



Department of Physics and Astronomy  
FALL 2021 Colloquium Series - Virtual

# “Beyond Procedures: Student Sensemaking in Mathematical Methods in Physics”

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Research on the use of mathematics in physics has included empirical and theoretical studies, and has covered courses across the spectrum. For this presentation, we consider the implications of these studies on the sophomore-level mathematical methods course offered by many physics departments, often referred to as the ‘Boas course’ after a common textbook. This course comes at a critical time for students, as they enter upper-division coursework. Surveys of students entering such a course suggest that for many students the math in introductory courses consisted primarily of plugging numbers in formulas and execution of algebraic or arithmetic procedures. Despite experience with procedures, many students entering math methods do not make sense of mathematical ideas relevant to upper-division physics. As a result, students need additional practice with physicist math and sensemaking. Moreover, models of learning and learning transfer suggest strongly that students will not spontaneously develop these skills by performing procedural exercises. The math methods course presents an ideal opportunity to develop these skills by explicitly practicing them in physics contexts. Supported in part by NSF grants PHYS-1405616 and PHYS-1912660.

**Thursday, Oct. 28, 2021**  
**4:00 - 5:20PM**

Talk will be via Zoom - contact [physics@csus.edu](mailto:physics@csus.edu) for links or visit our Colloquium Spotlight at [www.csus.edu/physics](http://www.csus.edu/physics)

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