

Spring 2018 Colloquium

Department of Physics & Astronomy, TAMU-Commerce

Mar 7, Wednesday, 4-5 PM in Science Building 127

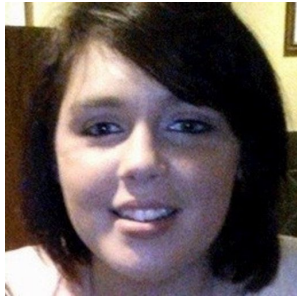
(coffee and cookies will be served at 3:50 PM)

Physics Education

Investigating Students' Understanding and Use of Mathematical Tools in Physics

Dr. Leanne Doughty

University of Colorado Denver



Dr. Leanne Doughty is a physics education researcher who studies student understanding and use of mathematical tools in physics contexts. Leanne trained as a high school physics, chemistry, and mathematics teacher in Ireland, receiving her BSc. in Science Education from Dublin City University in 2009. She earned a PhD in Physics in 2013, also from Dublin City University. Leanne worked as a research associate in the Physics Education Research Lab at MSU and is currently a postdoctoral researcher in Science Education at the University of Colorado Denver. Her research at CU Denver aims to understand what specific characteristics of active learning methods employed in undergraduate science and mathematics courses contribute to student success, and to identify the specific roles that Learning Assistants (LAs) play in facilitating active learning.

Abstract

Across STEM fields we frequently use math to model phenomenon and make predictions. Learning to use sophisticated math tools is therefore a core element of a student's preparation in all STEM disciplines. This is especially true in physics where, as students progress through their course sequence, physical models and the math required to interpret and use these models become increasingly complex. My research focuses on investigating how students understand and use math tools in their physics courses using two different approaches. One approach focuses on analyzing written responses to specifically designed tasks to identify difficulties students have using specific math tools. The other approach examines students' in-the-moment reasoning through the analysis of video recordings of students group problem-solving. The analysis of in-situ data facilitates insight into how students decide to use certain math tools and the ideas they consider while using them. This talk will discuss these two approaches, and present results and implications from both.