

## **Predicting Ambient Aerosol Cloud-Forming Potential: CCN Closure Analyses at Urban and Forested Sites**

REU Mentor: Tim VanReken

### **Objective**

Those particles in the atmosphere that have the potential to become cloud droplets are called cloud condensation nuclei, or CCN. Whether a particle acts as a CCN is a complex function of the atmospheric saturation level and the particle's size and composition. How well we understand this relationship is tested by a so-called CCN closure analysis, whereby we compare measured CCN concentrations to predictions based on separate measurements of particle size distribution and composition.

In summer 2008 and winter 2008-09, CCN data were collected in the Colorado Rockies and near Boise, Idaho. Particle size distribution (from a SMPS) and composition (from a PILS) are also available from these studies, including measurements of water-soluble organic carbon content. The goal of this study is to use these data to conduct CCN closure analyses for the two field studies.

### **Preliminary Training**

This project will focus on the analysis of existing datasets collected at field locations in the last 12 months. The Igor Pro software package will be used for most of this analysis. Igor is a powerful program, but has a somewhat steep learning curve. Significant time at the start of the project will be devoted to learning Igor Pro.

As this is primarily an analysis project, significant new data collection will not be necessary. However, it is important to always understand the underlying data collection techniques and their inherent limitations. To that end, the project will include training on the CCN counter, the SMPS, and the PILS.