NOBCChE STEM Week Grades 6-12 Teacher's Workshop
November 3, 2017; A two part workshop 8:00am – 12:00pm and 1:00pm – 5:00pm
Radisson Blu Hotel
35 S 7th St Minneapolis, MN 55402
Conference Room TBD

We hope you can join us for a Grade 6-12 Teacher's Workshop for Physical and Life Science Teachers during the NOBCChE K-12 STEM Week! This workshop will be hosted in part by the American Chemical Society and will be congruent with Next Generation Science Standards (NGSS) and Common Core Science Standards (CCSS) implemented in a number of states, including the state of Minnesota. While the final agenda and workshops topics are still being determined, potential coursework is included below. Keep in mind that we are currently exploring ways to expand the chemistry-driven content to be applicable to all Physical and Life Science disciplines. Please contact Teacher Workshop Chair, Fletcher Daniels (fdaniels19@gmail.com) to register or for more information.

Potential Workshops:

1. **Advancing Scientific Literacy with Chemistry Lesson Plans that Are Aligned with CCSS and NGSS (designed to be a longer workshop 90 – 120 min)**
   A team of teachers will discuss how to incorporate reading, writing, and learning strategies into the chemistry curriculum and how to develop inquiry lesson plans that are aligned with NGSS and CCSS and are based on successful past *ChemMatters* articles. Participants will build their own lesson plans designed to teach high-level literacy skills and to promote critical and analytical thinking. We will provide a selection of *ChemMatters* articles and templates for building the lessons plans.

2. **Using Modeling Activities in the High School Chemistry Classroom (60 minutes)**
   One of the most challenging aspects of chemistry for students is visualization. In this presentation we will provide several examples of modeling activities that teacher can use to help their students further their understanding of chemistry concepts. Presenters will describe several different activities and participants will complete the activities. Modeling activities including drawing/picturing, analogies, and differing representations will be shared. Topics covered will include molecular structure, reactions, kinetic molecular theory, concentration, and solutions. For example, one way for students to understand kinetic molecular theory and the behavior of gases is to represent a gas with a box of super bounce balls. Using this analogy, students can picture temperature, pressure, volume, and number of particles for gases. The activity also requires students to develop their own analogies and we will provide insight on how to assist students with this difficult task. Finally, it is crucial that students understand that models are not perfect and are just representations of physical phenomena. We will provide ideas for teachers to use to help students critique and analyze models.

3. **Science & Engineering Practices (60 minutes)**
   The Next Generation Science Standards (NGSS) focus on providing students with science process skills along with conceptual knowledge and engineering skills in grades K-12. The three dimensions focused on in the standards are (1) science and engineering practices, (2) crosscutting concepts, and (3) disciplinary core ideas. In this presentation, we will focus on the engineering and scientific practices and discuss how to use the pieces within the high school chemistry curriculum. We will provide examples of how to integrate of the engineering and science practices in the classroom and provide ideas for increasing students' skill sets in these areas. We will show how students can hone their skills through investigations, modeling techniques, experimental design, question asking, and data analysis. This topic will be presented in workshop style. Advice will be given to teachers on the best ways for implementation of the practices into their current curriculum.