

The Ice Core and Atmospheric Chemistry Lab at the University of Rochester (<http://www.sas.rochester.edu/ees/petrenko/index.html>) has openings for up to 2 hard-working and enthusiastic PhD students.

1) One of the available projects focuses on improved quantification of natural geologic emissions of methane. Methane is an important greenhouse gas, and its emissions are imperfectly understood, with natural geologic emissions (natural gas seeps, mud volcanoes and microseepage) being highly uncertain. Further, large uncertainties in natural geologic emissions make it more difficult to accurately estimate our methane emissions from fossil fuel extraction and use. This project would involve fieldwork in several hydrocarbon basins in the western US and extensive analysis of new and prior data to provide more accurate estimates of geologic methane emissions. This project is collaborative between the research groups of Profs. Vas Petrenko and Thomas Weber. The following experience and qualifications are desirable: strong mathematical preparation, coding experience, all-weather outdoor experience (e.g., hiking, backpacking), GIS, field geology, work with analytical instrumentation, strong communication skills. For further information, please contact Vas Petrenko at vasilii.petrenko@rochester.edu. For information on applying to the graduate program at the Department of Earth and Environmental Sciences at the University of Rochester please see <http://www.sas.rochester.edu/ees/graduate/apply.html>.

2) We are also seeking applicants for a project that would involve a collaboration between the Earth and Environmental Sciences and Physics and Astronomy departments at the University of Rochester. This project will seek to improve our understanding of past variability in the galactic cosmic ray flux. Cosmic rays originating from outside of our solar system constantly bombard the Earth, producing nuclides such as Carbon-14 and Beryllium-10 in the atmosphere and in surface materials. Measurements of these nuclides in ice cores and near-surface rocks have been used to study important climate processes and parameters such as solar variability and ice sheet dynamics. In order to fully interpret cosmogenic nuclide measurements, the history of the galactic cosmic ray flux must be known. This project will seek to improve our understanding of this history via measurements of Carbon-14 in Antarctic ice cores. The following experience and qualifications are desirable: strong preparation in physics and mathematics, coding experience, cold-weather outdoor experience (e.g., hiking, skiing), strong communication skills. Interested students may apply to either the Department of Earth and Environmental Sciences (contact Vas Petrenko at vasilii.petrenko@rochester.edu with questions) or the department of Physics and Astronomy (contact Segev BenZvi at sbenzvi@ur.rochester.edu) depending on their preference.