

ACS PRF# 54160-SE

ACS Summer School on Green Chemistry and Sustainable Energy

Dr. Mary Kirchhoff, American Chemical Society

The ACS Summer School on Green Chemistry and Sustainable Energy was held at the Colorado School of Mines in Golden, Colorado, July 10-17, 2018. Participation in the Summer School is open to graduate students and postdoctoral scholars from the U.S., Canada, and Latin America. Sixty-one graduate students and postdoctoral scholars, selected from 100 applicants, participated in the 2018 program. Applicants submitted a *curriculum vitae*, unofficial transcript of graduate courses, letter of nomination from a faculty member, and a one-page essay describing their interest in green chemistry and sustainable energy.

Students participated in a series of interactive lectures presented by experts on green chemistry and sustainable energy. Staff from the American Chemical Society's Petroleum Research Fund and Education Division provided information on proposal writing and careers, respectively. The instructors and titles of their presentations are provided below:

Eric Beckman, University of Pittsburgh

- Building Your Own Business: From Green Science to Green Innovation

Joan Brennecke, University of Notre Dame

- Greening Fossil Fuels
- Energy Applications of Ionic Liquids

David Constable, ACS Green Chemistry Institute®

- Sustainable and Green Chemistry by Design
- Greening Your Research – Practical Tools You Can Use Now

Jim Hutchison

- Systems Thinking in Chemistry

Nancy Jensen, American Chemical Society

- Writing Competitive Research Grant Proposals

Philip Jessop, Queen's University

- Choosing the Greenest Synthesis
- Greener Solvents

Mary Kirchhoff, American Chemical Society

- Green Chemistry: Principles and Practice

Bryan Pivovar, National Renewable Energy Laboratory

- Fuel Cells

Ryan Richards, Colorado School of Mines

- Zen and How to Get a Job, Keep a Job, and Maybe Even Prosper in the Chemical Sciences

Josh Schaidle, National Renewable Energy Laboratory

- Biomass Utilization: Opportunities and Challenges

Joerg Schlatterer, American Chemical Society

- ACS Resources for Graduate Students and Postdoctoral Scholars

Student groups engaged in a modified Life Cycle Assessment (LCA) exercise led by Philip Jessop of Queen's University. The groups assessed alternate routes to the same target molecule with respect to metrics such as bioaccumulation, ozone depletion potential, global warming

potential, and persistence. Students gave oral presentations on the results of their exercise to the entire Summer School.

Poster sessions provided an additional opportunity for students to share their research and gain insights into greener approaches to research. Forty-six students presented their research during two evening poster sessions.

The Summer School has been running continuously since 2003, and participants continue to rate the program very highly. In response to the statement, “The best thing about this program was...” students offered the following observations:

*Exposure to cutting edge technologies as well as practical skill building.*

*Meeting lots of new people and seeing how you connect – location, research, mutual friends, etc. There is a lot of potential for collaborations.*

*Being in touch with great people and learning from green chemistry/sustainable energy.*

*Making us understand the importance of “green” in our research to have and (also leave) a better and safe world (for next generations).*

*Networking with such a diverse group of cultures and experiences.*

*The diversity of the program. The passion to really want to build a generation that will be part of a change.*

Students provided suggestions for improving the program, such as including more industrial and international speakers and highlighting more applications of green chemistry. Participants also suggested additional topics (biotechnology, catalysis, flow chemistry, polymers, surface science, etc.) for future Summer Schools.