Rutgers University:
Challenges and Opportunities in Graduate Education in Physics and Astronomy

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The graduate program in Physics and Astronomy at Rutgers University has about 70 faculty members who can chair PhD dissertation committees in the experimental and theoretical areas of astrophysics and nuclear, particle, condensed matter and biological physics. With 10 women, the program has the largest number of women of any PhD program in the U.S. Yet we struggle to recruit women graduate students and a critical mass of graduate students, with only about 100 in the program. To help address the challenge in recruiting outstanding U.S. students, including women and other under-represented groups, we are hosting a new NSF Research Experience for Undergraduates summer program.

The program is committed to shortening time to the PhD and engaging students in research early in their careers. We have changed the PhD candidacy process to foster these goals. First we have eliminated the high-stakes written exams and replaced them with mastering the core graduate courses in Classical, Quantum and Statistical Mechanics and Electricity and Magnetism. Astronomy-option students can use core astrophysics courses to replace some of the physics requirements. The qualifying exam for PhD candidacy is now research based with students making written and oral presentations and answering questions to a faculty committee, where most members participate in many committees. Once students have been advanced to PhD candidacy they are required to have annual meetings with their dissertation committees making written and oral presentations.

The poster would provide details of the PhD candidacy requirements and an overview of the program’s research.