

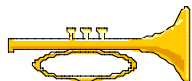
ON THE AIR!



A Quarterly Newsletter of the
NOAA Aeronomy Laboratory

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ANNOUNCEMENTS

Aeronomy Lab Hosts Coordination Meeting of ITCT: On June 7-8, the Coordination Committee of the Intercontinental Transport and Chemical Transformation (ITCT) program, an activity of the International Geosphere-Biosphere Programme, met in Boulder to discuss progress, plans, and coordination opportunities of the ITCT research. About a dozen international scientists participated in the meeting. ITCT is focusing on studies of the intercontinental and global consequences of chemically active climate-related gases such as ozone, fine particles, and other pollutants. Next steps include the writing of a more-detailed ITCT Science Plan and preparations for ITCT field activities in the 2002/2004 timeframe.

AL Website News: The Aeronomy Lab has launched a new page on its website. The page provides on-line access to the very rich database of ground-based and airborne measurements from the Aeronomy Lab's Particle Analysis by Laser Mass Spectrometry (PALMS) instrument. This unique dataset gives a full, detailed mass spectrum for each of thousands of individual particles that have been sampled and analyzed in real time from many regions worldwide. The spectra of over 50,000 individual particles are available in the database, which is searchable and interactive. It is hoped that the web page will foster collaboration and analysis of the extensive dataset. The website can be accessed off of the "Datasets" section of the Aeronomy Lab home page, www.al.noaa.gov.



Two papers by Aeronomy Laboratory scientists have been honored with the 2000 NOAA/OAR Outstanding Scientific Paper Award. In the Research Paper category, the paper "Observations of Rossby waves linked to convection over the eastern tropical Pacific", by **George Kiladis**, was selected [*Journal of Atmospheric Sciences*, 55, 321-339 (1998)]. In the Review Paper category, the paper "Stratospheric ozone depletion: A review of concepts and history", by **Susan Solomon**, was selected [*Reviews of Geophysics*, 37, 275-316 (1999)]. The annual NOAA/OAR Outstanding Paper Awards recognize papers with exceptional originality, scientific importance, technological importance, longevity in value, quality of writing, and relevance to the NOAA mission. The 2000 awards were given to 10 papers in the research category and two papers in the review category.

Dan Albritton received Boulder's 2001 Pacesetter Award in Science on January 23rd. Dan's award cited his many contributions to Boulder, NOAA, the Nation, and the world in three scientific areas (ozone depletion, climate, and air quality) and his accomplishments in communicating scientific understanding to decisionmakers in these three arenas. The Pacesetter Awards are bestowed annually by the *Boulder Daily Camera* in several categories, in recognition of outstanding contributions of Boulder County residents to the local community and beyond.

Kathy Straub received an award for Outstanding Student Presentation at the American Meteorological Society's Conference on Atmospheric and Oceanic Fluid Dynamics held June 4-8 in Breckenridge. Her presentation was on "Observations of a Convectively Coupled Kelvin Wave."

Susan Solomon has received the Bonfils-Stanton Foundation 2001 Award in Science and Medicine. She was bestowed with the award on April 19 in a ceremony attended by Colorado Gov. Bill Owens and many of the past winners of the award. Susan was cited for her insights in explaining the cause of the Antarctic ozone hole and for her efforts in science education and outreach in the community. The Bonfils-Stanton Foundation Awards are a prestigious Colorado award that each year honors three outstanding Colorado individuals for extraordinary achievements in Science and Medicine, Community Service, and Arts and Humanities. Susan was also honored by the Mayor and City Council of Boulder on February 6 as a recipient of the 1999 U.S. National Medal of Science. And in May, she received an honorary degree from the State University of New York.

George Reid gave the Nicolet Lecture, one of the American Geophysical Union's honorary Bowie Lectures, at the AGU Spring Meeting on May 30. The lectureship recognizes distinguished and sustained contributions to aeronomy and ionospheric physics.

Power Plants' Size, Location Present Opportunities for Air Quality Improvement

Aeronomy Lab researchers have found some surprising twists in the tale of how to minimize the ozone produced downwind of fossil-fuel burning electric power plants: remote rural sites may not be the optimal locations for power plants, and one large plant may have a lesser air quality impact than an equivalent number of smaller plants.

The findings came out of a series of experiments in the eastern U.S. during 1999, when researchers flew highly instrumented research aircraft into the plumes downwind of power plants. They measured a host of chemical components in the air as the plume

evolved. The nitrogen oxides (NO_x) in the plume, produced during the power-generating combustion processes, combine with volatile organic compounds (VOCs) in ambient air to make ozone pollution.

In a nutshell: if a power plant is in a rural site where VOCs emitted from trees are abundant, then the situation is ripe for high ozone production. And in larger power plant plumes, the very high-NO_x environment promotes a series of chemical transformations that suppress the formation of ozone. This new NOAA information could be important input into the planning and siting of new power plants.



WHAT'S UP WITH PEOPLE

In March, **Roy Miller** returned to the Chemistry and Climate Processes group after a two-year period of research at the Institute for Stratospheric Chemistry (FZJ) in Jülich, Germany. He will work on instrument development and field projects with the group... In June, **Joost de Gouw** joined the Tropospheric Chemistry group to work on proton-transfer reaction mass spectrometry measurements of atmospheric VOCs (volatile organic compounds). Joost was formerly with the Institute for Marine and Atmos-

pheric Research Utrecht in The Netherlands. **Alice Delia** has left the group and is continuing her graduate work at CU. **David Henderson**, a graduate student at CU, is working with the group to develop instruments for research on atmospheric particles... This summer, **Christine Wiedinmyer** joined the Theoretical Aeronomy group, where she will be working on air quality data analysis. She was formerly with the University of Denver. **Owen Cooper** is a National Research Council postdoc with the group. He arrived in July from the University of Virginia, and will work on topics related to atmospheric dynamics and air quality. **Andreas Stohl** is

visiting the Theoretical Aeronomy group during August and September. He is from the Technical University of Munich... This spring, the Atmospheric Chemical Kinetics group hosted visitor **Tony Cox** from Cambridge University. Tony worked on joint laboratory and theoretical projects with the group. **Paul Marshall**, of North Texas State University, also visited the group during the spring, to work on projects of joint interest in atmospheric kinetics. **Tomasz Gierczak**, a frequent collaborator with the group, will be visiting ACK for a year starting in July. He is from the University of Warsaw. In July, **Glenn Morrison** left the group to take a faculty position at University of Missouri at Rolla... **Ernesto Muñoz-Acevedo** is working with Leslie Hartten of the Tropical Dynamics and Climate group through the summer program of UCAR's Significant Opportunities in Atmospheric Research and Science (SOARS) program. He is a high school physics teacher from San Juan, Puerto Rico, who hopes to do graduate work in meteorology. **Tom Freestone** is also working with the group this summer to assist with field hardware as

well as data processing. He is a sophomore in aerospace engineering at CU. **Brad Bessenbacher** left the group in May to move closer to family back East... **Jenny Fox** has rejoined the Computing and Networking Resources Group for six months, where she is working on computing security issues for the Lab... We wish everyone the best in their new endeavors, whether here or elsewhere!

COMMUNICATING OUR SCIENCE

To Decisionmakers: Dan Albritton and Chris Ennis attended the first meeting held in association with the preparation of the 2002 WMO/UNEP ozone layer assessment, a Lead Authors' planning meeting held June 27-28 in London... Michael Trainer presented preliminary results of the Texas-2000 Air Quality Study at the Texas Natural Resources Conservation Commission (TNRCC) on June 5... Jim Meagher gave a presentation at the Environmental Protection Agency's Air Directors' Meeting, held in Tampa on May 16. On March 14, he presented results of the Nashville air quality field studies to scientists at the EPA's Region 4 office in Atlanta... Dave Fahey served as an External Reviewer at the final review meeting of the *Second Assessment of European Research on the Stratosphere*, held April 23-25 in Brussels... Jim Meagher attended an Executive Assembly Meeting of the NARSTO tri-national air quality research and planning group, and Fred Fehsenfeld attended a meeting on the drafting of the NARSTO assessment on particulate matter, both held in Toronto during the week of April 16... Michael Trainer attended the FY 2001 NOAA/OAR Air Quality Research Activities Implementation Planning Meeting held in Silver Spring, MD, on April 18. Air quality forecasting was among the topics... Dan Albritton and Susan Solomon participated in the final drafting meeting for the Intergovernmental Panel on Climate Change (IPCC) Working Group I report

Climate Change 2001: The Scientific Basis, which is part of the IPCC's 2001 Third Assessment Report on climate science, impacts, and options/mitigation. The meeting was held in Shanghai on January 17-20. Dan gave several briefings to legislators and administration officials after the release of the IPCC report, including Secretary of Commerce Donald Evans, Secretary of State Colin Powell, EPA Administrator Christine Todd Whitman, Sen. John McCain (AZ), Sen. Brownback (KS), Rep. Mark Udall (CO), Rep. Boehlert (NY), and Office of Management and Budget Deputy Director Sean O'Keefe... At a briefing hosted by the Aspen Institute on February 8, Dan addressed 22 members of Congress on the science of the climate system and the IPCC Third Assessment Report. Dan also testified at a House Science Committee hearing on "Climate Change: The State of the Science" on March 14... Dan Albritton is participating in the preparation of a Synthesis Report of the three IPCC Working Groups. He attended drafting meetings in January in Shanghai, in March in Geneva, and in June in Annapolis.

To the Scientific Community: Venues included:

- *Scientific Conferences and Symposia:* Several AL scientists attended the Gordon Research Conference on Atmospheric Chemistry, held June 18-22 in Newport, Rhode Island... Glenn Morrison attended the 94th Annual Conference of the Air & Waste Management Association, held in Orlando in late June... George Kiladis chaired a session and gave a talk at the AMS Conference on Atmospheric and Oceanic Fluid Dynamics held June 4-8 in Breckenridge. Kathy Straub presented a talk and a poster there... Susan McCaffery gave a talk at the Spring Meeting of the AGU, held May 29-June 1 in Boston... Stu McKeen participated in the U.S. Forest Service Combustion Conference, held in Missoula on May 24-25... George Kiladis gave a presentation on tropical/extratropical interaction at The Hemispheric Observations Systems Research and Predictability Experiment (THORPEX) meeting held in Monterey April 26-29... Adrian Tuck attended the NASA Astrobiology Institute General Meeting on April 10-12, where he gave a talk on atmospheric aerosols and the origin of life... Dan Cziczo gave a talk on meteoritic and organic material in the atmosphere at the April meeting of the American Chemical Society... Dan Murphy attended the Gordon Conference in Santa Barbara on February 26-27, where he gave a talk on gaseous ions... Dan Albritton gave the keynote address at the 2001 International Conference on Future Directions in Air Quality Research, held February 12-15 in Research Triangle Park... Dave Parrish attended the International Global Atmospheric Chemistry (IGAC) symposium and Council meeting held in Bangkok in January... Leslie Hartten presented papers on the topics of El Niño and wind profilers at the 81st AMS Annual Meeting, held January 14-19 in Albuquerque.
- *Research Workshops:* AL scientists presented papers at the workshop on Photooxidants, Particles, and Haze Across the Arctic and North Atlantic:

Transport Observations and Models, held June 12-15 in Palisades, NY... Dave Parrish presented papers at the Emissions of Chemical Species and Aerosols into the Atmosphere Workshop held June 19-22 in Paris... Ken Gage attended a NASA planning workshop on the Global Precipitation Measurements (GPM) Mission from Space, held in Maryland May 16-18... Karen Rosenlof and Ravi gave presentations at the Stratospheric Processes and their Role in Climate (SPARC) workshop on the upper troposphere/lower stratosphere, held near Munich April 17-21... Several AL scientists gave presentations at the European Geophysical Society General Assembly, held March 26-30 in Nice, France... Karen Rosenlof gave a presentation at the Japan-US workshop on Coupling of the Troposphere and Stratosphere by Dynamical, Radiative and Chemical Processes, held in mid-March in Kyoto... Ravi gave a talk at the International Workshop for Atmospheric Chemistry, held in Uji, Kyoto, Japan March 17-18... Ravi, Dave Fahey, and Ru-Shan Gao attended the Workshop on Nitrogen Oxides in the Lower Stratosphere and Upper Troposphere, held in Heidelberg March 19-22. Dave and Ravi were on the organizing committee for the workshop... Ken Gage and Leslie Hartten participated in a Department of Energy meeting of the Atmospheric Radiation Measurement science team, held in March in Atlanta... Several AL scientists participated in a workshop on stratospheric ozone changes, which was held March 7-9 in College Park, MD... George Kiladis attended scientific and planning meetings associated with the Climate Variability and Predictability (CLIVAR) research program in early February... Several AL scientists participated in the Intercomparison Workshop for the Texas 2000 Air Quality Study, hosted by the Aeronomy Lab on February 6-7... Fred Fehsenfeld, Michael Trainer, and Jim Meagher participated in the Southern Oxidants Study (SOS) Science Review, held January 29-30 in North Carolina.

• *Invited Lectures and Seminars:* Dave Fahey gave talks at Harvard University and the University of Wisconsin-Madison in late June... Susan Solomon gave an invited seminar at the Lawrence Livermore National Laboratory on May 31. She also spoke at NCAR on April 24 and at Princeton on March 27... Joachim Curtius gave a presentation at Aerodyne Research Inc. in Boston in May, on the topic of cluster ions... Dave Fahey gave a seminar at the University of Cambridge Department of Physical Chemistry on April 26, discussing denitrification in the Arctic stratosphere. Dave also gave talks at CIRES and at NASA Goddard Space Flight Center in mid-May, describing the discovery of large polar stratospheric cloud particles in the Arctic... On February 20, Adrian Tuck gave a talk at the University of California, Irvine, on the topic of "Atmospheric Aerosols in Prebiotic Chemistry"... Susan Solomon gave the Byrne Lecture at Oregon State University on February 20... On February 9, George Kiladis gave an invited seminar at the University of Hawaii, on the topic of equatorial waves

Karen Rosenlof served as a chapter Lead Author of the first international assessment on the topic of atmospheric water vapor, published in December 2000 under the World Climate Research Programme (WCRP) project on Stratospheric Processes and their Role in Climate (SPARC). Sam Oltmans, CMDL, was a co-Lead Author with Karen on Chapter 2: "Data Quality". Water vapor plays important roles in climate as well as ozone-related atmospheric chemistry. (See the report at: www.aero.jussieu.fr/~sparc/)

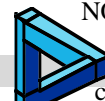
and tropical convection over the Pacific... Karen Rosenlof gave a seminar at the Geophysical Fluid Dynamics Laboratory on stratospheric water vapor trends over the past 40 years... In January, Ravi gave two seminars in Ahmedabad at the Physical Research Laboratory and a seminar at the Centre for Atmospheric and Ocean Science in Bangalore, sponsored by the Indian Meteorological Society.

To Media: Dan Albritton has fielded several media calls on the topic of climate change, the release of the IPCC Third Assessment Report's summaries in January, and the release of the National Research Council report on climate change in June. Coverage has appeared in several newspapers and magazines, including *The New York Times*, *USA Today*, *Science Magazine*, *Newsday*, *Philadelphia Daily News*, and *the Associated French Press*... Tom Ryerson was interviewed by radio and print media concerning a paper in the April 27 issue of *Science* on the chemistry of power plant plumes. A segment over four minutes in length aired on National Public Radio... The June 10 issue of *The New York Times* ran a story that featured Dan Albritton's unique, hand-illustrated viewgraphs on climate change. They reprinted two of the viewgraphs in full.

To Industry: On June 12, Dan Albritton gave an invited presentation on climate change "knowns and unknowns" at the Global Change Research Seminar of the Electric Power Research Institute (EPRI). The invitation provided an opportunity to strengthen the interaction with the power utilities sector on NOAA's climate science, as well as new air quality findings that pertain to the siting of new power plants... In April, AL and ETL signed a 5-year renewal of the Cooperative Research and Development Agreement (CRADA) with Radian and Sonoma Tech. The original CRADA was created 10 years ago to provide a means of commercializing the lower tropospheric wind profiling radars. Future work will focus on establishing meso-scale networks of profilers, adapting the profilers for use on ocean platforms, and integrating the profilers with other data streams.

To Students and Teachers: In May, Paul Goldan gave a talk about atmospheric research to a chemistry class at Mt. Bellow High School... On April 12, Dave Fahey was a Grand Award Judge for Physical Science at the Colorado Science and Engineering Fair, held at Colorado State University... John Daniel, Carl

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Howard, Stu McKeen, and Karen Rosenlof judged science fairs at local schools during the 2001 winter/spring semester. Stu also mentored an eighth-grade student from Summit Middle School, who advanced to the state finals with his science fair project... Katherine Straub volunteered for the National Ocean Sciences Bowl at the University of Colorado on February 10... Ned Lovejoy helped some visiting Boy Scouts complete requirements for their chemistry badges... From 29 January to 10 February, Carl Howard organized and taught a course for 45 students at Fairview High School. He arranged their visit to the Atmospheric Chemical Kinetics laboratory, where Carl and Glenn Morrison helped them conduct laboratory experiments to identify the chemical compound responsible for the scent of pine needles... In January, Ravi taught a two-week portion of a post-graduate course in space science for the benefit of young scientists of the Asia-Pacific region. The course was conducted by the Centre of Space Science and Technology Education in Asia and the Pacific, in affiliation with the United Nations.

To the Public: Leslie Hartten put together a new public display for the Limon Heritage Museum, on the topic of climate variations over Colorado's eastern plains. Paul Johnston helped to set up the display.

To Our Visitors: Dan Albritton described climate change understanding and NOAA's contribution during a visit of Shannon Walla (NWS), Erin Wuchte (DOC), and Dennis Dauphon (NOAA) to NOAA-Boulder on June 4... On March 30, several AL scientists hosted the visit of John Vandenberg (EPA) to AL and ETL. The visit was focused on NOAA research related to air quality... Several AL scientists met with Tom Watson, NOAA/OAR, during a visit on

May 25 and with Krisa Arzayus, a Sea Grant Fellow, on March 2... Dan Albritton gave a briefing on the findings of the 2001 IPCC report on climate change to visiting legislative staffers on February 22. Mike Quear (staff member on the House Science Subcommittee on Environment, Technology, and Standards) and Bryan Hannegan (staff scientist for the Senate Energy and Natural Resources Committee) attended... On January 30, Chris Ennis, Ravi, and Tom Ryerson hosted a visit of Dr. Ron Baird to the Aeronomy Lab. Baird heads the NOAA/OAR Sea Grant College program and is OAR's Associate Director for Ocean Resource Research... Several AL scientists met with Associate Director David Rogers and scientist Pai-Yei Whung, of the NOAA/OAR Office of Weather and Air Quality, during their visit on January 30.

Through Service on Scientific Panels and Boards:

In January, Wayne Angevine began a three-year term on the AMS Committee on Boundary Layers and Turbulence... Dave Fahey has begun a four-year term as vice-chairman of the Atmospheric Chemistry Gordon Conference... Ravi attended a meeting of the NASA Panel for Data Evaluation, held February 26-March 2 in Boston... Ravi serves on the National Research Council's Committee on Aeronautics Research and Technology for Environmental Compatibility, which is preparing a report about the impacts of aviation on noise and on the atmosphere.

DOWN THE ROAD



August 7-10: Texas 2000 Air Quality Study Data Workshop, Austin, Texas.