

Spring 2023 Colloquium

Department of Physics & Astronomy, A&M-Commerce

Mar 30, Thursday, 4-5 PM in Science Building 127

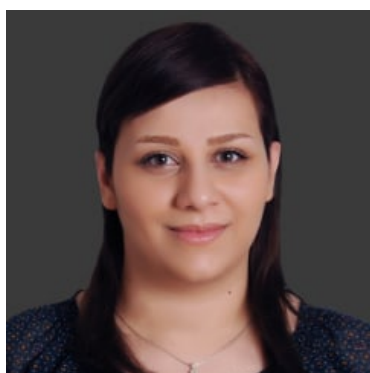
(coffee and cookies will be served at 3:50 PM)

Physics Education

Mathematical and psychosocial dimensions of learning in physics

Dr. Dina Zohrabi Alaee

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Dr. Dina Zohrabi Alaee is a Postdoctoral Associate in the School of Physics and Astronomy at Rochester Institute of Technology. Prior to joining RIT, Zohrabi was a graduate student with the Physics Education Group at Kansas State University. Before graduate school, she spent a decade teaching physics at the elementary, middle, and high school levels in Iran. Her graduate work focused on student understanding of electric and magnetic fields, processes of problem-solving, instructional change, and use of mathematics physics textbooks and physics problem solving. Recently, she used qualitative methods (e.g. observations and interviews) to understand students' learning and career decision-making during undergraduate research programs. In her free time, she enjoys knitting and playing board games.

Abstract

Learning physics is multi-faceted, containing mathematical, scientific, social, and psychosocial dimensions. In this colloquium, I will share my findings in physics education research around the mathematical and psychosocial dimensions that have implications in helping students to learn physics more conceptually and discuss how a context-rich learning environment (such as undergraduate research) can impact students' psychosocial gains (e.g., identity). The first part will focus on learning physics, particularly the concept of mathematical equality and understanding how students and experts translate mathematical solutions into physical understanding. I will discuss the different physical meanings associated with the equal signs across a range of undergraduate physics textbooks. In the second part, I will examine the challenges and benefits of doing undergraduate research with a particular attention to student's identity, sense of belonging, self-efficacy, and career decision-making. The findings shared in this talk have potential implications for instructional reforms in the in-person and remote physics learning environments across introductory and upper-division lecture and laboratory classrooms.