Storm Peak Laboratory

A Research and Educational Facility for the Atmospheric Sciences. Est. 1981 – Elev. 10,525

Mission
The mission of Storm Peak Laboratory is to integrate research and education by advancing discovery and understanding within the field of aerosol and cloud interactions.

A permanent mountain-top facility, Storm Peak Laboratory (SPL), was constructed during the summer of 1995 in the Rocky Mountains of northwestern Colorado (3220 m M.S.L.; 40.455 deg N, -106.744 deg W). Although SPL has been in existence in various forms for more than 30 years, the new facility is the latest stage of an evolutionary process of providing a practical, easily accessible facility for researchers, teachers and students of all ages and abilities. A clear upwind fetch places the lab in an ideal location from which to conduct studies of the free troposphere.

SPL is operated by the Desert Research Institute (DRI) Division of Atmospheric Sciences (DAS). DRI is a branch of the Nevada System of Higher Education and is committed to continuing research and education programs in the atmospheric sciences.

Purpose
High elevation, mountain-top atmospheric research facilities which are readily accessible under all weather conditions are limited in number worldwide. Sites which offer the ability to make time-extended observations of free tropospheric and in-cloud conditions which are not obtainable by airborne sampling platforms, provide valuable information with regard to cloud physics, cloud-aerosol chemistry, snow microphysics, and related topics.

A permanent research laboratory of this type allows study on a recurrent long-term basis, enabling a greater understanding and characterization of the meteorological processes than is available from temporally limited field projects at unfamiliar locations.

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THE DESERT RESEARCH INSTITUTE IS PART OF THE NEVADA SYSTEM OF HIGHER EDUCATION.
Education and Outreach

Storm Peak Laboratory has a long history of providing educational experiences. Each year the lab hosts atmospheric science and snow hydrology field courses from a multitude of universities for both undergraduate and graduate students. Colorado State University, University of Colorado, Ohio State University, University of Utah, University of Nevada, University of North Carolina, and University of Wisconsin commonly use the facility. Field classes at the lab are designed to give students experience in all facets of atmospheric science, from development of the research proposal and experiment to project planning and final reporting. The students participate in experiments and their class projects incorporate data from the state-of-the-art science instrumentation at Storm Peak Laboratory.

Approximately 250 students participate annually in the Storm Peak Laboratory’s 5th and 6th grade weather and climate education program. This program provides a hands-on, place-based educational experience where students have an opportunity to use scientific equipment (e.g., thermometers, anemometers, condensation particles counters, and barometers). During the field program, students measure and record temperature, pressure, relative humidity, wind speed, and particle concentration while they travel to Storm Peak Laboratory. Once at the laboratory, students tour the facility, discuss research activities, and explore application of these activities to their curriculum.

Storm Peak Laboratory engenders public outreach through media coverage of the research conducted at the facility. Reports have appeared on CNN, NBC, National Public Radio, National Geographic Explorer, the History Channel, the Weather Channel, and local television stations and in newspapers across the U.S.

Instruments and Sensors

Storm Peak Laboratory has many atmospheric science instruments, and a number of data products are now available on-line. The lab also hosts instrumentation for other organizations such as NOAA Global Monitoring Division, the U.S. Dept. of Agriculture, the World Meteorological Organization and the National Center for Atmospheric Research.

- Droplet Measurement Technologies (DMT) Cloud Condensation Nuclei (CCN)
- Multi-Filter Shadow-band Radiometer (UV & Visible)

DMT CLOUD DROPLET SIZE DISTRIBUTIONS PROBES
- SPP-100 forward scattering spectrometer 2–47 μm
- Cloud Imaging Probe 25–1550 μm
- Precipitation Imaging Probe 100-6200 μm

TRACE GASES
- CO, measurement
- O₃, SO₂, CO, NOₓ measurements
- Water Vapor Isotope – Picarro
- Gas Phase Elemental Mercury

AEROSOL SIZE DISTRIBUTIONS
- TSI Nano-Scanning Mobility Particle Sizer, Scanning Mobility Particle Sizer & Aerodynamic Particle Sizer

METEOROLOGICAL MEASUREMENTS
- FAA Automated Weather Observing System (AWOS)
- NOAA GPS Water Vapor Column Sensor
- Temperature, pressure, relative humidity, wind speed and direction
- Two Sonic Snow Depth Stations across mountain
- Seven Meteorological Stations across mountain

AEROSOL CONCENTRATION
- TSI Condensation Particle Counter, Models 3010, 3022, and 3076

AEROSOL OPTICAL PROPERTIES
- TSI Nephelometer – 3λ
- Particle Soot Absorption Photometer - 3λ
- Continuous Light Absorption Photometer – 3λ