The Orange County Section of the American Chemical Society

March 2020 Dinner Meeting

Thursday, March 19, 2020

The Doubletree Club Hotel
7 Hutton Centre Drive, Santa Ana
Phone: 714-751-2400

Social:	5:30PM
Dinner:	6:00PM
Presentation:	7:20PM

Atmospheric Aerosol Chemistry of Complex Terpene Mixtures Emitted from Real Plants

Celia Faiola, Ph.D.
Asst Professor, Ecology & Evolutionary Biology, and Dept of Chemistry
University of California, Irvine

Reservations

Please email OCACS@sbcglobal.net *ASAP* but no later than **12 noon** on **Tuesday, March 17, 2020**. Indicate if you will be attending the dinner and program or the program only, and list the names of all attendees. Dinner cost is $30 for members and members' significant others; $35 for non-members or those without reservations. Pay in cash or by check at the door, or mail a check in advance to OCACS, P.O. Box 211, Placentia CA 90871. **The first five students who register for a meeting will receive a $10 discount on their dinner.**

There is no charge for attending the program only. However, voluntary donations will be accepted to help defray meeting costs.

Note: OCACS pays the hotel on the basis of the number of dinner reservations made. Your RSVP for dinner is a commitment to pay for dinner. Space may be limited.

Directions

Take the Costa Mesa Freeway (55), exit at MacArthur Blvd. and go west (towards South Coast Plaza). Turn left on to MacArthur Place. The DoubleTree *Club* Hotel is straight ahead on the left. (Do not turn right at MacArthur Place to the DoubleTree Hotel, which is easily mistaken for the DoubleTree Club Hotel.) Park in front of the hotel, or follow the signs. If the parking lot is full, ask the valet staff where to park.

Atmospheric Aerosol Chemistry of Complex Terpene Mixtures Emitted from Real Plants

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Abstract

Plant emissions, including terpenes, are the largest source of volatile organic compounds to the atmosphere globally. Terpenes are highly reactive with atmospheric oxidants, contribute to aerosol production, and thereby influence Earth's radiation budget and cloud formation processes. Emissions from a single plant are complex mixtures of thirty or more different compounds and this number can be even higher if the plant is experiencing stress, but our understanding of terpene atmospheric chemistry is based on laboratory experiments using a handful of "model" compounds that have been studied in isolation. This work will summarize research investigating aerosol formation chemistry from real plant emissions (including conifers and shrubs) which provide a more realistic representation of the chemical complexity in the atmosphere. These results have highlighted the important role of a variety of plant compounds that have not been the subject of previous studies. For example, our studies demonstrate the important role of sesquiterpene chemistry in aerosol formation even when sesquiterpenes contribute just 10% of total plant emissions by mass. They are also the first to demonstrate that acyclic terpene structures undergo increased fragmentation upon oxidation, highlighting a major gap in current atmospheric chemistry models which treat acyclic and cyclic terpenes as a single lumped compound class. More locally, we have observed substantial contribution to aerosol formation from oxygenated monoterpenes commonly released by plants of the coastal sage scrub in Southern California. This research improves our understanding of atmospheric chemistry processes that drive aerosol production with implications for air quality and climate.

Biography

Dr. Faiola is an assistant professor at University of California Irvine with an appointment in both the Department of Chemistry and the Department of Ecology and Evolutionary Biology. She has a PhD in Engineering Science from Washington State University and conducted her postdoctoral research in the Aerosol Physics research group at the University of Eastern Finland. Her research is highly interdisciplinary and focuses on better understanding how complex biological systems influence important atmospheric chemistry processes that are relevant for air quality and climate predictions.