

Faculty Development Council Major Grant Proposal:

**Chemistry Education as an Agent for Global Progress**

Jason M. Keith  
Assistant Professor in Chemistry

**Project Description:** In light of recent social unrest on campus I have begun examining ways in which my chemistry courses can be used as an agent for bridging the divide between some of our different diverse social groups on campus. My preliminary attempts have included Colgate workshops such as the Winter Institute workshop on negotiating diversity in the classroom. While I have found these programs generally enlightening, I feel that translating what I have learned to my lecture based chemistry courses has been difficult and I've recently begun examining opportunities outside of Colgate that are specifically targeted towards chemistry or the physical sciences in general. Through this process I discovered and received preliminary acceptance to a Gordon Research Conference on Chemistry Education Research and Practice with the specific theme of "Chemistry Education as an Agent in Global Progress" at Bates College June 21-26, 2015. Specifically this conference will be focused on how chemical literacy affects different social groups differently through regional issues such as access to clean drinking water, food and drug safety, the ramifications of fossil fuel usage, and prevention and cleanup of chemical spills, all of which affect different socioeconomic groups in very different ways. My goal in participating in this conference would be to learn about incorporating these issues into the classroom in my current courses as well as the scientific perspectives core and to help begin a dialogue about how chemistry and chemical literacy affect diverse groups in different ways.

**Specific Participation:** In addition to attendance at all of the session I have been approved to present a poster at one of the poster sessions. My poster title is

“State of the Art Computational Chemistry Techniques and the Undergraduate Researcher” with the following abstract:

This work intends to discuss the benefits, limitations and idiosyncrasies involved in academic research combining state of the art modern density functional theory with undergraduate researchers. The basis of this work will examine the results, both good and bad, in this area coming from my laboratory at Colgate University. A primary goal of this evaluation is to understand the point at which classroom learning and research experience begin working in tandem and what advantages or disadvantages there are to having prior learning/experience in one or the other first.

**Gordon Research Conference Format:** (From the conference website) “The conference format includes invited plenary sessions, semi-structured poster sessions, and free time to interact and network with conferees. Several features of the conference create an atmosphere that is intended to invigorate professional connections and promote advancement of the field: daily forums with intense intellectual engagement, off-the-record discussion of unpublished work, free afternoons in an idyllic setting, common meals and dormitory accommodations, and a limit on participation (<160). All participants are expected to remain at the conference for its entirety.” <https://www.grc.org/programs.aspx?id=13620>

**Conference Schedule:** This conference has nine plenary sessions with a total of 21 presentations as well as 8 poster sessions. The full conference schedule can be found online at <https://www.grc.org/programs.aspx?id=13620>. The plenary session themes are:

- Physical and Conceptual Threats to Our Students' Chemistry Learning
- Chemical Literacy and Consequences
- Interest, Motivation and Disciplinary Identity in Chemistry
- Appetite and Agency in Chemistry
- Reasoning Using Chemistry Knowledge and Common Sense
- Navigating Education in Chemistry
- Learning to Practice Chemistry in Meaningful Contexts
- Equipping Chemistry Education to Facilitate Global Progress
- What a More Chemically Literate World Would Mean

**Funding History:**

Colgate Startup Grant: For purchase of equipment and supplies necessary for research.

- \$104,650.00 6/1/2013

Research Council Student Wage Grant: Supports student research assistants

- 150 hours Fall 2013
- 150 hours Spring 2014
- 150 hours Fall 2014
- 150 hours Spring 2015

Division of Natural Sciences Summer Student Stipends: Supports summer students for 8-10 weeks

- 4 students Summer 2014
- 4 students Summer 2015

Division of Natural Sciences Travel Allowance: ~\$1,750.00 in support for scholarship related travel and conference attendance

- 6/2014 Gordon Research Conference on Inorganic Chemistry ('13-'14)
- 3/2015 Gordon Research Conference on Inorganic Reaction Mechanisms ('14-15)

Future Funding: In addition to what is listed above I have submitted an American Chemical Society Petroleum Research Fund Undergraduate New Investigator Grant for \$55,000.00 that is currently under review and I am in the process of applying to the Research Council (my expenses) and the Center for Learning, Teaching and Research (student expenses) to attend the MERCURY Conference for Undergraduate Computational Chemistry along with two students in July 2015.

**Budget:**

Conference Registration, Housing and Meals	\$885.00
Travel (403 miles <sup>1</sup> * 2 * \$0.575 )	463.45
Additional Meals and Incidentals <sup>2</sup>	<u>92.00</u>
	\$1,440.45

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<sup>1</sup> One-way mileage from Colgate University to Bates College as determined by Google Maps.

<sup>2</sup> Day #1 begins at 4:30 pm and only dinner is provided. Day #6 breakfast is provided before departure. Breakfast, lunch and dinner are provided for Days #2-5.