
<tr>
<td>09/10</td>
<td>3,424,456</td>
</tr>
<tr>
<td>10/11</td>
<td>1,008,860</td>
</tr>
<tr>
<td>11/12</td>
<td>1,107,672</td>
</tr>
<tr>
<td>12/13</td>
<td>1,001,507</td>
</tr>
</tbody>
</table>
The above graph represents funds awarded as external grants during each year. The following Table is a more accurate accounting of the research expenditures. The final line in the TTU Physics research expenditures is a more appropriate amount to be used for comparison with the listed peer institutions rather than grant award totals from the above Table. Total expenditures from projects with Physics Co-PIs are shown in the Table below.

## Total Research Expenditures: Projects with Physics PIs and co-PIs

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics Dept Accts</td>
<td>$3,003,357</td>
<td>$1,506,703</td>
<td>$2,075,715</td>
<td>$2,110,747</td>
<td>$2,153,664</td>
<td>$1,871,364</td>
</tr>
<tr>
<td>NanoTech: Phys co-PIs</td>
<td>$1,530,782</td>
<td>$4,661,608</td>
<td>$1,936,957</td>
<td>$2,455,001</td>
<td>$1,063,975</td>
<td>$394,960</td>
</tr>
<tr>
<td>Education: Phys co-PIs</td>
<td>$145,593</td>
<td>$371,869</td>
<td>$432,014</td>
<td>$800,216</td>
<td>$1,226,526</td>
<td>$1,120,140</td>
</tr>
</tbody>
</table>

## Comparison of Research Expenditures

<table>
<thead>
<tr>
<th>Institution</th>
<th>07/08</th>
<th>08/09</th>
<th>09/10</th>
<th>10/11</th>
<th>11/12</th>
<th>12/13</th>
</tr>
</thead>
<tbody>
<tr>
<td>University of Kansas</td>
<td>$3,356,116</td>
<td>$2,568,515</td>
<td>$2,930,826</td>
<td>$4,103,063</td>
<td>$4,409,928</td>
<td></td>
</tr>
<tr>
<td>University of Oklahoma</td>
<td>$2,270,899</td>
<td>$2,455,040</td>
<td>$3,900,000</td>
<td>$5,400,000</td>
<td>$4,416,000</td>
<td>$4,147,217</td>
</tr>
<tr>
<td>West Virginia University</td>
<td>$2,037,715</td>
<td>$3,718,428</td>
<td>$1,325,499</td>
<td>$962,413</td>
<td>$1,119,280</td>
<td>$944,025</td>
</tr>
<tr>
<td>Oklahoma State University</td>
<td>$1,879,000</td>
<td>$2,097,000</td>
<td>$3,928,000</td>
<td>$2,088,000</td>
<td>$1,409,000</td>
<td>$4,519,000</td>
</tr>
<tr>
<td>University of Alabama</td>
<td>$2,998,839</td>
<td>$2,472,533</td>
<td>$8,104,194</td>
<td>$2,699,109</td>
<td>$5,851,189</td>
<td>$2,095,053</td>
</tr>
<tr>
<td>University of South Carolina</td>
<td>$2,445,824</td>
<td>$1,605,025</td>
<td>$3,424,458</td>
<td>$1,608,863</td>
<td>$1,107,872</td>
<td>$1,001,507</td>
</tr>
</tbody>
</table>

Physics
D. Internal Funding

Source of Internal Funds (TTU)

<table>
<thead>
<tr>
<th>Line Items</th>
<th>07/08</th>
<th>08/09</th>
<th>09/10</th>
<th>10/11</th>
<th>11/12</th>
<th>12/13</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research Development</td>
<td>70,903</td>
<td>89,682</td>
<td>24,453</td>
<td>40,820</td>
<td>19,116</td>
<td>15,983</td>
</tr>
<tr>
<td>Research Incentive</td>
<td>26,073</td>
<td>620</td>
<td>9,842</td>
<td>131,667</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Equipment Start up</td>
<td>111,970</td>
<td>24,622</td>
<td>99,200</td>
<td>215,323</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faculty Start-up (HEAF)</td>
<td>129,270</td>
<td>174,810</td>
<td>238,233</td>
<td>34,222</td>
<td>63,922</td>
<td>714,366</td>
</tr>
<tr>
<td>Matching from VP of Research</td>
<td>149,252</td>
<td>145,205</td>
<td>178,024</td>
<td>267,163</td>
<td>337,692</td>
<td>281,291</td>
</tr>
<tr>
<td>Special needs and opportunities</td>
<td>51,138</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Graduate School Fellowships</td>
<td>2,300</td>
<td>5,500</td>
<td>6,500</td>
<td>4,500</td>
<td>3,000</td>
<td></td>
</tr>
<tr>
<td>HEAF (non Start-up)</td>
<td>19,676</td>
<td>133,813</td>
<td>27,611</td>
<td>11,065</td>
<td>22,470</td>
<td></td>
</tr>
<tr>
<td><strong>TOTALS:</strong></td>
<td>483,371</td>
<td>624,770</td>
<td>498,894</td>
<td>446,525</td>
<td>441,637</td>
<td>1,384,100</td>
</tr>
</tbody>
</table>

All amounts in the above table were taken from actual expenditures in that year, except for new faculty start-up in 12/13 which are the amounts committed, some of which extend into future years. The amounts for FY-2008 may be incomplete, since that was pieced together from departmental records (incomplete). Only research accounts for FY-08 appear to have been transferred into the current accounting and reporting system.

E. Scholarships and endowments

The Physics department has endowments totaling $3,538,293 as of the end of fiscal year 2013. The largest endowment of just over $2.55 Million is for the Bucy Chair. There are three endowed scholarships specifically for graduate students which total close to $486,000, plus ten scholarships primarily for undergraduate physics or astronomy students. The net scholarship endowment amount for the department is just over $980,000. The following Table lists the total amount of Departmental Scholarships awarded in the last few years along with offers made (*) for the current academic year.

Departmental Scholarship Awards by Year

<table>
<thead>
<tr>
<th>Scholarships\Yr</th>
<th>2008-09</th>
<th>2009-10</th>
<th>2010-11</th>
<th>2011-12</th>
<th>2012-13</th>
<th>2013-14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate</td>
<td>8,000</td>
<td>22,500</td>
<td>27,225</td>
<td>23,000</td>
<td>23,810</td>
<td>25,900</td>
</tr>
<tr>
<td>Undergraduate</td>
<td>12,750</td>
<td>14,000</td>
<td>23,050</td>
<td>15,100</td>
<td>14,400</td>
<td>22,300</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>20,750</strong></td>
<td><strong>36,500</strong></td>
<td><strong>50,275</strong></td>
<td><strong>38,100</strong></td>
<td><strong>38,210</strong></td>
<td><strong>48,200</strong></td>
</tr>
</tbody>
</table>
F. Departmental resources for research and teaching (i.e., classroom space, lab facilities)

Source: Facilities and Planning

<table>
<thead>
<tr>
<th>Type of Space</th>
<th>Number of Rooms</th>
<th>TotalAssignable Square Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>OFFICES:</td>
<td>48</td>
<td>9,433.19</td>
</tr>
<tr>
<td>LABS:</td>
<td>37</td>
<td>19,649.15</td>
</tr>
<tr>
<td>STORAGE:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIBRARY:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OTHER</td>
<td>3</td>
<td>2,319.57</td>
</tr>
<tr>
<td>TOTAL SQUARE FEET</td>
<td></td>
<td>31401.91</td>
</tr>
</tbody>
</table>

Departmental records indicate a total space assignment of 31,926 ft$^2$, roughly divided as follows: eleven teaching laboratories @ 7245 ft$^2$, thirteen research laboratories @ 9538 ft$^2$, seven service rooms @ 4125 ft$^2$ for teaching and research including mechanical and electrical shop services, eleven spaces @ 2596 ft$^2$ for departmental operations that are labeled as offices by TTU, and thirty-six offices @ 6177 ft$^2$ to be used for faculty, post docs and graduate students; plus the Preston F. Gott Observatory located off campus containing a total of 2246 ft$^2$, including a new observing platform outfitted with six telescopes under a roll-off roof that is intended primarily for teaching use. The Table above, based on University records, includes one room currently assigned to Geosciences and does not include the latest space at the Observatory. Four of the research labs need to be renovated for incoming new faculty or for other usage, and we have a shortage of office space. Any continued growth of graduate programs is seriously limited by these space issues.

G. HEAF expenditures

<table>
<thead>
<tr>
<th>Labs</th>
<th>Classroom</th>
<th>Other (Start-up)</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>22,470</td>
<td>714,366</td>
<td>741,222</td>
</tr>
<tr>
<td>2012</td>
<td>110,065</td>
<td>63,922</td>
<td>173,987</td>
</tr>
<tr>
<td>2011</td>
<td>25,420</td>
<td>34,222</td>
<td>59,642</td>
</tr>
<tr>
<td>2010</td>
<td>27,611</td>
<td>238,233</td>
<td>265,844</td>
</tr>
<tr>
<td>2009</td>
<td>133,813</td>
<td>174,810</td>
<td>308,623</td>
</tr>
<tr>
<td>2008</td>
<td>19,676</td>
<td>129,270</td>
<td>148,946</td>
</tr>
</tbody>
</table>

The 2013 amount listed for start-up is the amount committed to three new faculty who started in January 2013. Much of this commitment will not be spent until later years; a total of

Physics
only $37,952 was paid out during FY-2013. All other amounts represent expenditures during the listed fiscal years.

H. External Program Accreditation – Name of body and date of last program accreditation review, if applicable. Include description of body and accreditation specifics.

Following the decision to terminate the Engineering Physics BS program in 2007, there have been no Physics programs that are externally accredited. That program had been accredited through the standard engineering accrediting body, ABET.
VI. Conclusion

The Physics graduate program has grown significantly during this six-year review period, with enrollment increasing by roughly 50%. We have taken other appropriate steps to make sure that degree production will remain at acceptable levels going forward. Research productivity has grown in terms of publications and conference presentations for both faculty and students. Grant funding grew early in this period to a high for the department in FY-2010, but had dropped off in the last couple of years as federal support has gotten very tight. We are currently in the process of a significant turnover in faculty with the expectation that with younger, more active researchers, the funding levels and research productivity will resume a generally upward trend.

Going forward, there are several major challenges facing the department, with the space issues perhaps the most important because that will eventually seriously impact everything else in a negative way if it is not dealt with satisfactorily. Increasing the research funding and the number of well-supported Research Assistantships for PhD students must be a top priority for the Physics faculty. Obtaining sufficient support for the number of Teaching Assistants needed to support a growing service teaching load requires institutional commitment that would assist in continuing growth of our graduate program as well. We address the major issues in more detail in what follows, and make specific requests for action by the University.

**Space Needs:** The Department of Physics has serious space issues that will require significant financial commitment from the University if our graduate program is to continue its recent growth. At present we have only 36 offices for 20 faculty, 12 post-docs, temporary and visiting faculty, and nearly 60 graduate students, which obviously is insufficient. We are currently searching for three more faculty, plus there is one additional vacancy. We have four available research labs that require significant renovation, but which will minimally meet immediate research lab needs. There are three large rooms and two other large office-sized rooms that make up the Mechanical and Electrical Shop operations. Geosciences and Physics have jointly requested an addition to the Science Building to move these and other support services out of the existing building in order to make over 5,000 ft² of existing space available for other uses. This would help, but a second Experimental Sciences Building in the central campus that is dedicated to some mix of Physics, Chemistry, and Materials research, plus a centralized science teaching building could provide a realistic long-range solution to our space deficit.

**Request:** We request that the University make a commitment to finding a short-range solution to our immediate space needs and that every consideration be given to Physics as TTU moves to meet its long-range research and education infrastructure needs.

**Research Funding and Institutional Support:** The Physics department has historically been heavily involved in interdisciplinary research efforts. We have recently lost a very active researcher, in part due to the lack of institutional support for an interdisciplinary research center. While securing sufficient funding for their research effort is the responsibility of the faculty, it is the responsibility of the institution to provide the necessary infrastructure. Having an internal source of funds to be used as “bridging” support for strong research groups that have a short-term loss of grant funding, and to provide the technical support staff and maintenance of major equipment for large research groups and research centers would greatly enhance the ability of Physics
such groups to weather down cycles in grant support, as well as improve chances for securing large scale grants and contracts.

**Request:** The University needs to increase internal support for major research efforts, and to maintain the technical support infrastructure of such groups, especially interdisciplinary efforts.

**Increased Support for Graduate Students:** Teaching and Research Assistantships are the traditional sources for financial support for graduate students. The physics department needs to raise the level of financial support for new graduate students, in the form of Assistantships and Scholarships or Fellowships, to be competitive in graduate recruitment, and especially to help make TTU attractive to the best domestic students. We have had to shift much of the burden of Teaching Assistant support over to student fees in recent years as the number of TAs required to meet the demands of an increase in undergraduate enrollments and the restructuring of our large service courses to meet this demand within the constraints of available teaching lab space. We need a major increase in TA numbers and in TA stipends to meet these various needs without dipping too deeply into funds intended for other educational purposes. Institutional and departmental funding of a modest number of Research Assistantships, with an appropriately competitive stipend, could significantly reduce the time to degree for PhD students that, for whatever reason, cannot be supported on grant funds. It is important that students nearing completion of their degrees can be provided the opportunity to attend major research conferences to present their results; thus, a secure source of funds for such travel support is crucial as we seek to increase program visibility at the national and international levels.

**Request:** The University and College should provide increased funding for graduate student Assistantships, in particular to realistically meet the introductory physics related teaching requirements. A few TTU supported RAs would free advanced students to focus on research.

At the end of the current review cycle the Physics Department is in a state of transition in many respects. We have grown our graduate student numbers, but need to improve quality. The Applied Physics research and education effort is being restructured and the department has added Astrophysics to our research and educational programs. A number of faculty have recently retired or otherwise left TTU, which offers us the chance to revitalize and restructure our research efforts, and to change the department’s profile significantly. While we face serious challenges, especially with respect to space issues and research funding, with the support of the College and University, the Physics Department’s graduate programs have an opportunity for continued growth, increased student success, and enhanced global visibility.
VII. Appendices – should include, but not be limited to, the following:

A. Strategic Plan  
B. Curriculum Map  
C. 18 Characteristics of Doctoral Programs  
D. Graduate Course Offerings  
E. Graduate Student Handbook  
F. Graduate Student Association(s)  
G. Graduate Faculty Information
Appendix A

Strategic Priorities and Goals
Department of Physics
Texas Tech University
October 1, 2013

Department of Physics Mission Statement
The mission of the Department is to provide quality undergraduate education, graduate education, and physics and astronomy service courses for other departments at Texas Tech University, to produce high quality research, and maintain an environment where research and creativity in physics can flourish.

Department of Physics Vision Statement
The Department of Physics aspires to the highest standards of excellence in all aspects of teaching, research, and service. Teaching to science, engineering, and non-science majors will be of the highest quality. Research conducted by the Department’s faculty and students will be of importance nationally and internationally. Opportunities to render service to the University, to the surrounding community, and to the nation will be pursued.

Scope of Department of Physics Programs
The Department of Physics is organized within the College of Arts and Sciences at Texas Tech University and offers a BS in Physics with concentrations in Physics, Astrophysics, Applied Physics, and Secondary Education in addition to the standard Physics major. The Department maintains research-based graduate programs in Physics at the MS and PhD levels and has an Applied Physics program at the MS level that includes both research and internship based options.

The Department of Physics is critically short of space
Suitable research, teaching, and office space is the primary limiting factor for growth in essentially all aspects of departmental operations

- Offices for expansion of the physics faculty and shared space for graduate students do not exist
- Research space is inadequate in both the number and quality of laboratories in our building
- The Science Building lacks suitable teaching space for a large fraction of our courses
- The capacity to include more activity based learning in any large course is non-existent

Potential short and long term solutions to meet many of the department’s critical needs include

- Moving the shop, other support services, and some geosciences operations out of our building
- A major renovation project to modernize freed space and most existing research labs
- New building dedicated to research with modern labs for both new and existing groups
- A modern centralized science teaching facility to be shared by several departments
TTU Priority #1: Increase Enrollment and Promote Student Success

Grow and diversify the graduate and undergraduate student population in physics; Improve retention and graduation rates.

Undergraduate Program:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Physics Majors</td>
<td>44</td>
<td>64</td>
<td>62</td>
<td>68</td>
<td>82</td>
<td>(75)</td>
<td>(100)</td>
</tr>
<tr>
<td>(Plus Engineering Physics)</td>
<td>6</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physics Minors</td>
<td>9</td>
<td>9</td>
<td>(9)</td>
<td>12</td>
<td>17</td>
<td>11</td>
<td>(20)</td>
</tr>
<tr>
<td>Incoming Freshman Enrolled</td>
<td>13</td>
<td>23</td>
<td>(15)</td>
<td>11</td>
<td>17</td>
<td>24</td>
<td>(25)</td>
</tr>
<tr>
<td>Average SAT score (1600)</td>
<td>1207</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Average ACT score ( )</td>
<td>28.3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transfers In (new/other TTU)</td>
<td>3/1</td>
<td>5/1</td>
<td>4/1</td>
<td>9/4</td>
<td>(5)</td>
<td>(8)</td>
<td>(10)</td>
</tr>
<tr>
<td>Retention: 1st to 2nd yr (So)</td>
<td>11</td>
<td>13</td>
<td>19</td>
<td>12</td>
<td>18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd to 3rd yr (Jr)</td>
<td>9</td>
<td>15</td>
<td>10</td>
<td>17</td>
<td>15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beyond 3rd yr (Sr)</td>
<td>8</td>
<td>10</td>
<td>19</td>
<td>22</td>
<td>19</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physics BS Degrees (Prev AY)</td>
<td>3</td>
<td>2</td>
<td>3</td>
<td>7</td>
<td>12</td>
<td>(10)</td>
<td>(12)</td>
</tr>
<tr>
<td>(&gt;15) Mean Time to Degree (Sem)</td>
<td>9.67</td>
<td>na</td>
<td>9.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diversity (Majors + Minors) (%)</td>
<td>46.4</td>
<td>47.3</td>
<td>41.9</td>
<td>42.4</td>
<td>40.2</td>
<td>(&gt;40)</td>
<td></td>
</tr>
<tr>
<td>Numbers of minorities / women</td>
<td>17/ 9</td>
<td>20/15</td>
<td>16/10</td>
<td>17/ 8</td>
<td>25/11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physics Scholarships (# )</td>
<td>11</td>
<td>17</td>
<td>22</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Offers / Awards ($k)</td>
<td>13/10</td>
<td>23/13</td>
<td>27/14</td>
<td>28/23</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TTU Scholarship Offers (#)</td>
<td>11</td>
<td>17</td>
<td>21</td>
<td>27</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Offers ($k)</td>
<td>36.5</td>
<td>79.5</td>
<td>96.2</td>
<td>116.2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Related Goals and Targets: (As listed in 2010)

- Increase the number of physics majors by a minimum of 5 / year and minors by 2 / year
- Increase the number of BS degrees to minimum of 8 each year by 2013 and 12/yr average by 2015
- Improve retention and graduation rates by at least 20% within three years
- Maintain the present level of diversity within the department

Key Strategies:

- Improve advising of Physics majors and minors and increase contact with the department
- Offer every required majors upper level course at least once per year
- Develop several non-traditional concentrations within the Physics BS program
- Develop recruitment efforts targeted toward strong science programs
- Identify key courses as critical to student success; assign the best teachers to those courses
- Increase the amount of scholarship funds awarded from departmental resources
- Work to maximize University and College level scholarship offers to physics students
- Help the Society of Physics Students (SPS) increase their membership and visibility
- Assign a faculty mentor to work with each major throughout their BS program
- Hire a staff person to help with recruiting, advising, and student records
## Graduate Program:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Graduate Student Numbers</td>
<td>48</td>
<td>55 (50)</td>
<td>63 (55)</td>
<td>54 (60)</td>
<td>57 (60)</td>
<td>(65)</td>
<td>(75)</td>
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<tr>
<td>Domestic / International First year</td>
<td>17</td>
<td>15 (15)</td>
<td>16 (15)</td>
<td>13 (15)</td>
<td>17 (15)</td>
<td>(15)</td>
<td>(20)</td>
</tr>
<tr>
<td>Pre / Post Prelim / PhD Proposal</td>
<td>29/19/5</td>
<td>37/18/8</td>
<td>42/20/9</td>
<td>32/26/13</td>
<td>35/22/12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>US Diversity: Minorities / Women</td>
<td>5 / 2</td>
<td>7 / 2</td>
<td>7 / 3*</td>
<td>5 / 2*</td>
<td>6 / 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Under-represented (%; *double)</td>
<td>41%</td>
<td>45%</td>
<td>45%</td>
<td>40%</td>
<td>40%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree Production (Prev AY)</td>
<td></td>
<td></td>
<td></td>
<td>8</td>
<td>7</td>
<td>26</td>
<td>12</td>
</tr>
<tr>
<td>MS Degrees PHYS / APPH</td>
<td>5 / 2</td>
<td>4 / -</td>
<td>2 / 2</td>
<td>10/11</td>
<td>8 / 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PhD Degrees</td>
<td>1</td>
<td>3</td>
<td>3</td>
<td>5</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mean time to PhD (BS + yrs)</td>
<td>6.0</td>
<td>5.4</td>
<td>6.4</td>
<td>6.3</td>
<td>6.4</td>
<td>(Ave 6.2)</td>
<td></td>
</tr>
<tr>
<td>Students Supported as TA / RA</td>
<td>28/9</td>
<td>23/19</td>
<td>39/15</td>
<td>36/11</td>
<td>41/12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Amount ($k/mo)</td>
<td>1.8/2.0</td>
<td>1.8/2.0</td>
<td>1.8/2.0</td>
<td>1.9/2.1</td>
<td>1.9/2.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fellowships:</td>
<td>- / 2</td>
<td>2 / -</td>
<td>1 / -</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Amount ($k/mo)</td>
<td>- / 3.0</td>
<td>2.0 / -</td>
<td>2.0 / -</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supported by Home Government</td>
<td>2</td>
<td>6</td>
<td>5</td>
<td>6</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internship</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Departmental Scholarships (#)</td>
<td>9</td>
<td>15</td>
<td>14</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Total Dept Awards ($k)</td>
<td>8.0</td>
<td>22.5</td>
<td>27.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TTU Awards (#) / Outside Sch (#)</td>
<td>4 / -</td>
<td>3 / -</td>
<td>1 / -</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Related Goals: (As listed in 2010)

- Grow the Physics graduate enrollment to 65 by Fall 2015
- Maintain the time to degree for graduate students at or below national average
- Improve pass rate on the PhD Preliminary Exam
- Increase domestic enrollment in our graduate programs

### Key Strategies:

- Establish additional Graduate Admissions Agreement with regional 4-year colleges
- Increase number and stipends of Teaching Assistantships available to new graduate students
- Identify and develop new applied physics focus areas
- Work with TTU to increase graduate scholarships to physics students
- Encourage grad students to apply for regional or national fellowships
- Fund Departmental Research Assistant positions: seek TTU help to identify funding source
- Hire a faculty member with industry or national lab ties
- Revitalize the MS Internship program
**TTU Priority #2: Strengthen Academic Quality and Reputation**

*Attract and retain the highest quality physics and astronomy faculty; Recruit and retain the highest quality students; Increase emphasis on teaching excellence and modernize the curriculum*

<table>
<thead>
<tr>
<th>Quality of Undergraduate Program:</th>
<th>AY 2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>% FTE Teaching Faculty Tenured/Track</td>
<td>87.0</td>
<td>80.0</td>
<td>76.0</td>
<td>70.4</td>
<td></td>
</tr>
<tr>
<td>% Intro Sections w/ Tenured/Track Faculty</td>
<td>89.8</td>
<td>72.5</td>
<td>54.7</td>
<td>63.6</td>
<td></td>
</tr>
<tr>
<td>% Intro sections with &lt; 19 students</td>
<td>10.2</td>
<td>7.8</td>
<td>9.4</td>
<td>11.1</td>
<td></td>
</tr>
<tr>
<td>% Intro sections with &gt; 50 students</td>
<td>49.0</td>
<td>60.8</td>
<td>62.3</td>
<td>61.6</td>
<td></td>
</tr>
<tr>
<td>% Majors courses with &lt; 19 students</td>
<td>100</td>
<td>100</td>
<td>91.7</td>
<td>78.6</td>
<td></td>
</tr>
<tr>
<td>Test scores- Incoming Freshmen: SAT ACT</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Percentage</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2015</th>
</tr>
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<tbody>
<tr>
<td>SAT</td>
<td>1207</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>ACT</td>
<td>28.3</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>% Majors with GPA &gt; 3.5</td>
<td>19.2</td>
<td>18.9</td>
<td>25.0</td>
<td>27.1</td>
<td></td>
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<tr>
<td>Faculty supervising undergrad research</td>
<td>4</td>
<td>6</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students in UG Research / Internships</td>
<td>7 / 2</td>
<td>10 / 4</td>
<td>8 / 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Regional/National Awards to students</td>
<td>1</td>
<td></td>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Quality of Graduate Program:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Graduate students (pre/post Prelim)</td>
</tr>
<tr>
<td>Outside Scholarships / Fellowships</td>
</tr>
<tr>
<td>Regional/National Awards to students</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Quality of Faculty:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries (compared to national averages)</td>
</tr>
<tr>
<td>Assistant Professors ( #/ $k ave 9 mo)</td>
</tr>
<tr>
<td>(number / Sal %)</td>
</tr>
<tr>
<td>Associate Professors</td>
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<tr>
<td></td>
</tr>
<tr>
<td>Full Professors</td>
</tr>
<tr>
<td></td>
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<tr>
<td>Endowed Chairs</td>
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<tr>
<td>Faculty Awards (National/International)</td>
</tr>
<tr>
<td>(State/Regional)</td>
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<tr>
<td>Fellowships in Professional Societies</td>
</tr>
</tbody>
</table>

**Related Goals / Strategies**

- Make concerted effort to attract a Senior Hire in TTU /Departmental emphasis area
- Hire accomplished teachers and researchers into any open faculty position
- Continue to review and modernize course offerings as we grow student numbers
- Increase student performance expectations while monitoring course assessments
- Continue to modify introductory courses taking into account needs of programs we serve
- Refine the new concentrations in Physics BS program
- Develop an Astronomy minor
- Significantly increase number of majors aiming for a teaching career

**Physics**
TTU Priority #3: Expand and Enhance Research and Creative Scholarship

*Increase funding for Physics and Astronomy research and educational programs: Enhance national and global visibility*

<table>
<thead>
<tr>
<th>FY</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Grants (per ORS) #)</td>
<td>19.2</td>
<td>14.5</td>
<td>16.9</td>
<td>13.8</td>
<td>12.1</td>
<td></td>
</tr>
<tr>
<td>Amount (sk)</td>
<td>2445.8</td>
<td>1805.0</td>
<td>3424.5</td>
<td>1608.9</td>
<td>1107.7</td>
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<tr>
<td>New Funding / TT FTE</td>
<td>122.3</td>
<td>90.3</td>
<td>190.3</td>
<td>89.4</td>
<td>61.5</td>
<td>(&gt;100)</td>
</tr>
<tr>
<td>Continuing Grants</td>
<td>19</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Funds available FY start (sk)</td>
<td>1110.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% TT Faculty w/ funding</td>
<td>63</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Research Expenditures

- Restricted (sk) | 1350 |
- Amt / TT FTE | 75 |

Proposals (#/$M Request)

<table>
<thead>
<tr>
<th>FY</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>% TT Faculty w/prop</td>
<td>60.0</td>
<td>65.0</td>
<td>66.7</td>
<td>55.6</td>
<td>61.1</td>
<td></td>
</tr>
</tbody>
</table>

Publications: (CY Basis)

- Books / Book Chapters | - / 3 | - / 4 |
- Invited Publications | 2 | 8 |
- Refereed Journal Pubs | 126 | 167 |
  - % TT Faculty w/ publications | 77.8 | 78.9 |
  - Graduate student co-authors | 35 | 27 |
  - UG student co-authors | 4 | 1 |
- Other Publications | 31 | 24 |

Increase Visibility:

Conference Presentations

- Faculty (National / Int) | 45+ | 70 |
- Grad Students (Nat /Int) | 29 | 17 |
  - (Local/Regional) | 12 | 16 |
- UG Conf Presentations | 3 | 3 |

Invited Conf. Talks | 7 | 17 |

Other Invited Presentations | 14+ | 15+ |

Research Awards: Faculty

- Grad Students (ttu/inside) | 1 / - | 1 / - | 2 / |
- UG Students (ttu/inside) | 1 / | 2 / |

High Visibility Grants | 1 | 1 | 1 |

Extended Faculty Visits

- By TTU Faculty | 2 | 3 | 4 | 5 | 3 |
- Other Faculty To TTU | 1 | 1 | 1 | 4 | 2 |

Physics
Research Areas for Growth - Five Year Hiring Priorities as initially ranked by faculty

Departmental discussions are ongoing (5 - 7 positions anticipated beyond current searches)

- Astronomy / Astrophysics
- Applied Physics - overlap with existing areas
- Experimental Condensed Matter / Nano-Tech
- Experimental Biophysics / Nano-Bio / Medical Applications
- High Energy (Particle) Physics
- Computational Modeling (technological materials physics / biophysics-biomedical)
- STEM Education related research / program development

Factors in selecting and ordering priorities

- Available resources / infrastructure
- Cluster hire
- Build on existing strengths
- Mesh with overall TTU Strategic Plan
- Enhance collaborative research possibilities
- Support other program priorities
- Student recruiting benefit

Space and Other Infrastructure Needs

- Define 5 – 10 year departmental space and infrastructure needs
- Secure office and research space outside Science Building (short term)
- Move shops and selected labs out of Science Bldg (Science Bldg Annex / mid term)
- Renovate freed up space in Science Bldg (mid term)
- Specialized research space / Separate research campus (mid/long term)
- Central science teaching facility (long term)

Related Goals / Strategies

- Make a concerted effort to attract a senior faculty member as a TTU Strategic Hire
- Define research focus areas for faculty hiring – replacement and / or expansion
- Recruit 5 to 7 new faculty in selected research areas over the next 3-5 years
- Encourage increased research proposal submissions
- Work with the administration to add research space and associated student offices
- Reward successful grantsmanship with reduced teaching (and financially when possible)
- Encourage participation in national and international collaborations
- Make it possible for graduate students to attend and present at major conferences
- Strongly encourage undergraduate research participation with TTU based support
- Provide RA support for productive students from department when grant support is not available
- Increase emphasis on STEM education research and teacher training programs
- Encourage faculty to participate in a wide variety of STEM related programs
TTU Priority # 4: Further Outreach and Engagement

Expand engagement in local science activities; Partner with regional institutions to further physics education and research

(Reported on a CY basis)

<table>
<thead>
<tr>
<th></th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Faculty reporting local public outreach</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of reported activities</td>
<td>&gt;20</td>
<td>&gt;20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of public participants</td>
<td>&gt;600</td>
<td>&gt;1000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Students involved in above O&amp;E</td>
<td>&gt;15</td>
<td>&gt;15</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SPS Sponsored Activities</td>
<td>2</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of public participants</td>
<td>~60</td>
<td>~75</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Funding generated for O&amp;E ($k)</td>
<td>10.2</td>
<td>6.5</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faculty / Students participating in events sponsored by others</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Faculty w/ education O&amp;E (local/regional)</td>
<td>11</td>
<td>12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Classroom visits – K-12 students impacted</td>
<td>&gt;600</td>
<td>&gt;1000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Workshops /Activities for Teachers</td>
<td>9</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of teachers impacted</td>
<td>212</td>
<td>268</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Science fair – faculty/students involved</td>
<td>6/12</td>
<td>7/13</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>K-12 students impacted</td>
<td>450</td>
<td>450</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Scholars Mentored (national/regional)</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% Faculty w/ TTU interdisciplinary activities</td>
<td>&gt;50</td>
<td>&gt;50</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research (Faculty w/ local/regional partners)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(w/ national/international collaborations)</td>
<td>7</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All departmental O&E activities have been seriously under-reported up to present. Most participation numbers are best guess estimates.

Related Goals / Strategies

- Plan and participate in local science related activities and events
- Plan and participate in workshops for public school science teachers
- Seek funding for significant outreach / engagement activities
- Improve record of outreach / engagement activities of faculty and students
- Improve record of numbers of public participants in departmental events

Physics
TTU Priority #5: Increase and Maximize Resources

Increase departmental endowments and other resources; Distribute resources to maximize benefit

<table>
<thead>
<tr>
<th>AY</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>2020</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Maximize Formula Funding:

- Total SCH: 16056 17101 18929 20512
- Undergraduate: 15396 16382 17763 19290
- Graduate: 660 719 1166 1222
- Weighted SCH: 34296 38341 50372 54407
- Formula ( $ / WSCH): 59.02 59.02 62.19 62.19 53.71
- Undergraduate: 25503 27193 29997 32397
- Graduate: 8793 11147 20375 22010
- Generated Funding ( $k): 2024.1 2262.9 3132.6 3383.6

Improve Efficiency:

- Instr Cost ( $k State): 2970.5 2927.8 2923.6
- Instr Cost/WSCH: 77.48 58.12 53.74
- Instr Cost/SCH: 173.71 154.67 142.53
- WSCH / FTE FT-Faculty: 1591.5 1692.8 2554.4 2293.7
- SCH / FTE FT-Faculty: 745.1 755.0 959.9 864.8

Departmental Endowments:

- Scholarship Endowments ( $k): 930 944 942
- Bucy Chair Endowment ( $k): 2287 2397 2494
- Endowment Assets (+Op Bal): 3538 3693 3772
- Net Income from Endowments: (381) 234 210

Departmental Scholarships:

- Number of Offers (UG/Grad): 11/8 17/9 22/15 23/13
- Total Amount of Offers ( $k): 26.8 39.7 54.3 37.1
- Total Amount of Awards ( $k)*: 18.3 20.7 36.5 50.3 34.1

* Awarded primarily from previous years offers

Related Goals / Strategies

- Work with Development to obtain a second Endowed Chair in Physics
- Work with the Administration to identify additional faculty and student office space
- Obtain new well equipped research space, and update equipment and instrumentation
- Work with the College and University to secure the resources for additional TAs
- Increase the number and amounts of departmental scholarships
- Compete effectively for College and University Scholarships and Fellowships
- Encourage eligible students to apply for regional/national scholarships and fellowships
## APPENDIX B

### Curriculum Map

<table>
<thead>
<tr>
<th>Date</th>
<th>Texas Tech University Program Level - Curriculum Map</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/1/2013</td>
<td><img src="image" alt="" /></td>
</tr>
</tbody>
</table>

### Degree Title:

Ph.D. in Physics

### Selected Program Learning Outcomes

**Students will be able to:**

- Demonstrate their advanced knowledge
- Integrate several topical areas
- Demonstrate mastery of written communication
- Demonstrate effective oral communication
- Demonstrate the ability to think critically on issues related to their chosen subfield

### Courses in Degree Program (beyond MS requirements)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Level</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 5302</td>
<td>X</td>
<td>R F X</td>
</tr>
<tr>
<td>PHYS 6306</td>
<td>X</td>
<td>R F X</td>
</tr>
<tr>
<td>PHYS 7000</td>
<td>M</td>
<td>R F M</td>
</tr>
<tr>
<td>PHYS 8000</td>
<td>M</td>
<td>R F M</td>
</tr>
</tbody>
</table>

**Legend:**

- **I. Outcome Statement:** The program outcome is (x) explicitly or (m) implicitly reflected in the course syllabus as being one of the learning outcomes for the course.
- **II. Level of Content Delivery:**
  - **I. Introduced:** Students are not expected to be familiar with the content or skill at the collegiate level. Instruction and learning activities focus on basic knowledge, skills, and/or competencies and entry-level complexity. Only one (or a few) aspect of the outcome is addressed in the given course (score of 1).
  - **R. Reinforced:** Students are expected to possess a basic level of knowledge and familiarity with the content or skills at the collegiate level. Instruction and learning activities concentrate on enhancing and strengthening knowledge, skills, and expanding complexity. Several aspects of the outcome are addressed in the given course, but these aspects are treated separately (score of 1).
  - **A. Advanced:** Students are expected to possess a strong foundation in the knowledge, skill, or competency at the collegiate level. Instructional and learning activities continue to build upon previous competencies with increased complexity. All components of the outcome are addressed in the integrative contexts (score of 1).

**III. Feedback on Student Performance/Assessment:**

<table>
<thead>
<tr>
<th>Feedback</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Students are asked to demonstrate their learning on the outcome through homework, projects, tests, etc. and are provided formal feedback (score of 1).</td>
<td></td>
</tr>
</tbody>
</table>
### Texas Tech University Program Level - Curriculum Map

#### M.S. in Physics

<table>
<thead>
<tr>
<th>Date</th>
<th>Degree Title</th>
<th>OUTCOME STATEMENT</th>
<th>SELECTED PROGRAM LEARNING OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/1/2013</td>
<td>M.S. in Physics</td>
<td></td>
<td>Students will be able to integrate several topical areas. Students will demonstrate mastery of written communication. Students will demonstrate effective oral communication. Students will demonstrate the ability to think critically on issues related to their chosen subfield.</td>
</tr>
</tbody>
</table>

**Courses in Degree Program (Selected):**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Level</th>
<th>Outcomes</th>
<th>Level</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 5301</td>
<td>X</td>
<td>R</td>
<td>F</td>
<td>X</td>
</tr>
<tr>
<td>PHYS 5303</td>
<td>X</td>
<td>R</td>
<td>F</td>
<td>X</td>
</tr>
<tr>
<td>PHYS 5305</td>
<td>X</td>
<td>R</td>
<td>F</td>
<td>X</td>
</tr>
<tr>
<td>PHYS 5306</td>
<td>M</td>
<td>R</td>
<td>F</td>
<td>M</td>
</tr>
<tr>
<td>PHYS 7000</td>
<td>M</td>
<td>R</td>
<td>F</td>
<td>M</td>
</tr>
<tr>
<td>PHYS 6000</td>
<td>M</td>
<td>R</td>
<td>F</td>
<td>M</td>
</tr>
</tbody>
</table>

**Selected Typical Course:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Level</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 6000</td>
<td>M</td>
<td>F</td>
</tr>
</tbody>
</table>

---

### Texas Tech University Program Level - Curriculum Map

#### M.S. in Applied Physics

<table>
<thead>
<tr>
<th>Date</th>
<th>Degree Title</th>
<th>OUTCOME STATEMENT</th>
<th>SELECTED PROGRAM LEARNING OUTCOMES</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/1/2013</td>
<td>M.S. in Applied Physics</td>
<td></td>
<td>Students will be able to integrate several topical areas. Students will demonstrate mastery of written communication. Students will demonstrate effective oral communication. Students will demonstrate the ability to think critically on issues related to their chosen subfield.</td>
</tr>
</tbody>
</table>

**Courses in Degree Program (Selected):**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Level</th>
<th>Outcomes</th>
<th>Level</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 5301</td>
<td>X</td>
<td>R</td>
<td>F</td>
<td>X</td>
</tr>
<tr>
<td>PHYS 5303</td>
<td>X</td>
<td>R</td>
<td>F</td>
<td>X</td>
</tr>
<tr>
<td>PHYS 5305</td>
<td>X</td>
<td>R</td>
<td>F</td>
<td>X</td>
</tr>
<tr>
<td>PHYS 5306</td>
<td>M</td>
<td>R</td>
<td>F</td>
<td>M</td>
</tr>
<tr>
<td>PHYS 5001</td>
<td>M</td>
<td>R</td>
<td>F</td>
<td>M</td>
</tr>
<tr>
<td>PHYS 6000/2</td>
<td>M</td>
<td>R</td>
<td>F</td>
<td>M</td>
</tr>
</tbody>
</table>

**Selected Applied Courses:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Level</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 6000/2</td>
<td>M</td>
<td>F</td>
</tr>
</tbody>
</table>

---

**Legend**

<table>
<thead>
<tr>
<th>Code</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>1 or 2</td>
</tr>
<tr>
<td>R</td>
<td>X or M</td>
</tr>
<tr>
<td>F</td>
<td>X, M, or F</td>
</tr>
<tr>
<td>A</td>
<td>X, R, M</td>
</tr>
</tbody>
</table>

**Terms:**

- **Level**: I (Introductory), R (Reinforced), F (Advanced)
- **Feedback**: (F) Feedback on Student Performance
- **Level of Content Delivery**: (I) Outcome Statement, (R) Level, (A) Feedback
APPENDIX C

18 Characteristics of Doctoral Programs
Programs included only if in existence 3 or more years. Program is defined at the 8-digit CIP code level.

<table>
<thead>
<tr>
<th>Arts and Sciences</th>
<th>Department</th>
<th>Doctoral Degree Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physics</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1. **Number of Degrees Per Year**
   - **Average, 2007-2009**
   - For each of the three most recent years, of the number of degrees awarded per academic year.

2. **Graduate Rates**
   - **Students Starting 1997-1999**
   - For each of the three most recent years, of the percent of first-year doctoral students \(^2\) who graduated within ten years.
   - \(^2\)First-year doctoral students: Those students who have matriculated as doctoral students with a doctoral degree objective.
   - Fall 2009: 50%, Fall 2010: 25%

3. **Average Time to Degree**
   - **Students Starting 1997-1999**
   - For each of the three most recent years, average of the graduates' time to degree \(^3\)
   - \(^3\)For each academic year, the time to degree is defined as beginning the year students matriculated with a doctoral degree objective until the year they graduated.
   - FY 2009-2010: 5.5, FY 2010-2011: 5.8

4. **Employment Profile**
   - **(in field within one year of graduation)**
   - For each of the three most recent years, the number and percent of graduates by year employed, those still seeking employment, and unknown.
   - [Employment Profile Table]

5. **Admissions Criteria**
   - **Description of Admission Factors**
   - 1) Graduate School Application
   - 2) Official Transcripts
   - 3) Official copy of the TOEFL scores (for international students)
   - 4) Department Application form
   - 5) GRE scores

6. **Percentage of Full-time Students**
   - **FTS */number students enrolled (headcount) for last three fall semesters.**
   - \(*\)Definition of Full Time Student (FTS) is institutional by program.
   - Fall 2009: 95%, Fall 2010: 98%, Fall 2011: 93.2%

7. **Average Institutional Financial Support Provided**
   - For those receiving financial support, the average monetary institutional support provided per full-time graduate student for the prior year from assistantships, scholarships, stipends, grants, and fellowships (does not include tuition or benefits).
   - Note: This number represents the weighted average monthly salary of all Research & Teaching Assistants and Graduate Part-Time Instructors.
   - Fall 2009: 1,440.77

[URL: http://www.phys.ttu.edu/cgi-bin/phys_app.cgi]
### Percentage Full-time Students with Institutional Financial Support

In the prior year, the number of FTS with at least $1000 of annual support/the number of FTS.

<table>
<thead>
<tr>
<th></th>
<th>Fall 2009</th>
<th>Fall 2010</th>
<th>Fall 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

### Number of Core Faculty

Number of core faculty in the prior years

- Core faculty: Full-time tenured and tenure-track faculty who teach 50 percent or more in the doctoral program or other individuals integral to the doctoral program who can direct dissertation research.

<table>
<thead>
<tr>
<th></th>
<th>Fall 2009</th>
<th>Fall 2010</th>
<th>Fall 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>18</td>
<td>18</td>
<td>18</td>
</tr>
</tbody>
</table>

### Student-Core Faculty Ratio

For each of the three most recent years, average of full-time student equivalent (FTSE)/average of full-time faculty equivalent (FTFE) of core faculty

<table>
<thead>
<tr>
<th></th>
<th>Fall 2009</th>
<th>Fall 2010</th>
<th>Fall 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.2</td>
<td>2.64</td>
<td>1.23</td>
</tr>
</tbody>
</table>

### Core Faculty Publications

For each of the three most recent calendar years, average of the number of discipline-related refereed papers/publications, books/book chapters, juried creative/performance accomplishments, and notices of discoveries filed/patents issued per core faculty member.

<table>
<thead>
<tr>
<th></th>
<th>Calendar Year 2009</th>
<th>Calendar Year 2010</th>
<th>Calendar Year 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refereed Papers/Publications</td>
<td>163</td>
<td>7.00</td>
<td>9.82</td>
</tr>
<tr>
<td>Books/Book Chapters</td>
<td>2</td>
<td>0.17</td>
<td>0.24</td>
</tr>
<tr>
<td>Juried Creative/Performance Accomplishments</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Notices of Discoveries Filed/Patents</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Core Faculty External Grants

For each of the three most recent years, average of the number of core faculty receiving external funds, average external funds per faculty, and total external funds per program per academic year.

- All external funds received by core faculty from any source including research grants, training grants, gifts from foundations, etc., reported as expenditures.

<table>
<thead>
<tr>
<th></th>
<th>Fall 2009</th>
<th>Fall 2010</th>
<th>Fall 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Core Faculty receiving external funds</td>
<td>13</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Average External Grant $ per Faculty</td>
<td>190,300</td>
<td>89,400</td>
<td></td>
</tr>
<tr>
<td>Total External Grant $</td>
<td>3,424,456</td>
<td>1,608,860</td>
<td></td>
</tr>
</tbody>
</table>

### Faculty Teaching Load

Total number of semester credit hours in organized teaching courses taught per academic year by core faculty divided by the number of core faculty.

<table>
<thead>
<tr>
<th></th>
<th>Fall 2009</th>
<th>Fall 2010</th>
<th>Fall 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>710</td>
<td>205</td>
<td>275</td>
</tr>
</tbody>
</table>

### Faculty Diversity

Core faculty by ethnicity (White, Black, Hispanic, other) and gender,

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>11</td>
<td>1</td>
<td>8</td>
<td>1</td>
<td>16</td>
<td>2</td>
</tr>
<tr>
<td>Black</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>1</td>
<td>8</td>
<td>1</td>
<td>16</td>
<td>2</td>
</tr>
</tbody>
</table>

### Student Diversity

Enrollment headcount by ethnicity (White, Black, Hispanic, Other) and gender in program.

<table>
<thead>
<tr>
<th></th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>8</td>
<td>1</td>
<td>10</td>
<td>1</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Black</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hispanic</td>
<td>2</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>21</td>
<td>7</td>
<td>25</td>
<td>7</td>
<td>26</td>
<td>9</td>
</tr>
</tbody>
</table>

12/18/2013
### Date of Last External Review

*Date of last formal external review.*

- 11/1/2007

### External Program Accreditation

Name of body and date of last program accreditation review, if applicable.

### Student Publications/Presentations

For the three most recent calendar years, the number of discipline-related refereed papers/publications, juried creative/performance accomplishments, book chapters, books, and external presentations per year by student FTE.

<table>
<thead>
<tr>
<th></th>
<th>Calendar Year 2009</th>
<th>Calendar Year 2010</th>
<th>Calendar Year 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refereed Papers/Publications</td>
<td>42</td>
<td>45 total</td>
<td>70 total</td>
</tr>
<tr>
<td>Juried Creative/Performance Accomplishments</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Book Chapters</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Books</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>External Presentations</td>
<td>46</td>
<td>41 total</td>
<td>33 total</td>
</tr>
</tbody>
</table>

Calculated FTE:

- 2010: 1.18
- 2011: 1.63

Calculated FTE YOY:

- 2010: 1.08
- 2011: 0.77
APPENDIX D

Graduate Course Offerings

**5000. Independent Study (V1-3).** Prerequisite: Permission of the department chair. Offers independent study under the direct supervision of a faculty member. Not to be used for thesis or dissertation research or writing.

**5001. Master’s Internship (V1-12).** Prerequisite: Permission of the internship coordinator. Internship in an industrial or research laboratory setting. Arranged through the department and directly related to degree program.

**5101. Seminar (1).** Must be taken by every graduate student for at least the first four semesters. Taken pass-fail.

**5104. Instructional Laboratory Techniques in Physics (1).** Laboratory organization and instructional techniques. Must be taken by all teaching assistants when on appointment.

**5274. Physics Pedagogy (2).** A course in teaching methods and pedagogy for physics laboratories and recitations.

**5300. Special Topics (3).** Prerequisite: Approval of graduate advisor and/or department chair. Topics in semiconductor, plasma, surface, particle physics, spectroscopy, and others. May be repeated in different areas.

**5301. Quantum Mechanics I (3).** Experimental basis and history, wave equation, Schrödinger equation, harmonic oscillator, piecewise constant potentials, WKB approximation, central forces and angular momentum, hydrogen atom, spin, two-level systems, and scattering. M.S. and Ph.D. core course.

**5302. Quantum Mechanics II (3).** Prerequisite: PHYS 5301 or equivalent. Quantum dynamics, rotations, bound-state and time-dependent perturbation theory, identical particles, atomic and molecular structure, electromagnetic interactions, and formal scattering theory. Ph.D. core course.

**5303. Electromagnetic Theory (3).** Electrostatics and magnetostatics, time varying fields, Maxwell’s equations and conservation laws, electromagnetic waves in materials and in waveguides. M.S. and Ph.D. core course.

**5304. Solid State Physics (3).** Prerequisite: PHYS 5301 or equivalent. A survey of the microscopic properties of crystalline solids. Major topics include lattice structures, vibrational properties, electronic band structure, and electronic transport.
5305. **Statistical Physics (3)**. Elements of probability theory and statistics; foundations of kinetic theory. Gibb’s statistical mechanics, the method of Darwin and Fowler, derivation of the laws of macroscopic thermodynamics from statistical considerations; other selected applications in both classical and quantum physics. M.S. and Ph.D. core course.


5307. **Methods in Physics I (3)**. Provides first-year graduate students the necessary skill in mathematical methods for graduate courses in physical sciences; applications such as coordinate systems, vector and tensor analysis, matrices, group theory, functions of a complex variable, variational methods, Fourier series, integral transforms, Sturm-Liouville theory, eigenvalues and functions, Green functions, special functions and boundary value problems. Tools course.

5308. **Molecular Biophysics (3)**. Study of the physics of the structures and dynamics of biological molecules and assemblies at the molecular level. Required for students in biophysics research.

5309. **Methods in Biophysics (3)**. Study of experimental and computational methods in biophysics. Requires an individual research project. Mandatory for students in biophysics research.

5311. **Nuclear Physics (3)**. Prerequisite: PHYS 5301. Deals with nuclear physics covering such topics as nuclear structure models, interactions, reactions, scattering, and resonance. Nuclear energy is discussed as an application.

5312. **Elementary Particle Physics (3)**. Prerequisites: PHYS 5302, 5303. The role of symmetries, gauge theories, and the Standard Model. First-order Feynman diagram calculations aided by computing tools and comparison with the experimental data. Experimental techniques and detectors in particle physics.


5330. **Semiconductor Materials and Processing (3)**. Survey of semiconductor materials deposition, characterization, and processing techniques with emphasis on the fundamental physical interactions underlying device processing steps.

5335. **Physics of Semiconductors (3)**. Theoretical description of the physical and electrical properties of semiconductors; Band structures, vibrational properties and phonons, defects, transport and carrier statistics, optical properties, and quantum confinement.
5336. **Device Physics (3).** Principles of semiconductor devices; description of modeling of p/n junctions, transistors, and other basic units in integrated circuits; relationship between physical structures and electrical parameters.

5371. **Conceptual Physics for Teachers (3).** Inquiry-based course in elementary physical principles of mechanics, heat, electricity, and magnetism.

5372. **Astronomy for Teachers (3).** Inquiry-based course in solar system, stellar, and galactic astronomy. Discusses history of human understanding of the universe.

5373. **Mathematical Modeling of the Physical World (3).** Studies how and why mathematics is used to model physical situations and uses physical examples extensively.

5374. **Research Experience in Physics (3).** Motivates physics/education research activities. Discusses scientific method, research plans, literature searches, data collection and analysis. Designed for math/science teachers; not allowed for physics majors.

6000. **Master’s Thesis (V1-6).**

6002. **Master’s Report (V1-6).**

6304. **Condensed Matter Physics (3).** Prerequisite: PHYS 5304. Problems of current interest in condensed matter physics. Topics include transport properties in solids, superconductivity, magnetism, semiconductors, and related topics.

6305. **Statistical Mechanics II: Critical Phenomena (3).** Equilibrium treatments of strongly interacting systems, phase transitions, and critical phenomena; mean field and Landau theories, scaling and critical exponents, renormalization approach, disorder and percolation.

6306. **Advanced Electromagnetic Theory (3).** Prerequisite: PHYS 5303. Classical theory of electromagnetic fields, radiation, scattering and diffraction, special theory of relativity and electrodynamics, special topics. Ph.D. core course.

6309. **Advanced Quantum Mechanics (3).** Prerequisite: PHYS 5302. Scattering, second quantization, charge particle interactions, path integral, Klein-Gordon and Dirac equations, many electron systems.

6312. **Quantum Field Theory I (3).** Prerequisites: PHYS 5301, 5302. A first course in quantum field theory. Path integral approach to quantization of fields, Feynman diagrams and calculation of quantum electrodynamics (QED) processes.

7000. **Research (V1-12).**

8000. **Doctor's Dissertation (V1-12).**
APPENDIX E

Graduate Student Handbook

The Physics Department make our Graduate Booklet available to each incoming graduate student. It is available in hardcopy, prominently displayed in the Department office.

It is also available on the Departments web site and can be viewed at

APPENDIX F

Graduate Student Association(s)

There is an Association of Physics Graduate Students which has been nominally in existence for a number of years. It is occasionally quite active, organizing a few events per year such as a get together to welcome new grad students in the early fall, and a graduate student research event with a poster competition each spring with a few exceptions. This group has also functioned as a conduit for the graduate students to bring concerns to the Chair and to the faculty in general.

We have not located any document that outlines the formal structure of this organization and will suggest that the current group should create a more formal document for future reference.
APPENDIX G

Graduate Faculty Information

Physics
GRADUATE FACULTY APPLICATION FORM  
TEXAS TECH UNIVERSITY  
Confirmation/Reappointment

**Instructions:** The Graduate Faculty Application Form is to be generated in the DigitalMeasures software platform, please make any additions or corrections in DigitalMeasures and reprint application.

<table>
<thead>
<tr>
<th>Name: Nural Akchurin</th>
<th>Department/Unit: Physics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rank/Title: Professor</td>
<td>Date Submitted: 12-09-2013</td>
</tr>
<tr>
<td>Date: 2000</td>
<td></td>
</tr>
<tr>
<td>TTU</td>
<td>Phone: (806) 742-3427</td>
</tr>
<tr>
<td>Email: <a href="mailto:nural.akchurin@ttu.edu">nural.akchurin@ttu.edu</a></td>
<td>City/State</td>
</tr>
<tr>
<td>Mailing Address:</td>
<td>Zip:</td>
</tr>
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**I. Academic Background**

<table>
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<th>Degree</th>
<th>Field</th>
<th>Institution</th>
<th>Year Awarded</th>
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<tr>
<td>Ph D</td>
<td>Physics</td>
<td>University of Iowa</td>
<td>1990</td>
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<table>
<thead>
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<th>Field</th>
<th>Institution</th>
<th>Year Awarded</th>
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<tr>
<td>BA</td>
<td>Physics</td>
<td>Vassar College</td>
<td>1982</td>
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**II. Professional Experience, Academic and Nonacademic**

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<th>Institution/Agency</th>
<th>Year(s)</th>
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<tr>
<td>Visiting Scientist</td>
<td>CERN - European Laboratory for Particle Physics</td>
<td>May 2010 - September 2011</td>
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**III. Direction of Graduate Students (completed theses and dissertations directed in the last six years)**

<table>
<thead>
<tr>
<th>Student's Name</th>
<th>Involvement</th>
<th>Year Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Youn Roh</td>
<td>Dissertation Committee Chair</td>
<td>December 2011</td>
</tr>
</tbody>
</table>

Physics
Institution

IV. Other Service on Graduate Committees in the last six years (excluding III)

Student's Name: Chiyoung Jeong
Involvement: Dissertation Committee Member
Year Completed: December 2011
Institution: Texas Tech University

V. Graduate Courses Taught in the last six years

**Summer I TTU 2013**
PHYS 7000 Research

**Spring TTU 2013**
PHYS 7000 Research

**Fall TTU 2011**
PHYS 7000 Research

**Summer II TTU 2011**
PHYS 8000 Doctor's Dissertation

**Summer I TTU 2011**
PHYS 8000 Doctor's Dissertation

**Spring TTU 2011**
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6000 Master's Thesis

**Fall TTU 2010**
PHYS 8000 Doctor's Dissertation

**Summer II TTU 2010**
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6002 Master's Report
PHYS 6000 Master's Thesis
PHYS 5001 Master's Internship

**Summer I TTU 2010**
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6002 Master's Report
PHYS 6000 Master's Thesis
VI. Published Research and Creative Activity in the last six years

**Peer-Reviewed/Refereed**

**Journal Articles (Invited)**


**Journal Articles (Accepted)**


Conference Proceedings (Accepted)


Non-Peer-Reviewed/Refereed

Journal Articles (Accepted)


**Conference Proceedings (Accepted)**


**Other (Accepted)**


Lee, S., Akchurin, N., Chlebana et al. (2010). *Commissioning and Performance of the CMS Hadronic Calorimeters in Proton Collisions at a Center of Mass Energy of 7 TeV at the Large Hadron Collider*. CMS AN-2010-183.

Physics


Lee, S., Akchurin, N., Green et al. (2009). *Search for a SM Higgs Boson in the qqH, H --> WW --> \mu\nu\nu\mu\nu Channel with the CMS Experiment*. CMS AN-2009-029.


VII. Current Participation in Professional Associations


Reviewer, Grant Proposal, National Science Foundation. (January 2012 - December 2012).


Editor, Conference Proceedings, XVth International Conference on Calorimetry in High Energy Physics, Santa Fe, New Mexico. (January 2012 - December 2012).

Reviewer, Grant Proposal, Department of Energy. (January 2010 - December 2010).

Reviewer, Grant Proposal, Department of Energy. (January 2010 - December 2010).

Reviewer, Grant Proposal, National Science Foundation. (January 2010 - December 2010).


Reviewer, Grant Proposal, National Science Foundation. (May 2009 - August 2009).

VIII. Presentations in the last six years

*Invited*

Akchurin, N. (Author Only), APS Texas Section Meeting, American Physical Society, Lubbock, "Higgs Searches at the CMS Detector at the LHC," National, Peer Reviewed/Refereed, Published in Proceedings. (December 2012).


Akchurin, N., Colloquium, Texas Tech University, Lubbock, TX, "Recent Results from CMS and TTU Contributions to CMS." (September 16, 2010).

Akchurin, N., Colloquium, Harbin Institute of Technology, Physics Department, Harbin, China, "Recent Results from CMS and Outlook." (May 20, 2010).

Akchurin, N., Colloquium, Beijing University, Beijing, China, "Recent Results from CMS and Outlook." (May 13, 2010).

Accepted


IX. Grant and Contract Activity for the last six years

Contract


Grant


Wigmans, M., Akchurin, N., Lee, S., Volobouev, I., "Experimental Particle Physics Research at Texas Tech University (Fermilab service account)," Sponsored by U.S. Department of Energy (Grant administered by Fermilab), $10,000.00. (March 1, 2011 - February 29, 2012).


Lee, S. (Co-Principal), Akchurin, N. (Co-Principal), Volobouev, I. (Co-Principal), Wigmans, M. (Principal), "Experimental Particle Physics Research at Texas Tech University (Supplemental Proposal)," Sponsored by Department of Energy, Federal, $80,000.00. (March 1, 2010 - February 28, 2011).
Wigmans, M., Akchurin, N., Lee, S., Volobouev, I., "Experimental Particle Physics Research at Texas Tech University at Texas Tech University (Fermilab Service Account)," Sponsored by U.S. Department of Energy (Grant administered by Fermilab), $10,000.00. (March 1, 2010 - February 28, 2011).

Akchurin, N. (Co-Principal), "Experimental Particle Physics Research at Texas Tech University," Sponsored by Department of Energy (Fermilab), Federal, $10,000.00. (March 1, 2009 - March 1, 2010).

Akchurin, N. (Co-Principal), "ExperimentalParticle Physics Research at Texas Tech University," Sponsored by Department of Energy, Federal, $367,000.00. (March 1, 2009 - February 28, 2010).

Akchurin, N. (Co-Principal), "Experimental Particle Physics Research at Texas Tech University," Sponsored by Department of Energy, Federal, $29,000.00. (March 1, 2009 - February 28, 2010).


Lee, S. (Co-Principal), Akchurin, N. (Co-Principal), Volobouev, I. (Co-Principal), Wigmans, M. (Principal), "Experimental Particle Physics Research at Texas Tech University," Sponsored by Department of Energy, Federal, $10,000.00. (March 1, 2009 - February 28, 2010).


Lee, S. (Co-Principal), Akchurin, N. (Co-Principal), Volobouev, I. (Co-Principal), Wigmans, M. (Principal), "Experimental Particle Physics Research at Texas Tech University (Supplemental Proposal)," Sponsored by Department of Energy, Federal, $29,000.00. (March 1, 2009 - February 28, 2010).


by U.S. Department of Energy, Federal, $21,000.00. (March 1, 2008 - February 28, 2009).


Wigmans, M., Akchurin, N., "Experimental Particle Physics Research at Texas Tech University (Fermilab service account)," Sponsored by U.S. Department of Energy, $10,000.00. (March 1, 2007 - February 29, 2008).


**Grant**

Wigmans, M., Akchurin, N., "Matching Funds for DOE Grant (1,2)," Sponsored by Texas Tech University, $150,000.00. (September 1, 2012 - August 31, 2013).


Wigmans, M., Akchurin, N., Lee, S., Volobouev, I., "Experimental Particle Physics Research at Texas Tech University (Fermilab service account)," Sponsored by U.S. Department of Energy (Grant administered by Fermilab), $10,000.00. (March 1, 2012 - April 30, 2013).

Akchurin, N., "Experimental Particle Physics Research at Texas Tech University (Fermilab Service Account)," Sponsored by Department of Energy, Federal, $10,000.00. (March 1, 2012 - February 28, 2013).

Wigmans, M., Akchurin, N., "Matching Funds for DOE Grant (1)," Sponsored by Texas Tech University, $150,000.00. (September 1, 2011 - August 31, 2012).

Wigmans, M., Akchurin, N., "Matching Funds for DOE Grant (1)," Sponsored by Texas Tech University, $150,000.00. (September 1, 2009 - August 31, 2010).

Wigmans, M., Akchurin, N., "Matching Funds for DOE Grant," Texas Tech University, $150,000.00. (September 1, 2008 - August 31, 2009).

Wigmans, M., Akchurin, N., Lee, S., Volobouev, I., "Experimental Particle Physics Research at Texas Tech University (Fermilab service account)," Sponsored by U.S. Department of Energy (Grant administered by Fermilab), Federal, $10,000.00. (March 1, 2008 - February 28, 2009).


Wigmans, M., Akchurin, N., "Matching Funds for DOE Grant (1)," Texas Tech University, $100,000.00. (September 1, 2007 - August 31, 2008).

Wigmans, M., Akchurin, N., "Matching Funds for DOE Grant (1)," Sponsored by Texas Tech University, $150,000.00. (September 1, 2007 - August 31, 2008).

Wigmans, M., Akchurin, N., Lee, S., Volobouev, I., "Matching Funds for DOE Grant (3)," Texas Tech University, $25,000.00. (September 1, 2007 - August 31, 2008).

\textbf{Grant - Not Funded}

Lee, S. (Co-Principal), Akchurin, N. (Principal), "An Anti-Cherenkov Photomultiplier Tube," Sponsored by Texas Higher Education Coordinating Board, State, $90,000.00.

\textbf{Sponsored Research}

Akchurin, N. (Co-Principal), "Matching Funds for DOE Grant," Sponsored by TTU, State, $150,000.00. (September 1, 2008 - August 31, 2009).

X. Other professional activities during the \textit{last six years} that contribute to graduate education

\textbf{Fellowships, Scholarships and Awards}

Professor of the Year (2012), TTU SPS. (April 2012).

\textbf{Service/Engagement}

Committee Chair, Prelim Exam Committee. (November 2011 - Present).
Committee Chair, Undergraduate Majors Committee. (December 2009 - Present).

Committee Member, Executive Committee. (September 2009 - Present).

Committee Member, Graduate Preliminary Exam Committee. (January 2005 - Present).

Committee Member, Executive Committee. (January 2010 - December 2010).

Committee Chair, Undergraduate Majors Committee. (January 2010 - December 2010).

Proposal Reviewer for VPR, MRI-R2 Proposal Reviewer. (June 2009).

Committee Member, Natural and Physical Sciences Research Council. (September 2010 - Present).

Committee Member, STAMATS. (December 2012).

Consulting


GRADUATE FACULTY APPLICATION FORM
TEXAS TECH UNIVERSITY
Confirmation/Reappointment

Instructions: The Graduate Faculty Application Form is to be generated in the DigitalMeasures software platform, please make any additions or corrections in DigitalMeasures and reprint application.

Name: Kelvin Cheng
Department/Unit: Physics
Rank/Title: Adjunct Professor
Date Submitted: 12-08-2013
Appointment Date: 1988 / 2013
TTU Email: kelvin.cheng@ttu.edu
Phone: (806) 742-2992
Campus Mail Stop:
Mailing Address

I. Academic Background

Degree Field Institution Year Awarded
Ph D Physics University of Waterloo 1983
M. Phil Physics Chinese University of Hong Kong 1980
BS Physics Chinese University of Hong Kong 1978

II. Professional Experience, Academic and Nonacademic

Title Institution/Agency Year(s)
Williams Endowed Professor in Interdisciplinary Physics Trinity University September 1, 2011 - Present
<table>
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<th>Title</th>
<th>Vice Chair (current) Designated Chair Elect (2012) and Chair (2013)</th>
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<td>Year(s)</td>
<td>March 31, 2011 - Present</td>
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<td>Title</td>
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<td>Institution/Agency</td>
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<td>Year(s)</td>
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III. Direction of Graduate Students (completed theses and dissertations directed in the last six years)

<table>
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<tr>
<th>Student's Name</th>
<th>Liming Qiu</th>
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<th>Student's Name</th>
<th>John Como</th>
<th>Involvement</th>
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IV. Other Service on Graduate Committees in the last six years (excluding III)

<table>
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<tr>
<th>Student's Name</th>
<th>Mohammad Alwarawrah</th>
<th>Involvement</th>
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V. Graduate Courses Taught in the last six years

**Spring TTU 2013**
PHYS 8000 Doctor's Dissertation

**Summer II TTU 2012**
PHYS 8000 Doctor's Dissertation

**Summer I TTU 2012**
PHYS 8000 Doctor's Dissertation

**Spring TTU 2012**
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research

Physics
Fall TTU 2011
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research

Summer II TTU 2011
PHYS 8000 Doctor's Dissertation

Summer I TTU 2011
PHYS 8000 Doctor's Dissertation

Spring TTU 2011
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6000 Master's Thesis

Fall TTU 2010
PHYS 8000 Doctor's Dissertation
PHYS 6306 Advanced Electromagnetic Theory

Summer II TTU 2010
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6002 Master's Report
PHYS 6000 Master's Thesis
PHYS 5001 Master's Internship

Summer I TTU 2010
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6002 Master's Report
PHYS 6000 Master's Thesis
PHYS 5001 Master's Internship

Spring TTU 2010
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6002 Master's Report
PHYS 6000 Master's Thesis
PHYS 5303 Electromagnetic Theory
PHYS 5001 Master's Internship

Fall TTU 2009
6306 Advanced Electromagnetic Theory

Spring TTU 2009
5309 Methods in Biophysics
VI. Published Research and Creative Activity in the last six years

Peer-Reviewed/Refereed

**Journal Articles (Accepted)**


Non-Peer-Reviewed/Refereed

**Journal Articles (Accepted)**


VII. Current Participation in Professional Associations

Vice Chair of Texas Section, American Physical Society. (September 1, 1988 - Present).

Member, Biophysical Society. (June 1, 1983 - Present).

Editor, Associate Editor, Review of Nanoscience and Nanotechnology, American Scientific Publishers, Valencia, USA, California. (October 10, 2010 - Present).

Officer, Vice President, Texas Section American Physical Society, Texas. (April 17, 2010 - Present).

Invited AP examine reader, Education Testing Service, Kansas, Missouri. (June 1, 2011 - June 8, 2011).

Reviewer, Grant Proposal, UT Health Sciences Center of San Antonio. (April 1, 2011 - April 5, 2011).

Reviewer, Grant Proposal, NSF. (March 1, 2011 - March 5, 2011).

Reviewer, Conference Paper, Texas APS meeting, San Antonio, Texas. (October 12, 2010).

VIII. Presentations in the last six years

**Invited**


Cheng, K., Invited Lecture, Trinity University - Chemistry Department, San Antonio, Texas, "2-state Hypothesis of ion channels," Local. (March 1, 2012).


Cheng, K., Invited Seminar, Texas Tech University, Lubbock, TX, "Protein unfolding," Local. (September 14, 2011).


Accepted


Qiu, L. (Author Only), Vaughn, M. (Author Only), Cheng, K. (Chair), Texas Section American Physical Society Meeting Fall Meeting, Texas Section American Physical Society, Commerce, TX, "Dimeric Interaction of Beta Amyloid in Membranes," State, Published in Proceedings. (October 7, 2011).


Cheng, K., Texas Section American Physical Society Meeting Fall Meeting, Texas Section American Physical Society, Commerce, TX, "TA mentorship in lecture significantly enhances students’ learning in mechanics in large introductory physics classes," State, Published in Proceedings. (October 7, 2011).


Cheng, K., National American Physical Society Meeting, American Physical Society, Dallas, TX, "Integrating pre-, in- and post-lecture activities to improve students' learning in a large introductory physics course," National, Published in Proceedings. (March 22, 2011).


Cheng, K., National American Association of Physics Teacher (AAPT) Winter Meeting, AAPT, Jacksonville, Florida, "Large-Scale Assessment of Lecture/Lab Physics

Cheng, K., Caglar, M., Joint Fall 2010 Texas APS APPT meeting, APS, San Antonio, Texas, "An online and integrative computer-based approach to improve students' learning in a large introductory physics course," State, Published in Proceedings. (October 23, 2010).


Cheng, K., Joint Spring 2010 Meeting of the Texas Sections of the APS, AAPT, and SPS, Austin, Texas, "A large Scale Assessment of the Introductory Courses: Analysis," State, Published in Proceedings. (March 19, 2010).


IX. Grant and Contract Activity for the last six years

Grant

Cheng, K., "Exploration of the Molecular Organization, Interactions, and Regulatory Role of Superlattice Domains in Lipid Membranes," Sponsored by Welch Foundation, Private, $150,000.00. (June 1, 2007 - May 31, 2010).

Grant


Grant - Not Funded


Grant - Pending
X. Other professional activities during the last six years that contribute to graduate education

**Fellowships, Scholarships and Awards**

Research Grant, National Institute of General Medical Sciences of NIH. (September 1, 2009).

**New Format for existing course**

Fall TTU 2009


**New Course Preparation Work**

Fall TTU 2009


Spring TTU 2009

"Methods in Biophysics," 5309-001. This is our first graduate course created in this department. Sampling different and modern methods used in biophysics research. Presented simulations of protein dynamics and membrane dynamics during lectures. Require a term paper with format similar to a research paper.

**Service/Engagement**

Committee Chair, Teaching Laboratory Committee. (October 1, 2009 - Present).

Committee Member, Advisory Committee to VP of Research on Research Misconduct. (November 2009 - Present).

**Consulting**

Government, NIH. (June 1, 2009 - June 10, 2009).

Government, NIH. (June 1, 2008 - June 10, 2008).
GRADUATE FACULTY APPLICATION FORM
TEXAS TECH UNIVERSITY
Confirmation/Reappointment

Instructions: The Graduate Faculty Application Form is to be generated in the DigitalMeasures software platform, please make any additions or corrections in DigitalMeasures and reprint application.

Name: Stefan K. Estreicher
Department/Unit: Physics
Rank/Title: Horn Professor
Date Submitted: 12-08-2013
Appointment Date: 1986
TTU Email: stefan.estreicher@ttu.edu
Phone: (806) 742-3723
Campus Mail Stop: 1051
Mailing Address: ____________________________________________
City/State ________________ Zip __________

I. Academic Background

Degree Robert A. Welch Postdoctoral Fellow
Field Physics
Institution Rice University
Year Awarded 1986

Degree Ph D
Field theoretical physics
Institution University of Zürich
Year Awarded 1982

Degree MS
Field Physics
Institution University of Geneva
Year Awarded 1978

II. Professional Experience, Academic and Nonacademic

III. Direction of Graduate Students (completed theses and dissertations directed in the last six years)

Student's Name Mehmet Bahadir Bebek
Involvement Doctoral Advisory Committee Chair
Year Completed

Physics
<table>
<thead>
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<th>Institution</th>
<th>Texas Tech University</th>
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<tr>
<td>Student's Name</td>
<td>Byungkyun Kang</td>
</tr>
<tr>
<td>Involvement</td>
<td>Dissertation Committee Chair</td>
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<td>Year Completed</td>
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<tr>
<td>Institution</td>
<td>Texas Tech University</td>
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</table>

| Student's Name    | Andris Docaj           |
| Involvement       | Master's Thesis Committee Chair |
| Year Completed    | March 2012             |
| Institution       | Texas Tech University  |

| Student's Name    | Terrance Michael Gibbons |
| Involvement       | Dissertation Committee Chair |
| Year Completed    | March 2012              |
| Institution       | Texas Tech University   |

| Student's Name    | Daniel Backlund         |
| Involvement       | Dissertation Committee Chair |
| Year Completed    | June 2010               |
| Institution       | Texas Tech University   |

IV. Other Service on Graduate Committees in the last six years (excluding III)

On numerous committees; but detailed record not kept

V. Graduate Courses Taught in the last six years

**Summer II TTU 2013**
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research

**Summer I TTU 2013**
PHYS 8000 Doctor's Dissertation

**Spring TTU 2013**
PHYS 7000 Research
PHYS 5303 Electromagnetic Theory

**Fall TTU 2012**
PHYS 7000 Research
PHYS 6306 Advanced Electromagnetic Theory

**Summer II TTU 2012**
PHYS 7000 Research
Summer I TTU 2012
PHYS 7000 Research

Spring TTU 2012
PHYS 7000 Research
PHYS 5303 Electromagnetic Theory

Fall TTU 2011
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6306 Advanced Electromagnetic Theory
PHYS 6000 Master's Thesis

Summer II TTU 2011
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research

Summer I TTU 2011
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research

Spring TTU 2011
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6000 Master's Thesis
PHYS 5303 Electromagnetic Theory

Fall TTU 2010
PHYS 7000 Research

Summer II TTU 2010
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6002 Master's Report
PHYS 6000 Master's Thesis
PHYS 5001 Master's Internship

Summer I TTU 2010
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6002 Master's Report
PHYS 6000 Master's Thesis
PHYS 5001 Master's Internship

Spring TTU 2010
Physics
VI. Published Research and Creative Activity in the last six years

Peer-Reviewed/Refereed

**Journal Articles (Invited)**


**Journal Articles (Accepted)**


**Book Chapters (Invited)**


**Book Chapters (Accepted)**


**Conference Proceedings (Invited)**


\textbf{Conference Proceedings (Accepted)}


\textbf{Non-Peer-Reviewed/Refereed}

\textbf{Conference Proceedings (Invited)}


\textbf{VII. Current Participation in Professional Associations}

fellow, Institute of Physics. (September 1, 2006 - Present).

member, Materials Research Society. (January 1, 2000 - Present).

fellow, American Physical Society. (1997 - Present).

Reviewer, Journal Article, Physical Review B.


Committee Member, International Advisory Committee of the ICDS. (July 2002 - Present).


Editor, Associate Editor, Journal of Applied Physics. (July 2013 - December 2013).


External Examiner, Simon Fraser University, Vancouver. (October 6, 2011 - October 10, 2011).

secretary and acting chair, International Steering Committee of the ICDS. (July 2009 - July 2011).


Editor, Conference Proceedings, ICDS-25, St Peters burg, Russia. (2009).

Committee Member, International Program Committee of ICDS-25. (September 2008 - July 2009).


Seminar, EFPL. (2008).


Member, International Advisory Committee of the ICDS. (2008).

Member, International Program Committee of ICDS-25. (2008).

Member, International Steering Committee of the ICDS. (2008).

Seminar, King's College London. (2008).


External Examiner, PhD of Gianpietro Moras at King's College London (UK). (2008).


Member, Program Committee, Gordon Research Conference 'Defects on Semiconductors'. (2008).


Solar Focus Meeting, Germany. (March 2008 - 2008).


Co-Chair, 24th International Conference on Defects in Semiconductors (ICDS). (2007).

Member, International Advisory Committee of the ICDS. (2007).

Member, International Steering Committee of the ICDS. (2007).


Member, Program Committee, Gordon Research Conference 'Defects on Semiconductors'. (2007).

VIII. Presentations in the last six years

Invited


Estreicher, S., Osher Lifelong Learning Institute, OLLI, Texas Tech University, "The Story of Wine, 2 lectures," Local. (February 2013).


Estreicher, S., Plenary - 14th Int. Conf. on Defects-Recognition, Imaging & Physics in Semiconductors, DRIP, Myazaki, Japan, "Theory of defects in Physics


Estreicher, S., Technical seminar, University of Melbourne, Melbourne, Australia, "Can you control the thermal conductivity of semiconductors by doping?," Regional. (July 13, 2011).

Estreicher, S., Technical seminar, University of Oviedo, Oviedo, Spain, "Impurity-dependence of the thermal conductivity calculated from first principles," Regional. (June 27, 2011).


Estreicher, S., Technical seminar, Walter Schottky Institute, Munich, Germany, "Can you control the thermal conductivity of semiconductors by doping?," Regional. (May 26, 2011).


Estreicher, S., technical seminar, University of Aveiro, Aveiro, Portugal, "impurity-controlled thermal conductivity of semiconductor nanostructures." (November 2010).


Estreicher, S., technical seminar, University of Aarhus, Aarhus, Denmark, "impurity-controlled thermal conductivity of semiconductor nanostructures." (September 2010).

Estreicher, S., technical seminar, University of Goettingen, Goettingen, Germany, "transition metal impurities in Si." (September 2010).
Estreicher, S., technical seminar, Technical University Dresden, Dresden, Germany, "transition metal impurities in Si." (September 2010).

Estreicher, S., technical seminar, MIT, Cambridge MA, "Can the thermal conductivity of Si nanostructures be controlled by hyperdoping?." (August 13, 2010).


Estreicher, S. (Presenter Only), Wine Marketing class, wine marketing - TTU, Human Sciences, Local. (February 2, 2010).


Estreicher, S., Colloquium, Mechanical Engr., TTU, Lubbock, TX, "Vibrational dynamics of impurities in semiconductors and of semiconductors containing impurities," Local, Peer Reviewed/Refereed, Published in Proceedings. (November 2008).


Estreicher, S., Colloquium, MIT- Lab for Photovoltaics Research, Boston, MA, "Fe (Ni and Ti) in silicon: the visible, the hidden, and the (partially) passivated," National, Peer Reviewed/Refereed, Published in Proceedings. (August 2008).


Estreicher, S., Colloquium, Texas Tech University, Lubbock, TX, "Iron impurities in silicon," Local, Peer Reviewed/Refereed, Published in Proceedings. (October 2007).


General


Estreicher, S., department colloquium, Physics Department, TTU, "Can the thermal conductivity of semiconductors be controlled by impurities?," Local. (September 2009).

Estreicher, S., technical seminar, University of Cambridge, UK, "Can the thermal conductivity of semiconductors be controlled by impurities?," International. (May 2009).


IX. Grant and Contract Activity for the last six years

Grant


Estreicher, S. (Principal), "Dynamics of Impurities in Semiconductors," Sponsored by R.A. Welch Foundation, Private, $190,000.00. (June 1, 2009 - May 31, 2012).


Estreicher, S. (Principal), "Dynamics of impurities and defects in semiconductors," Sponsored by R.A Welch Foundation, Private, $180,000.00. (June 1, 2006 - May 31, 2009).


Estreicher, S. (Principal), Stavola, M. (Principal), "Hydrogenation methods and passivation mechanisms for c-Si photovoltaics," Sponsored by National Renewable Energy Laboratory, $98,000.00. (March 2006 - December 2007).

**Sponsored Research**

Estreicher, S., "dynamics of impurities in semiconductors," Sponsored by TRIP (state of Texas) - matching funds, State, $12,500.00. (November 2012 - May 2013).

**Grant - Not Funded**


Estreicher, S. (Principal), Stavola, M. (Principal), "Research on Defect and Impurity Engineering for Efficiency Improvements of c-Si Solar Cells," Sponsored by Department of Energy, $500,000.00. (December 2010).


**Grant - Pending**

X. Other professional activities during the last six years that contribute to graduate education

Fellowships, Scholarships and Awards

Scientist of the year, ARCS (Achievement Rewards for College Scientists). (October 24, 2012).

travel grant, Alexander von Humboldt Foundation. (June 2010).

President’s Book Award, Texas Tech University. (2008).

New Format for existing course

Fall TTU 2012

"Advanced Electromagnetic Theory," PHYS 6306-001. lecture notes on power point available for students to download. This reduces the amount of writing students need to do and leaves more time for discussion and examples. A lot of complicated equations though...

Spring TTU 2012

"Electromagnetic Theory," PHYS 5303-001. PowerPoint lecture, downloadable by students

Fall TTU 2011


Spring TTU 2011


New Course Preparation Work

Fall TTU 2012

"Advanced Electromagnetic Theory," PHYS 6306-001. lecture notes on power point available for students to download. This reduces the amount of writing students need to do and leaves more time for discussion and examples. A lot of complicated equations though...

Fall TTU 2011

Spring TTU 2011


Service/Engagement

Committee Member, Nanoscience faculty search committee. (November 2012 - Present).

Committee Chair, Comprehensive Performance Evaluation committee. (April 2009 - Present).

Committee Member, Executive committee. (2009 - Present).

Committee Chair, Faculty Affairs committee. (January 2009 - Present).

Committee Member, PhD Qualifying Examination committee. (2009 - Present).

Committee Member, various search committees in condensed matter and nanoscience. (September 2006 - Present).

Committee Chair, Pre-Tenure Review committee. (January 1, 2009 - December 31, 2009).

various Horn professor-related committees. (January 2001 - Present).

Committee Member, Search for Vice-President for Research. (February 2013 - October 2013).

Committee Member, ad-hoc committee on Academic misconduct. (February 2012 - May 2012).

Committee Member, RCM Council. (September 2009 - February 2011).

Committee Member, RCM sub-committee on Research. (September 2009 - February 2011).

Committee Member, RCM sub-committee on Communications. (January 2009 - February 2011).

Committee Chair, REA Subcommittee on Research. (March 2009 - May 2009).
Committee Member, President’s Task Force on Revenue Enhancement and Allocation. (January 2009 - May 2009).

Committee Member, VPR search committee. (January 2009 - May 2009).

Committee Member, visioning committee for the Maddox Chairs in Engineering. (March 2009).

Committee Member, 'Vision" Committee to decide on the research of Jack F. Maddox, Donovan Maddox Distinguished Engineering Chairs. (2008).

Committee Member, Chancellor's Efficiencies Task Force. (2008).


Committee Member, President's Task Force on Revenue Enhancement and Allocation (REA). (2008).

Committee Member, REA sub-committee on Communications. (2008).

Committee Chair, REA Subcommittee Research. (2008).

Committee Member, VPR Search Committee. (2008).

Chairperson, Maddox Chair Review Committee. (2007).

Chairperson, Maddox Chair Review Committee. (2006 - 2007).

Physics
GRADUATE FACULTY APPLICATION FORM  
TEXAS TECH UNIVERSITY  
Confirmation/Reappointment

Instructions: The Graduate Faculty Application Form is to be generated in the DigitalMeasures software platform, please make any additions or corrections in DigitalMeasures and reprint application.

Name: Thomas L. Gibson (Ph.D.)  
Department/Unit: Physics

Rank/Title: Associate Professor  
Date Submitted: 12-08-2013  
Appointment Date: 1985

TTU Email: thomas.gibson@ttu.edu  
Phone: (806) 742-1606  
Campus Mail Stop:

Mailing Address:  
City/State:  
Zip:

I. Academic Background

Degree: Ph D  
Field: Physics

Institution: University of Oklahoma  
Year Awarded: 1982

Degree: BS  
Field: Physics

Institution: Cameron University  
Year Awarded: 1977

II. Professional Experience, Academic and Nonacademic

Title: Associate Professor  
Institution/Agency: Texas Tech University  
Year(s): September 1, 1991 - Present

III. Direction of Graduate Students (completed theses and dissertations directed in the last six years)

Student's Name: Kenneth Carrell  
Involvement: Dissertation Committee Chair  
Year Completed: October 23, 2009  
Institution: Physics
IV. Other Service on Graduate Committees in the last six years (excluding III)

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<thead>
<tr>
<th>Student's Name</th>
<th>Corey Petty</th>
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<th>Thomas Halverson</th>
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<td>Involvement</td>
<td>Dissertation Committee Member</td>
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<table>
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<tr>
<th>Student's Name</th>
<th>Jake Schwierking</th>
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<td>Master's Thesis Committee Member</td>
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<table>
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<th>Jason McAfee</th>
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V. Graduate Courses Taught in the last six years

**Spring TTU 2012**
PHYS 5322 Computational Physics

**Spring TTU 2011**
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6000 Master's Thesis

**Summer II TTU 2010**
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6002 Master's Report
PHYS 6000 Master's Thesis
PHYS 5001 Master's Internship
VI. Published Research and Creative Activity in the last six years

**Peer-Reviewed/Refereed**

**Journal Articles (Accepted)**


VII. Current Participation in Professional Associations

Member, American Physical Society.

Committee Member, Texas Section of the American Physical Society, Lubbock, Texas. (March 1, 2012 - October 27, 2012).

VIII. Presentations in the last six years

IX. Grant and Contract Activity for the last six years

X. Other professional activities during the last six years that contribute to graduate education

**Service/Engagement**

Committee Member, Petition to Retain TTU Physics Baccalaureate Degree.

Faculty Advisor, Sigma Pi Sigma Installation Ceremony.

Physics
Recruitment Activity, University Day Fall 2011.

Recruitment Activity, Undergraduate Recruiter. (May 30, 2012 - Present).

Committee Chair, Undergraduate Text Book Committee. (April 15, 2012 - Present).

Committee Member, Undergraduate Service Course Committee. (September 1, 2010 - Present).

Supervisor, Supervise James Lee Burnside: PC Network Support II Staff Member. (May 27, 2010 - Present).

Director, Departmental Computing Center. (September 1, 1985 - Present).

Committee Member, Teaching Evaluation. (September 1, 2010 - December 20, 2011).

Committee Chair, Teaching Evaluation. (September 1, 1995 - December 20, 2010).

Committee Member, Facilities Study Group. (September 1, 2008 - August 30, 2010).

Board Member, South Plains Regional Science and Engineering Fair, Lubbock, Texas. (March 5, 1999 - Present).

Member, Circus Physicus, Lubbock, TX. (May 24, 2012).

Guest Speaker, Harwell Elementary Science Fair, Lubbock, Texas. (November 18, 2011).

Member, Circus Physicus, Lubbock. (November 11, 2011).

Member, Circus Physicus, Lubbock. (November 5, 2011).

Member, Circus Physicus, Lubbock. (May 17, 2011).

Member, Circus Physicus, Lubbock. (April 15, 2011).

Member, Circus Physicus, Lubbock. (March 29, 2011).

Member, Circus Physicus, Lubbock. (January 29, 2011).

Member, Circus Physicus, Lubbock, Texas. (2010).
GRADUATE FACULTY APPLICATION FORM
TEXAS TECH UNIVERSITY
Confirmation/Reappointment

Instructions: The Graduate Faculty Application Form is to be generated in the DigitalMeasures software platform, please make any additions or corrections in DigitalMeasures and reprint application.

Name: Wallace L. Glab
Department/Unit: Physics
Rank/Title: Associate Professor
Date Submitted: 12-08-2013
Appointment Date: 1990
TTU Email: wallace.glab@ttu.edu
Phone: (806) 742-3776
Campus Mail Stop: 1051
Mailing Address:

I. Academic Background

Degree
Field
Institution
Year Awarded
Ph D
Physics
University of Illinois
1984

Degree
Field
Institution
Year Awarded
MS
Physics
University of Illinois
1980

Degree
Field
Institution
Year Awarded
BS
Physics
University of Illinois
1978

II. Professional Experience, Academic and Nonacademic

Title
Institution/Agency
Year(s)
Associate Professor
Texas Tech University
September 1, 1995 - Present

III. Direction of Graduate Students (completed theses and dissertations directed in the last six years)

Physics
Student's Name | Jake Schwierking  
Involvement | Master's Thesis Committee Chair  
Year Completed | June 20, 2010  
Institution |  

IV. Other Service on Graduate Committees in the last six years (excluding III)

Student's Name | John Como  
Involvement | Dissertation Committee Member  
Year Completed |  
Institution |  

Student's Name | Ken Carrell  
Involvement | Dissertation Committee Member  
Year Completed |  
Institution |  

Student's Name | Liming Qui  
Involvement | Dissertation Committee Member  
Year Completed |  
Institution |  

V. Graduate Courses Taught in the last six years

**Summer I TTU 2013**  
PHYS 5374 Research Experience in Physics  

**Summer I TTU 2012**  
PHYS 5374 Research Experience in Physics  

**Spring TTU 2011**  
PHYS 8000 Doctor's Dissertation  
PHYS 7000 Research  
PHYS 6000 Master's Thesis  

**Summer II TTU 2010**  
PHYS 8000 Doctor's Dissertation  
PHYS 7000 Research  
PHYS 6002 Master's Report  
PHYS 6000 Master's Thesis  
PHYS 5001 Master's Internship  

**Summer I TTU 2010**  
PHYS 6002 Master's Report  

Physics
VI. Published Research and Creative Activity in the last six years

VII. Current Participation in Professional Associations

Member, Sigma Pi Sigma. (October 20, 1982 - Present).

Member, American Physical Society. (August 1, 1979 - Present).

Reviewer, Grant Proposal, National Science Foundation. (December 10, 2011 - December 30, 2011).

Reviewer, Grant Proposal, National Science Foundation. (November 29, 2011 - December 20, 2011).

Reviewer, Grant Proposal, National Science Foundation. (March 1, 2010 - March 21, 2010).

Reviewer, Grant Proposal, National Science Foundation. (April 1, 2009 - August 31, 2009).

VIII. Presentations in the last six years

Accepted

Glab, W., SPIN-UP, NSF, Austin, TX, "Group presentation on Physics Major program at TTU," National. (May 6, 2012).

IX. Grant and Contract Activity for the last six years

Grant - Pending

Hardin, E. (Principal), Siwatu, K. (Supporting), Gellene, G. (Supporting), Howle, V. (Supporting), Dini, M. (Supporting), Glab, W. (Supporting), "Implicit theories Physics
of intelligence in gateway pipeline courses," Sponsored by NIH, Federal, $971,675.00.

Cañas, J. (Co-Principal), Gellene, G. (Principal), Nutter, B. (Co-Principal), Toda, M. (Co-Principal), Glab, W. (Co-Principal), Hardin, E. (Co-Principal), "Sealing the Leaky Pipeline: Developing BASIC (Bridge and Support Involving Clickers) Courses in the Collegiate STEM Classroom," Sponsored by National Science Foundation, Federal, $2,062,173.00.

X. Other professional activities during the last six years that contribute to graduate education

New Course Preparation Work

Summer I TTU 2012

"Research Experience in Physics," PHYS 5374-001. Developed all new lecture based and hands-on exercises for educating middle school teachers on the techniques and meaning of physics research.

Service/Engagement

Committee Chair, Physics major re-organization. (February 1, 2011 - Present).

Committee Chair, Scholarship committee. (January 1, 2010 - Present).

Committee Member, Physics Teaching Laboratories. (September 1, 2009 - Present).

Committee Member, Undergraduate Majors Committee. (September 1, 2009 - Present).

Committee Chair, Astrophysics search committee. (June 1, 2012 - November 30, 2012).

Committee Member, Facilities. (January 1, 2008 - August 31, 2009).

Faculty Advisor, Tech Gun Club. (August 31, 2011 - Present).

Faculty Advisor, Americans for Firearms Freedom. (February 10, 2011 - Present).

Committee Member, Radiation and Laser Safety Committee. (September 1, 1997 - Present).

Board Member, Shepherd King Lutheran Church, Lubbock, TX. (January 22, 2012 - Present).
Committee Member, Shepherd King Lutheran Church, Lubbock, TX. (December 30, 2011 - Present).

Member, Physics Circus, Lubbock, TX. (May 24, 2012).

Member, Physics Circus, Lubbock, TX. (November 5, 2011).

Member, Physics Circus, Lubbock, TX. (June 21, 2011).
Instructions: The Graduate Faculty Application Form is to be generated in the DigitalMeasures software platform, please make any additions or corrections in DigitalMeasures and reprint application.

Name: Luis Grave De Peralta
Department/Unit: Physics
Rank/Title: Associate Professor
Date Submitted: 12-08-2013
Appointment Date: 2007

TTU Email: luis.grave-de-peralta@ttu.edu
Phone: (806) 742-3773
Campus Mail Stop: __________

I. Academic Background

Degree: Ph D
Field: Electrical Engineering
Institution: Texas Tech University
Year Awarded: 2000

Degree: Licenciado
Field: Physics
Institution: Oriente University
Year Awarded: 1982

II. Professional Experience, Academic and Nonacademic

Title: Associate Professor
Institution/Agency: Texas Tech University
Year(s): September 2013 - Present

Title: Assistant Professor
Institution/Agency: Texas Tech University
Year(s): January 2007 - August 2013

III. Direction of Graduate Students (completed theses and dissertations directed in the last six years)

Physics
<table>
<thead>
<tr>
<th>Student's Name</th>
<th>Involvement</th>
<th>Year Completed</th>
<th>Institution</th>
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<tbody>
<tr>
<td>Dongyu Cao</td>
<td>Master's Thesis Committee Chair</td>
<td>In progress</td>
<td>Texas Tech University</td>
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<tr>
<td>Mdhaoui Alhusain</td>
<td>Master's Thesis Committee Chair</td>
<td>In progress</td>
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<tr>
<td>Nouf Alharbi</td>
<td>Master's Thesis Committee Chair</td>
<td>In progress</td>
<td>Texas Tech University</td>
</tr>
<tr>
<td>Daniel Dominguez</td>
<td>Doctoral Advisory Committee Chair</td>
<td>In progress</td>
<td>Texas Tech University</td>
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<tr>
<td>Darshan Desai</td>
<td>Doctoral Advisory Committee Chair</td>
<td>In progress</td>
<td>Texas Tech University</td>
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<tr>
<td>Willis Agutu</td>
<td>Master's Thesis Committee Chair</td>
<td>In progress</td>
<td>Texas Tech University</td>
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<tr>
<td>Alam Kamrul</td>
<td>Master's Thesis Committee Chair</td>
<td>August 2012</td>
<td>Texas Tech University</td>
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<tr>
<td>Daniel Dominguez</td>
<td>Master's Thesis Committee Chair</td>
<td>July 2012</td>
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<tr>
<td>Ongart Thiabgoh</td>
<td>Master's Thesis Committee Chair</td>
<td>July 2012</td>
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</table>
Institution: Texas Tech University

Student's Name: Jacob Ajimo
Involvement: Doctoral Advisory Committee Chair
Year Completed: December 2011

Institution: Texas Tech University

Student's Name: Mohammed Alsheheri
Involvement: Master's Thesis Committee Chair
Year Completed: December 2011

Institution: Texas Tech University

Student's Name: Adam Houk
Involvement: Master's Thesis Committee Chair
Year Completed: December 2011

Institution: Texas Tech University

Student's Name: Amy West
Involvement: Master's Thesis Committee Chair
Year Completed: December 2011

Institution: Texas Tech University

Student's Name: Robier Rodriguez
Involvement: Master's Thesis Committee Chair
Year Completed: December 2011

Institution: Texas Tech University

Student's Name: Moses Marchante
Involvement: Master's Thesis Committee Chair
Year Completed: March 11, 2010

Institution: Texas Tech University

Student's Name: Alicja Idziaszek
Involvement: Master's Thesis Committee Chair
Year Completed: December 2008

Institution: Texas Tech University

Student's Name: Micah Gatz
Involvement: Master's Thesis Committee Chair
Year Completed: December 2008

Institution: Texas Tech University

IV. Other Service on Graduate Committees in the last six years (excluding III)

Physics
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<tr>
<th>Student's Name</th>
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<th>Charles J. Regan</th>
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<th>Karthik Sudandraprakash</th>
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Physics
V. Graduate Courses Taught in the last six years

**Fall TTU 2013**
PHYS 7000 Research  
PHYS 5300 Special Topics: Plasmonics and Metamaterials

**Summer II TTU 2013**
PHYS 7000 Research

**Summer I TTU 2013**
PHYS 6000 Master's Thesis

**Spring TTU 2013**
PHYS 7000 Research  
PHYS 6000 Master's Thesis

**Fall TTU 2012**
PHYS 7000 Research

**Summer I TTU 2012**
PHYS 7000 Research  
PHYS 6000 Master's Thesis

**Spring TTU 2012**
PHYS 7000 Research  
PHYS 6000 Master's Thesis  
PHYS 5300 Special Topics: Plasmonics and Metamaterials

**Fall TTU 2011**
PHYS 8000 Doctor's Dissertation  
PHYS 7000 Research  
PHYS 6000 Master's Thesis

**Summer II TTU 2011**
PHYS 8000 Doctor's Dissertation  
PHYS 7000 Research
Summer I TTU 2011
PHYS 7000 Research

Spring TTU 2011
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6000 Master's Thesis
PHYS 5300 Special Topics: Plasmonics and Metamaterials

Summer II TTU 2010
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6002 Master's Report
PHYS 6000 Master's Thesis
PHYS 5001 Master's Internship

Summer I TTU 2010
PHYS 7000 Research
PHYS 6002 Master's Report
PHYS 6000 Master's Thesis
PHYS 5001 Master's Internship

Spring TTU 2010
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6002 Master's Report
PHYS 6000 Master's Thesis

Spring TTU 2009
PHYS 7000 Research

Fall TTU 2008
PHYS 7000 Research
PHYS 6000 Master's Thesis

Spring TTU 2008
PHYS 7000 Research
PHYS 6000 Master's Thesis

VI. Published Research and Creative Activity in the last six years

Peer-Reviewed/Refereed

Journal Articles (Accepted)


VII. Current Participation in Professional Associations

Member, Optica Society of America. (March 2010 - Present).

Member, American Physics Society. (2007 - Present).

VIII. Presentations in the last six years

**Accepted**


Grave De Peralta, L. (Author Only), Kamrul, A. (Presenter & Author), 2012 Texas Section Fall Meeting, APS, Lubbock, TX, "Double slit diffraction experiments with surface plasmon polaritons," Regional, Published in Proceedings. (October 2012).

Grave De Peralta, L. (Presenter & Author), Dominguez, D. (Author Only), 2012 Texas Section Fall Meeting, APS, Lubbock, TX, "How to detect photons passing trough interference minima," Regional, Published in Proceedings. (October 2012).

Grave De Peralta, L. (Author Only), Bernussi, A. (Author Only), Regan, C. J. (Presenter & Author), Rodriguez, R. (Author Only), Gourshetty, S. (Author Only), Dominguez, D. (Author Only), 2012 Texas Section Fall Meeting, APS, Lubbock, TX, "Optical wide-field nanoscope," Regional, Published in Proceedings. (October 2012).
Grave De Peralta, L. (Author Only), Bernussi, A. (Author Only), Reagan, C. J. (Author Only), Thiabgoh, E. (Presenter & Author), 2012 Texas Section Fall Meeting, APS, Lubbock, TX, "Practical metamaterial lenses for plasmonic applications," Regional, Published in Proceedings. (October 2012).

Gourshetty, S. (Presenter & Author), Regan, C. J. (Author Only), Grave De Peralta, L. (Author Only), Bernussi, A. (Author Only), 2012 Texas Section Fall Meeting, APS, Lubbock, TX, "Study of Plasmonic Crystal to Metamaterial Transition in Dielectric Doped Two-Dimensional Periodic Structures," Regional, Published in Proceedings. (October 2012).

Grave De Peralta, L. (Author Only), Bernussi, A. (Author Only), Regan, C. J. (Author Only), Willis, A. (Presenter & Author), 2012 Texas Section Fall Meeting, APS, Lubbock, TX, "Study of surface plasmon polariton propagation in plasmonic waveguides," Regional, Published in Proceedings. (October 2012).

Dominguez, D. (Presenter & Author), Houk, A. (Author Only), Grave De Peralta, L. (Author Only), 2011 Spring Meeting of the Texas Section of the APS, AAPT, and SPS, APS, AAPT, and SPS, Texas, Regional, Published in Proceedings. (March 2011).

Ajimo, J. (Presenter & Author), Regan, C. (Author Only), Bernussi, A. (Author Only), Park, S. (Author Only), Lopez-Boada, R. (Author Only), Grave De Peralta, L. (Author Only), Spring Meeting of the Texas Section of the APS, AAPT, and SPS, APS, AAPT, and SPS, Texas, "Diffraction by a double slit: study on the influence of the slits' walls," Regional, Published in Proceedings. (March 2011).

Ajimo, J. (Presenter & Author), Regan, C. (Author Only), Bernussi, A. (Author Only), Grave De Peralta, L. (Author Only), 2010 Fall Meeting – Texas Section of the American Physical Society & Texas Section of the American Association of Physics Teachers, APS, San Antonio, TX, USA, "Surface plasmon polariton propagation, interference and diffraction," Regional, Peer Reviewed/Refereed. (October 2010).

Grave De Peralta, L. (Author Only), Dominguez, D. (Presenter & Author), Sandy, J. (Presenter & Author), 2010 Fall Meeting – Texas Section of the American Physical Society & Texas Section of the American Association of Physics Teachers, APS, Austin, TX, "Can interference occur in conditions where the which-path information is available?," Regional, Peer Reviewed/Refereed, Published in Proceedings. (October 23, 2010).

Grave De Peralta, L. (Author Only), Dominguez, D. (Presenter & Author), Sandy, J. (Presenter & Author), 2010 Fall Meeting – Texas Section of the American Physical Society & Texas Section of the American Association of Physics Teachers, APS, Austin, TX, "Ultra fast response of arrayed waveguide gratings: a
phenomenological quantum approach," Regional, Peer Reviewed/Refereed, Published in Proceedings. (October 23, 2010).


Grave De Peralta, L. (Author Only), Dominguez, D. (Presenter & Author), 2009 Fall Meeting of the Texas Sections of the APS, AAPT, and SPS, APS, AAPT, and SPS, Texas, "Quantum Description of Diffraction of Light by a Multiple Slit: The Heuristic Value of the Correspondence Principle," Regional, Peer Reviewed/Refereed, Published in Proceedings. (2009).


IX. Grant and Contract Activity for the last six years

**Contract**

Holtz, M. (Principal), Bernussi, A. (Co-Principal), Berg, J. (Co-Principal), Fan, Z. (Co-Principal), Grave De Peralta, L. (Co-Principal), Nikishin, S. (Co-Principal), "Nanophotonic Devices," Sponsored by U. S. Army, Texas Tech University, $1,402,000.00. (August 31, 2010 - August 30, 2011).


**Grant**

**Grant - Not Funded**


Bernussi, A. (Co-Principal), Grave De Peralta, L. (Principal), "Dynamics of Guide-Wave Surface Plasmon Polariton in Hybrid Nanophotonics," Sponsored by AFOSR, Federal, $2,400,000.00.

Bernussi, A. (Principal), Grave De Peralta, L. (Co-Principal), "Dynamics of surface plasmon polariton in active sub-wavelength structures," Sponsored by NSF, Federal, $385,055.00.

**Grant - Pending**


**Sponsored Research - Pending**

X. Other professional activities during the last six years that contribute to graduate education

Fellowships, Scholarships and Awards

CAREER, NSF. (February 2010).

New Course Preparation Work

Spring TTU 2011

"Special Topics: Plasmonics and Metamaterials," PHYS 5300-014.

Service/Engagement

Committee Member, Faculty search. (November 2011 - Present).

Committee Member, Physics Mayors. (2010 - Present).

Committee Member, Scholarships. (2010 - 2011).

Panelist, TTU Annual NSF CAREER Forum. (March 2011).

Panelist, TTU Annual NSF CAREER Forum. (March 2010).
GRADUATE FACULTY APPLICATION FORM
TEXAS TECH UNIVERSITY
Confirmation/Reappointment

Instructions: The Graduate Faculty Application Form is to be generated in the DigitalMeasures software platform, please make any additions or corrections in DigitalMeasures and reprint application.

Name: Mark Holtz
Department/Unit: Physics

Rank/Title: Adjunct Professor
Date Submitted: 12-08-2013
Appointment Date: 1991 / 2013

TTU Email: mark.holtz@ttu.edu
Phone: Campus Mail Stop:

Mailing Address: City/State Zip

I. Academic Background

Degree: Ph D
Field: Physics
Institution: Virginia Polytechnic Institute and State University
Year Awarded: 1987

Degree: BS
Field: Physics
Institution: Bradley University
Year Awarded: 1980

II. Professional Experience, Academic and Nonacademic

Title: Professor of Physics
Institution/Agency: Texas Tech University
Year(s): August 1, 1991 - 2013

III. Direction of Graduate Students (completed theses and dissertations directed in the last six years)

Student's Name: Sandeep Sohal
Involvement: Dissertation Committee Chair
Institution: Physics
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<tr>
<th>Student's Name</th>
<th>Yu Mao</th>
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<td>Student's Name</td>
<td>Bobby Logan Hancock</td>
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<td>Doctoral Advisory Committee Chair</td>
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<td>Student's Name</td>
<td>Mohammed Nazari</td>
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<td>Master's Thesis Committee Chair</td>
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<tr>
<td>Student's Name</td>
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Physics
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<tr>
<td>January 2010</td>
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<td>Dana Rosenbladt</td>
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<td>2009</td>
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<td>Yanhan Zhou</td>
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<td>Rakib Uddin</td>
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<td>Yanhan Zhou</td>
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<td>Mahesh Pandikunta</td>
<td>Dissertation Committee Member</td>
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<td>Ananth Krishnan</td>
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<td>2010</td>
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<td>Stephen Frisbie</td>
<td>Dissertation Committee Member</td>
<td>2010</td>
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</table>

IV. Other Service on Graduate Committees in the last six years (excluding III)

- Yanhan Zhou, Dissertation Committee Member
- Rakib Uddin, Dissertation Committee Member
- Mahesh Pandikunta, Dissertation Committee Member
- Ananth Krishnan, Dissertation Committee Member
- Stephen Frisbie, Dissertation Committee Member
V. Graduate Courses Taught in the last six years

**Summer II TTU 2013**
PHYS 7000 Research

**Summer I TTU 2013**
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research

**Fall TTU 2012**
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research

**Summer II TTU 2012**
PHYS 7000 Research

**Summer I TTU 2012**
PHYS 7000 Research

**Spring TTU 2012**
PHYS 7000 Research
PHYS 6000 Master's Thesis

**Fall TTU 2011**
PHYS 7000 Research
PHYS 5300 Special Topics

**Summer II TTU 2011**
PHYS 7000 Research

**Summer I TTU 2011**
PHYS 7000 Research

**Spring TTU 2011**
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6000 Master's Thesis

**Summer II TTU 2010**
VI. Published Research and Creative Activity in the last six years

**Peer-Reviewed/Refereed**

**Journal Articles (Accepted)**


Liu, L., Kuryatkov, V. V., Nikishin, S., Harris, H. R., Holtz, M. (2013). Wet Etching Silicon Nanofins with (111)-Oriented Sidewalls. *JVSTB.*


**Conference Proceedings (Accepted)**


**Non-Peer-Reviewed/Refereed**

**Book Chapters (Accepted)**

**Conference Proceedings (Accepted)**


VII. Current Participation in Professional Associations

Member, Materials Research Society. (2000 - Present).

Member, American Physical Society. (September 1, 1983 - Present).

Committee Member, American Physical Society, Washington, D.C.. (November 1, 2011 - Present).


VIII. Presentations in the last six years

**Invited**

Accepted


Nazari, M. (Presenter & Author), Zhao, Y. (Author Only), Kuryatkov, V. (Author Only), Fan, Z. (Author Only), Bernussi, A. (Author Only), Holtz, M. (Author Only), 2012 Texas Section Fall Meeting, APS, Lubbock, TX, "Temperature dependence of the optical properties of VO2 deposited on sapphire with different orientations," Regional, Published in Proceedings. (October 2012).

Zhu, Y. (Presenter & Author), Holtz, M., Bernussi, A., 2012 Texas Section Fall Meeting, APS, Lubbock, TX, "Terahertz time-domain spectroscopy of cotton sheets," Regional, Published in Proceedings. (October 2012).


Feng, W. (Presenter & Author), Rajanna, G. (Author Only), Sohal, S. (Author Only), Nikishin, S. (Author Only), Bernussi, A. (Author Only), Holtz, M. (Author Only), MRS Fall 2010 Meeting, Boston, USA, "Effects of MBE growth on the

Physics


General


Karaoglan, G. (Presenter & Author), Nikishin, S., Holtz, M., Coan, M. M. (Author Only), Johnson, D. W. (Author Only), Woo, J. H. (Author Only), Physics


IX. Grant and Contract Activity for the last six years

Contract

Holtz, M. (Principal), Bernussi, A. (Co-Principal), Berg, J. (Co-Principal), Fan, Z. (Co-Principal), Grave De Peralta, L. (Co-Principal), Nikishin, S. (Co-Principal), "Nanophotonic Devices," Sponsored by U. S. Army, Texas Tech University, $1,402,000.00. (August 31, 2010 - August 30, 2011).


Grant

Holtz, M. (Principal), Temkin, H. (Co-Principal), "Research Superiority," Sponsored by State of Texas Emerging Technology Fund, State, $2,000,000.00.


Holtz, M. (Co-Principal), Nikishin, S. (Principal), "III-Nitride FinFETs on Silicon Substrates," Sponsored by NSF, Federal, $216,000.00. (September 1, 2010 - August 31, 2013).

Nikishin, S. (Principal), Holtz, M. (Co-Principal), "Development of new semiconductor materials for nanoengineered," Sponsored by NHARP Texas, Texas Tech University, $196,460.00. (June 1, 2010 - May 31, 2013).

Physics

Holtz, M. (Co-Principal), Nikishin, S. (Principal), Berg, J. (Co-Principal), Bernussi, A. (Co-Principal), "Nano-Engineering Efficient Optoelectronic Devices," Sponsored by NSF, Federal, $1,000,000.00. (June 1, 2006 - May 31, 2012).

**Grant - Not Funded**

Holtz, M. (Principal), Berg, J. (Co-Principal), Harris, H. (Co-Principal), "Thermal conductivity in nanowires," Sponsored by NSF, Federal, $525,000.00.


Nikishin, S. (Principal), Berg, J. (Co-Principal), Bernussi, A. (Co-Principal), Morse, A. (Co-Principal), Miller, D. L. (Co-Principal), Holtz, M. (Supporting), Fan, Z. (Supporting), Jackson, W. (Supporting), Mitchell, R., "PFI: Academic/Small Business Enterprise to Develop a UVC Laser Technology Platform for Environmental and Human Health," Sponsored by NSF, Texas Tech University, $600,000.00. (June 1, 2011 - May 31, 2013).

Holtz, M. (Principal), Berg, J. (Co-Principal), Nikishin, S. (Co-Principal), "III-Nitride field effect transistors," Sponsored by NSF, Federal, $525,000.00.


Holtz, M. (Principal), Berg, J. (Co-Principal), Fan, Z. (Co-Principal), "ARI Cleanroom Renovation," Sponsored by NSF, Federal, $2,000,000.00.


Physics


**Grant - Pending**


X. Other professional activities during the last six years that contribute to graduate education

**New Course Preparation Work**

**Fall TTU 2011**

"Special Topics," PHYS 5300-014.

**Service/Engagement**

Committee Member, PhD Qualifier Committee. (September 1, 2010 - Present).

Committee Member, Faculty Affairs Committee. (2008 - Present).

Committee Member, Arts and Sciences Strategic Research Committee. (January 1, 2011 - Present).

Committee Member, Common Materials Characterization Facility. (September 2010 - Present).

Committee Chair, Graduate Review Mechanical Engineering. (December 2008 - August 2009).
GRADUATE FACULTY APPLICATION FORM
TEXAS TECH UNIVERSITY
Confirmation/Reappointment

Instructions: The Graduate Faculty Application Form is to be generated in the DigitalMeasures software platform, please make any additions or corrections in DigitalMeasures and reprint application.

Name: Juyang Huang
Department/Unit: Physics
Rank/Title: Professor
Date Submitted: 12-11-2013
Appointment Date: 1999
TTU Email: juyang.huang@ttu.edu
Phone: (806) 742-4780
Campus Mail Stop:
Mailing Address:
City/State Zip

I. Academic Background

Degree Field Institution Year Awarded
Ph D Physics State University of New York 1987
MS Electrical and Computer Engineering State University of New York 1986
BS Physics Zhejiang University 1981

II. Professional Experience, Academic and Nonacademic

Title Institution/Agency Year(s)
Professor Texas Tech University September 1, 2011 - Present
Associate Professor Physics
III. Direction of Graduate Students (completed theses and dissertations directed in the last six years)

<table>
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<tr>
<th>Student's Name</th>
<th>Involvement</th>
<th>Year Completed</th>
<th>Institution</th>
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<tr>
<td>Christopher Stanley</td>
<td>Master's Thesis Committee Chair</td>
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<td>Texas Tech University</td>
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<tr>
<td>Yu Mao</td>
<td>Dissertation Committee Chair</td>
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<tr>
<td>Ebrahim Hassan Zadeh</td>
<td>Dissertation Committee Chair</td>
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<tr>
<td>Eda Baykal</td>
<td>Dissertation Committee Chair</td>
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<tr>
<td>Serkan Balyimez</td>
<td>Dissertation Committee Chair</td>
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<tr>
<td>Wei Wang</td>
<td>Dissertation Committee Chair</td>
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<tr>
<td>Cholpon Tilegenova</td>
<td>dissertation Committee Chair</td>
<td>June 1, 2012</td>
<td>Texas Tech University</td>
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<tr>
<td>Mohammad Alwarawrah</td>
<td>dissertation Committee Chair</td>
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<tr>
<td>Student's Name</td>
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<tr>
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IV. Other Service on Graduate Committees in the last six years (excluding III)

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<td>Student's Name</td>
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<tr>
<td>Student's Name</td>
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<tr>
<td>Student's Name</td>
<td>Shashidhaar Guttula</td>
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<td>Involvement</td>
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Physics
Institution: Texas Tech University

V. Graduate Courses Taught in the last six years

**Summer II TTU 2013**
- PHYS 8000 Doctor's Dissertation

**Summer I TTU 2013**
- PHYS 8000 Doctor's Dissertation
- PHYS 5300 Special Topics

**Spring TTU 2013**
- PHYS 8000 Doctor's Dissertation
- PHYS 7000 Research
- PHYS 5101 Seminar

**Fall TTU 2012**
- PHYS 7000 Research
- PHYS 5306 Classical Dynamics
- PHYS 5101 Seminar

**Summer II TTU 2012**
- PHYS 7000 Research
- PHYS 5300 Special Topics

**Summer I TTU 2012**
- PHYS 7000 Research

**Spring TTU 2012**
- PHYS 8000 Doctor's Dissertation
- PHYS 7000 Research

**Fall TTU 2011**
- PHYS 8000 Doctor's Dissertation
- PHYS 7000 Research
- PHYS 5306 Classical Dynamics

**Summer II TTU 2011**
- PHYS 8000 Doctor's Dissertation
- PHYS 7000 Research

**Summer I TTU 2011**
- PHYS 8000 Doctor's Dissertation
- PHYS 7000 Research

**Spring TTU 2011**

Physics
PHYS 8000 Doctor's Dissertation  
PHYS 7000 Research  
PHYS 5309 Methods in Biophysics  
PHYS 5101 Seminar  

**Fall TTU 2010**  
PHYS 8000 Doctor's Dissertation  
PHYS 7000 Research  
PHYS 5306 Classical Dynamics  
PHYS 5101 Seminar  

**Summer II TTU 2010**  
PHYS 8000 Doctor's Dissertation  
PHYS 7000 Research  
PHYS 6002 Master's Report  
PHYS 6000 Master's Thesis  
PHYS 5300 Special Topics  
PHYS 5001 Master's Internship  

**Summer I TTU 2010**  
PHYS 8000 Doctor's Dissertation  
PHYS 7000 Research  
PHYS 6002 Master's Report  
PHYS 6000 Master's Thesis  
PHYS 5001 Master's Internship  

**Spring TTU 2010**  
PHYS 8000 Doctor's Dissertation  
PHYS 7000 Research  
PHYS 6002 Master's Report  
PHYS 6000 Master's Thesis  
PHYS 5308 Molecular Biophysics  

**Fall TTU 2009**  
8000 Doctor's Dissertation-PHYS 8000  
7000 Graduate Research - PHYS 7000  
6000 Master's Thesis- 6000  
5306 Classical Dynamics-PHYS 5306  

**Spring TTU 2009**  
7000 Graduate Research-PHYS 7000  

VI. Published Research and Creative Activity in the last six years  

**Peer-Reviewed/Refereed**  

Physics
Journal Articles (Accepted)


Non-Peer-Reviewed/Refereed

Book Chapters (Accepted)


VII. Current Participation in Professional Associations

Member, American Physical Society. (February 1, 2001 - Present).

Member, American Chemical Society. (September 1, 1999 - Present).

Member, Biophysical Society. (September 1, 1989 - Present).

Reviewer, Journal Article, PLOS ONE. (June 2013).


Reviewer, Grant Proposal, The National Science Foundation. (January 20, 2010 - December 20, 2010).


Physics
Reviewer, Grant Proposal, The National Science Foundation. (February 20, 2009 - October 20, 2009).


VIII. Presentations in the last six years

Invited

Huang, J. (Presenter & Author), Colloquium, Department of Physics and Astronomy, Trinity University, San Antonio, TX, "The Complex Roles of Hybrid Lipids in Cell Membranes," Regional. (2013).


Huang, J. (Presenter & Author), Chemistry Colloquium, Department of Chemistry, Texas Tech University, Lubbock, TX, "Predicting the behaviors of cholesterol," Local. (2007).

Huang, J. (Presenter & Author), Colloquium, Department of Physiology and Biophysics, TTUHSC, Lubbock, TX, "Effect of cholesterol on Lipid Membrane Heterogeneity," Local. (2007).

**Accepted**


Balyimez, S. (Presenter & Author), Huang, J. (Author Only), Texas Section American Physical Society Meeting, TSAPS, Lubbock, TX, "Ergosterol and Stigmasterol Interact with Phosphatidylcholine Lipid Bilayers Less Favorably Than Cholesterol," Regional. (October 26, 2012).

Hassan Zadeh, E. (Presenter & Author), Huang, J. (Author Only), Texas Section American Physical Society Meeting, TSAPS, Lubbock, TX, "Gramicidin Alters the Lipid Compositions of Liquid-Ordered and Liquid-Disordered Membrane Domains," Regional. (October 25, 2012).

Baykal Caglar, E. (Presenter & Author), Huang, J. (Author Only), Gordon Research Conference on Biopolymers, Salve Regina University, Newport, RI, "Accomplishing a Better Uniformity in Lipid Composition in Giant Unilamellar Vesicles by Using Damp Lipid Film," National. (June 5, 2012).

Balyimez, S. (Presenter & Author), Huang, J. (Author Only), Gordon Research Conference on Biopolymers, Salve Regina University, Newport, RI, "Large Domain Formation in POPC/POPE Lipid Bilayers at the Maximum Solubility Limit of Cholesterol," National. (June 4, 2012).


Dai, J. (Presenter & Author), Alwarawrah, M. (Author Only), Huang, J. (Author Only), Biophysical Society Annual Meeting 2011, Biophysical Society, Baltimore, MD, "Inhibition of Melittin Activity by Cholesterol, Unsaturated Lipid, and Negatively Charged Lipids Studied by Molecular Dynamics Simulation," International, Published Elsewhere. (March 5, 2011).


Alwarawrah, M. (Presenter & Author), Dai, J., Huang, J., Center for Membrane Protein Research 2nd annual meeting at Texas Tech University Health Sciences Center 2010, TTUHSC, "A Molecular View of the Cholesterol Condensing Effect in DOPC Lipid Bilayers.,” Local. (November 2010).

Alwarawrah, M. (Presenter & Author), Dai, J., Feigenson, G. W., Huang, J., Center for Membrane Protein Research 2nd annual meeting at Texas Tech University Health Sciences Center 2010, TTUHSC, "Molecular Interactions in Phase Separation of DOPC/DSPC/cholesterol Ternary Mixtures.,” Local. (November 2010).

Baykal Caglar, E. (Presenter & Author), Huang, J., Center for Membrane Protein Research 2nd annual meeting at Texas Tech University Health Sciences Center 2010, TTUHSC, "SYNTHESIS OF GIANT UNILAMELLAR VESICLES (GUV) FROM LIPOSOMES PREPARED BY THE RAPID SOLVENT EXCHANGE (RSE) METHOD," Local. (November 2010).

Balyimez, S. (Presenter & Author), Huang, J., Center for Membrane Protein Research 2nd annual meeting at Texas Tech University Health Sciences Center 2010, TTUHSC, "The Maximum Solubility of Cholesterol in POPC/POPE Lipid Mixtures," Local. (November 2010).

Baykal Caglar, E. (Presenter & Author), Huang, J., Annual Meeting of Texas Section of the American Physical Society (TSAPS) 2010, TSAPS, "SYNTHESIS OF GIANT UNILAMELLAR VESICLES (GUV) FROM LIPOSOMES PREPARED BY THE RAPID SOLVENT EXCHANGE (RSE) METHOD," Regional. (October 2010).


General


IX. Grant and Contract Activity for the last six years

Physics
Grant

Huang, J. (Principal), "TTU FY2013 First Proposal Stimulus Program," Sponsored by Office of the Vice President for Research, TTU, $15,000.00. (March 1, 2013 - Present).

Huang, J. (Co-Principal), Feigenson, G. W. (Principal), "Membrane Control of Protein-Protein contact: Simulation Based on Phase diagrams," Sponsored by The National Institute of Health, Federal, $1,532,781.00. (March 1, 2007 - February 28, 2012).

Huang, J. (Principal), "Driving Force of Lipid Raft Formation," Sponsored by The National Science Foundation, Texas Tech University, $275,346.00. (March 1, 2004 - February 28, 2008).

Grant - Not Funded

Huang, J. (Principal), "Control of Membrane Domain Properties by Proteins and Hybrid Lipids," Sponsored by NSF, Federal, $564,575.00.

Huang, J. (Principal), "Connecting Model Membranes to Biomembranes," Sponsored by NSF, Federal, $584,471.00.

Huang, J. (Principal), "Effects of Natural Linactants on Biomembrane Domains," Sponsored by The Welch Foundation, Private, $150,000.00.

Huang, J. (Co-Principal), Tao, Y. (Principal), "Selectively targeting tumor VEGF by hypoxia-activated prodrug TPZ-liposom in kidney cancer," Sponsored by DOD, Federal, $200,000.00.

Huang, J. (Principal), "Control of Submicron-Size Membrane Domains by Hybrid Lipids," Sponsored by NSF, Federal, $560,103.00.

Huang, J. (Principal), "Modulation of membrane domain sizes and properties by hybrid lipids," Sponsored by NSF, Federal, $559,102.00.

Huang, J. (Principal), "Modulation of membrane domain sizes and properties by hybrid lipids," Sponsored by NSF, Federal, $742,034.00.

Huang, J. (Co-Principal), Filleur, S. (Principal), "PEDF Gene Delivery for Prostate Cancer Treatment," Sponsored by NIH, Federal, $750,000.00.

X. Other professional activities during the last six years that contribute to graduate education

Fellowships, Scholarships and Awards

Physics
"Excellence and Inspiration in the Classroom" Award, by Forum Chapter of Mortar Board at TTU. (November 17, 2011).

New Course Preparation Work

Spring TTU 2013

"Seminar," PHYS 5101-001.

Fall TTU 2012

"Seminar," PHYS 5101-001.

Summer II TTU 2012

"Special Topics," PHYS 5300-018.

Spring TTU 2011

"Methods in Biophysics," PHYS 5309-001. Designed some hands-on experiments for this new course. Invited 3 experts to give guest lectures and facility tours.

Fall TTU 2010

"Seminar," PHYS 5101-001. Organizing the graduate seminar course took far more time and energy than teaching a normal graduate course.

Summer II TTU 2010

"Special Topics," PHYS 5300-018.

Spring TTU 2010

"Molecular Biophysics," PHYS 5308-001. New videos and PowerPoint lecture notes were developed A lot time and energy were spent to develop this new course. Students evaluations were excellent (4.7/5.0)

Service/Engagement

Committee Chair, Biophysics Faculty Search Committee. (June 1, 2012 - Present).

Committee Chair, Lab Safety Committee. (September 2011 - Present).

Committee Chair, Teaching Evaluation Committee. (September 2010 - Present).

Physics
Associate chair of the department. (February 2010 - Present).

Committee Member, Graduate Affair Committee. (February 1, 2009 - Present).

Committee Member, Pre-Tenure Review Committee. (March 15, 2008 - Present).

Committee Chair, Facility planning group. (January 1, 2007 - Present).


Committee Member, Physics Department Executive Committee. (January 1, 2007 - Present).

Committee Member, PhD Preliminary Exam Committee. (January 1, 2001 - September 2011).

Faculty Advisor, Advised new physics undergraduates during New Student Orientation days. (April 2009 - August 2009).

Committee Chair, Biophysics Search Committee. (2007).

Committee Member, Research and Technology Campus Building - Team Selection. (November 2012 - Present).

Faculty Advisor, Clark Scholar Program. (April 2013 - May 2013).

Faculty Mentor, Clark Scholar Program. (June 2011 - August 2011).

Video interviewed by Dell Computer for producing a video highlighting the High Performance Computing Center at Texas Tech University. (October 2010).

Grant Proposal Reviewer, Internal, Reviewed an internal MRI proposal for the VP for research. (December 2009).

Guest Speaker, Gave an invited seminar for the Clark Scholar Program. (June 2009).

Committee Member, Endowed Chair Evaluation Committee. (March 2007 - May 2008).

Committee Member, Endowed Chair Evaluation Committee. (2007).
**I. Academic Background**

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<td>MS</td>
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<td>Georgia State University</td>
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<td>BS</td>
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**II. Professional Experience, Academic and Nonacademic**

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<tr>
<th>Title</th>
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<tr>
<td>Associate Professor of Physics</td>
<td>Texas Tech University</td>
<td>January 2013 - Present</td>
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<td>CEO</td>
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Physics
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<tr>
<td>Year(s)</td>
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<tr>
<td>Title</td>
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<td>Year(s)</td>
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<tr>
<td>Title</td>
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<tr>
<td>Institution/Agency</td>
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<td>Year(s)</td>
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<tr>
<td>Title</td>
<td>Adjunct Research Professor</td>
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<td>Institution/Agency</td>
<td>George Mason University</td>
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III. Direction of Graduate Students (completed theses and dissertations directed in the last six years)

IV. Other Service on Graduate Committees in the last six years (excluding III)

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<tr>
<th>Student's Name</th>
<th>Davon Ferrara</th>
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<td>Involvement</td>
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V. Graduate Courses Taught in the last six years

VI. Published Research and Creative Activity in the last six years

**Peer-Reviewed/Refereed**

**Journal Articles (Accepted)**


Non-Peer-Reviewed/Refereed

Other (Accepted)


VII. Current Participation in Professional Associations

Member, American Association for the Advancement of Science. (2005 - Present).

Member, International Astronomical Union. (2003 - Present).


VIII. Presentations in the last six years

Invited


IX. Grant and Contract Activity for the last six years

X. Other professional activities during the last six years that contribute to graduate education

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**GRADUATE FACULTY APPLICATION FORM**
**TEXAS TECH UNIVERSITY**
**Confirmation/Reappointment**

**Instructions:** The Graduate Faculty Application Form is to be generated in the DigitalMeasures software platform, please make any additions or corrections in DigitalMeasures and reprint application.

**Name:** David Lamp  **Department/Uni:** Physics
I. Academic Background

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<th>Degree</th>
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<td>Field</td>
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<table>
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<tr>
<th>Degree</th>
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II. Professional Experience, Academic and Nonacademic

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<th>Title</th>
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III. Direction of Graduate Students (completed theses and dissertations directed in the last six years)

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<tr>
<th>Student's Name</th>
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<tr>
<th>Student's Name</th>
<th>Brandy Land</th>
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<td>Student's Name</td>
<td>Julie Combes</td>
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<td>Student's Name</td>
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<td>Student's Name</td>
<td>Natascha Cox</td>
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<td>Student's Name</td>
<td>Paula Everett</td>
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<td>Student's Name</td>
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<td>Student's Name</td>
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<td>Student's Name</td>
<td>Dorothy Davis</td>
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Physics
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<td>Sherry Wagner</td>
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<td>T Webb Brignon</td>
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<td>A Perez</td>
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<td>C Adcox</td>
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<td>S Aldrich</td>
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<td>Paul Castillo</td>
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<td>R Castro</td>
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<td>L Arispe</td>
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**Physics**
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<td>J Routier</td>
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<td>Rachell Lamm</td>
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<td>Maria Centano</td>
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<td>Teha Cooks</td>
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<td>Chantay Doctor</td>
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<tr>
<td>Katheryn Duncan</td>
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<td>Donna Fox</td>
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<td>Elissa Gere</td>
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<td>Trina Hardin</td>
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**Physics**
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<tr>
<th>Student's Name</th>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Student's Name</th>
<th>Jose Olivencia</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year Completed</td>
<td>Aug 2013</td>
</tr>
<tr>
<td>Institution</td>
<td>Texas Tech University</td>
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<tr>
<td>Involvement</td>
<td>Master's Thesis Committee Chair</td>
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</table>

<table>
<thead>
<tr>
<th>Student's Name</th>
<th>Heather Plaisance</th>
</tr>
</thead>
<tbody>
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<td>Master's Thesis Committee Chair</td>
</tr>
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</table>

Physics
<table>
<thead>
<tr>
<th>Student's Name</th>
<th>Involvement</th>
<th>Year Completed</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Melissa Pruitt</td>
<td>Master's Thesis Committee Chair</td>
<td>Aug 2013</td>
<td>Texas Tech University</td>
</tr>
<tr>
<td>Cari Quillen</td>
<td>Master's Thesis Committee Chair</td>
<td>Aug 2013</td>
<td>Texas Tech University</td>
</tr>
<tr>
<td>George Rodriguez</td>
<td>Master's Thesis Committee Chair</td>
<td>Aug 2013</td>
<td>Texas Tech University</td>
</tr>
<tr>
<td>Heather Ross</td>
<td>Master's Thesis Committee Chair</td>
<td>Aug 2013</td>
<td>Texas Tech University</td>
</tr>
<tr>
<td>Jessica Salazar</td>
<td>Master's Thesis Committee Chair</td>
<td>Aug 2013</td>
<td>Texas Tech University</td>
</tr>
<tr>
<td>Rosa Seman</td>
<td>Master's Thesis Committee Chair</td>
<td>Aug 2013</td>
<td>Texas Tech University</td>
</tr>
<tr>
<td>Jennifer Smith</td>
<td>Master's Thesis Committee Chair</td>
<td>Aug 2013</td>
<td>Texas Tech University</td>
</tr>
<tr>
<td>Ryan Timmons</td>
<td>Master's Thesis Committee Chair</td>
<td>Aug 2013</td>
<td>Texas Tech University</td>
</tr>
</tbody>
</table>

Physics
Year Completed Aug 2013
Institution Texas Tech University

Student's Name Erin Tippett
Involvement Master's Thesis Committee Chair
Year Completed Aug 2013
Institution Texas Tech University

Student's Name Diane Wells
Involvement Master's Thesis Committee Chair
Year Completed Aug 2013
Institution Texas Tech University

Student's Name Amy Williams-Hansen
Involvement Master's Thesis Committee Chair
Year Completed Aug 2013
Institution Texas Tech University

Student's Name Catherine Wright
Involvement Master's Thesis Committee Chair
Year Completed Aug 2013
Institution Texas Tech University

IV. Other Service on Graduate Committees in the last six years (excluding III)

V. Graduate Courses Taught in the last six years

**Summer I TTU 2013**
PHYS 5372 Astronomy for Teachers
PHYS 5371 Conceptual Physics for Teachers

**Spring TTU 2013**
PHYS 5373 Math Modeling

**Fall TTU 2012**
PHYS 5371 Conceptual Physics for Teachers
EDSE 5377 Science Curriculum and Instruction

**Fall TTU 2011**
PHYS 5373 Math Modeling

**Summer I TTU 2011**
VI. Published Research and Creative Activity in the last six years

Peer-Reviewed/Refereed

Journal Articles (Accepted)

Aguirre, Z., Ortiz, R., Lamp, D., Williams, G. Brock, Crmeans, L. Building teachers’ capacity to integrate math and science content: Implications for professional learning models. *Journal of Science Teacher Education*.

VII. Current Participation in Professional Associations

Member, Science Teachers Association of Texas. (2000 - Present).

University Rep to Texas division, American Association of Physics Teachers. (1998 - Present).

Member, National Science Teacher Association. (1998 - Present).

VIII. Presentations in the last six years

Accepted


Ortiz, R. (Presenter & Author), Aguirre, Z., Lamp, D. (Presenter Only), Williams, G. Brock (Presenter Only), Lubbock Independent School District Leadership Conference, LISD, Lubbock, TX, "What is the big idea? Making connection between mathematical and science content areas.," Local. (June 2011).


General


IX. Grant and Contract Activity for the last six years

Grant

Williams, G. Brock (Co-Principal), Aguirre, Z. (Principal), Lamp, D. (Co-Principal), Ortiz, R. (Co-Principal), "Proyecto English Learner Science and Math Physics


Lamp, D. (Principal), Casadonte, D. (Co-Principal), McGinley, M. (Co-Principal), Baker, M. (Co-Principal), Ortiz, R. (Co-Principal), Aguirre, Z. (Principal), Williams, G. Brock (Co-Principal), "Middle School Math/Science MS^2: Understanding by Design," Sponsored by Greater Texas Foundation, State, $1,500,000.00. (June 1, 2009 - August 31, 2013).

Lamp, D. (Co-Principal), Anderson, E. (Principal), Taraban, R. (Co-Principal), Surles, J. (Co-Principal), "Retaining and Preparing Reflective and Self-Directed Learners in the STEM Disciplines," Sponsored by TTU VP Research, Texas Tech University, $124,253.00. (September 1, 2008 - August 31, 2010).

X. Other professional activities during the last six years that contribute to graduate education

Fellowships, Scholarships and Awards

Skoog Cup, Science Teachers' Association of Texas. (November 2011).

New Format for existing course

Spring TTU 2013

"Math Modeling," PHYS 5373-D01.

Fall TTU 2012


"Science Curriculum and Instruction," EDSE 5377-D01.

Summer I TTU 2010


New Course Preparation Work
Spring TTU 2013
"Math Modeling," PHYS 5373-D01.

Fall TTU 2012
"Science Curriculum and Instruction," EDSE 5377-D01.

Fall TTU 2011
"Math Modeling," PHYS 5373-D01. Created curriculum and all delivered modules on scale, electricity, radioactive decay, integration.

Summer I TTU 2010

Service/Engagement

Committee Chair, Undergraduate Advisor. AS - Physics (BS). (July 1, 2012 - Present).
Committee Member, Undergraduate Affairs. (September 2011 - Present).
Committee Member, Low Producing BS Petition. (July 2011 - Present).
Committee Chair, Undergraduate Service Course. (January 2010 - August 2011).
Committee Member, ASCAP. (September 2010 - Present).
Committee Member, STEM Council. (August 2010 - Present).
Committee Chair, MSCI (MS2) Program Coordinator. (April 2010 - Present).
Committee Chair, Science and Math Education program. (July 2011 - December 2012).
Committee Chair, Faculty Awards. (January 1, 2009 - 2011).
Committee Member, Convocations. (September 2011 - Present).
Committee Member, Core Curriculum Natural Science. (January 1, 2009 - Present).

Committee Member, South Plains Regional Science and Engineering Fair, Lubbock, Texas. (1990 - Present).

Physics
GRADUATE FACULTY APPLICATION FORM
TEXAS TECH UNIVERSITY
Confirmation/Reappointment

**Instructions:** The Graduate Faculty Application Form is to be generated in the DigitalMeasures software platform, please make any additions or corrections in DigitalMeasures and reprint application.

**Name:** Sung-Won Lee  
**Department/Unit:** Physics

**Rank/Title:** Associate Professor  
**Submitted:** 12-08-2013  
**Appointment Date:** 2006

**TTU Email:** sungwon.lee@ttu.edu  
**Phone:** (806) 742-3730  
**Campus Mail Stop:** 1051

**Mailing Address:**

I. Academic Background

<table>
<thead>
<tr>
<th>Degree</th>
<th>Field</th>
<th>Institution</th>
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<tbody>
<tr>
<td>Ph D</td>
<td>Experimental High Energy Physics</td>
<td>University of Glasgow</td>
</tr>
<tr>
<td>MS</td>
<td>Experimental High Energy Physics</td>
<td>Kyungpook National University</td>
</tr>
<tr>
<td>BS</td>
<td>Physics</td>
<td>Daegu University</td>
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II. Professional Experience, Academic and Nonacademic

<table>
<thead>
<tr>
<th>Title</th>
<th>Institution/Agency</th>
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<tbody>
<tr>
<td>Assistant Professor</td>
<td>Texas Tech University</td>
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<tr>
<td>Associate Professor</td>
<td>Texas Tech University</td>
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Physics
Year(s) | January 2006 - August 2012
--- | ---

III. Direction of Graduate Students (completed theses and dissertations directed in the last six years)

<table>
<thead>
<tr>
<th>Student's Name</th>
<th>James Faulkner</th>
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<tr>
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<table>
<thead>
<tr>
<th>Student's Name</th>
<th>Kittikul Kovitanggoon</th>
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<table>
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<tr>
<th>Student's Name</th>
<th>Chiyoun Jeong</th>
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IV. Other Service on Graduate Committees in the last six years (excluding III)

<table>
<thead>
<tr>
<th>Student's Name</th>
<th>Brandon Skelton</th>
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<td>Involvement</td>
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<table>
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<tr>
<th>Student's Name</th>
<th>Terence Libeiro</th>
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<td>Involvement</td>
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<table>
<thead>
<tr>
<th>Student's Name</th>
<th>Youn Roh</th>
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<tbody>
<tr>
<td>Involvement</td>
<td>Dissertation Committee Member</td>
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<tr>
<td>Year Completed</td>
<td>December 2011</td>
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<tr>
<td>Institution</td>
<td>Texas Tech University</td>
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</table>

V. Graduate Courses Taught in the last six years

**Summer II TTU 2013**
- PHYS 8000 Doctor's Dissertation
- PHYS 7000 Research

**Summer I TTU 2013**

Physics
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research

Spring TTU 2013
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research

Fall TTU 2012
PHYS 7000 Research

Summer II TTU 2012
PHYS 7000 Research

Summer I TTU 2012
PHYS 7000 Research

Spring TTU 2012
PHYS 7000 Research

Fall TTU 2011
PHYS 7000 Research

Summer II TTU 2011
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research

Summer I TTU 2011
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research

Spring TTU 2011
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6000 Master's Thesis

Fall TTU 2010
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research

Summer II TTU 2010
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6002 Master's Report
PHYS 6000 Master's Thesis
PHYS 5001 Master's Internship

Physics
Summer I TTU 2010
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6002 Master's Report
PHYS 6000 Master's Thesis
PHYS 5001 Master's Internship

Spring TTU 2010
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6002 Master's Report
PHYS 6000 Master's Thesis

VI. Published Research and Creative Activity in the last six years

Peer-Reviewed/Refereed

Journal Articles (Accepted)


Lee, S., The CDF Collaboration (2010). First Measurement of the Ratio $\sigma_{t\bar{t}}/\sigma_Z*\gamma* \rightarrow e\ell \ell$ and Precise Extraction of the $t\bar{t}$ Cross Section. *Phys. Rev. Lett.*, 105(01), 012001.


Physics


Lee, S., The CDF Collaboration (2010). Measurement of the Lambda0(b) Lifetime in Lambda0(b) ---\rightarrow Lambda^+_c pi^+ Decays in p anti-p Collisions at 1.96 TeV. *Phys. Rev. Lett.*, 104(10), 102002.


Lee, S., The CDF Collaboration (2009). First Observation of B-bar0_s --> D+/-_s K-/+ and Measurement of the Ratio of Branching Fractions B(B-bar0_s --> D+/-_s K-/+)/B(B-bar0_s --> D+_s pi+-). *Phys. Rev. Lett.*, 103(19), 191802.


Lee, S., The CDF Collaboration (2009). Search for the Decays $B_0$ $(s) \rightarrow e^+ \mu^-$- and $B_0$ $(s) \rightarrow e^+ e^-$ in CDF Run II. *Phys. Rev. Lett.*, 102(20), 201801.


Lee, S., The CDF Collaboration (2009). First Measurement of the Ratio of Branching Fractions $B$(Lambda0(b) $\rightarrow$ Lambda+_c mu- nu-bar_mu)/$B$(Lambda0(b) $\rightarrow$ Lambda+_c pi+-). Phys. Rev. D, 79(3), 032001.


Lee, S., The CDF Collaboration (2009). Search for the Rare B Decays \( B^+ \rightarrow mu^+ mu^- K^+ \), \( B_0 \rightarrow mu^+ mu^- K^*(892)0 \), and \( B_0(s) \rightarrow mu^+ mu^- phi \) at CDF. *Phys. Rev. D*, **79**(1), 011104(R).


Lee, S., The CDF Collaboration (2008). Search for Pair Production of Scalar Top Quarks Decaying to a \( \tau \) Lepton and a \( b \) Quark in \( pp\bar{p} \) Collisions at \( \sqrt{s}=1.96\)TeV. *Phys. Rev. Lett.*, **101**(7), 071802.


**Conference Proceedings (Accepted)**


**Non-Peer-Reviewed/Refereed**

**Other (Accepted)**


Physics


Lee, S., Akchurin, N., Chlebana et al. (2010). *Commissioning and Performance of the CMS Hadronic Calorimeters in Proton Collisions at a Center of Mass Energy of 7 TeV at the Large Hadron Collider*. CMS AN-2010-183.


Lee, S., Autermann et al. (2010). *Type-I and Type-II CaloMET performances in 7 TeV data*. CMS AN-2010-131.

Lee, S., Harris et al. (2010). Event displays of dijet events with highest pT in pp collisions at 900 GeV. CMS AN-2010-016.


Lee, S., Akchurin, N., Green et al. (2009). Search for a SM Higgs Boson in the qqH, H --> WW --> l\nu l\nu(=e/\mu) Channel with the CMS Experiment at 10 TeV. CMS AN-2009-181.


Lee, S., Akchurin, N., Akgun et al. (2009). Higgs Study via Vector Boson Fusion in the qqH, H --> ZZ --> l\nu l\nu l\nu l\nu Channel at 10 TeV. CMS AN-2009-175.


Lee, S., Akchurin, N., Green et al. (2009). Search for a SM Higgs Boson in the qqH, H --> WW --> \mu\nu\mu\nu Channel with the CMS Experiment. CMS AN-2009-029.


Lee, S., Mao et al. (2008). *Prospect of Higgs Boson Search in the qqH, H to W^+W^- to \ell^\pm\nu jj Channel with the CMS Experiment*. CMS AN-2008-052.

Lee, S., Mao et al. (2008). *Study of QCD Background and Lepton Isolation Strategy for qqH, H to W^+W^- to \ell^\pm\nu jj with lepton + multi-jet + missing $E_T$ Final States*. CMS AN-2008-066.


**Periodicals (Accepted)**


VII. Current Participation in Professional Associations

Vienna, VA, Korean-American Scientists and Engineers Association. (July 2010 - Present).

College Park, MD, American Physical Society. (May 2006 - Present).

Raleigh, NC, Association of Korean Physicists in America. (January 2002 - Present).

Officer, Secretary, Association of Korean Physicists in America. (June 2013 - Present).


Editor, Associate Editor, Association of Korean Physicists in America. (September 2009 - May 2013).


Committee Member, XVth International Conference on Calorimetry in HEP. (September 2011 - December 2012).

Editor, Conference Proceedings, XVth International Conference on Calorimetry in HEP. (September 2011 - December 2012).

Committee Member, The 2102 Fall Joint Texas Sections APS, AAPT, SPS Meeting. (March 2012 - October 2012).

Reviewer, Ad Hoc Reviewer, CMS HCAL Publication Steering Committee. (November 2009 - 2010).


Committee Member, CMS HCAL Data Quality Monitoring Board. (September 2007 - August 2009).

VIII. Presentations in the last six years

Invited


Lee, S. (Presenter Only), Invited seminar, Seoul National University, Seoul, Korea, "Recent CMS Physics Results at the LHC," Local. (May 2011).


Accepted


Lee, S. (Author Only), Joint Fall 2009 Meeting of the Texas Sections of the APS, AAPT, and SPS, American Physical Society, San Marcos, TX, "Study of hadronic W decays in the Jets+MET final state," Regional, Peer Reviewed/Refereed, Published Elsewhere. (September 23, 2009).
IX. Grant and Contract Activity for the last six years

**Contract**


Lee, S. (Principal), "US CMS LPC Funds for Supporting TTU Graduate Students at Fermilab LPC," Sponsored by Department of Energy / Fermilab LPC, Federal, $46,300.00. (May 1, 2009 - April 30, 2010).


**Grant**


Wigmans, M., Akchurin, N., Lee, S., Volobouev, I., "Experimental Particle Physics Research at Texas Tech University (Fermilab service account)," Sponsored by U.S. Department of Energy (Grant administered by Fermilab), $10,000.00. (March 1, 2011 - February 29, 2012).

Lee, S. (Principal), "QuarkNet at TTU," Sponsored by NSF/University of Notre Dame, Federal, $4,000.00. (September 2010 - August 2011).


Lee, S. (Co-Principal), Akchurin, N. (Co-Principal), Volobouev, I. (Co-Principal), Wigmans, M. (Principal), "Experimental Particle Physics Research at Texas Tech University (Supplemental Proposal)," Sponsored by Department of Energy, Federal, $80,000.00. (March 1, 2010 - February 28, 2011).

Wigmans, M., Akchurin, N., Lee, S., Volobouev, I., "Experimental Particle Physics Research at Texas Tech University at Texas Tech University (Fermilab Service Account)," Sponsored by U.S. Department of Energy (Grant administered by Fermilab), $10,000.00. (March 1, 2010 - February 28, 2011).
Lee, S. (Co-Principal), Akchurin, N. (Co-Principal), Volobouev, I. (Co-Principal), Wigmans, M. (Principal), "Experimental Particle Physics Research at Texas Tech University," Sponsored by Department of Energy, Federal, $10,000.00. (March 1, 2009 - February 28, 2010).


Lee, S. (Co-Principal), Akchurin, N. (Co-Principal), Volobouev, I. (Co-Principal), Wigmans, M. (Principal), "Experimental Particle Physics Research at Texas Tech University (Supplemental Proposal)," Sponsored by Department of Energy, Federal, $29,000.00. (March 1, 2009 - February 28, 2010).


Grant


Wigmans, M., Akchurin, N., Lee, S., Volobouev, I., "Experimental Particle Physics Research at Texas Tech University (Fermilab service account)," Sponsored by U.S. Department of Energy (Grant administered by Fermilab), $10,000.00. (March 1, 2012 - April 30, 2013).


Wigmans, M., Akchurin, N., Lee, S., Volobouev, I., "Experimental Particle Physics Research at Texas Tech University (Fermilab service account)," Sponsored by U.S. Department of Energy (Grant administered by Fermilab), Federal, $10,000.00. (March 1, 2008 - February 28, 2009).

Wigmans, M., Akchurin, N., Lee, S., Volobouev, I., "Matching Funds for DOE Grant (3)," Texas Tech University, $25,000.00. (September 1, 2007 - August 31, 2008).

Grant - Not Funded

Lee, S. (Co-Principal), Akchurin, N. (Principal), "An Anti-Cherenkov Photomultiplier Tube," Sponsored by Texas Higher Education Coordinating Board, State, $90,000.00.


Grant - Pending


X. Other professional activities during the last six years that contribute to graduate education

Physics
Fellowships, Scholarships and Awards

2010 SPS Outstanding Chapter Award, American Institute of Physics. (February 2011).

2011 Marsh W. White Outreach Award, American Institute of Physics. (February 2011).


2010 SPS Outstanding Professor Award, SPS/Department of Physics. (April 2010).

2010 Marsh W. White Outreach Award, American Institute of Physics. (January 2010).

2008 SPS Outstanding Professor Award, SPS/Department of Physics. (April 2008).

Service/Engagement

Faculty Advisor, Sigma Pi Sigma. (January 2011 - Present).

Committee Member, Undergraduate Majors Committee. (September 2009 - Present).

Committee Member, Department Web Page. (January 2008 - Present).

Committee Chair, HEP Group Postdoctoral Research Associate Search Committee. (February 2006 - Present).

Degree Program Coordinator, Undergraduate Advisor (associate). AS - Physics (BS). (September 2010 - August 2013).

Committee Member, Physics Teaching Laboratories Committee. (November 2009 - August 2013).

Committee Member, Faculty Affairs Committee. (September 2009 - August 2013).

Department representative, University Day Committee. (March 2008 - August 2013).

Faculty Advisor, Society of Physics Students. (January 2008 - August 2013).
Committee Member, Scholarship Committee. (January 2012 - February 2012).

Committee Member, PQE/Prelim Committee. (September 2009 - August 2011).

Committee Member, Facilities/Infrastructure Committee. (September 2007 - August 2009).

Board Member, South Plains Regional Science & Engineering Fair, Lubbock, TX. (September 5, 2012 - Present).

Program Coordinator, NSF TTU-QuarkNet Program, Lubbock, TX. (September 2010 - Present).


Session Chair, South Plains Regional Science & Engineering Fair, Lubbock, TX. (March 2006 - August 2012).

Program Organizer, “Flying Physics Circus” at Harwell Elementary School, Lubbock, TX. (May 4, 2011).

Program Organizer, SPS Spring Rocket Contest, Lubbock, TX. (April 2008 - April 2011).
GRADUATE FACULTY APPLICATION FORM
TEXAS TECH UNIVERSITY
Confirmation/Reappointment

Instructions: The Graduate Faculty Application Form is to be generated in the DigitalMeasures software platform, please make any additions or corrections in DigitalMeasures and reprint application.

Name: Roger L. Lichti
Department/Unit: Physics
Rank/Title: Professor and Chair
Date Submitted: 12-05-2013
Appointment Date: 1979

TTU Email: roger.lichti@ttu.edu
Phone:
Mailing Address:
City/State:
Zip:

I. Academic Background

Degree Field Institution Year Awarded
Ph D Physics University of Illinois 1972
MS Physics University of Illinois 1969
BS Physics Ottawa University 1967

II. Professional Experience, Academic and Nonacademic

Title: Department Chair
Institution/Agency: Texas Tech University
Year(s): September 1, 2009 - Present

Title: Professor
III. Direction of Graduate Students (completed theses and dissertations directed in the last six years)

<table>
<thead>
<tr>
<th>Student's Name</th>
<th>Involvement</th>
<th>Year Completed</th>
<th>Institution</th>
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<tbody>
<tr>
<td>Ganga Jayarathna</td>
<td>Master's Thesis Committee Chair</td>
<td></td>
<td>Texas Tech University</td>
</tr>
<tr>
<td>Brittany Baker</td>
<td>Dissertation Committee Chair</td>
<td></td>
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<tr>
<td>Patrick Mengyan</td>
<td>Dissertation Committee Chair</td>
<td></td>
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<tr>
<td>Jesse Vernon</td>
<td>Master's Thesis Committee Chair</td>
<td>December 2011</td>
<td></td>
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<tr>
<td>John McCuin</td>
<td>Dissertation Committee Chair</td>
<td>May 2011</td>
<td></td>
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<tr>
<td>Brent Carroll</td>
<td>Dissertation Committee Chair</td>
<td>August 2010</td>
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Chaired three student’s

Applied Physics

MS Report

Committee

Physics
IV. Other Service on Graduate Committees in the last six years (excluding III)

On a total of at least 7 MS Committees (2 outside of the department) and 4 PhD Committees (1 outside the department) during this 6-year period.

V. Graduate Courses Taught in the last six years

**Summer II TTU 2013**
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research

**Summer I TTU 2013**
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research

**Spring TTU 2013**
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 5336 Device Physics

**Fall TTU 2012**
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research

**Summer II TTU 2012**
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research

**Summer I TTU 2012**
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research

**Spring TTU 2012**
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6304 Condensed Matter Physics
PHYS 6000 Master's Thesis

Fall TTU 2011
PHYS 7000 Research
PHYS 6000 Master's Thesis

Summer II TTU 2011
PHYS 7000 Research

Summer I TTU 2011
PHYS 7000 Research

Spring TTU 2011
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6002 Master's Report
PHYS 6000 Master's Thesis

Fall TTU 2010
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6305 Statistical Mechanics II: Critical Phenomena
PHYS 6000 Master's Thesis
PHYS 5001 Master's Internship

Summer II TTU 2010
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6002 Master's Report
PHYS 6000 Master's Thesis
PHYS 5001 Master's Internship

Summer I TTU 2010
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6000 Master's Thesis
PHYS 5001 Master's Internship

Spring TTU 2010
PHYS 8000 Doctor's Dissertation
PHYS 7304 Condensed Matter Physics
PHYS 7000 Research
PHYS 6002 Master's Report
PHYS 6000 Master's Thesis

VI. Published Research and Creative Activity in the last six years

Peer-Reviewed/Refereed

Journal Articles (Invited)


Journal Articles


Refereed Conference Proceedings


VII. Current Participation in Professional Associations

American Physical Society, Member

Materials Research Society, Member

American Association of Physics Teachers, Member

VIII. Presentations in the last six years

Accepted


Physics


Lichti, R. (Author Only), Mengyan, P. W. (Presenter & Author), Celebi, Y. G. (Author Only), Carroll, B. R. (Author Only), Baker, B. B. (Author Only), Bani-Salameh, H. N. (Author Only), Yonenaga, I. (Author Only), 12th International Conference on Muon Spin Rotation Relaxation and Resonance, Cancun, Mexico,
"Longitudinal Muon Spin Depolarization in Bulk Si0.09Ge0.91," International, Peer Reviewed/Refereed, Published in Proceedings. (May 2011).


Magnetic Polaron in EuS. 11th International Conference on μSR, Tsukuba, Japan, International, Peer Reviewed/Refereed, Published Elsewhere.  (May 2009)


IX. Grant and Contract Activity for the last six years

Grant


Lichti, R. (Principal), "Energies and Defect Chemistry of Muonium in Compound Semiconductors," Sponsored by Welch Foundation, Private, $150,000.00. (June 1, 2008 - May 31, 2011).
Lichti, R. (Principal), "Muonium Defect Levels in Semiconductors," Sponsored by National Science Foundation, Federal, $300,000.00. (September 1, 2006 - August 31, 2010).

X. Other professional activities during the last six years that contribute to graduate education

Service/Engagement

Degree Program Coordinator. AS - Physics (MS).

Degree Program Coordinator. AS - Physics - Applied Physics (MS).

Degree Program Coordinator. AS - Physics (PHD).

Degree Program Coordinator. AS - Physics (BS).

Committee Member, Executive Committee. (August 31, 2009).

Committee Chair, Graduate Affairs Committee. (August 31, 2009).

Committee Member, Radiation and Laser Safety Committee. (August 31, 2009).
**GRADUATE FACULTY APPLICATION FORM**
**TEXAS TECH UNIVERSITY**
**Confirmation/Reappointment**

**Instructions:** The Graduate Faculty Application Form is to be generated in the DigitalMeasures software platform, please make any additions or corrections in DigitalMeasures and reprint application.

<table>
<thead>
<tr>
<th>Name: Thomas J. Maccarone</th>
<th>Department/Unit: Physics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rank/Title: Associate Professor</td>
<td>Date Submitted: 12-06-2013</td>
</tr>
<tr>
<td>Appointment Date: Jan 2013</td>
<td></td>
</tr>
<tr>
<td>TTU Email: <a href="mailto:thomas.maccarone@ttu.edu">thomas.maccarone@ttu.edu</a></td>
<td>Phone: (806) 742-3760</td>
</tr>
<tr>
<td>Campus Mail Stop: 1051</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mailing Address</th>
<th>City/Stat</th>
<th>Zip</th>
</tr>
</thead>
</table>

**I. Academic Background**

<table>
<thead>
<tr>
<th>Degree</th>
<th>Field</th>
<th>Institution</th>
<th>Year Awarded</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ph D</td>
<td>Astronomy</td>
<td>Yale University</td>
<td>2001</td>
</tr>
<tr>
<td>MS</td>
<td>Astronomy</td>
<td>Yale University</td>
<td>1999</td>
</tr>
<tr>
<td>MPhil</td>
<td>Astronomy</td>
<td>Yale University</td>
<td>1999</td>
</tr>
<tr>
<td>BS</td>
<td>Physics</td>
<td>California Institute of Technology</td>
<td>1996</td>
</tr>
</tbody>
</table>

**II. Professional Experience, Academic and Nonacademic**

**III. Direction of Graduate Students (completed theses and dissertations directed in the last six years)**

<table>
<thead>
<tr>
<th>Student's Name</th>
<th>Involvement</th>
<th>Year Completed</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tana Joseph</td>
<td>Doctoral Advisory Committee Chair</td>
<td>2013</td>
<td>Other</td>
</tr>
</tbody>
</table>

Physics
1. Other Service on Graduate Committees in the last six years (excluding III)
   Pre-examiner for the PhD thesis of Karri Koljonen, Aalto University, Helsinki, Finland, Spring 2013

V. Graduate Courses Taught in the last six years

**Spring TTU 2013**
ASTR 4301 Astrophysics I

**Summer I TTU 2013**
PHYS 7000 Research

VI. Published Research and Creative Activity in the last six years

**Peer-Reviewed/Refereed**

**Journal Articles (Accepted)**


Maccarone, T. (2013). The biphase explained: understanding the asymmetries in coupled Fourier Physics


**Book Chapters (Invited)**


**Other (Accepted)**


VII. Current Participation in Professional Associations

Member, American Astronomical Society.

Member, American Physical Society.

Member, International Astronomical Union.

Fellow, Royal Astronomical Society.


Editor, Conference Proceedings, *Astrophysics and Space Science.*


Reviewer of satellite time and grant proposals, NASA, Washington, DC.


Editor, Conference Proceedings, Royal Society.


Session Chair, t INTEGRAL’s journey through the high energy sky,, Rome. (October 2013).


Committee Member, Black holes in globular clusters, Monterey, CA. (April 9, 2013).
VIII. Presentations in the last six years

Invited

Maccarone, T., INTEGRAL’s journey through the high energy sky, Rome, Italy, "The emission mechanisms in black hole X-ray binaries: the soft gamma-ray contribution to the picture," International. (October 2013).

Maccarone, T. (Presenter & Author), Trinity University Department of Physics, San Antonio, TX, "Black holes and neutron stars in globular clusters," Local. (September 2013).

Maccarone, T. (Presenter & Author), University of Wisconsin-Milwaukee, Milwaukee, WI, "Black holes and neutron stars in globular clusters," Local. (September 2013).

Maccarone, T. (Presenter & Author), Astrophysics Institute of the Canary Islands, La Laguna, Tenerife, Spain, "Black holes and neutron stars in globular clusters," Local. (July 2013).

Maccarone, T. (Presenter & Author), National Autonomous University of Mexico, Mexico City, Mexico, "Black holes and neutron stars in globular clusters," Local. (April 2013).


Maccarone, T. (Presenter & Author), Texas A&M-Commerce Department of Physics, Commerce, TX, "Black holes and neutron stars in globular clusters," Local. (January 2013).

Accepted


General


IX. Grant and Contract Activity for the last six years

Grant


X. Other professional activities during the last six years that contribute to graduate education

Fellowships, Scholarships and Awards

Astrophysics Institute of the Canary Islands, Spanish government. (August 2013).

Service/Engagement

Committee Member, Graduate program committee.

Committee Member, Undergraduate program committee. (January 2013 - September 2013).

Physics
**GRADUATE FACULTY APPLICATION FORM**  
**TEXAS TECH UNIVERSITY**  
**Confirmation/Reappointment**

**Instructions:** The Graduate Faculty Application Form is to be generated in the DigitalMeasures software platform, please make any additions or corrections in DigitalMeasures and reprint application.

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<tr>
<th>Name: Charles W. Myles (PhD)</th>
<th>Department/Unit: Physics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rank/Title: Professor</td>
<td>Date: 12-08-2013</td>
</tr>
<tr>
<td>Date Submitted: 12-08-2013</td>
<td>Appointment Date: 1978</td>
</tr>
<tr>
<td>TTU Email: <a href="mailto:Charley.Myles@ttu.edu">Charley.Myles@ttu.edu</a></td>
<td>Phone: (806) 742-3768</td>
</tr>
<tr>
<td>Mailing Address:</td>
<td>Campus Mail Stop: 1051</td>
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### I. Academic Background

<table>
<thead>
<tr>
<th>Degree</th>
<th>Research Assistant Professor - Materials Physics</th>
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<tr>
<td>Field</td>
<td>University of Illinois at Urbana-Champaign, Urbana, Illinois</td>
</tr>
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<td>Institution</td>
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<td>Year Awarded</td>
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</tr>
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<td>Institution</td>
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<td>Year Awarded</td>
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<td>Field</td>
<td>Battelle Memorial Institute, Columbus, Ohio</td>
</tr>
<tr>
<td>Institution</td>
<td>Battelle Memorial Institute, Columbus, Ohio</td>
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<td>Year Awarded</td>
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Physics
Year Awarded 1971
Degree BS
Field University of Missouri at Rolla
Institution
Year Awarded 1969

II. Professional Experience, Academic and Nonacademic

<table>
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<tr>
<th>Title</th>
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<tbody>
<tr>
<td>Institution/Agency</td>
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<td>Year(s)</td>
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<table>
<thead>
<tr>
<th>Title</th>
<th>Co-Director, Engineering Physics</th>
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<td>Texas Tech University</td>
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<td>Year(s)</td>
<td>September 1, 2000 - June 30, 2010</td>
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III. Direction of Graduate Students (completed theses and dissertations directed in the last six years)

<table>
<thead>
<tr>
<th>Student's Name</th>
<th>Dong Xue</th>
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<tbody>
<tr>
<td>Involvement</td>
<td>Dissertation Committee Chair</td>
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<table>
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<tr>
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<th>Annie Jessica Wacheux</th>
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<td>Master's Thesis Committee Chair</td>
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<th>Student's Name</th>
<th>Emmanuel Nenghabi</th>
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<td>Dissertation Committee Chair</td>
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<table>
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<td>Year Completed</td>
<td>December 15, 2007</td>
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IV. Other Service on Graduate Committees in the last six years (excluding III)

<table>
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<tr>
<th>Student's Name</th>
<th>Premitha Pansalawatte</th>
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Physics
<table>
<thead>
<tr>
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<td>Year Completed</td>
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<tr>
<td>Student's Name</td>
<td>Victor Siller</td>
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<td>Student's Name</td>
<td>Milinda Pattanayak</td>
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<tr>
<td>Student's Name</td>
<td>Andrey Perevalov</td>
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<tr>
<td>Involvement</td>
<td>Dissertation Committee Member</td>
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<tr>
<td>Student's Name</td>
<td>Darshan Desai</td>
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<tr>
<td>Student's Name</td>
<td>Sanchari Sen</td>
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<td>Involvement</td>
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<tr>
<td>Student's Name</td>
<td>Victor Ogunjimi</td>
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<td>Involvement</td>
<td>Dissertation Committee Member</td>
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<tr>
<td>Year Completed</td>
<td>Texas Tech University</td>
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<tr>
<td>Student's Name</td>
<td>Tharanga Dissanayaka Mudiyanselage</td>
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<tr>
<td>Involvement</td>
<td>Dissertation Committee Member</td>
</tr>
<tr>
<td>Year Completed</td>
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<tr>
<td>Institution</td>
<td>Texas Tech University</td>
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<tr>
<td>Student's Name</td>
<td>Shoushi Li</td>
</tr>
<tr>
<td>Involvement</td>
<td>Dissertation Committee Member</td>
</tr>
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<td>Year Completed</td>
<td>August 31, 2013</td>
</tr>
<tr>
<td>Institution</td>
<td>Texas Tech University</td>
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</tbody>
</table>
Student's Name: Andris Docaj  
Involvement: Master's Thesis Committee Member  
Year Completed: December 31, 2012  
Institution: Texas Tech University

Student's Name: Jacob Ajimo  
Involvement: Dissertation Committee Member  
Year Completed: October 15, 2011  
Institution: Texas Tech University

Student's Name: Ross Carroll  
Involvement: Dissertation Committee Member  
Year Completed: June 30, 2010  
Institution: Texas Tech University

V. Graduate Courses Taught in the last six years

**Summer II TTU 2013**  
PHYS 7000 Research  
PHYS 6000 Master's Thesis

**Spring TTU 2013**  
PHYS 7000 Research  
PHYS 6000 Master's Thesis

**Fall TTU 2012**  
PHYS 7000 Research  
PHYS 5335 Physics of Semiconductors

**Summer II TTU 2012**  
PHYS 7000 Research

**Summer I TTU 2012**  
PHYS 7000 Research

**Spring TTU 2012**  
PHYS 7000 Research  
PHYS 5101 Seminar

**Fall TTU 2011**  
PHYS 7000 Research  
PHYS 5304 Solid State Physics  
PHYS 5101 Seminar
VI. Published Research and Creative Activity in the last six years

Peer-Reviewed/Refereed

Journal Articles (Accepted)


Conference Proceedings (Accepted)


VII. Current Participation in Professional Associations

Member, Materials Research Society. (June 1, 1995 - Present).

Member, American Association of Physics Teachers. (January 1, 1985 - Present).

Member, Texas Section American Association of Physics Teachers. (January 1, 1985 - Present).


Member, American Physical Society. (November 1, 1974 - Present).

Member, Sigma Xi. (April 15, 1968 - Present).


Chair of the Joint Fall, 2012 Meeting of the Texas Sections of APS, AAPT, & SPS, Texas Section American Physical Society, Organizing Chair, Fall 2012 Meeting, Lubbock, Texas. (January 1, 2012 - December 31, 2012).

Recipient of the 2012 Texas Section APS Distinguished Service Award, Texas Section of the American Physical Society, Distinguished Service Award Recipient, Lubbock, Texas. (October 26, 2012).

Secretary-Treasurer, Texas Section American Physical Society, Secretary-Treasurer, Texas. (March 15, 2005 - April 30, 2011).

VIII. Presentations in the last six years

Invited


Accepted

Xue, D. (Presenter & Author), Myles, C. (Author Only), Higgins, C. (Author Only), Fall 2012 Meeting, Texas Section of the APS, Texas Section, American Physical Society, Texas Tech University, Lubbock, Texas, "Theoretical Study of the Properties of the Type II Clathrate AxSn136," Regional. (October 27, 2012).

Myles, C. (Presenter & Author), Higgins, C. (Presenter & Author), Fall 2012 Meeting, Texas Section of the APS, Texas Section, American Physical Society, Texas Tech University, Lubbock, Texas, "Theoretical Study of the Structural and Electronic Properties of KxSi136," Regional. (October 27, 2012).


Myles, C. (Presenter & Author), Higgins, C. (Author Only), Fall 2011 Meeting, Texas Section of the APS, Texas Section, American Physical Society, Commerce, Texas, "Framework Contraction, Local Structure, and Electronic Properites of Nax Si136 Clathrates"," Regional. (October 7, 2011).

Myles, C. (Presenter & Author), Department of Physics Colloquium, University of Southern California, Los Angeles, California, "Rattling ‘Guest’ Atoms in Group IV Clathrate Materials", Local. (June 21, 2011).


Norouzzadeh, P. (Presenter & Author), Myles, C. (Author Only), Fall 2010 Meeting of the Texas Section of the APS, Texas Section, American Physical Society, San Antonio, Texas, "Structural, Electronic, and Vibrational Properties of the Type VIII Si and Ge Clathrates," Regional, Published Elsewhere. (October 22, 2010).


IX. Grant and Contract Activity for the last six years

Grant - Not Funded


X. Other professional activities during the last six years that contribute to graduate education

Fellowships, Scholarships and Awards

2012 Distinguished Service Award, Texas Section of the American Physical Society. (October 26, 2012).

Alumni Century Award, Missouri University of Science & Technology. (September 15, 2011).

New Course Preparation Work

Fall TTU 2009

"Solid State Physics," PHYS 5304-001. Developed Power Point slides for each lecture. Posted them on-line so that the students could download them. Made extensive on-line resources available to students.

Service/Engagement

Committee Member, Physics Department Executive Committee. (January 1, 2011 - Present).

Committee Chair, Graduate Affairs. (September 1, 2009 - Present).

Physics Graduate Advisor, Physics Graduate Advisor. (August 1, 2009 - Present).

Conference Chair and Chair of the Organizing Committee, 2012 Texas Section APS Meeting, Chair, Organizing Committee. (January 1, 2012 - December 31, 2012).
Committee Member, Equitable Compensation Committee, Lubbock District, United Methodist Church. (May 1, 2012 - Present).

Lay Leader, Agape' United Methodist Church, Lubbock, TX. (January 1, 2011 - Present).

Board Member, Board of Missions, Lubbock District, United Methodist Church, Lubbock, TX. (January 1, 2009 - Present).

Committee Member, District Advancement Committee, Boy Scouts of America, Lubbock, TX. (January 1, 2008 - Present).

Committee Member, Boy Scout Troop 505, Lubbock, TX. (January 1, 2004 - Present).

Chairperson, Agape' United Methodist Church, Lubbock, Texas. (January 1, 2008 - December 31, 2010).
GRADUATE FACULTY APPLICATION FORM
TEXAS TECH UNIVERSITY

Confirmation/Reappointment

Instructions: The Graduate Faculty Application Form is to be generated in the DigitalMeasures software platform, please make any additions or corrections in DigitalMeasures and reprint application.

Name: Mahdi Sanati
Rank/Title: Associate Professor
Department/Unit: Physics
Date Submitted: 12-08-2013
Appointment Date: 2004
TTU Email: m.sanati@ttu.edu
Phone: (806) 742-3759
Campus Mail Stop:
Mailing Address: 
City/State: 
Zip: 

I. Academic Background

Degree: Ph D
Field: Physics
Institution: University of Cincinnati
Year Awarded: 1999

II. Professional Experience, Academic and Nonacademic

Title: Faculty Research Fellow
Institution/Agency: Los Alamos National Laboratory
Year(s): August 23, 2007 - Present

III. Direction of Graduate Students (completed theses and dissertations directed in the last six years)

Student's Name: Jian Dai
Involvement: Dissertation Committee Member
Year Completed: 
Institution: Physics

IV. Other Service on Graduate Committees in the last six years (excluding III)

Student's Name: 
Involvement: 
Year Completed: 
Institution: 

Physics
Student's Name   Liming Qiu
Involvement   Dissertation Committee Member
Year Completed
Institution

V. Graduate Courses Taught in the last six years

**Summer II TTU 2013**
PHYS 7000 Research

**Spring TTU 2013**
PHYS 5305 Statistical Physics
PHYS 5300 Special Topics: Applied Quantum Mechanics

**Fall TTU 2012**
PHYS 5307 Methods in Physics I

**Spring TTU 2012**
PHYS 5305 Statistical Physics

**Fall TTU 2011**
PHYS 6309 Advanced Quantum Mechanics
PHYS 5307 Methods in Physics I

**Summer II TTU 2011**
PHYS 5300 Special Topics

**Summer I TTU 2011**
PHYS 5300 Special Topics

**Spring TTU 2011**
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6000 Master's Thesis

**Fall TTU 2010**
PHYS 5307 Methods in Physics I

**Summer II TTU 2010**
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6002 Master's Report
PHYS 6000 Master's Thesis
PHYS 5001 Master's Internship

**Summer I TTU 2010**

Physics
VI. Published Research and Creative Activity in the last six years

Peer-Reviewed/Refereed

Journal Articles (Accepted)


**Books (Accepted)**


**Conference Proceedings (Invited)**


**Non-Peer-Reviewed/Refereed**

**Conference Proceedings (Invited)**


**VII. Current Participation in Professional Associations**

Member, American Physical Society. (February 1, 1994 - Present).

Reviewer, Journal Article, Physical Review.

Editor, Journal Editor, ISRN Thermodynamics. (November 1, 2011 - Present).

**VIII. Presentations in the last six years**

**Invited**


**Accepted**

Physics
IX. Grant and Contract Activity for the last six years

**Contract - Pending**

Sanati, M., "Thermal conductivity of UO2 and PuO2 under pressure," Sponsored by Los Alamos National Laboratory, Texas Tech University, $25,000.00.

**Grant - Not Funded**

Sanati, M., "Modeling of Thermal Properties of Nuclear Fuels: A First-Principles Approach," Sponsored by NHARP, Texas Tech University, $150,000.00.

X. Other professional activities during the last six years that contribute to graduate education

**New Format for existing course**

**Summer I TTU 2010**

"Special Topics," PHYS 5300-034.

**New Course Preparation Work**

**Spring TTU 2013**


**Spring TTU 2012**


**Fall TTU 2009**

"Advanced Quantum Mechanics," 6309-001.

**Service/Engagement**

Committee Chair, Graduate Committee. (November 1, 2007 - Present).

Committee Member, Graduate Affair Committee. (September 1, 2007 - Present).

Committee Member, Ph.D qualifying exam committee. (September 1, 2004 - Present).
### GRADUATE FACULTY APPLICATION FORM

**Texas Tech University**

**Confirmation/Reappointment**

**Instructions:** The Graduate Faculty Application Form is to be generated in the DigitalMeasures software platform, please make any additions or corrections in DigitalMeasures and reprint application.

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<th>Beth Thacker</th>
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<td>Physics</td>
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<tr>
<td>Rank/Title</td>
<td>Associate Professor</td>
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<td>Date Submitted</td>
<td>12-08-2013</td>
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<td>Date Appointment</td>
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</tr>
<tr>
<td>Email</td>
<td><a href="mailto:beth.thacker@ttu.edu">beth.thacker@ttu.edu</a></td>
</tr>
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<td>Phone</td>
<td>(806) 742-2996</td>
</tr>
<tr>
<td>Mailing Address</td>
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</tr>
<tr>
<td>City/State</td>
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### I. Academic Background

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### II. Professional Experience, Academic and Nonacademic

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<th>Title</th>
<th>Associate Professor</th>
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<td>Year(s)</td>
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III. Direction of Graduate Students (completed theses and dissertations directed in the last six years)

<table>
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<th>Student's Name</th>
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<th>Institution</th>
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<tbody>
<tr>
<td>Bhishma Karki</td>
<td>Doctoral Advisory Committee Chair</td>
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<table>
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<tbody>
<tr>
<td>Vanalet Rusuriye</td>
<td>Master's Thesis Committee Chair</td>
<td>2012</td>
<td>Texas Tech University</td>
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</table>

IV. Other Service on Graduate Committees in the last six years (excluding III)

V. Graduate Courses Taught in the last six years

**Summer II TTU 2013**
PHYS 7000 Research

**Spring TTU 2013**
PHYS 7000 Research

**Fall TTU 2012**
PHYS 7000 Research
PHYS 6000 Master's Thesis
PHYS 5274 Physics Pedagogy

**Summer II TTU 2012**
PHYS 7000 Research

**Spring TTU 2012**
PHYS 7000 Research

**Fall TTU 2011**
PHYS 7000 Research
PHYS 5274 Physics Pedagogy
PHYS 5104 Instructional Laboratory Techniques in Physics

**Summer II TTU 2011**
PHYS 7000 Research

**Spring TTU 2011**
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6000 Master's Thesis
VI. Published Research and Creative Activity in the last six years

Non-Peer-Reviewed/Refereed

Journal Articles (Accepted)


VII. Current Participation in Professional Associations

Member, American Physical Society.

Member, American Association of Physics Teachers. (1993 - Present).

Member, Phi Beta Kappa. (1980 - Present).

Committee Member, AP Physics Development Committee, NY. (2004 - 2009).

Officer, President/Elect/Past, Texas Section Association of Physics Teachers, TX. (2005 - 2008).

VIII. Presentations in the last six years

Invited
Thacker, B. (Presenter & Author), Texas Section of American Association of Teachers, Texas Section of American Association of Teachers, Lubbock TX, "Lessons From a Large-Scale Assessment Project at Texas Tech," Regional. (October 2012).

Thacker, B. (Presenter & Author), Colloquium Texas Tech University, Texas Tech University, Lubbock TX, "Lessons from A Large Scale Assessment at Texas Tech University," Regional. (December 2011).

Thacker, B. (Presenter & Author), Communicating Physics Outside the Classroom, American Association of Physics Teachers, Omaha NB, "Why Conceptual Inventories are Insufficient Assessment of Our Instructional Methods," National. (August 2011).


Thacker, B. (Presenter & Author), Colloquium Texas State University, Texas State University, San Marcos, TX, "Assessment: How do we know what works?," Regional. (March 2011).

Thacker, B. (Presenter & Author), American Association of Physics Teachers, American Association of Physics Teachers, Jacksonville, Florida, "Why there is a Need for Assessment in Undergraduate Physics," National. (January 2011).

Thacker, B., Colloquium, Florida International University, Florida International University, Miami, FL, "How do we know that it works? Assessing students' understanding and whether or not we have achieved our goals," National. (March 2009).

Accepted

Thacker, B. (Author Only), Chapagain, G. (Presenter & Author), Texas Section of the American Physical Society, American Association of Physics Teachers and Society of Physics Students, Texas Section of the American Physical Society, American Association of Physics Teachers and Society of Physics Students, Lubbock, TX, "The Effect of Problem Format on Students’ Answers," Regional. (October 2012).

Thacker, B. (Author Only), Chapagain, G. (Presenter & Author), West Texas STEM Conference, West Texas STEM Conference, Midland, TX, "The Effect of Problem Format on Students’ Answers," Regional. (October 2012).

Thacker, B. (Author Only), Chapagain, G. (Presenter & Author), Undergraduate Research Conference, Undergraduate Research Conference Texas Tech University, Lubbock, TX, "The Effect of Problem Format on Students’ Answer," Local. (April 2012).


Thacker, B. (Author Only), West, K. (Presenter & Author), Communicating Physics Outside the Classroom, American Association of Physics Teachers, Omaha NB, "Comparison of an Inquiry-based Algebra-based Course to Traditional Teaching," National. (August 2011).

Thacker, B. (Author Only), West, K. (Presenter & Author), Communicating Physics Outside the Classroom, American Association of Physics Teachers, Omaha NB, "Teaching Assistant Impact on Student Understanding of Electrostatic Concepts," National. (August 2011).


IX. Grant and Contract Activity for the last six years

Grant

Physics


**Grant**


X. Other professional activities during the last six years that contribute to graduate education

**Service/Engagement**

Committee Member, Executive Committee. (September 2007 - Present).

Committee Chair, Physics Teaching Laboratories. (2009 - 2011).

Committee Chair, Undergraduate Affairs Committee. (September 2007 - December 2009).

Committee Chair, Scholarship Committee. (2002 - 2008).

Committee Member, Scholarship Committee. (2002 - 2008).

**Consulting**

For Profit Organization, College Board, New York, NY. (September 2004 - April 2009).
GRADUATE FACULTY APPLICATION FORM
TEXAS TECH UNIVERSITY
Confirmation/Reappointment

Instructions: The Graduate Faculty Application Form is to be generated in the DigitalMeasures software platform, please make any additions or corrections in DigitalMeasures and reprint application.

Name: Igor Volobuev

Department/Unit: Physics

Rank/Title: Assistant Professor

Date Submitted: 12-08-2013

Appointment Date: 2006

TTU Email: i.volobuev@ttu.edu

Phone: (806) 742-4572

Campus Mail Stop:

I. Academic Background

II. Professional Experience, Academic and Nonacademic

III. Direction of Graduate Students (completed theses and dissertations directed in the last six years)

Student's Name: Terence Libeiro
Involvement: Dissertation Committee Chair
Year Completed:
Institution:

IV. Other Service on Graduate Committees in the last six years (excluding III)

Student's Name: Mehmet Umut Caglar
Involvement: Dissertation Committee Member
Year Completed:
Institution: Texas Tech University

Student's Name: Chiyoung Jeong
Involvement: Dissertation Committee Member
Year Completed: October 2011

Physics
V. Graduate Courses Taught in the last six years

**Summer II TTU 2013**
PHYS 7000 Research

**Summer I TTU 2013**
PHYS 7000 Research

**Spring TTU 2013**
PHYS 7000 Research
PHYS 5302 Quantum Mechanics II

**Fall TTU 2012**
PHYS 7000 Research
PHYS 5301 Quantum Mechanics I

**Summer II TTU 2012**
PHYS 7000 Research

**Summer I TTU 2012**
PHYS 7000 Research

**Spring TTU 2012**
PHYS 7000 Research
PHYS 5302 Quantum Mechanics II

**Fall TTU 2011**
PHYS 7000 Research
PHYS 6000 Master's Thesis
PHYS 5301 Quantum Mechanics I

**Summer II TTU 2011**
PHYS 7000 Research

**Summer I TTU 2011**
PHYS 7000 Research

**Spring TTU 2011**
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6000 Master's Thesis
PHYS 5302 Quantum Mechanics II

**Summer II TTU 2010**
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6002 Master's Report
PHYS 6000 Master's Thesis
PHYS 5001 Master's Internship

**Summer I TTU 2010**
PHYS 7000 Research
PHYS 6000 Master's Thesis
PHYS 5001 Master's Internship

**Spring TTU 2010**
PHYS 8000 Doctor's Dissertation
PHYS 7000 Research
PHYS 6002 Master's Report
PHYS 6000 Master's Thesis
PHYS 5302 Quantum Mechanics II
PHYS 5101 Seminar

**Fall TTU 2009**
5301 Quantum Mechanics I
5300 Problem Solving in Physics

VI. Published Research and Creative Activity in the last six years

**Peer-Reviewed/Refereed**

**Journal Articles (Invited)**


**Journal Articles (Accepted)**


Volobouev, I., CMS Collaboration (2011). Search for B(s) and B to dimuon decays in pp collisions at 7 TeV. *Physical Review Letters*, 107, 191802.


Volobouev, I., CMS Collaboration (2011). Search for supersymmetry in events with a lepton, a photon, and large missing transverse energy in pp collisions at sqrt(s) = 7 TeV. *Journal of High Energy Physics (JHEP), JHEP06(2011), 093.*


Volobouev, I., CMS Collaboration (2011). Measurement of Bose-Einstein Correlations in pp Collisions at sqrt(s)=0.9 and 7 TeV. *Journal of High Energy Physics (JHEP)(JHEP05(2011)), 029.*


Volobouev, I., CMS Collaboration (2011). Strange Particle Production in pp Collisions at sqrt(s) = 0.9 and 7 TeV. *Journal of High Energy Physics (JHEP)(JHEP05(2011)), 064.*


Volobouev, I., CMS Collaboration (2010). First Measurement of the Underlying Event Activity at the LHC with $\sqrt{s} = 0.9$ TeV. *European Physical Journal C*, 70, 555-572.

Volobouev, I., CDF Collaboration (2010). Search for R-parity Violating Decays of $\tau$ sneutrinos to $\tau\mu\tau$, $\tau\mu\tau$, and $e\tau\mu\tau$ Pairs in ppbar Collisions at $\sqrt{s} = 1.96$ TeV. *Physical Review Letters*, 105, 191801.


Volobouev, I., CDF Collaboration (2010). Search for $WW$ and $WZ$ resonances decaying to electron, missing $E_T$, and two jets in $p\bar{p}$ collisions at $\sqrt{s}=1.96$ TeV. *Physical Review Letters*, 104, 241801.


Volobouev, I., CDF Collaboration (2010). Measurement of the $t\bar{t}$ Production Cross Section in $p\bar{p}$ Collisions at $\sqrt{s}=1.96$ TeV using Soft Electron b-Tagging. *Physical Review D*, 81, 092002.


Volobouev, I., CDF Collaboration (2010). Measurement of the Lambda_b Lifetime in Lambda_b -> Lambda_c+ pi- Decays in $p\bar{p}$ Collisions at $\sqrt{s} = 1.96$ TeV. *Physical Review Letters*, 104, 102002.

Volobouev, I., CDF Collaboration (2010). Measurement of the Top Quark Mass and $p\bar{p}$ -> $t\bar{t}$ Cross Section in the All-Hadronic Mode with the CDFII Detector. *Physical Review D*, 81, 052011.

Volobouev, I., CMS Collaboration (2010). Transverse momentum and pseudorapidity distributions of charged hadrons in pp collisions at $\sqrt{s} = 0.9$ and 2.36 TeV. *Journal of High Energy Physics*, 1002, 041.


Physics


Volobouev, I., CDF Collaboration (2009). Search for the Production of Narrow t anti-b Resonances in 1.9 fb-1 of p anti-p Collisions at s**(1/2) = 1.96-TeV. *Physical Review Letters, 103*, 041801.


pl+ l- anti-p events in p anti-p collisions at s**(1/2) = 1.96-TeV. *Physical Review Letters, 102*, 222002.


Volobouev, I., CDF Collaboration (2009). Search for the Decays B0(s) ---> e+ mu- and B0(s) ---> e+ e- in CDF Run II. *Physical Review Letters, 102*, 201801.


**Conference Proceedings (Accepted)**


**Other (Accepted)**


**Non-Peer-Reviewed/Refereed**

**Conference Proceedings (Accepted)**


**Other (Accepted)**


VII. Current Participation in Professional Associations

Member, American Physical Society. (July 1, 1994 - Present).

Committee Member, Local Organizing Committee for the XVth International Conference on Calorimetry in High Energy Physics. (February 2011 - February 2013).

VIII. Presentations in the last six years

Accepted


IX. Grant and Contract Activity for the last six years

Grant


Wigmans, M., Akchurin, N., Lee, S., Volobouev, I., "Experimental Particle Physics Research at Texas Tech University at Texas Tech University (Fermilab service account)," Sponsored by U.S. Department of Energy (Grant administered by Fermilab), $10,000.00. (March 1, 2011 - February 29, 2012).


Lee, S. (Co-Principal), Akchurin, N. (Co-Principal), Volobouev, I. (Co-Principal), Wigmans, M. (Principal), "Experimental Particle Physics Research at Texas Tech University (Supplemental Proposal)," Sponsored by Department of Energy, Federal, $80,000.00. (March 1, 2010 - February 28, 2011).


Wigmans, M., Akchurin, N., Lee, S., Volobouev, I., "Experimental Particle Physics Research at Texas Tech University at Texas Tech University (Fermilab Service Account)," Sponsored by U.S. Department of Energy (Grant administered by Fermilab), $10,000.00. (March 1, 2010 - February 28, 2011).

Lee, S. (Co-Principal), Akchurin, N. (Co-Principal), Volobouev, I. (Co-Principal), Wigmans, M. (Principal), "Experimental Particle Physics Research at Texas Tech University," Sponsored by Department of Energy, Federal, $10,000.00. (March 1, 2009 - February 28, 2010).


Lee, S. (Co-Principal), Akchurin, N. (Co-Principal), Volobouev, I. (Co-Principal), Wigmans, M. (Principal), "Experimental Particle Physics Research at Texas Tech University (Supplemental Proposal)," Sponsored by Department of Energy, Federal, $29,000.00. (March 1, 2009 - February 28, 2010).


Sponsored Research


Grant


Wigmans, M., Akchurin, N., Lee, S., Volobouev, I., "Experimental Particle Physics Research at Texas Tech University (Fermilab service account)," Sponsored by U.S. Department of Energy (Grant administered by Fermilab), $10,000.00. (March 1, 2012 - April 30, 2013).

Wigmans, M., Akchurin, N., Lee, S., Volobouev, I., "Experimental Particle Physics Research at Texas Tech University (Fermilab service account)," Sponsored by U.S. Department of Energy (Grant administered by Fermilab), Federal, $10,000.00. (March 1, 2008 - February 28, 2009).

Wigmans, M., Akchurin, N., Lee, S., Volobouev, I., "Matching Funds for DOE Grant (3)," Texas Tech University, $25,000.00. (September 1, 2007 - August 31, 2008).

**Grant - Not Funded**


X. Other professional activities during the last six years that contribute to graduate education

**New Format for existing course**

**Fall TTU 2009**

"Problem Solving in Physics," 5300-038.

"Quantum Mechanics I," 5301-001.

**Service/Engagement**

Committee Member, Prelim Exam. (November 2011 - Present).

Committee Member, Graduate Affairs. (August 20, 2007 - Present).

Committee Chair, Prelim Exam. (September 1, 2008 - September 30, 2010).

Committee Chair, Physics Colloquium. (June 1, 2009 - May 31, 2010).

Faculty Co-Advisor, TTU Knight Raiders Student Chess Club. (January 1, 2007 - Present).

Committee Member, Chess Program Hiring Committee. (April 17, 2012 - July 30, 2012).

Committee Member, SPICE Advisory Board. (September 1, 2009 - February 28, 2012).
Judge of Special Awards, 57th South Plains Regional Science and Engineering Fair, Lubbock, TX. (February 15, 2013).

Judge of Special Awards, 56th South Plains Regional Science and Engineering Fair, Lubbock, TX. (March 24, 2012).

Judge of Special Awards, 55th South Plains Regional Science and Engineering Fair, Lubbock, TX. (February 18, 2011).

Judge of Special Awards, 54th South Plains Regional Science and Engineering Fair, Lubbock, TX. (March 26, 2010).
**GRADUATE FACULTY APPLICATION FORM**  
**TEXAS TECH UNIVERSITY**  
**Confirmation/Reappointment**

**Instructions:** The Graduate Faculty Application Form is to be generated in the DigitalMeasures software platform, please make any additions or corrections in DigitalMeasures and reprint application.

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<tr>
<td>Department/Unit</td>
<td>Physics</td>
</tr>
<tr>
<td>Rank/Title</td>
<td>Professor</td>
</tr>
<tr>
<td>Date Submitted</td>
<td>12-08-2013</td>
</tr>
<tr>
<td>TTU</td>
<td></td>
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<tr>
<td>Email</td>
<td><a href="mailto:richard.wigmans@ttu.edu">richard.wigmans@ttu.edu</a></td>
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<tr>
<td>Phone</td>
<td>(806) 742-3779</td>
</tr>
<tr>
<td>Campus Mail Stop</td>
<td>1051</td>
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<tr>
<td>Address</td>
<td></td>
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**I. Academic Background**

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<td>Year Awarded</td>
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**II. Professional Experience, Academic and Nonacademic**

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<th>Title</th>
<th>J.F. Bucy Professor of Physics</th>
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<td>Year(s)</td>
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Physics
III. Direction of Graduate Students (completed theses and dissertations directed in the last six years)

IV. Other Service on Graduate Committees in the last six years (excluding III)

V. Graduate Courses Taught in the last six years

**Spring TTU 2011**
- PHYS 8000 Doctor's Dissertation
- PHYS 7000 Research
- PHYS 6000 Master's Thesis

**Fall TTU 2010**
- PHYS 7000 Research
- PHYS 5312 Elementary Particle Physics

**Summer II TTU 2010**
- PHYS 8000 Doctor's Dissertation
- PHYS 7000 Research
- PHYS 6002 Master's Report
- PHYS 6000 Master's Thesis
- PHYS 5001 Master's Internship

**Summer I TTU 2010**
- PHYS 8000 Doctor's Dissertation
- PHYS 7000 Research
- PHYS 6000 Master's Thesis
- PHYS 5001 Master's Internship

**Spring TTU 2010**
- PHYS 8000 Doctor's Dissertation
- PHYS 7000 Research
- PHYS 6002 Master's Report
- PHYS 6000 Master's Thesis

VI. Published Research and Creative Activity in the last six years

**Peer-Reviewed/Refereed**

**Journal Articles (Accepted)**


Non-Peer-Reviewed/Refereed

**Journal Articles (Accepted)**


Physics

**Books (Accepted)**


**Book Chapters (Accepted)**


**Other (Accepted)**


**VII. Current Participation in Professional Associations**


Member, XIVth International Conference on Calorimetry in High Energy Physics, Santa Fe, New Mexico. (May 2012).


Member, XIIIth International Conference on Calorimetry in High Energy Physics, Beijing. (May 2010).


Member, International Advisory Committee, Pavia. (May 2008 - 2008).

Reviewer, Grant Proposal, Italian Ministry of University Education and Research (MIUR). (May 2008).


VIII. Presentations in the last six years

   General

Wigmans, M., Colloquium, Brookhaven National Laboratory, Upton, NY, "DREAM - towards high-resolution jet spectroscopy," Peer Reviewed/Refereed. (December 17, 2012).

Wigmans, M., Colloquium, Iowa State University, Ames, IA, "Dual-Readout Calorimetry," Peer Reviewed/Refereed. (October 9, 2012).


Wigmans, M., Colloquium, Rutherford Laboratory, Didcot, UK, "Dual-Readout Calorimetry," Peer Reviewed/Refereed. (June 22, 2011).

Wigmans, M., Colloquium, University of Oxford, United Kingdom, "Dual-Readout Calorimetry," Peer Reviewed/Refereed. (June 21, 2011).


Wigmans, M., 14th International Conference on Calorimetry in High Energy Physics, Beijing, China, "Hadron Calorimetry - What have we learned since CALOR 1?", Peer Reviewed/Refereed. (May 14, 2010).

Wigmans, M., Colloquium, KEK, Tsukuba, Japan, "Dual-Readout Calorimetry," Peer Reviewed/Refereed. (May 7, 2010).

Wigmans, M., Colloquium, Department of Physics, Texas Tech University, Buenos Aires, Argentina, "Neutrinos in an Expanding Universe," Peer Reviewed/Refereed. (January 6, 2010).

Wigmans, M., Colloquium, Universidad de Buenos Aires, Buenos Aires, Argentina, "Dual-Readout Calorimetry," Peer Reviewed/Refereed. (January 4, 2010).

Wigmans, M., Colloquium, University of Bern, Switzerland, "Dual-Readout Calorimetry," Peer Reviewed/Refereed. (June 10, 2009).


Wigmans, M., Colloquium, University of Cosenza, Italy, "Dual-Readout Calorimetry," Peer Reviewed/Refereed. (May 19, 2009).


Wigmans, M., Keynote speech at meeting of the Brazilian Particle Physics Community, SPACAL, Rio de Janeiro (Brazil), "Twenty years of SPACAL," International, Peer Reviewed/Refereed. (December 30, 2008).


Wigmans, M., Colloquium, Federal University of Rio de Janeiro, Rio de Janeiro (Brazil), "Recent Results from the DREAM Project," Peer Reviewed/Refereed. (December 11, 2008).

Wigmans, M., Colloquium, CERN, Geneve, Switzerland, "Calorimetry - Challenges of present and future experiments," Peer Reviewed/Refereed. (June 6, 2008).


Wigmans, M., Colloquium, University of Roma, La Sapienza, Italy, "Recent Results from the DREAM Project," Peer Reviewed/Refereed. (March 14, 2008).

Wigmans, M., Colloquium, University of Pisa, Italy, "Recent Results from the DREAM Project," Peer Reviewed/Refereed. (March 11, 2008).

IX. Grant and Contract Activity for the last six years

Grant


Wigmans, M., Akchurin, N., Lee, S., Volobouev, I., "Experimental Particle Physics Research at Texas Tech University (Fermilab service account)," Sponsored by U.S. Department of Energy (Grant administered by Fermilab), $10,000.00. (March 1, 2011 - February 29, 2012).


Lee, S. (Co-Principal), Akchurin, N. (Co-Principal), Volobouev, I. (Co-Principal), Wigmans, M. (Principal), "Experimental Particle Physics Research at Texas Tech University (Supplemental Proposal)," Sponsored by Department of Energy, Federal, $80,000.00. (March 1, 2010 - February 28, 2011).


Lee, S. (Co-Principal), Akchurin, N. (Co-Principal), Volobouev, I. (Co-Principal), Wigmans, M. (Principal), "Experimental Particle Physics Research at Texas Tech University (Supplemental Proposal)," Sponsored by Department of Energy, Federal, $80,000.00. (March 1, 2010 - February 28, 2011).

Wigmans, M., Akchurin, N., Lee, S., Volobouev, I., "Experimental Particle Physics Research at Texas Tech University at Texas Tech University (Fermilab Service Account)," Sponsored by U.S. Department of Energy (Grant administered by Fermilab), $10,000.00. (March 1, 2010 - February 28, 2011).


Lee, S. (Co-Principal), Akchurin, N. (Co-Principal), Volobouev, I. (Co-Principal), Wigmans, M. (Principal), "Experimental Particle Physics Research at Texas Tech University," Sponsored by Department of Energy, Federal, $10,000.00. (March 1, 2009 - February 28, 2010).

Wigmans, M., "Experimental Particle Physics Research at Texas Tech University (Fermilab service account)," Sponsored by U.S. Department of Energy (Grant administered by Fermilab), $10,000.00. (March 1, 2009 - February 28, 2010).

Lee, S. (Co-Principal), Akchurin, N. (Co-Principal), Volobouev, I. (Co-Principal), Wigmans, M. (Principal), "Experimental Particle Physics Research at Texas Tech University (Supplemental Proposal)," Sponsored by Department of Energy, Federal, $29,000.00. (March 1, 2009 - February 28, 2010).


Wigmans, M., "Matching Funds for DOE Grant," Texas Tech University, $10,000.00. (September 1, 2008 - August 31, 2009).


Wigmans, M., "Matching Funds for DOE Grant (4)," Texas Tech University, $10,000.00. (September 1, 2007 - August 31, 2008).


Wigmans, M., Akchurin, N., "Experimental Particle Physics Research at Texas Tech University (Fermilab service account)," Sponsored by U.S. Department of Energy, $10,000.00. (March 1, 2007 - February 29, 2008).


Physics

Grant


Wigmans, M., Akchurin, N., "Matching Funds for DOE Grant (1,2)," Sponsored by Texas Tech University, $150,000.00. (September 1, 2012 - August 31, 2013).


Wigmans, M., Akchurin, N., Lee, S., Volobouev, I., "Experimental Particle Physics Research at Texas Tech University (Fermilab service account)," Sponsored by U.S. Department of Energy (Grant administered by Fermilab), $10,000.00. (March 1, 2012 - April 30, 2013).


Wigmans, M., Akchurin, N., "Matching Funds for DOE Grant (1)," Sponsored by Texas Tech University, $150,000.00. (September 1, 2011 - August 31, 2012).


Wigmans, M., Akchurin, N., "Matching Funds for DOE Grant (1)," Sponsored by Texas Tech University, $150,000.00. (September 1, 2009 - August 31, 2010).

Wigmans, M., Akchurin, N., "Matching Funds for DOE Grant," Texas Tech University, $150,000.00. (September 1, 2008 - August 31, 2009).

Wigmans, M., Akchurin, N., Lee, S., Volobouev, I., "Experimental Particle Physics Research at Texas Tech University (Fermilab service account)," Sponsored by U.S. Department of Energy (Grant administered by Fermilab), Federal, $10,000.00. (March 1, 2008 - February 28, 2009).


Wigmans, M., Akchurin, N., "Matching Funds for DOE Grant (1)," Texas Tech University, $100,000.00. (September 1, 2007 - August 31, 2008).

Wigmans, M., Akchurin, N., "Matching Funds for DOE Grant (1)," Sponsored by Texas Tech University, $150,000.00. (September 1, 2007 - August 31, 2008).

Wigmans, M., Akchurin, N., Lee, S., Volobouev, I., "Matching Funds for DOE Grant (3)," Texas Tech University, $25,000.00. (September 1, 2007 - August 31, 2008).


**Grant - Not Funded**

Wigmans, M., "Infrastructure needs for the TTU Particle Physics group (ARRA Proposal)," Sponsored by U.S. Department of Energy, $200,000.00. (September 1, 2008 - August 31, 2009).

**Sponsored Research**


X. Other professional activities during the last six years that contribute to graduate education

**New Format for existing course**

**Fall TTU 2010**

"Elementary Particle Physics," PHYS 5312-001.

**New Course Preparation Work**
Fall TTU 2010

"Elementary Particle Physics," PHYS 5312-001.

Service/Engagement

Faculty Research Committee, Astrophysics Faculty Search Committee. (2012).


Committee Member, Search Committee for the Cash Chair in Nuclear Engineering. (2010).

Committee Chair, Search Committee for a Faculty Member in Astronomy. (2009).

Committee Member, Faculty Affairs Committee. (January 1, 2009 - May 31, 2009).

Committee Member, Faculty Affairs Committee. (2007 - 2008).

Committee Member, Search Committee Member for the Cash Chair in Nuclear Engineering. (2009).
Graduate Program Reviews
2007-2012

FACULTY AND STUDENT
SURVEY RESULTS

College: Arts and Sciences
Department: Physics
Conducted by: Institutional Research & Information Management

November 2013
## FACULTY SURVEY RESULTS –

### Number of faculty participated in survey

<table>
<thead>
<tr>
<th>Title</th>
<th>Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professor</td>
<td>5</td>
</tr>
<tr>
<td>Assoc. Professor</td>
<td>10</td>
</tr>
<tr>
<td>Asst. Professor</td>
<td>1</td>
</tr>
<tr>
<td>Emeritus</td>
<td>0</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
</tr>
<tr>
<td><strong>PARTICIPANT TOTAL</strong></td>
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### SCALE

<table>
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<tr>
<th>Strongly Agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly Disagree</th>
<th>N/A</th>
<th><strong>Average</strong></th>
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</thead>
</table>

### Q-1 The facilities and equipment available to teach graduate courses are adequate.

<table>
<thead>
<tr>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>-</th>
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<tbody>
<tr>
<td>3</td>
<td>11</td>
<td>5</td>
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<td>1</td>
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</tbody>
</table>

### Q-2 I have adequate access to facilities and equipment needed for my graduate work.

<table>
<thead>
<tr>
<th>5</th>
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<tbody>
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<td>4</td>
<td>8</td>
<td>4</td>
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</tbody>
</table>

### Q-3 The quality and availability of departmental graduate student office space is adequate for my needs.

<table>
<thead>
<tr>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
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<td></td>
<td></td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>3</td>
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</tbody>
</table>

### Q-4 Library resources available to me are adequate.

<table>
<thead>
<tr>
<th>5</th>
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<th>1</th>
<th>-</th>
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</thead>
<tbody>
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<td>2</td>
<td>11</td>
<td>5</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

### Q-5 Teaching resources (faculty, teaching assistants) are adequate to my needs.

<table>
<thead>
<tr>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>-</th>
</tr>
</thead>
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<tr>
<td>3</td>
<td>10</td>
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</tbody>
</table>

### Q-6 The program offers an adequate selection of graduate courses, sufficient for timely completion of a full graduate program.

<table>
<thead>
<tr>
<th>5</th>
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<th>3</th>
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<td>1</td>
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</tbody>
</table>

### Q-7 The graduate courses available are taught at an appropriate level and are of sufficient rigor.

<table>
<thead>
<tr>
<th>5</th>
<th>4</th>
<th>3</th>
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<th>-</th>
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</thead>
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<td>2</td>
<td>8</td>
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<td>1</td>
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<td>1</td>
</tr>
</tbody>
</table>

### Q-8 The graduate teaching by faculty in the program is of appropriate quality.

<table>
<thead>
<tr>
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<th>2</th>
<th>1</th>
<th>-</th>
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</tr>
</tbody>
</table>

### Q-9 Graduate courses in other fields, needed to support your program or minor, are sufficiently available.

<table>
<thead>
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<th>2</th>
<th>1</th>
<th>-</th>
</tr>
</thead>
<tbody>
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<td>1</td>
<td>7</td>
<td>5</td>
<td></td>
<td>7</td>
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</tbody>
</table>

### Q-10 There is adequate communication about policy and program changes in your department.

<table>
<thead>
<tr>
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<th>1</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10</td>
<td>5</td>
<td>4</td>
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<td></td>
</tr>
</tbody>
</table>

### Q-11 There is adequate communication from the upper administration regarding policy changes.

<table>
<thead>
<tr>
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<th>2</th>
<th>1</th>
<th>-</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>7</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Question</td>
<td>Response 1</td>
<td>Response 2</td>
<td>Response 3</td>
<td>Response 4</td>
<td>Rating</td>
</tr>
<tr>
<td>----------</td>
<td>------------</td>
<td>------------</td>
<td>------------</td>
<td>------------</td>
<td>--------</td>
</tr>
<tr>
<td>Q-12 I am satisfied with the professional interaction with faculty throughout TTU.</td>
<td>2</td>
<td>11</td>
<td>4</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Q-13 Graduate courses in other fields, needed to support your program(s) or minors, are sufficiently accepted.</td>
<td>1</td>
<td>7</td>
<td>7</td>
<td>5</td>
<td>3.60</td>
</tr>
<tr>
<td>Q-14 Graduate courses in other fields, needed to support your program(s) or minors, are sufficiently recommended by your advisor(s).</td>
<td>1</td>
<td>7</td>
<td>6</td>
<td>6</td>
<td>3.64</td>
</tr>
<tr>
<td>Q-15 I am receiving the research and professional development guidance I need from other faculty.</td>
<td>1</td>
<td>9</td>
<td>8</td>
<td>2</td>
<td>3.35</td>
</tr>
<tr>
<td>Q-16 I am satisfied with the professional interaction with the graduate program coordinator(s).</td>
<td>3</td>
<td>6</td>
<td>5</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Q-17 I am satisfied with the professional interaction with other faculty within the program(s).</td>
<td>4</td>
<td>7</td>
<td>6</td>
<td>3</td>
<td>3.60</td>
</tr>
<tr>
<td>Q-18 I am treated as a respected contributor to the graduate program in which I am involved.</td>
<td>5</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Q-19 I have been given an opportunity to be engaged in decisions regarding changes in the program(s).</td>
<td>2</td>
<td>9</td>
<td>5</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Q-20 Course and program changes are evaluated by all faculty and voted upon by those faculty.</td>
<td>3</td>
<td>9</td>
<td>6</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Q-21 Sufficient graduate teaching assistantship stipends are available.</td>
<td>3</td>
<td>7</td>
<td>3</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Q-22 The program offers adequate opportunity for its faculty to gain teaching training.</td>
<td>1</td>
<td>11</td>
<td>4</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Q-23 Graduate teaching assistantships assignments are made equitably, based on established criteria.</td>
<td>7</td>
<td>6</td>
<td>3</td>
<td>4</td>
<td>4.25</td>
</tr>
<tr>
<td>Q-24 Graduate program policies are clearly defined and readily available to me.</td>
<td>1</td>
<td>9</td>
<td>6</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Q-25 Graduate program policies clearly identify petition and appeals procedures available.</td>
<td>1</td>
<td>5</td>
<td>7</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
**FACULTY COMMENTS:**

**What do you consider to be the strengths of your graduate program(s)?**

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>a few individual research groups and a few individuals who teach/train our graduate students well</td>
<td></td>
</tr>
<tr>
<td>Fairly collegial faculty who are willing to serve on student committees and to help provide guidance or resources to students and other departmental groups.</td>
<td></td>
</tr>
<tr>
<td>Most of our Faculty is involved in high level research. Therefore, our graduate students have the opportunity to obtain the skills needed in the fields they are trying to be professionals.</td>
<td></td>
</tr>
<tr>
<td>Having been at Texas Tech only a few months, and given the level of interaction that I have had with the rest of the physics faculty (vice faculty in other departments), I am not sure I have enough information to answer this question in a meaningful manner.</td>
<td></td>
</tr>
<tr>
<td>I am teaching a graduate course very close to my research. I introduce most updated results and research techniques to graduate students in addition to standard subjects from textbooks. I hope it helps them to advance in their research area.</td>
<td></td>
</tr>
<tr>
<td>Our program is small enough and personalized enough for most students to get a good experience.</td>
<td></td>
</tr>
<tr>
<td>A good fraction of the students come with their own financial support, and the prelim exam keeps a high standard to the students who move from the master's to PhD program.</td>
<td></td>
</tr>
<tr>
<td>Dedicated graduate recruiter (advisor).</td>
<td></td>
</tr>
<tr>
<td>Good faculty in some physics disciplines</td>
<td></td>
</tr>
<tr>
<td>The department support students to do research even if their Ph.D. supervisor does not have grants.</td>
<td></td>
</tr>
<tr>
<td>The new professors getting feedback from the students on how they believe the courses should be structured to have the most impact.</td>
<td></td>
</tr>
<tr>
<td>We have a wide range of MS and PhD options, rangin from high-energy/particle physics to Astrophysics, condensed-matter, biophysics, nanoscience, some programs offer both theory and experiment options; teaching loads vary with the amount of research activity; graduate students enjoy small classes and a lot of contact with the instructors; the department supports research efforts by both graduate students and research-active faculty.</td>
<td></td>
</tr>
<tr>
<td>Our preliminary exam is of high standard nationally, which ensures the quality of PhD students.</td>
<td></td>
</tr>
<tr>
<td>There are opportunities for graduate students to do research in a wide variety of physics sub-areas. These range from very basic physics to very applied problems. The vast majority of the faculty are nationally recognized scholars in their area of specialty. Most faculty are actively engaged in and publish often in their research area. This provides graduate students with opportunities to publish their research, attend national meetings to present their research, and thus to become known to potential employers. Graduate students therefore usually receive an excellent education in their research area and, for the most part, eventually are able to find employment after graduation.</td>
<td></td>
</tr>
<tr>
<td>Graduate students who enter our program are provided the opportunity to receive the education needed to fill in any gaps in their undergraduate education. This can be a vital assistance to incoming graduate students who may have entered our program with a weak undergraduate background.</td>
<td></td>
</tr>
<tr>
<td>Every graduate student receives advice every semester from the Graduate Advisor concerning their progress towards graduation, any difficulties they may be having, which courses they should take the following semester, and navigating through the various, sometimes bureaucratic rules and regulations imposed by the Physics Department.</td>
<td></td>
</tr>
</tbody>
</table>
graduate school. / / The student to professor ratio is low enough that most students can talk with and get to know most of the faculty in the department. Graduate courses are always taught by faculty members, not by instructors or lecturers.

**What changes, if any, could be made to improve the quality of your graduate program(s)?**

<table>
<thead>
<tr>
<th>Change</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improve the quality of the faculty and, especially, the students.</td>
<td>There are no consequences for doing a poor job in this department. There are also no rewards for doing a good job.</td>
</tr>
<tr>
<td>We need to modify our requirements on incoming graduate students</td>
<td>Current graduate students are rushed through the required courses in two semesters and are expected to take the PhD Preliminary Exam after only one year at TTU. This puts incoming students with a weak undergraduate physics education at a major disadvantage and often leads to such people failing the Preliminary Exam and/or making poor grades in the required courses, and/or causing them to drop out of the PhD program. Some of these students even eventually drop out of the program without even completing their MS degree.</td>
</tr>
<tr>
<td>More specialized courses are needed</td>
<td>More specialized courses are needed in a few of the research areas that have enough students to justify such courses.</td>
</tr>
<tr>
<td>More research lab and office spaces are urgently needed</td>
<td>More research lab and office spaces are urgently needed for new experimental faculty members, which would give students more selections on their research topics.</td>
</tr>
<tr>
<td>more stipends/fellowships for research assistants</td>
<td>More stipends/fellowships for research assistants / we need space for faculty offices, research labs, graduate student offices</td>
</tr>
<tr>
<td>Attract professors that have interesting research and grants.</td>
<td>Attract professors that have interesting research and grants. / Offer new courses that can help students to do their research.</td>
</tr>
<tr>
<td>Better funding. More active research involvement from both faculty and</td>
<td>Better funding. More active research involvement from both faculty and graduate students. Add more postdocs.</td>
</tr>
<tr>
<td>graduate students. Add more postdocs.</td>
<td>More funding for TAs.</td>
</tr>
<tr>
<td>I need to write a book.</td>
<td>I need to write a book.</td>
</tr>
<tr>
<td>We need to do a better job recruiting high caliber graduate students.</td>
<td>We need to do a better job recruiting high caliber graduate students. I think this falls mostly on us doing a better job publishing high impact papers, rather than on the graduate recruiter. I think we also need to offer a few more graduate level elective courses, but that means expanding our department a bit. It would be very helpful if the graduate school dealt properly with students coming in with international qualifications. I managed to convince some high quality British students to come here, and their qualifications were not treated appropriately because they do not map easily to the American system. / / Graduate student office space is seriously inadequate. / / For or new astrophysics research program, it would be very helpful if the university made a serious investment in a world class telescope. This could be done either by arranging a donation or by contributing from the endowment.</td>
</tr>
<tr>
<td>Increase stipend size, reduce teaching load, and ELIMINATE RECITATION</td>
<td>Increase stipend size, reduce teaching load, and ELIMINATE RECITATION sections.</td>
</tr>
<tr>
<td>The concept of &quot;academic freedom&quot; seems foreign to some faculty in this</td>
<td>The concept of &quot;academic freedom&quot; seems foreign to some faculty in this department. Should a qualified professor wish to work in, teach, and or supervise students in any given area, there doesn't seem to be a logical reason why they should not be welcomed into that area. This is not the case in our department, and has (in my limited experience), hampered the development of several programs significantly in a very short period of time.</td>
</tr>
<tr>
<td>We need to attract better students. The transition of TTU to a research institution should help in</td>
<td>We need to attract better students. The transition of TTU to a research institution should help in</td>
</tr>
</tbody>
</table>
this regard.

| Stronger recruiting of graduate students and better stipends. Better office space and a budget for modest purchase and replacement of computers for teaching assistants should be provided. |
| better research oriented faculty should be hired |

Please feel free to add any additional comments or questions in the space below.

the graduate faculty quality is directly proportional to the quality of the research they do. if we have highly regarded researchers are graduate faculty, i think we would be ok.

| Some of professors use the same text book and material for more than 6 years. They do not have time to spend on changing the text book or lecture notes or even modify the homework or exams questions. |
### STUDENT SURVEY RESULTS – PHYSICS

#### Number of students participating in survey

| Doctoral | 27 |
| Master’s Thesis | 9 |
| Other | 1 |
| **PARTICIPANT TOTAL** | **37** |

#### Student participant: Years in program

| 1st year | 13 |
| 2nd year | 5 |
| 3rd year | 6 |
| 4th year | 6 |
| 5th year | 5 |
| 6th year | 1 |
| No answer | 1 |

#### SCALE

<table>
<thead>
<tr>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>N/A</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly Agree</td>
<td>Agree</td>
<td>Neutral</td>
<td>Disagree</td>
<td>Strongly Disagree</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Q-1** The research facilities and equipment available for my graduate research meet my needs.

<table>
<thead>
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<th>10</th>
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<th>7</th>
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<tbody>
<tr>
<td>3.32</td>
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</tbody>
</table>

**Q-2** I have adequate access to facilities and equipment needed for my graduate work.

<table>
<thead>
<tr>
<th>6</th>
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<th>9</th>
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<tr>
<td>3.33</td>
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</table>

**Q-3** The quality and availability of departmental graduate student office space is adequate for my needs.

<table>
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<tr>
<th>6</th>
<th>5</th>
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<tr>
<td>2.73</td>
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</table>

**Q-4** Library resources available to me are adequate for my needs.

<table>
<thead>
<tr>
<th>13</th>
<th>8</th>
<th>9</th>
<th>2</th>
<th>2</th>
<th>3</th>
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<tr>
<td>3.82</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Q-5** Teaching resources (faculty, teaching assistants) are adequate to my needs.

<table>
<thead>
<tr>
<th>3</th>
<th>13</th>
<th>8</th>
<th>8</th>
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<tr>
<td>3.14</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>

**Q-6** The program offers an adequate selection of graduate courses, sufficient for timely completion of a full graduate program.

<table>
<thead>
<tr>
<th>7</th>
<th>11</th>
<th>9</th>
<th>8</th>
<th>2</th>
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</thead>
<tbody>
<tr>
<td>3.35</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Q-7** The graduate courses available are taught at an appropriate level and are of sufficient rigor.

<table>
<thead>
<tr>
<th>3</th>
<th>11</th>
<th>10</th>
<th>5</th>
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</tr>
</thead>
<tbody>
<tr>
<td>2.89</td>
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<td></td>
<td></td>
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</table>

**Q-8** The graduate teaching by faculty in the program is of appropriate quality.

<table>
<thead>
<tr>
<th>2</th>
<th>11</th>
<th>10</th>
<th>8</th>
<th>6</th>
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</thead>
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<tr>
<td>2.86</td>
<td></td>
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**Q-9** Graduate courses in other fields, needed to support my program or minor, are sufficiently available.

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**Q-10** Program seminars are adequate to keep me informed of developments in my field.

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**Q-11** The initial advising I received when I entered the program was an adequate orientation.

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Q-12 I have a department mailbox or other form of communication with faculty & graduate students.

|   | 20 | 8 | 4 | 2 | 2 | 1 | 4.17 |

Q-13 I have adequate access to my major professor.

|   | 13 | 9 | 6 | 2 | 1 | 6 | 4.00 |

Q-14 I am receiving the research and professional development guidance I need.

|   | 9 | 8 | 7 | 7 | 2 | 4 | 3.45 |

Q-15 I am satisfied with the professional interaction with my major professor.

|   | 12 | 8 | 7 | 2 | 3 | 5 | 3.75 |

Q-16 I am satisfied with the professional interaction with faculty both within the program and at TTU.

|   | 6 | 13 | 9 | 5 | 4 |   | 3.32 |

Q-17 I am treated as a respected contributor to the research program in which I am involved.

|   | 10 | 7 | 7 | 3 | 4 | 6 | 3.52 |

Q-18 I have been given an opportunity to be engaged in significant research for my thesis or dissertation.

|   | 9 | 9 | 9 | 2 | 1 | 7 | 3.77 |

Q-19 If I decide to change my major professor, the mechanism for doing so is suitable.

|   | 1 | 9 | 10 | 3 | 2 | 12 | 3.16 |

Q-20 I am informed of opportunities for professional development and contacts outside TTU, such as attendance at professional meetings.

|   | 5 | 11 | 8 | 7 | 4 | 2 | 3.17 |

Q-21 Graduate teaching or research assistantship stipends are adequate.

|   | 5 | 7 | 10 | 11 | 3 | 1 | 3.00 |

Q-22 The program offers adequate opportunity for its graduate students to gain teaching experience.

|   | 5 | 17 | 10 | 2 | 2 | 1 | 3.58 |

Q-23 Graduate teaching assistantships, assignments are made equitably, based on established criteria.

|   | 8 | 7 | 10 | 7 | 2 | 3 | 3.35 |

Q-24 Program policies are clearly defined and readily available to me.

|   | 8 | 15 | 7 | 3 | 3 | 1 | 3.61 |

Q-25 Graduate program policies clearly identify petition and appeals procedures available to me.

|   | 1 | 7 | 17 | 6 | 3 | 3 | 2.91 |

Q-26 There is a well-established mechanism for regular graduate student participation in decisions affecting students, whenever this is appropriate.

|   | 1 | 7 | 13 | 7 | 5 | 4 | 2.76 |

**STUDENT COMMENTS:**

**What do you consider to be the strengths of this program?**

- Theoretical coaching to just pass exams BUT not to think critically to face world's scientific challenges.
- Progress of research on my specialization.
- There is ample opportunity for research, if you go looking.
Small student population, ample opportunities to study and work with other Engineering programs.

This program has a good faculty and teaching staff plus lots of research opportunities.

Nothing that is significant.

The high energy physics group is highly reputable, although that's only a perk to those interested in high energy physics.

I think the teaching load is appropriate for a graduate student majoring in physics. Also, I think the seminars are informative and understandable enough for a student of my level.

Focusing on the quality of teaching and letting graduate / students vote for the professors to teach at least / the core courses. Many professors in general like to teach at the graduate / because graduate rarely complain about the quality of teaching unlike lower undergraduate students who care much about the teaching as well as willing to complain.

I get a good degree of input in which classes I want to teach.

The program has a very diverse faculty component and cutting edge research in many areas. The Lab Coordinator is very clear regarding expectations of TAs and is readily available should an issue arise. There seems to be a reasonable dispersion of theoretical and experimental opportunities. There is definitive expansion of the department in terms of the number of tenure track faculty and research areas.

Great faculty taking their job seriously and responsibly, good opportunities for graduate students in research and teaching.

The programming allows students start doing research early when he/she can find an advisor.

Building

Encouraging students to do research. Informing about the research going on in the department. Providing support for conferences in the country.

Great student-to-teacher ratio.

Try to bring good professors in the latest research areas like in nanotechnology, experimental condense matter physics. These fields are at most demand in view of current job market. Unfortunately TTU don't have good professors in these areas.

There is enough financial support as teaching assistantship (sometimes research assistantship).

Giving me the teaching opportunity. The way that TA assignments are distributed. The lab coordinator.

What do you consider to be the weaknesses of this program?

Not enough equipment for experimental research due to lack of research grant that professors need.

The ways that most of the professors teach considering the graduate level requirements.

Program should have wide range of research areas. I felt that graduate students don't have much options to choose the good research topics for their research.

Funding. Some faculty take little time to appropriately prepare for class, including fully understanding the material to be covered. The faculty are quick to conclude that students not performing well in the department are inadequate for the degree program, yet do very little to improve the quality of instruction within the courses that are in place to prepare the students for the program.
The fact that the number of faculty is limited especially on certain research areas decreases the possibility of easy collaboration.

| Faculties' attitude towards students, unfair scholarship distribution, no criteria for best TA award |
| 1. The core courses are not strong enough in terms of teaching and instructor capability. The program should assign professional persons to perform the core courses. This disadvantage can be clearly seen from the number of students who take the core courses in the past few years. For example the number of students who took QM I is around 15 but the latter course (QM II) has less than 5. The E&M I, II also showed the same statistics. / 2. Elective courses are limited. The program should offer more variety courses (elective). / 3. Research area is limited. / 3. The preliminary Ph.D. qualifying exam process is not clear in terms of measurement. There is no correspondence between class performance and ability of passing the exam. In short, the exam is not standardized. |

Sometimes communications can be an issue.

| The teaching quality of the professors is sometimes lacking. The course itself generally seems to contain the correct amount of information; however, the teaching ability at times hinders the level at which this information can be conveyed. This is not to say that the teaching is bad, only that the teaching could be improved by more uniform expectations of those teaching. |
| Poor teaching quality coupled with classes of laughable difficulty sets grad students up for failure, especially on the preliminary exam. I don't generally feel like I understand what is expected of me. I'm apparently not allowed to get a second job, but I'm only supported 10.5 months of the year, and I'm not aware of any employer who is willing to hire someone for 6 weeks. This means that I am forced to constantly scrape, which adds a very unwelcome level of stress to the whole graduate experience. |

The way that the professors are chosen to teach graduate courses. / For instance, letting an experimental physicist teach a graduate course supposed to be taught by theoretical and vice versa.

I didn't receive an office assignment until the middle of my first semester here and yet I was teaching and grading undergraduate courses from the beginning. Offices should be provided to graduate students when they arrive.

There is a severe lack of research options, the department as a whole doesn't seem to have much regard for the graduate students, the graduate adviser is more or less a grouchy old man who doesn't make himself very available, and the quality of teaching leaves a lot to be desired.

Graduate advising. Coupling competent Professors with courses. i.e. Not have research professors should not be teaching core courses. The only professor that is both qualified and passionate about teaching rather than just spewing information out is Dr. Sanati. He should be the graduate advisor and teach more of the core courses. Dr. Huang is another great professor.

The timeliness of professional responsibilities such as getting new graduates offices and keys to the building.

There is a lack of seriousness about some of the students, even a lack of respect for their own program.

Better quality teachers for graduate level courses. Also, better academic advisor is needed.

Policies regarding academic probation and suspension are not upheld, so classes have...
students which tend to bring down the course level. I understand we are short on teaching assistance and thus allow these policies to slide a bit, but when it effects the quality of other student's education this is unacceptable. Additionally there remains a disjointedness within the graduate student population as well as the faculty.

The graduate students' stipend is too low, especially since we do not get all of our tuition covered or insurance provided.

We (TA's) do not have offices yet. It is very difficult to offer office hours to our students without an office. The computer lab in the department has regularly scheduled classes so finding a time for research work in there is tough. Professors don't teach they simply regurgitate material in the book. I thought graduate school would be different in this aspect.

Not enough experimental science professors (especially in Bio-Physics and Condensed Matter).

There is no sort of orientation to the program. The TA's are thrown into their labs and recitations with little to no guidelines for the first week or two.

No offices for TAs, even if allocated it's very late. / Very optimum stipend. / Too much teaching assignment, which makes our study difficult.

Crumming content as opposed to understanding. This goes to an extent where students crum diagrams and figures coz the exam asking for a diagram (c) in homework 3 when the diagram is not shown. So the student is expected to crum the diagrams,amd sometimes the diagram that was for Q 2(c) was by mistake meant for Q 1 (c). The professor grades with the mistakes like that and then he says I am sorry after students have failed. The students fear telling the professor coz the professor will fail them. Again the professor looks at students differently. Only students from certains parts of Europe can do Physics, the rest can not. The most disadvantaged group are students of color. One time a student of color passed qualifying exam. This professor stopped the student on the hallway and asked the student six times if the student really passed. what happened was that the professor was absent in the oral exam when this student was in session. This professor insists to sit in oral exam for all studen

**What changes, if any, could be made to improve the quality of this program?**

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| There should be a nameless exam papers (can have codes) so this profesor who only looks for certaining color os students will not know who exactly he is grading his paper. The Oral exam is a crap. It is meant to pick student based on non-academic aspects. One student boasted of face book how she laughed at the professor who likes you girls, and the student passed qualifying exams. All that she is doing now is to beautify herself and openly laughs at those working hard. The qualifying exam has hidden factors unknown to students. It should just be taken off and something else should come in. why have many who crum to pass then after passing they are just facebooking 24 hours? How comes those who claim to pass can not teach simple experiments of high school like Ohm's law? How comes Arab students can only work with Arab professor, Chinese students only with chinese profesor? Then student from Australia will not have a professor to work with, and will be branded with failing grades. | Assigning offices for TAs by the first day of the semester. / progress on stipend. / Reducing the teaching load, no more than two classes, so that we'll get good hours to do our own study. / More experimental science professors. / Better computer lab without classes being held in the lab. Assign offices first week of school. Have professors that actually teach material. Just a rant but when I become a professor I Physics
believe I will actually teach my students instead of just re-state what the book says word for word. Change the mentality of professors that just because we are graduate students doesn't mean we already know 100% of the subject. That's why we are in school still.

Either cover all of the tuition and provide insurance for the graduate students, or raise the base stipend.

Schedules are difficult to mingle, but an occasional luncheon or something similar would help engender communication within the department. An area where graduate students could converge to discuss ideas (like the SPS lounge) would be a nice addition. It would also be in the best interest of the department for the faculty to be required to meet monthly to discuss issues of policy, funding, accountability of faculty to their students regarding testing, grading, and material coverage. (The latter seems to be quite desperate particularly in introductory level courses.) Student documentation and information about new course listings (i.e. syllabus) should be available through the physics department website. This would lower costs for students (lab manuals), allow documentation to be modified in a timely fashion, and provide a more realistic layout of student/professor expectations to reduce attrition rates.

Paying for the entire school tuition

Remove Dr. (name removed) from anything crucial to a grad student's growth academically. Also a competent Head of the department will go a long way. One that doesn't try to brush cheating, student talking back to professor, students taking majority of their course work outside of the physics department while receiving TA support, etc. / / Mainly, the professors that teach should not be distracted with their own research. Second, the Head should work hard to always improve the department and not treat the position as a cushion job.

The department could be improved by broadening the areas of research, and by instituting either higher standards for instruction or more reasonable expectations for course outcomes.

Most professors don't believe the fact that it's unexpected from the student to understand completely the physics of this taught course. What they do is simply giving the graduate student a grade will place his GPA on probation. Moreover, in the following semester, with another professor, he will double the probation on his GPA or dropping his name from the program. On the top of that, if you want to drop the course that will your future, you encounter difficulty in dropping that course. In my case, I added one course from the graduate school itself, but they refused when I want to drop a course will affect my GPA. Learning is not something happen overnight or in only a single semester. It's at the same time illogical to judge the background base on only a single semester performance. Ultimately, the reason why I'm hear is to learn. Not to worry about my GPA and look after it.

Make the classes more difficult, especially the core classes. Teaching quality doesn't really matter so much at the graduate level, if the classes are difficult the student is forced to learn and has a better idea of what is expected of them.

I think that implementation of teaching quality reviews would be beneficial to the department. It would probably also be helpful to instructors if they were encouraged to attend developmental workshops over teaching. Our department has some that specialize in Physics Education Pedagogy. Perhaps looking to them for some ideas would be useful.

1. Assign appropriate instructors to perform the core courses. / 2. More research areas. / 3. The preliminary exam should be standardized. For example student should have their right to see at least the solution of the exam.

Encouraging friendly and good manners between people in the department

having more faculty to balance the inequality between the research areas. Offering more
elective course. Letting senior grad students to do recitation for graduate level courses.

I think program needs more professors and courses. I think diversity of specific majors is required for this program. Some majors are not available. Some professors are not good enough at teaching and they are insisting on teaching some courses.

No longer allow teachers to use PowerPoint presentations on a regular basis...this is becoming an epidemic!!! Work through the course material in class with the students, instead of quickly brushing over the material and then expecting great results from students on exams. Don’t expect strokes of genius to occur during the exams themselves; in other words, if you only cover and/or assign easy examples/questions during the course, and then place advanced questions on the test, the students will be overwhelmed and will not pass. Tests are meant to "test" the students comprehension of the material covered in class; they are not meant for curve balls or advanced applications for which the teacher inadequately (if at all) prepared the students for. If the professor wants to increase the advancement in the course, then advance the course as a whole, not just the exams.

I will strengthen the experimental condensed matter physics, nanotechnology and bio-physics research areas in this program. By doing this, TTU will attract good graduate students and students will stand good in the job market.

I would change the graduate advisor.

Please feel free to add any additional comments below.

the notion that "who is going to teach which graduate course" among the professors should be discussed more carefully at the departmental meetings.

This department does very little to reward satisfactory progress towards a degree (much like in industry how employees receive raises for staying with the company and making satisfactory contributions); so it should come as no surprise that in the current state of the U.S. economy, students are taking their sweet time graduating. Give raises to the students making satisfactory progress towards graduation, and dock pay or expel those who are not. An employee with a B.S. in physics can earn ~$40,000 annually right out of college, yet a graduate student only makes ~$20,000 (where is the incentive to be, or do well, in graduate school)? Understandably, a Ph.D. (once received) will get upwards of $75,000...but it shouldn't be a step-function ($20k to $75k). Regarding the faculty, if they want Grade A graduate students, then they need to put Grade A effort into preparing them for their research/courses (that is why it is called graduate "school").

Unfair scholarship distribution: The scholarship committee awards the scholarship to the same students every year. I know one student who didn't get any departmental scholarship in his/her first two years. Then he/she talked to his/her advisor about it. After that, he/she received departmental scholarship for the next 3 years. So connections and having an advisor to talk to the scholarship committee works to get a departmental scholarship. / / Best TA Award: There is no criteria for best TA award. They don't look at the student evaluations. They don't check how TAs teach. I don't know what their criteria is. Their criteria for best TA award may be either connections or TAs' manners in the TA meeting with the lab coordinator. If that is the case, it is unfair. / / Unrespectful treatment: I don't think grad students are treated...
The faculty member were telling bad and non-sense things about grad students. Also when I see faculty members in the Physics office, I don't find them very friendly. Of course that is not true for all of them. 

Not Helpful Faculties: I know from senior grad students that faculties are not very willing to write reference letters and not very helpful in job search.

A research university should mean strong in both teaching courses and doing intensive research. The quality of teaching cannot be ignored.

Overall, I believe this to be a very strong department and I am very happy to be pursuing my graduate study with this institution.

There is no balance in the quality of teaching at the graduate level with the type of questions in qualifying exam. The level the material covered in the graduate courses is incomparable to the level of the qualifying exam. Even though if both graduate courses and qualifying exam come from the same professors. For example: for the past six or seven years, only two or three students at the latest passed the qualifying exam out of approximately ten other students.

Surprisingly, last year, when they want to have more PhD students, they let eight students who took the exam to pass out of twelve students. This time of qualifying exam, they came up with the idea that they are quite dissatisfied with past exam due to the easyness of tha past exam. In addition to that, this time only two students who passed the exam out six.

It's absolutely ridiculous that the graduate assistants were not assigned offices until the middle of the semester, and had to wait two more weeks on top of that to get keys to their offices. Additionally, this is the only university that I've heard of where the graduate assistants have to pay tuition and aren't provided with health insurance. I thought that was the standard.

The department is good, but has the potential to be a great if everyone would step up and do a little extra.

Oral qualifying exam is testing something else NOT physics. How comes (name removed) must sit in Oral exam of every student? How comes only those students like by (same name removed) pass the Oral exam? One student posted in facebook how she laughed with (same name removed), and (same name removed) made her pass qualifying exam. Now the young girl is just beautifying herself, never comes to school for research. Some students who already had made several publications were failed in the Oral exam because (same name removed) doesn't like them. Why is it that (same name removed) must scrutinize every student in the department? There are other professors who are also qualified, they never intimidate students like (same name removed) does. Why can't (same name removed) just do research and leave lecturing for other professors?