ON THE AIR!

NOAA CIRES

AERONOMY LABORATORY

A Quarterly Newsletter of the NOAA Aeronomy Laboratory

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ANNOUNCEMENTS

Ravi received the 1998 Polanyi Medal from the Faraday Division of the Royal Society of Chemistry, UK, for his achievements in laboratory studies of atmospheric chemical kinetics. The prestigious award, which is bestowed only every two years, was presented to Ravi in September in Spain. In conjunction with receiving the Medal, Ravi gave the Polanyi Lecture. An audience of 250 heard him speak on "Chemical Kinetics and Atmospheric Chemistry — A Tango with Two Leaders."

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Adrian Tuck has received the 1997 Editors' Citation for Excellence in Refereeing for the *Journal of Geophysical Research-Atmospheres.* The citation recognizes Adrian for especially insightful reviews of submitted papers. He was presented with the award at the 1998 AGU Spring Meeting in Boston.

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A poster by **David Thomson** and **Richard Winkler** was chosen as one of the top three posters submitted in the research and development category at the "NIWeek98" National Instruments Worldwide Conference on Measurement and Automation, held August 24-28 in Austin. As a result of the selection, Dave gave an oral presentation on the poster, which described innovations by Dave and Wink in the use of commercial software for data acquisition and instrument control in the Particle Analysis by Laser Mass Spectrometry (PALMS) instrument.

ANTARCTIC HONOR ROLL: THE NOXON CLIFF, THE SANDERS NUNATAK, and THE SOLOMON GLACIER & SOLOMON SADDLE

Three Aeronomy Laboratory scientists have been honored in a most unusual way: geographical features in Antarctica now bear their names. The Noxon Cliff, the Sanders Nunatak, the Solomon Glacier, and the Solomon Saddle now lie beneath the ozone layer that sparked the curiosity and scientific attention of the three researchers.

Susan Solomon was the first to be honored when, in 1994, the Board on Geographic Names designated that both a glacier and an adjacent snow saddle would bear her name. The Solomon Glacier (78°23´S, 162°30´E) and Solomon Saddle (78°23´S, 162°39´E) lie southeast of McMurdo Station, site of much research that has advanced our understanding of the Antarctic stratospheric ozone layer and the springtime ozone hole. Susan's work as leader of the 1986 and 1987 National Ozone Expeditions, along with her theoretical studies that elucidated the cause of the ozone hole, underlie her selection for the honor.

Ryan Sanders' feature, the Sanders Nunatak, lies at 77°34´S, 163°02´E. The nunatak, which is an "isolated mountain peak protruding through glacial ice," is (unlike Susan's namesakes) easily reached from nearby McMurdo. Ryan received the honor just this year. It marks his key role in both National Ozone Expeditions and his subsequent contributions to understanding the behavior of chlorine dioxide and ozone in Antarctica.

The Noxon Cliff gives form to a perfect poetry of atmospheric science, geography, and life. The cliff honors John Noxon for his role in pioneering the technique of visible spectroscopy for measurements of stratospheric trace gases, particularly nitrogen dioxide. His observations of a pronounced dropoff in NO_2 at polar latitudes became known as the "Noxon cliff." It was not recognized until later that the observation was an early hint about the unusual polar heterogeneous chemistry that leads to the development of the ozone hole. Though John died in 1985, just before the discovery of the ozone hole, the Noxon Cliff at 77°32´S, 163°05´E will bear witness to the healing of the ozone hole that is now predicted to begin in the 21st Century.

The Aeronomy Lab Review

It was "all hands on deck" for the Aeronomy Lab's External Review, which took place on September 1-3. The purpose of the Review was to examine the goals, accomplishments, and plans of the Lab's research. Nearly everyone contributed to an array of tasks involved in preparing for the Review, giving presentations or laboratory tours, and handling the arrangements for the 3-day event.

The review team was led by Dr. Jim Rasmussen, Director of the NOAA Environmental Research Laboratories (ERL), and included 4 external reviewers:

Dr. Roland Madden, National Center for Atmospheric Research (Colorado)
Prof. Patrick McCormick, Hampton University (Virginia)
Prof. Stuart Penkett, University of East Anglia (United Kingdom)
Prof. Paul Wine, Georgia Institute of Technology (Georgia)

Several members of NOAA management from Silver Spring and Washington attended, as well as Directors and scientists from the other ERL labs here in Boulder.

The Review agenda included a mixture of presentations, discussions/questions, and visits to laboratories, the nearby Mesa research site, and the Aeronomy Lab's section of the new building. Three major topic areas of the Aeronomy Lab's research were described in sessions chaired by Ravi (Stratospheric Ozone), Fred Fehsenfeld (Regional Tropospheric Chemistry) and Susan Solomon (The Chemistry, Radiation, and Dynamics of Climate). Twenty researchers spoke in the sessions, and many more hosted lab tours and poster presentations.

The initial, general comments we received in the closing session of the Review were quite positive, both from the reviewers and NOAA management.

HOME and AWAY

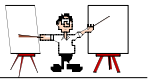
WAM Achieves a Rare Look at the Tropopause

Following on the heels of successful test flights in March, the first science flights of the WB57F Aerosol Mission (WAM) met all expectations of researchers in the Meteorological Chemistry group. Completed in April and May were six science flights that provided a rare, extended look at the chemistry near and above the tropopause, a region of the atmosphere that the NASA/U.S. Air Force WB57F is uniquely suited to address. It was the first airborne science mission for both the Particle Analysis by Laser Mass Spectrometry (PALMS) instrument (Dan Murphy, Dave Thomson, Mike Schein) and the Lab's new methane instrument (Erik Richard and Ken Kelly). Met Chem group members provided instruments that measured ozone (Mike Proffitt) and water vapor (Ken Kelly); they also assisted with meteorological/cloud forecasting for the mission (Susan Hovde, Jeff Hicke, Karen Rosenlof). Initial data analyses have revealed an intriguing array of substances in the particles sampled by PALMS, such as signs of meteoritic material in some stratospheric aerosols. ♣

WHAT'S UP WITH PEOPLE

Murari Lal, of the Indian Institute of Technology, collaborated with members of the Middle Atmosphere group on stratospheric ozone assessment work during a visit this summer. **Victor Dvortsov** has joined that group to do postdoctoral research on topics ranging from transport by convection to radiation. He was previously with the State University of New York at Stony Brook. **Darren Miller**, an undergraduate math major at the University of Colorado (CU), has also joined the group and will be helping out with measurements in clouds… **Sandra Laursen** and **David McCabe** have joined the Atmospheric Chemical Kinetics group. Sandra is a National Research Council postdoc, and David is a graduate student at CU. **Abdel W. Mellouki** of the Centre National de la Recherche Scientifique, France, began a 1-month visit with the group on September 18… Several transitions are occurring in the Tropical Dynamics and Climate group. **Mark Haeg** received his Masters degree in business administration from CU in May and left AL/CIRES at the end of July to take up a position with a small software company in the Boulder area. **Matt Wheeler** completed his requirements for the Ph.D. at CU's Program in Atmospheric and Oceanic Sciences and will begin a postdoc at NCAR in September. **Demetry Gemolas** graduated from CU in May and has taken a job with Lockheed Martin in Colorado Springs. **Adrian Matthews** completed his 2-year postdoctoral appointment and will be taking a faculty position at Monash University in Australia. **Yuichi Ohno** has returned to the Communications Research Laboratory in Japan after completing a year of research in the group. New to the group is **Brad Bessenbacher**, who comes to AL from Purdue University. He will be working on processing and archiving data from the Trans-Pacific Profiler Network… **Erik Richard** left the Meteorological Chemistry group to take a new position at Georgia Institute of Technology… **Megan Melamed**, an undergraduate chemistry major in her junior year this fall at Colby College in Maine, worked at AL this summer under the Practical Hands-On Application to Science Education (PHASE) program. She updated the Aeronomy Laboratory's chemicals inventory and also helped with our publications database… We wish everyone the best in their new endeavors, whether here or elsewhere!

COMMUNICATING OUR SCIENCE



To Decisionmakers: On August 6, Dan Albritton briefed Deputy Commerce Secretary Robert Mallett on opportunities for DOC to help serve as an information source to industry on climate… Dan also was an invited participant at the Scoping Meeting of the IPCC Third Assessment Report (year 2000), held June 29-July 1 in Germany… In June, Dave Fahey and Dan Albritton attended the second-draft meeting of the IPCC assessment on Aviation and the Global Atmosphere. Dave is a chapter lead author on the report, which is scheduled for completion next year.

To the Scientific Community. Venues included:

• *Scientific Conferences and Symposia:* Jim Meagher traveled to Durban, South Africa, to give an invited talk at the 11th World Clean Air and Environment Congress, which took place on September 13-18… Mike Proffitt gave a talk on the Fritz Peak tropospheric ozone measurements at the First International Asia-Pacific Symposium on Remote Sensing of the Atmosphere, Environment, and Space. The meeting took place in Beijing on September 14-18… Ravi, Jim Burkholder, Mary Gilles, and Cheryl Longfellow presented papers at the 15th International Symposium on Gas Kinetics held in Bilbao, Spain, September 6-10… Ravi gave an invited talk at the 6th Federation of European Chemical Societies (FECS) Conference on Chemistry and the Environment in Copenhagen in August… Ravi and Scott Herndon gave talks at the Workshop on Reactive Intermediates in Sulfur Chemistry in Poznen, Poland, that same month… Members of the Tropospheric Chemistry and Middle Atmosphere groups presented talks and posters at the Joint International Symposium on Global Atmospheric Chemistry in Seattle, August 19-25… George Reid and Ken Gage gave talks at the 32nd Scientific Assembly of the Committee on Space Research (COSPAR), which met in July in Nagoya, Japan. George was co-convenor of a session on dynamics of the mesosphere and is one of three co-editors of the proceedings of the meeting, which will appear in the journal *Advances in Space Research.* Ken spoke on the application of Doppler radar wind profilers to ground validation of satellite precipitation measurements… Ken Gage presented an invited paper on highlights of Trans-Pacific Profiler Network research at the July 21-24 Western Pacific Geophysics meeting in Taipei… Christopher Williams gave an invited paper on tropical precipitating cloud systems at the Progress in Electromagnetics Research Symposium (PIERS 98) that was held July 13-17 in Nantes, France… Dan Murphy and Ann Middlebrook participated in the 1998 Conference of the American Association for Aerosol Research (AAAR) held on June 22-26 in Cincinnati. Ann gave a tutorial on heterogeneous chemistry at the meeting… Several members of the Middle Atmosphere group participated in the Gordon Research Conference on Solar Radiation and Climate, held June 15-19 at Plymouth State College in New Hampshire… Ravi and Jim Burkholder gave talks on stratospheric chemistry at the Photochemical Meeting that was held on May 11-15 in Pasadena… Several AL scientists presented talks and papers at the Spring Meeting of the American Geophysical Union, which took place in Boston May 25-29… On May 6, David Fahey was one of six leading U.S. scientists who were chosen to speak at the 1998 Leermakers Symposium at Wesleyan University in Middletown, Connecticut. An audience of ~120 people heard Dave's talk describing the use of in-situ aircraft measurements to address photochemistry and transport issues in the lower stratosphere.

• *Research Workshops:* The Aeronomy Laboratory organized an August 10-12 workshop in Boulder on the 1997 North Atlantic Regional Experiment (NARE) mission results. Collaborators from several institutions participated in the meeting… Several members of the Aeronomy Lab presented talks at the Telluride atmospheric chemistry workshop on "Uncertainties in Tropospheric Photochemistry" on August 3-7… Ann Middlebrook, Fred Fehsenfeld, and Jim Meagher participated in the Southern Oxidants Study-related Aerosol Measurement Program Workshop held in Raleigh on 21 July. Ann gave a presentation on the Aeronomy Lab's Particle Analysis by Laser Mass Spectrometry (PALMS) instrument and its relation to future research on particulate matter… Several AL researchers took part in a June workshop on the results of the Stratosphere-Troposphere Exchange Experiment: Radiation, Aerosols, and Ozone (STERAO) mission… Dave Parrish and Fred Fehsenfeld described the NARE 1997 results and made other contributions to a NASA Subsonic Assessment Ozone and Nitrogen Oxide Experiment (SONEX) meeting in Atlanta June 15-19… Several members of the Aeronomy Lab participated in the NASA Joint Science Team Meeting for Photochemistry of Ozone Loss in the Arctic Region in Summer (POLARIS)/Observations of the Middle Stratosphere (OMS)/Stratospheric Tracers of Atmospheric Transport (STRAT), held June 22-26 in Snowmass, Colorado… Dave Parrish gave a presentation at the Atmosphere/Ocean Chemistry Experiment (AEROCE 96) Intensive Workshop in May… Dave Hanson gave a talk on bromine chemistry in sulfuric acid solutions at the NASA Atmospheric Effects of Aviation Project (AEAP) meeting in Norfolk, Virginia, in April.

• *Seminars:* On September 17, Dan Albritton gave two seminars on the stratospheric ozone layer at Pennsylvania State University… Wayne Angevine gave a seminar on wind profiler measurements compared to mesoscale models at the Environmental Modeling Center of the National Center for Environmental Prediction, Camp Springs, MD, in May… Dave Fahey described the POLARIS mission at the Physics Departmental Seminar at the University of Wisconsin, Madison, on May 22… Dan Albritton gave a talk on scientific aspects of the Kyoto Climate Protocol at NCAR on April 13.

To the Public: On August 26, Dan Albritton gave a presentation and answered questions on global warming and the Kyoto Climate Protocol in Arvada,

Colorado, at a special Town Meeting on the topic hosted by Rep. David Skaggs... Leslie Hartten put together a display on "The Climate of the Eastern Plains" for the Limon Heritage Museum's summer season in Limon, Colorado. The display gave meteorological information that Leslie gathered and "customized" for the particular circumstances, comparing the regional climate to that in other areas of the country. Leslie also led the weather activities for the "Take Our Children to Work Day" activities at CIRES in April… On April 23, Dan Albritton gave a talk about the Kyoto Climate Protocol to the Annual Meeting of the CU Chapter of Sigma Xi.

To Media: In April, Leslie Hartten was featured in a story in *The Ridgefield Press* (Connecticut) on "Solving the El Niño Puzzle." The article describes her educational and research paths and details her work at AL/CIRES analyzing wind data from the Trans-Pacific Profiler Network and other field measurements… In August, Dave Parrish was interviewed by local NBC affiliates and national print media in connection with an Arizona State University study published in *Nature* on the possible connection between weekly cycles in meterology and pollution variables. Numerous print articles resulted.

To Students and Teachers: On July 2, Susan Solomon gave a presentation on ozone depletion to a group of pre-college science teachers. The lecture was arranged by the American Meteorological Society. Also in July, Susan participated in a panel discussion at NCAR on "Women in Science" involving local area high school students… In May, Stephen Reid gave a presentation at the Gilpin County Junior High School in conjunction with the school's Careers Day. He described what NOAA does and answered questions about a career in science… Karen Rosenlof gave a presentation on using aircraft and balloon measurements to study ozone in the stratosphere to a 3rd grade class at Bear Creek Elementary School on May 12… Ken Gage gave a talk on El Niño at the University Hill Elementary School on April 29… Paul Goldan gave a chemistry demonstration to a 4th grade class at Broomfield's Kohl Elementary School in April. He received many interesting "thank you" letters and notes from the kids after the visit… Greg Huey gave a presentation to four classes of 5th graders at Hygiene Elementary School on April 15. Greg's presentation on global warming and the oceans incorporated demonstrations that proved popular with the students. Maury Movsovich worked with teachers at Hygiene to arrange the visit.

To Our Visitors: On July 22, George Kiladis and Wayne Angevine gave presentations on the Aeronomy Lab's meteorological and wind-profiler research to Admiral Craig Dorman. Adm. Dorman is working with the National Weather Service to evaluate and infuse new technology that may be useful to NWS in the future… Eric Williams spoke on the topic of tropospheric ozone and biosphere-atmosphere interactions to 20 visitors from the U.S. Forest Service on April 15.

Through Service on Scientific Panels and Boards: George Reid has been appointed Editor-in-Chief of the U.S. National Report to the International Union of Geodesy and Geophysics (IUGG). The report, which will be completed by mid-1999, will summarize U.S. scientific highlights of all branches of geophysics over the last four years… Dan Albritton, Fred Fehsenfeld, Jim Meagher, and others are participating in planning meetings regarding the role of the North American Research Strategy for Tropospheric Ozone (NARSTO) in particulate matter research. A meeting on September 11 resulted in a set of NARSTO research recommendations on particulate matter key research questions and research needs… Gerd Hübler participated in the final Design Review Meeting for the NOAA G-IV Aeromet research aircraft. It is likely that the Aeronomy Lab will be placing instrument payloads aboard that aircraft in the future… Ken Gage attended the Science Team Meeting of the joint U.S.-Japan Tropical Rainfall Measurement Mission (TRMM) satellite project in May and served as a panelist for the TRMM program meeting in August… Susan Solomon and Dan Albritton were participants in the NOAA Climate and Global Change Advisory Panel Meeting held in early August in St. Michaels, MD… Ann Middlebrook is chairing the Working Group on Aerosol Chemistry for the American Association for Aerosol Research (AAAR) 1999 Conference.

DOWN THE ROAD

August-September: Texas-Florida Underflights second campaign (TEFLUN-B), Melbourne, Florida. The Tropical Dynamics and Climate group is participating in this and in a subsequent campaign that begins in the fall in the Rondonia province of Brazil.

September 20-25: Fourth International Tropospheric Profiling Symposium, Snowmass, Colorado. Ken Gage is one of the General chairs for the Symposium, Wayne Angevine is a chair on the Program Committee, and several Aeronomy Laboratory researchers will be prominent among the speakers.

October 22: New NOAA building dedication, Boulder.

October 26-29: IPCC Aviation Assessment 3rd draft peer-review meeting, Montreal. Dan Albritton and Dave Fahey will attend.

November 16-24: 10th Meeting of the Parties to the United Nations Montreal Protocol, Cairo. Dan Albritton will serve as science advisor at the meeting.

Upcoming AL Seminar Speakers: Dan Murphy (Sept. 30); Barney Ellison (Oct. 14); Peggy Lemone (Oct. 28); Susan Solomon (Jan. 20).

On the Air! is a quarterly publication of the NOAA Aeronomy Laboratory. Please send any comments, questions, and suggestions to: Chris Ennis (phone 303-497-7538; email cennis@al.noaa.gov).