

DPP07-2007-000021

Abstract for an Invited Paper
for the DPP07 Meeting of
the American Physical Society

Plasma Physics Research at an Undergraduate Institution

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Undergraduate research experiences have motivated many physics majors to continue their studies at the graduate level. The Department of Physics and Astronomy at SUNY Geneseo, a primarily undergraduate institution, recognizes this simple reality and is committed to ensuring research opportunities are available to interested majors beginning as early as their freshman year. Every year for more than a decade, as many as two dozen students and 8 faculty members have worked on projects related to high energy density physics and inertial confinement fusion during the summer months and the academic year. By working with their research sponsors, it has been possible to identify an impressive number of projects suitable for an institution such as Geneseo. These projects tend to be hands-on and require teamwork and innovation to be successful. They also take advantage of in-house capabilities such as the 2 MV tandem pelletron accelerator, a scanning electron microscope, a duoplasmatron ion deposition system and a 64 processor computing cluster. The end products of their efforts are utilized at the sponsoring facilities in support of nationally recognized programs. In this talk, I will discuss a number of these projects and point out what made them attractive and appropriate for an institution like Geneseo, the direct and indirect benefits of the research opportunities for the students and faculty, and how the national programs benefited from the cost-effective use of undergraduate research. In addition, I will discuss the importance of exposure for both students and faculty mentors to the larger scientific community through posters presentations at annual meetings such as the DPP and DNP. Finally, I will address the need for even greater research opportunities for undergraduate students in the future and the importance of establishing longer “educational pipelines” to satisfy the ever growing need for top-tier scientists and engineers in industry, academia and the national laboratories.