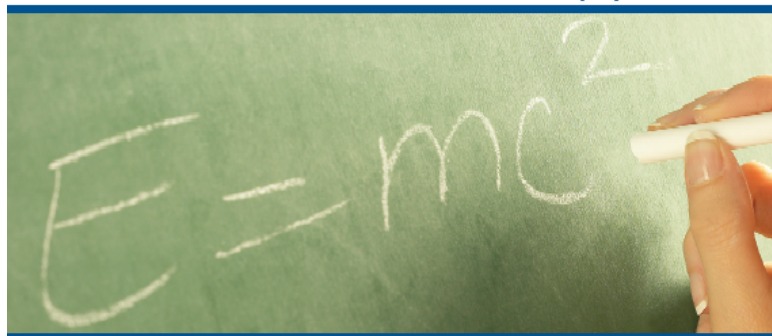
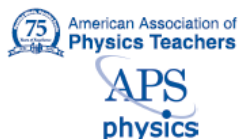


Summary of the AAPT Panel Discussions on Graduate Education

AAPT Committee on Graduate Education in Physics, M. Thoennesen, Chair (MSU)

Report of the Joint AAPT-APS Task Force



GRADUATE EDUCATION IN PHYSICS

Revised June 2006

Committee Membership

David Campbell, Chair
Boston University

Tom Appelquist
Yale University

Renee Diehl
Penn State University

Joel Fajans
University of California, Berkeley

J.D. Garcia
University of Arizona

Jim Gates
University of Maryland

Allen Goldman
University of Minnesota

Peter Jung
University of Ohio

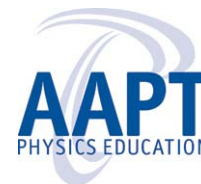
Michael Paesler
North Carolina State



Future of the Core Curriculum



Demonstration of Mastery: The Future of the Exam



Future of the Core Curriculum

January 7, 2007

Panel members:

Laura Bodine (Graduate Student, Washington)

Ken Heller (Minnesota)

Michael Paesler (North Carolina State)



Attendance:

47 (including 11 graduate students)

“It also has been argued that physics departments need to modernize the curriculum, noting that the traditional core has not changed for 50 years.”

What are desired skills for postdocs: Independence, Knowledge, Technique...

Task Force Recommendations

1. The TFGE recommends that the content of **core courses be consistent year-to-year** and be supervised closely by the department. Within that context, the TFGE believes that turnover in instructors is a positive occurrence.
2. ...
3. The TFGE recommends that the Ph.D. physics **core curriculum should consist** of the material generally covered in a
 - one-year course in **Classical Electrodynamics**,
 - one-year course in **Quantum Mechanics**,
 - one-semester course in **Classical Mechanics**, and
 - one-semester course in **Statistical Mechanics and Thermodynamics**.

Topics at Panel Discussion*

- What is a good course load (for the core), 2 or 3 courses?
- Where is most of the time spent in graduate school? Before or after candidacy?
- Although core courses have all the same title, is the content really the same?
- Is the large attrition rate of ~30% (true?) due to the (boring) content of core courses?
- Should the different learning styles of the students be accommodated by different learning models?
- Should the core be split up into many (20-30) distinctly different topics?
- Should the students be allowed (with supervision, advice and approval) to design their individual curriculum?
- Is the mismatch between preparation in college and expectation in the core courses a major problem?
- Will anybody still be able to teach Jackson in the future?
- Why don't we use the summer semesters more effectively?

*In no particular order,
partially taken from notes by P. Viele (Cornell)

Demonstration of Mastery: The Future of the Exam

July 31, 2007



Panel members:

Eric Adles (Graduate Student, North Carolina State)

Marianne Breinig (Tennessee)

Joe Perez (Auburn)

David Tedeschi (South Carolina)

Andrew Zangwill (Georgia Tech)

Attendance:

16 (including 3 graduate students)

“Anecdotal evidence suggest that some graduate physics departments have changed or eliminated these requirements or made other changes such as the elimination or “watering down” of comprehensive exam.

Task Force Recommendations

13. ...

14. The TFGE makes **no recommendation** at this time concerning the use of comprehensive exams, except to note that there needs to be some method of evaluating students' knowledge of the core subjects.

15. The TFGE recommends that the physics **department chairs engage in discussions** of comprehensive examinations and their alternatives.

16. ...

Topics at Panel Discussion*

- Minimize the time between first and second try! (GT has only 8 weeks)
- Open or closed grading? (50/50 split among participants)
- Clearly state exam goals and “passing grade”! (Students passing due to a lower threshold for bad exams did not demonstrate “mastery”)
- Offer test preparation class!
- Is it helpful to give the students a choice of problems?
- Professors like easy but unusual problems, they test thinking and not memorization.
- Students like hard but standard problems where they can get partial credit; they are not “all-or-nothing”.
- Should the exam also test capability to perform independent research (how)?
- How long should students who pass the (theoretically biased) exam be allowed to continue when they cannot perform independent research?
- More general comments:
 - Continuous advising is crucial!!
 - Guidance committees need guidance!!

Web Questionnaire for Directors for Graduate Studies

J. Tate, T. Hodapp, S. Otwell, C. Singh, M. Thoennesen

February 2007

Sent to 141 departments

64 responses

“...we are basically following our instincts without any true knowledge of what other institutions might be doing, or any documented knowledge of what has worked or not worked at other locations. A conference like this would therefore be extremely useful.”

Are you contemplating changes or have you recently implemented changes in your graduate curriculum and program?

- 29 departments have made recent changes to the curriculum, for example modifications to the core curriculum, adding interdisciplinary courses, formal TA training, etc.
- 14 departments have made recent changes to the exam structure.
- 12 departments are actively considering changes.
- 19 departments reported that they are satisfied with their current system.

What topics would be of interest or concern to you?

- Curriculum (23), Recruiting (21), Funding (18), Exam structure (13), Interdisciplinary aspects (10), Preparation in College (7), Job situation (6), Retention (6), Diversity (6), Foreign student issues (5)