

You are cordially invited to attend

**Wednesday, November 29, 2017**

**12:00 pm - 1:00 pm**

252 Erickson Hall

Michigan State University

Light refreshments provided

**Dr. Marcy Towns**

Professor of Chemistry and Director of General Chemistry, Purdue University

**Blending chemical and mathematical knowledge  
as solve problems in chemical kinetics**

**Abstract:**

Answering recent calls for discipline-based education research and interdisciplinary work, this study seeks to investigate how students integrate chemistry and mathematics during problem solving in chemical kinetics, a context that has little attention in the literature. This work investigates the following research question: *In what ways do chemistry and mathematics knowledge interact as students engage in chemical kinetics problem solving?* Personal constructs, a blend of personal and social constructivism, served as the theoretical framework for this study, which involved semi-structured interviews using a think-aloud protocol with 36 general chemistry students, 5 upper-level physical chemistry students, and 3 chemical engineering students. Audio and written data were collected using a Livescribe pen, which were then combined to create interpreted narratives for each student. Blended processing, a theory from cognitive science that characterizes human knowledge integration, was used as a methodological framework to guide the analysis. Open coding revealed themes relating to common topics that were discussed when blending occurred; variation in the depth of blending was also characterized. Results provide implications for supporting student problem solving and the modeling of chemical processes.



**Dr. Marcy H. Towns** is a Professor of Chemistry and Director of General Chemistry at Purdue University. She is a Fellow of the American Association for the Advancement (AAAS) 2009, and a Fellow of the American Chemical Society (ACS) 2012. She received the 2017 ACS Award for Achievement in Research for the Teaching and Learning of Chemistry and the 2017 James Flack Norris Award for Outstanding Achievement in the Teaching of Chemistry from the Northeast Section of the ACS. She has been recognized with Purdue University's most prestigious honors for teaching including The Class of 1922 Outstanding Innovation in Helping Students Learn Award (2015) and the Charles B. Murphy Outstanding Undergraduate Teaching Award (2013). She received the 2017 Distinguished Women Scholar award

from Purdue University and Linfield College's Distinguished Alumna award in 2015. She has over 60 publications, over 1600 citations, and over 100 international and national presentations. She is an Associate Editor for the *Journal of Chemical Education*, focusing on manuscripts pertaining to chemistry education research.



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