



ON THE AIR!



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NOAA Aeronomy Laboratory



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ANNOUNCEMENTS

Our New Look: With this issue, we begin a slightly new “look” for our newsletter. And, we are catching up. We’ll be back on track with 2002 news in our next issue.

NOAA Research Scores Highly in Citation Survey: A new survey of the most highly cited geosciences research over the last decade was published late in 2001, and NOAA is prominent among the institutions that have been most frequently cited in the peer-reviewed literature. The survey was conducted by *Science Watch*, a publication of the Research Services Group of the Institute for Scientific Information (ISI) in Philadelphia. The group analyzed papers published

and cited in more than 300 ISI-indexed geosciences journals between 1991 and June 2001. The results are published in the November/December 2001 issue of *Science Watch*. NASA and NOAA topped the list of the most-cited institutions, with 61,984 and 46,058 citations, respectively. The survey also examined the citations of individual researchers. Three NOAA Research scientists were among the “top 25” most-cited authors: Susan Solomon and Fred Fehsenfeld (of the Aeronomy Lab) and Ants Leetmaa (of GFDL; formerly with NWS). The results give a tangible, quantified indication of the scope and depth of the NOAA Research scientists’ contributions to the geosciences, as well as their strong standing with the international scientific community.



AWARDS AND RECOGNITION



Dan Albritton was awarded the 2001 Distinguished Presidential Rank Award by President George W. Bush in a ceremony held in Washington, D.C., on October 15. The award recognizes Dan “for his sustained extraordinary accomplishments as an eminent scientist, for exceptional leadership of NOAA’s Aeronomy Laboratory, and for his unique role as “scientist-statesman” for NOAA and the nation.” The award cited Dan’s contributions in three scientific areas (climate, the ozone layer, and air quality) and noted his impeccable record for communicating scientific understanding on all three topics to decisionmakers in the U.S. and worldwide.

Steve Brown has been recognized with the 2001 Presidential Early Career Award for Scientists and Engineers. The citation reads “For innovative work in the development and application of the new cavity ring-down spectroscopy technique to atmospheric problems of societal importance.” The Award is the highest honor bestowed by the United States Government on outstanding scientists and engineers beginning their careers.

Michael Trainer received the NOAA Research Employee of the Year Award for 2001. Michael was honored for his work that uncovered the connection between distant northwest-Canadian forest fires and (previously unexplained) “spikes” in pollution in the southeastern U.S. The work has revealed that distant forest fires can, at times, be an important factor in the ability of municipalities to meet the U.S. air quality standards.

Adrian Tuck received the Medal of Honor from the University of Helsinki, in recognition of his contributions to the understanding of the chemistry and dynamics of the stratosphere and his work on organic aerosols. In receiving the award in Helsinki on September 19, Adrian gave a talk on the dynamical influences on midlatitude ozone trends.

Several Aeronomy Lab staff members were honored with a Group Achievement Award from NASA recognizing their contributions to the SAGE III Ozone Loss and Validation Experiment (SOLVE). They are: **Ken Aikin, Cathy Burgdorf, Steve Ciciora, Dave Fahey, Debe Fisher, Ru-Shan Gao, John Holocek, Rich McLaughlin, Suzie Milano-Schoser, Megan Northway, Peter Popp, Steve Reid, Erik Richard, Tom Thompson, Adrian Tuck, and Dick Winkler.**

Owen Cooper received an Outstanding Student Paper Award at the 2001 AGU Spring Meeting in Boston. The award was for his poster on “Trace Gas Composition of Mid-Latitude Cyclones over the Western North Atlantic Ocean: A Conceptual Model.”

Linda Koch was awarded a 1-year CIRES Graduate Research Fellowship this past fall. Her research is on the temperature dependence of the chemistry of dimethyl sulfide oxidation in the atmosphere, a process that relates to the formation of new particles in the atmosphere and ultimately to climate.

Aeronomy Lab Research Tackles Key Climate Questions

How do hurricanes perturb atmospheric composition? Aeronomy Lab scientists participated in the Fourth Convection and Moisture Experiment (CAMEX-4) with colleagues from AOML, NASA, other agencies, and academia. The September/October mission, based out of Jacksonville, Florida, involved “overflights” of hurricanes by the NASA ER-2 high altitude research aircraft to study the processes associated with hurricane development and evolution. The Aeronomy Lab’s involvement added a “chemistry” perspective to the CAMEX-4 mission by measuring ozone and water vapor as the aircraft flew through the upper troposphere and lower stratosphere. The measurements reveal how the hurricanes affect the exchange of air between the troposphere and stratosphere. During previous field missions to study the ozone layer, AL scientists have observed that hurricanes can lead to large perturbations in the atmosphere’s dynamics and chemical composition. For example, altitude profiles of gases such as ozone and nitrous oxide are very markedly changed when the air has been influenced by hurricanes. This has potentially important implications for the radiation budget as well as the calculation and interpretation of trends in stratospheric ozone over the midlatitudes. The analysis of the CAMEX-4 data will extend recent Aeronomy Lab work showing how dynamical processes associated with the subtropical jet stream produce intrusions of air from the upper tropical troposphere into the lower midlatitude stratosphere, affecting stratospheric ozone there.

What makes a “good” seed particle for clouds? The transition between liquid water and ice in clouds has important consequences for both precipitation and the radiative properties of the clouds. In November, scientists at the Aeronomy Lab and Colorado State University teamed up to study this transition by making the first real-time measurements of the chemical composition of individual ice nuclei. The scientists sampled air into a diffusion flow chamber, in which a controlled humidity profile near ice-coated walls allowed ice crystals to grow on only those ambient particles that are good “seed” particles. The ice crystals were then separated out, evaporated, and the particles were sent in real time to the Particle Analysis by Laser Mass Spectrometry (PALMS) instrument. Particles with good ice nucleating properties were compared to other particles either by sampling all particles or by changing the water vapor profile in the diffusion chamber. The experiment took place at the Storm Mountain Laboratory (operated by the Desert Research Institute) near Steamboat Springs, Colorado. Its 10,500-foot elevation provided the opportunity to sample both moderately polluted air and less-polluted tropospheric parcels. Typically, less than 1% of the ambient particles are good at nucleating ice. The experimental results suggest that at this mountain top location, the particles that readily nucleate ice had very different chemical compositions than the majority of particles that were present in the air, a finding that paves the way for improving the predictability of cloud formation processes.

How do clouds affect the radiation budget? In early November, Aeronomy Laboratory scientists completed a series of flights on the NOAA Gulfstream-IV aircraft during the G-IV’s fall hurricane-season missions. AL researchers “piggy-backed” their instrument for measuring radiative properties of clouds on the G-IV’s usual payload, thereby seizing an ideal opportunity to collect additional atmospheric data on the already-planned flights. As Hurricane Michelle developed in late October, the aircraft flew above clouds and the Aeronomy Lab instruments looked downward and measured radiation reflected off of the clouds in the 425-1050 nanometer wavelength range. Detailed analysis of the reflected light signals in that spectral range provides a diagnostic of how the cloud absorbed the original incoming solar radiation. The ultimate aim of the research is to gain a better understanding of the radiation that is reflected off of clouds, an important parameter in the earth’s radiation budget that has consequences for climate.



WHAT’S UP WITH PEOPLE

In the Atmospheric Chemical Kinetics group, **Stefan Rosen** of the University of Stockholm has begun a postdoctoral appointment to study heterogeneous chemistry. **Lev Drosnoperov** from the New Jersey Institute of Technology is visiting from November through January, to work on kinetics projects of joint interest. **Ted Shepherd**, University of Toronto, is visiting from September until May, conducting research on atmospheric dynamics and chemistry. **Joachim Curtius** left the group to take a faculty position at the University of Mainz in Germany. **Paul Marshall** concluded his sabbatical with the group and returned to North Texas State University. **Ed Dunlea** completed his Ph.D. at CU and is beginning a postdoctoral position with AL’s Tropospheric Chemistry group...

The Chemistry and Climate Processes group hosted a 1-week visit of **Klaus Pfeilsticker**, of Heidelberg University, in August. **Victor Dvortsov** left to take a research position in pri-

vate industry. **Darren Miller** left the group to pursue interests outside of science...

Kathy Perkins has joined the Tropospheric Chemistry group, where she is developing an instrument for the detection of aerosol particle composition. She is from Harvard University. **John Nowak**, from Georgia Tech, has joined the group as a National Research Council postdoc. He is working on development and field deployment of the ammonia chemical ionization mass spectrometer. **Carsten Warneke** has also joined the group as a CIRES visiting fellow, and is working on instrumentation for the detection of atmospheric organics. As of December, **Kathy Green** and **Karen Layman** are job-sharing a position as secretary in the Tropospheric Chemistry group...

The Tropical Dynamics and Climate group hosted a visit of **David Atlas**, NASA Goddard Space Flight Center, in September to discuss AL’s work in using wind profilers to study precipitating cloud systems as part of NASA’s Tropical Rainfall Measuring Mission (TRMM) Ground Validation Program...

Christine Wiedinmyer left the Theoretical Aeronomy group to take a position at NCAR...

Paula Hudson has begun a postdoc with the Meteorological Chemistry group, to work with the field deployments of the single-particle measuring instrument. She is from the University of Colorado. **Tim Marcy** has also begun a postdoc with the group, to work on field missions involving the nitric acid chemical ionization mass spectrometer. He is from CU. **John Holoccek** left the group in August to pursue graduate work in the atmospheric sciences...

We wish everyone the best in their new endeavors, whether here or elsewhere!

COMMUNICATING OUR SCIENCE

• **To Decisionmakers:** Dan Albritton cochaired the internal first-draft review meeting of the 2002 international ozone-layer assessment, held November 28-30 in Fairfax, VA. Dave Fahey, Ravi, Chris Ennis, and Jeanne Waters participated in the meeting... Fred Fehsenfeld and Jim Meagher participated in the internal review meeting for the forthcoming NARSTO assessment of particulate matter, held October 11-13 in Sacramento... Dan Albritton participated in briefings of the NOAA Assistant Administrators in October, on the subject of NOAA's Climate and Observations and Services Program... Dan Albritton attended the approval meeting of the Intergovernmental Panel on Climate Change (IPCC) Climate Synthesis Report, held September 24-28 in London... Dan Albritton attended a Congressional site visit to the New Hampshire AIRMAP site; Sen. Judd Gregg (NH) was in attendance... In his role as Cochair of the Montreal Protocol Scientific Assessment Panel, Dan Albritton attended the Open-Ended Working Group meeting of the Parties, held in July in Montreal... Fred Fehsenfeld gave a presentation on energy facility siting issues at a DOC/DOE Energy Roundtable on "The Critical Role of New Environmental Information and Technology in Meeting National Energy Needs," held in Washington, DC, on July 17. Representatives of the U.S. energy industry were invited to attend the Roundtable, which provided a forum for the timely discussion of environmental and technical information pertinent to current and long-term issues faced by the industry.

• **To the Scientific Community:** Venues included:

• **Scientific Conferences and Symposia:** Several AL scientists presented talks and posters at the Fall Meeting of the American Geophysical Union, held December 10-14 in San Francisco... In November, Ann Middlebrook gave a presentation at the American Meteorological Society meeting held in Boston... Dan Murphy gave a talk at the 6th International Conference on Mercury as a Global Pollutant, held October 15-19 in Minimata, Japan... Ann Middlebrook and Paula Hudson attended the American Association of Aerosol Research meeting held in Portland in October... In September, Ravi gave the plenary talk to the European Aerosol Conference-2001 in Leipzig, Germany.

He also gave an invited presentation at the Free Radical Symposium in Assisi, Italy that same month... Jim Roberts gave a talk at the 8th European Symposium in Turin, Italy, in September... In September, Stephen Reid attended the Network for the Detection of Stratospheric Change (NDSC) Symposium in Bordeaux, France... Scientists in the Chemistry and Climate Processes group participated in and helped organize the AGU Chapman Conference on Atmospheric Absorption of Solar Radiation, August 13-17 in Estes Park, CO... Dave Thomson attended the NIWEEK (National Instruments) Conference held in Austin, TX in August... Stephen Reid attended the Climate Conference 2001 at the University of Utrecht, The Netherlands, August 20-24... Adrian Tuck and Ann Middlebrook attended the American Chemical Society Fall National Meeting, held August 26-30 in Chicago... Karen Rosenlof gave an invited talk at the International Geoscience and Remote Sensing Symposium, held in Australia July 9-13, on the topic of satellite observations of ozone and related gases... Bob Portmann gave a presentation at the Global Change Open Science Conference held July 10-13 in Amsterdam... Ken Gage, Christopher Williams, Dave Fahey, and Ravi attended the 8th Scientific Assembly of the International Association of Meteorology and Atmospheric Sciences, held in July in Innsbruck. Ravi was the convener of a symposium on Middle Atmospheric Chemistry and Radiation... Ken Gage participated in the 7th Precipitation Conference, held in Rockland, Maine, June 30-July 3. He and Christopher Williams also attended the AMS Radar Conference in Munich, July 19-25.

AL Website News: A link to the Intercontinental Transport and Chemical Transformation (ITCT) 2002 activities is available through the AL website at www.al.noaa.gov.

• **Research Workshops:** Dave Parrish gave a presentation at the EPA-sponsored Climate Change and Air Quality Workshop, held December 3-5 in Raleigh, NC. His talk discussed the evaluation of emission inventories through ambient observations... George Kiladis presented a talk at the Courant Institute of Mathematical Sciences Workshop on Tropical Waves and Convection, held November 28-30 in Manhattan... Ken Gage participated in a workshop on requirements for global precipitation data for NOAA, held November 28-30 in Silver Spring... On November 13-16, Dave Parrish attended the TRANsport and Chemical Evolution in the Pacific (TRACE-P) Workshop held in Norfolk, VA... Jim Meagher participated in the U.S. Weather Research Program's Prospectus Development Team Workshop, held November 6-8 in Palm Springs to discuss capabilities and plans for developing an operational air quality forecast... Dave Fahey attended the Earth Observing System/Aura Satellite Validation Workshop on November 7-8 in Washington, D.C... Ken Gage, Christopher Williams, and Wally Clark participated in a Tropical Rainfall Measuring Mission (TRMM) Science Team meeting in Fort Collins in late October, to discuss the status of the TRMM satellite and the plans for the next-generation satellite, the Global Precipitation Monitor (GPM). They also gave presentations at the Specialist Meeting on Microwave Remote Sensing held in

Boulder in early November... Dave Parrish attended the Pasadena ACE-Asia Data Workshop on October 29-31... Several Aeronomy Lab scientists participated in the Texas 2000 Air Quality Study Data Workshop, held August 7-10 in Austin, TX... Fred Fehsenfeld, Jim Meagher, and Tom Ryerson attended a workshop July 9-10 in Austin, TX, to discuss ozone data from the Texas 2000 Air Quality Study... Several Aeronomy Lab scientists attended the Workshop on Laboratory Studies of Upper Troposphere/Lower Stratosphere Processes, held July 23-27 in Breckenridge, CO. Ravi was one of the primary coordinators of the workshop.

• **Invited Lectures and Seminars:** Susan Solomon gave a presentation at the Department of Chemistry, University of Toronto, on November 29... Ravi presented a seminar at the California Institute of Technology on November 27... Ravi gave a presentation at Leeds University, London, on September 11... On September 28, Tom Ryerson gave a seminar at Georgia Institute of Technology, describing the findings of the 2000 Texas Air Quality Study... In July, George Kiladis was an invited speaker at the NCAR Advanced Study Program Summer Colloquium on ocean-atmosphere interactions in the tropics... On July 18, Dan Albritton gave an invited presentation to the National Research Council Committee on air quality management in the U.S.

• **To Media:** In December, Chris Ennis hosted a visit of Randy Flinders, production manager with The Weather Channel, to the Aeronomy Laboratory.

• **To Industry:** Fred Fehsenfeld, Jim Meagher, Tom Ryerson, and Michael Trainer discussed the findings of the 2000 Texas Air Quality Study at a meeting of power-industry constituents and air quality managers held December 12-13 in Houston... Ken Gage and Barbara Herrli attended a meeting regarding the future of the wind profiler Cooperative Research and Development Agreement (CRADA) with Vaisala, held in Finland in October. Vaisala has purchased the wind profiler business from Radian Corp., the original partner with NOAA in the longstanding CRADA... In August, Dave Fahey and Sandy MacDonald of FSL met with Northrop Grumman regarding the potential future use of the Global Hawk, a pilotless remote aircraft, for a future meteorological global observing network... On June 12-13, Dan Albritton participated in a briefing sponsored by the Electric Power Research Institute to provide representatives of the electric power industry a current summary on climate change.

• **To Students and Teachers:** A paper authored by Aeronomy Lab scientists and colleagues was selected to appear in *Earth in Space*, AGU's monthly science magazine for students. The paper is entitled "Severe and Extensive Denitrification in the 1999-2000 Arctic Winter," by Peter Popp et al., *Geophysical Research Letters* 28, 2875-2878, 2001... Susan Solomon gave a

The Aeronomy Lab hosted a roundtable discussion on September 24-25 for the exchange of scientific information and understanding between AL scientists, air quality managers for the State of Texas, and scientists from the major petrochemical industries that are concentrated in the Houston metro area.

presentation on Antarctic ozone and discussed careers in science with a group of over thirty high school students from Cheyenne, WY. The group, Women in Science, visited several NOAA labs in Boulder on December 5... Susan Solomon gave a series of lectures on midlatitude and polar ozone to a group of 60 international graduate students at Cambridge University in September... In August, Mary Gilles and Dave McCabe spent three days working with high school science teachers through the CIRES "Earthworks" program... Ru-Shan Gao, Harald Stark, and Chris Ennis gave laboratory tours and presentations on August 10 to a visiting class of about twenty Advanced Placement chemistry students from Palmer High School... In late August, Eric Ray participated in and lectured for the summer short course for young scientists on the mixing of geophysical flows at the Cargese International School in Corsica, France.

• **To Our Visitors:** Susan Solomon hosted a visit of OAR Assistant Administrator Dave Evans on October 25... Chris Ennis and John Daniel hosted a visit of Sean Willard, of NOAA's Climate Observations and Services Program, on September 26.


• **Through Service on Scientific Panels and Boards:** In early December, Fred Fehsenfeld was in Silver Spring, MD, to participate in the Review Panel of the Atmospheric Chemistry Project, which is sponsored by the NOAA Climate and Global Change Program... Ravi attended a meeting of the Scientific Steering Group of SPARC (Stratospheric Processes and Their Role in Climate), held December 4-7 in Honolulu. He has also been selected to serve on a newly formed committee of the NRC, the Climate Research Committee, which will study and report on the uncertainty associated with "natural" climate change feedbacks. He attended meetings of the Committee in August in Boulder and in November in Seattle... Dan Albritton and Susan Solomon participated in meetings of the NOAA Climate and Global Change Panel, held in October in Washington, DC, and in July in Seattle... Susan Solomon participated in a meeting of NOAA's Committee on Long-Term Climate Monitoring in July... George Reid has been appointed to the National Academy of Science's Decadal Survey Committee for Solar and Space Physics, and also to the Editorial Board for the AMS Glossary of Meteorology.

DOWN THE ROAD



The Aeronomy Lab will be busy with field missions in 2002. Here's the lineup:

- Winterstorms 2002 (January-February)
- ITCT 2k2 (April-May)
- CRYSTAL-FACE Mission (July)
- The New England Air Quality Study (July-August)

 *On the Air!* is a quarterly publication of the NOAA Aeronomy Laboratory. It is posted on the World Wide Web at www.al.noaa.gov. Please send comments, suggestions, or questions to: Chris Ennis (phone 303-497-7538; email: Christine.A.Ennis@noaa.gov).