2014 Barbara Stull Graduate Student Award
Committee Report

June 18, 2014

Award Committee
Mike Carrabba – Chair
David McCurdy - Chair Elect
Bernhard Lendl

The Awards Committee conferred by email to discuss and agree upon recipients of Barbara Stull Graduate Student Award. The committee evaluated the candidates for the award from a pool of outstanding applications that were sent in SAS National Office through the application process. The committee decided to bestow two awards this year. The committees select Erin Boyle and Elise Dennis as the 2014 recipients.

Awardees Narratives

Elise Dennis, a graduate student at the University of Indiana, who works in the research community of Professor Gary Hieftje, has been recommended for the selection of the Barbara Stull award from the Society for Applied Spectroscopy. Elise has focused her efforts on the design, development, and evaluation new mass spectrometer based on constant-momentum acceleration (CMA) for velocity-based mass separations. She has been integrally involved in the design and construction of this mass spectrometer, and to date has 3 first-author publications (including an invited paper) and as a co-author on 4 other papers. She is co-author on two patents (one awarded and one submitted) and has given 5 presentations on the results of her work. Additionally, while a graduate student, Elise has served as a head associate instructor for a graduate level instrumentation course (1 year) and an associate instructor for introductory chemistry classes (2 years) while a graduate student. Elise is a member of the Society for Applied Spectroscopy, the American Society for Mass Spectrometry (ASMS) and the American Chemical Society. It is truly impressive to have such a significant series of papers while also maintaining involvement as a graduate teaching assistantship.

Erin S. Boyle received her B.S. in Chemistry with a minor in mathematics from the University of Maryland in 2008. While at Maryland she initially focused on Environmental Science first researching in-situ remediation of toxic Cr(VI) in soil and later she turned to spectroscopy, using time correlated single photon counting for the investigation of the optical properties of organic matter in water. As a graduate student at UW-Madison she has built a fluorescence based instrument for measuring trace levels of formaldehyde which has been successfully tested in field campaigns. In 2010, she then joined the laboratory of Prof. Wright (UW-Madison) where she could engage in research activities in the area of multi-resonant coherent multidimensional spectroscopy techniques. The motivation of her research is to contribute to an understanding of the functioning of photosynthetic water splitting, in particular on the yet unknown mechanism by which the oxygen evolving complex in plants make oxygen. This research

topic is funded by the NSF and has possible impact on the generation of renewable energy. During careful evaluation of her experimental data from experiments using doubly vibrationally enhanced four wave mixing, she discovered a completely unexpected and yet unknown process which she named Triple Sum Frequency (TSF). In subsequent experiments, Erin discovered that this process can be enhanced by adding an electronic state to form a triple quantum coherence involving two vibrational states and one electronic state, termed Triply Resonant Sum Frequency (TRSF). In her most recent publication she demonstrated that TRSF is actually Resonant Infrared Spectroscopy which is analogous to Resonant Raman Spectroscopy. Because of its groundbreaking nature, this paper was selected as Editors' choice and has recently been referenced in C&E News. Based on her discovery Erin is a well deserving recipient of the Barbara Stull Graduate Student Award.