

GC PER: Student Content Understanding, Problem-Solving and Reasoning

Sponsor: AAPT

Time: 12:30–2:20 p.m.

Date: Tuesday, Jan. 21

Location: Grand Sierra H

Presider: TBA

GC01: 12:30-12:40 p.m. Developing a Strategy to Address Physics Students' Mathematical Difficulties*

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We report preliminary plans to address mathematical difficulties revealed in our four-year investigation of students in introductory physics courses. We have administered over 5000 written diagnostic tests in algebra- and calculus-based physics courses, and carried out many individual problem-solving interviews. We have previously reported that difficulties with basic mathematical operations are widespread, and that performance on problems using symbols for constants is consistently and significantly worse than on problems using numbers. In collaboration with Ohio State University, we are working to develop and test an online instructional tool that will provide opportunities for regular, targeted practice to address these difficulties. We have refined our diagnostic tool to explore the distinction between specific operational difficulties on the one hand, and difficulties arising from context complexity on the other. We will report our most recent findings and describe how they inform our initial instructional strategies.

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