Dusty Skies and Dirty Cities: Light-Induced Chemistry at the Surface of Atmospheric Dust

PROJECT DESCRIPTION

"Over one billion tons of dust are released into the atmosphere each year. After its release, dust is transported long distances, and can influence air quality in distant cities. In many cities, resuspended road dust—a complex mixture containing crustal materials, brake wear and tire tread particles, and organic pollutants—also contributes to particulate levels in the atmosphere. Although dust contains light-absorbing minerals, our understanding of the role that dust plays in catalyzing chemical reactions in the atmosphere—and influencing urban air quality and health—is currently incomplete. In this project, the research intern will work with senior lab members to improve our quantitative understanding of photochemistry (chemistry catalyzed by the sun) at the surface of atmospheric dust.

Our work is at the interface between environmental, atmospheric, analytical, and even a bit of organic chemistry, so the research intern will gain experience with a broad range of topics. Specifically, the research intern will have the opportunity to work with a wide variety of laboratory instrumentation, including a solar simulator, high-performance liquid chromatography (HPLC), and high-sensitivity gas analyzers. The research intern will also gain experience with our custom-built systems, including several flow tubes for the study of gas–particle interactions. Through presentations at weekly group meetings, the research intern will also gain scientific communication skills and learn about other group members' work.

Finally, our research group is strongly committed to undergraduate research, and specifically to involvement of undergraduates in research publications—for example, we are currently writing a paper on road dust chemistry that includes contributions from five undergraduate researchers!"

FACULTY-DEPARTMENT

Science- Chemistry

DESIRED FIELD OF (STUDENT) STUDY

I would prefer students to have a typical chemistry background (including analytical and/or organic chemistry), and to have either course experience or a strong interest in environmental/atmospheric chemistry. I would also be happy to accept students in either chemical or environmental engineering or in atmospheric/earth sciences, as long as they have taken some chemistry at the university level.

Contact: Brendan Cavanagh, Internship Coordinator (Inbound)
University of Alberta International
intern@ualberta.ca

INTERNSHIP LOCATION

University of Alberta Main Campus - Edmonton

NUMBER OF INTERNSHIP POSITIONS

1

INTERNSHIP START DATE

July 4

INTERNSHIP END DATE

3 months after start date

ARE THE DATES FLEXIBLE?

Yes, I am flexible regarding the internship dates. Selected students can contact me to request a date change.

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