

September 2004

Atmospheric Circulation

Newsletter of the University of Washington Atmospheric Sciences Department

Jim Holton's Global Influence

by Professor Clifford Mass

Jim Holton passed away on March 3, 2004. The rest of the world knew Jim as a highly respected researcher, a member of the U.S. National Academy of Sciences, and the author of a leading textbook in dynamic meteorology. But for us, memories of him are deeper and more personal...as a warm friend, a wonderful lecturer and teacher, a department chairman who brought in a new generation of faculty members, a loving father and husband, and an inveterate athlete. His passing stunned the department, with the rapid and unexpectedness of the loss making it all the more difficult.

During his years as a UW faculty member, Jim guided 26 doctoral and seven M.S. students, many of whom have gone on to become leaders in our field. He won virtually every award available to an atmospheric scientist, including the Roger Revelle Medal of the AGU in 2000 and the Rossby Research Medal of the AMS in 2001 - the highest awards for excellence in research given by these two professional societies.

When he joined the faculty in 1966, Jim's early work dealt with the nocturnal jet along the eastern slope of the Rockies and fluid dynamics using rotating tanks of salt water. In 1968, he was author of four important papers on the Quasi-Biennial Oscillation of the tropical stratosphere, including a paper with R.S. Lindzen, which is regarded as the essential explanation of its origin. He continued to work on tropical dynamics and wave

interactions through the early 1970's, with the first edition of his textbook being published in 1972. In the early 1980s, Jim's observational work showed the interaction between the QBO and the global stratospheric circulation and its relation to stratospheric waves. Subsequently, his research turned to the role of gravity waves in the stratosphere, as well as the water vapor puzzle of that region. In 1987 he co-authored a book with David Andrews and Conway Leovy entitled "Middle Atmosphere Dynamics". The themes of atmospheric dynamics, stratosphere-troposphere constituent exchange, and gravity wave - mean flow interaction continued to benefit from his insight and leadership for the remainder of his life. The six volume "Encyclopedia of Atmospheric Sciences", which he co-edited with Judy Curry and John Pyle, appeared in print in 2002, while the fourth edition of "An Introduction to Dynamic Meteorology" was published in 2004.

A memorial celebration of Jim's life was held at the University of Washington on 3 April 2004. Attended by nearly 200 friends, family and colleagues, many described the kindness, generosity and humanity that accompanied his scientific and athletic interactions. The gathering ended with a moving "Walk with Jim" in which his



Professor James Reed Holton, 1938 - 2004

recent hike across central England was documented with slides and music. The department received at least 100 emails and phone calls from people who could not attend the celebration, and another gathering in Jim's honor took place at the University of Reading for his European friends.

Jim will be greatly missed by his wife Margaret; sons Eric and Dennis; daughter-in-law Gretchen; grandchildren Jake, Bailey and Noah; sisters Janet and Shirley; friends and colleagues around the world. He personified the dedication to our profession, excellence in teaching, and collegiality and cooperation that has allowed our department to grow and prosper.

In lieu of other remembrances, the family asks that memorial contributions be sent to the James Holton Building Fund at New Hope Farms, P.O. Box 89, Goldendale, Washington 98620, where Jim had served on the board of directors.

Chairman's Column



The biggest event of the past year was a sad one, the sudden and unexpected death of Professor Jim Holton. We miss him keenly. Jim's memorial service at Kane Hall brought us together to celebrate the life of a truly exceptional human being, but it was also a celebration of the worldwide community that he helped to build among the alumni and friends of this department.

As it begins its 58th year of existence, the Department strives to continue its tradition of excellence. In the past six years five new teaching faculty and four research faculty have joined the Department. Two more new faculty are in the process of being recruited and we are beginning a search for a new faculty member in the areas of cloud and aerosol processes or dynamic meteorology.

The number of undergraduate majors has reached an all-time high of more than 50, while our graduate student number hovers around 60. Our endowed scholarship funds allow us to provide partial tuition support to 4 to 6 worthy undergraduate students each year.

We expect to continue to sponsor evening lectures on issues of weather, climate and air quality that are accessible and interesting to the public. Howie Bluestein from the University of Oklahoma was the first distinguished speaker sponsored by our Graduate Education Fund, and gave an exciting talk on tornadoes. In another evening lecture, our own weather celebrity Professor Cliff Mass gave a rousing presentation of Northwest weather phenomena and attempts to predict them.

Best wishes for the coming year,
Dennis L. Hartmann

Faculty Profile: Joel Thornton

Joel Thornton joined the faculty of the Department on June 1, 2004. Joel was raised in Vermont and earned a B.A. degree in chemistry from Dart-



mouth College. He received a Ph.D. degree in the UC Berkeley Chemistry Department in 2002 working with R.C. Cohen and then went for a two-year postdoctoral engagement with J.P.D. Abbatt at the University of Toronto. Joel is deeply interested in good teaching. He received the Outstanding Graduate Student Instructor Award in the Berkeley Chemistry Department in 1999, and UC, Berkeley's Teaching Effectiveness Award in 2000.

The focus of Joel's research is to understand at a molecular level the interplay between human activities and the natural variations of the earth-ocean-atmosphere system. In Joel's view *"The atmosphere is a giant chemical reactor with 'natural' and 'human-made' inputs. The resulting chemistry is fascinating, deserving study in its own right. But knowing humans can cause significant and sometimes harmful changes to the atmosphere is a primary motivating factor for me. Unless we understand the chemistry at a fundamental level, we will not be able to accurately predict the consequences of our activities."* Important research questions involve the production of ozone in urban, rural and remote regions of the troposphere, and the chemical processes that control the formation, composition, and lifetime of atmospheric aerosols.

Joel will bring a strong program in laboratory and field measurements using new mass spectrometric techniques to measure key free radical reservoir species such as hydroperoxides and nitrates, and a suite of oxygenated hydrocarbons. He promises that, once the students gain some experience with this technology, they will be hooked.

Joel is an avid jazz fan and enjoys playing jazz piano and tenor sax.

Faculty Promotions



Igor Kamenkovich
Promoted to Research Associate
Professor



Sandra Yuter
Promoted to Research Associate
Professor



Robert Wood
Promoted to Research Assistant
Professor

Weather Forecast Contest Winners

Overall: Justin Sharp
Temperature: Eric Gruit
Precipitation: Justin Sharp

Gary Maykut's Retirement

by Professor John M. (Mike) Wallace

Gary Maykut retired this year after a 47-year association with the department. Gary joined the department in 1957 as a student helper on Konrad Buettner's Mountain Valley Winds Project, carrying helium bottles up and down the slopes on Mt. Rainier and tracking the motion of pibals in and around the Carbon River Valley at the base of the Willis Wall. This research continued for 3 summers and involved numerous other students in the department such as Kristina Katsaros, ultimately producing a Ph.D. thesis for Norman Thyer which provided a definitive explanation of mountain-valley wind systems. During the next several summers, Gary carried out aircraft flights over the Olympic Mountains to test the performance of Bob Charlson's nephelometer, investigations of the orographic deformation of wind flow over mountainous terrain around Mount Rainier, and studies of the mass balance of the Blue Glacier with Ed LaChapelle. He began his graduate studies in 1963, just after the appointment of Norbert Untersteiner, with whom he carried out his graduate research. Gary's Ph.D. thesis, completed in 1969, was the first comprehensive model of the thermodynamic processes that govern the growth of sea ice. After completion of his Ph.D., Gary was appointed to the research faculty in the

department. His first collaborations were with Phil Church and Darrell Weaver and produced a detailed radiation climatology for Barrow, Alaska. Subsequent research focused on sea ice, its optical properties and its interactions with the overlying air and the underlying ocean. Gary was also a major contributor to several large field programs in the Arctic.

At the retirement party roast, Norbert Untersteiner marveled at how much Gary has been able to accomplish without ever setting foot on the Arctic pack ice; his students praised him for his lofty editorial standards, which few of them were able to achieve; his research colleague, Miles Mc Phee, revealed Gary's strategy in getting the last word in writing collaborative papers and research proposals.

In his response, Gary elaborated on the reasons why theoreticians must, at all costs, avoid the uncertainties generated by exposure to the actual complexities of systems they are attempting to model. Finally, he revealed how high writing standards could be used to control unruly students and colleagues. Other entertainment for the evening was provided by Stanislove, a local folksinger, who brought down the house with his rendition of Mike Wallace's famous ballad, "He Won't Go to the Arctic".



Professor Gary Maykut with three of his Ph.D. students at his retirement celebration at Ivar's. L-R: Mark Wensnahan, '95, Bonnie Light, '00; Gary Maykut, '69; and Don Perovich, '83.

In addition to his wife Naydene and sons Wolfe and Christopher, there were many local and out-of-town friends on hand for the occasion. Among the latter were Norman Thyer, Bob Lake, Willy Weeks, Ken Bennington, Don Perovich and Darrell Weaver, all of whom have been associated with the department in years past. Now that he's stepped down from the ivory tower, Gary looks forward to pursuing his many outside interests, which include foraging for rare books, retrieving amethyst crystals from deposits hidden in remote cliffs along the crest of the Cascades, savoring Northwest folk music, and watching the American political process unfold on C-Span in the wee hours of the morning.



L-R: Professor Qiang Fu, Celeste Johanson, Professor Steve Warren

Global Warming Real

Qiang Fu, Steve Warren, Grad Student Celeste Johanson of UW and Dian Seidel of NOAA (not pictured) published a paper in the 6 May 2004 issue of *Nature Magazine* that showed estimates of global warming from surface thermometers and satellite-based remote sensing are in agreement that warming has occurred over the past 30 years. The secret was to account

for the stronger cooling in the stratosphere that is driven by greenhouse gas increases and ozone depletion, which hides some of the surface warming effect in the satellite data. Previously, the apparent disagreement between surface and satellite data had been used by some to argue that global warming might not be occurring, but now we know it is.

Doctor of Philosophy Degrees

- Michela Biasutti, Ph.D., "On the annual cycle over the Atlantic sector: The relative role of land and ocean" (D.S. Battisti & E. S. Sarachik)
- Simon deSzoeko, Ph.D., "Evolution of the cross-equatorial atmospheric boundary layer in the East Pacific: Observations and models" (C.S. Bretherton)
- F.A. (Tony) Eckel, Ph.D., "Toward an effective short-range ensemble forecast system" (C.F. Mass)
- Curtis James, Ph.D., "Radar Observations of Orographic Precipitation" (R.A. Houze)
- David Lorenz, Ph.D., "Wave-Mean-Flow interaction and the annular mode" (D.L. Hartmann)
- David Mechem, Ph.D., "Organized layer overturning in the mesoscale convective systems over the western Pacific warm pool" (R.A. Houze)
- Gretchen Mullendore, Ph.D., "Cross-tropopause tracer transport in midlatitude convection" (J.R. Holton, D. R. Durran)

Undergraduate Research

The following faculty and undergraduate students have worked together during the past year:

- Jessica Zvaluskas with Prof. Anderson on aerosol variability and statistical data analysis.
- Elliot Ginder, Cynthia Peacock, Charles Barnhart, Michael Louie, and Christopher Glein with Prof. Catling.
- Jeremy Harbeck with Prof. Grenfell characterizing melt ponds and ice concentration during melt season in the Arctic.
- Sean Casey on TRMM and IMPROVE data analysis with Prof. Houze.
- David Peterson with Prof. Rhines on general research in geophysical fluid dynamics.
- Tim Whitcomb and Dan Podhola with Prof. Yuter, on TRMM and accretion data processing and analysis of ocean drizzle precipitation.
- Ryan Eastman and Prof. Warren on recent trends in cover and cloud types over land.

Master of Science Degrees

- Justin Wettstein, M.S. "A physically consistent long-term reconstruction of the northernannular mode using tree rings" (J. M. Wallace)
- Christopher Woods, M.S., "Synergistic interactions between frontal and orographic forcing of precipitation: A case study of the 13-14 December 2001 IMPROVE-2 precipitation event," (P.V. Hobbs)

Kudos to:

- Sean Casey, undergraduate, who received the Om and Saraswati Bahethhi Minority Scholarship from the AMS.
 - Kathleen Crahan, who works with Prof. Hegg, received an NAS Internship with the Science Technology and Economic Policy unit in Washington, D.C. during winter quarter.
 - Kimberly Comstock, Ph.D. student with Prof. Bretherton, won the Spiros G. Geotis Prize of the AMS for her paper, "Evolution of drizzle cells in SE Pacific Stratocumulus."
 - Aaron Donohoe, Justin Minder and Mark Zelinka, recipients of Program on Climate Change (PCC) First Year Fellowships.
 - Aaron Donohoe, recipient of the UW Achievement Reward for College Scientists (ARCS) Fellowship.
 - Deanna Hence, recipient of UW GO-MAP Assistantship.
 - Jessica Koury, recipient of AMS First Year Fellowship.
 - Rei Ueyama, recipient of NSF three year Fellowship, and the Mass Media Science and Engineering Fellowship for Summer 2004.
 - Lucas Harris: AMS ITT Industries Aerospace/Communications Division GraduateFellowship.
 - Steven Cavallo: DOE Atmospheric Radiation Measurement Program Graduate Fellowship.

Scholarships - Bruce Caldwell Memorial Fund

- Jessica Leonard
- Dustin Helland
- Jeremy Harbeck
- Jamie O'Brien
- Zachary Oliver (incoming freshman)

Bachelor of Science Degrees

Congratulations to the following students who have earned their B.S. degrees this past year:

- Candace Berg
- Gerald Casson
- Laurelin Cleifton
- Dustin Helland
- Jessica Leonard
- Hai Lu
- Matthew Munson
- Steve Robinson
- Shawn Sluman
- Garrett Wedam

Welcome to the New Graduate Students for 2004-2005

- Aaron Donohoe (Bowdoin College)
- Brigid Dotson (Arizona State U)
- Deanna Hence (U of Michigan)
- Clark Kirkman (Lewis and Clark; U. Wisconsin, Madison)
- Jessica Koury (U of Colorado)
- Hafen McCormick (Rennselaer Polytech)
- Justin Minder (Vassar College)
- Steven Robinson (UW)
- Rei Ueyama (Cornell U)
- Mark Zelinka (Pennsylvania State U)



Kim Comstock (right), receiving 2003 Geotis Award from Brad Colman, STAC Commissioner.

Scholarships - Atmospheric Sciences Anonymous Endowed Fund

- Ryan Eastman
- Cynthia Peacock



Donor Recognition



The Department of Atmospheric Sciences gratefully acknowledges the donors who have generously supported us during the past fiscal year July 1, 2003 through June 30, 2004.

Gerhard Achtelek, Jr.	Michele & Todd Dankers	John Karamanian	Rajul Pandya	Jordan Sutton
Andrew Ackerman	Jean Dewart	Kristina & Michael Katsaros	Ethan Patashnik &	Robert Thompson
Theodore Anderson	Dale Durran	Thomas & Laura Kleespies	Jennifer Sims	John Thorp
Franklin & Helen Badgley	Charles Elderkin	Stephen Klein	William Poteet &	James Tillman
James and Carol Bassett	Anna & Robert Farber	Kevin and Sheri Kodama	Sally Schoenberg	Barbara Trimble
Robert Baughman	Brad Ferrier	Karen Kowalewsky	Richard & Joan Reed	Norman & Barbara Wagner
Robert Berkovitz	Jennifer & Peter Francis	Dennis Lamb	Robert Reeves	John M. Wallace
Harold Bernard &	Qiang Fu	Nrgar-Cheung Lau &	Jeffrey Renner	Jean Church Weick &
Christina Hilland-Bernard	Jack Gross	C.P.F. Hsu	Frances Replogle	Richard Weick
Michael Biggerstaff	Halstead & Lynne Harrison	Conway Leovy	Dale Rogers	William Whitcomb
Thomas Borda	Dennis & Lorraine Hartmann	William Lipscomb	David Rowe	Ming-Jen Yang
S. Edward Boselley	Angeline Hartmann	Jerrold McAlpine	Dorothy Russell	Xiaoli Zhu
Christopher Bretherton	Edward Hindman	Mary J. & John McDermott	Jason Sechrist	Xun Zhu
Richard & Suzanne Brintzenhof	Katherine Holland	James Murphy	Catherine Smith	
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Joost Businger	Ronald & Gail Irving	Frank Nishimoto	Hui Su	
Eugene Chermack	Ben Jong-Dao Jou	Janice Obuchowski	Ronald Surface	

Giving to the Department of Atmospheric Sciences

Please consider supporting the activities of the Department of Atmospheric Sciences. Your gift strengthens the core of the UW through recruitment and retention of world-class students and faculty. Your support of under-

graduate and graduate students helps to create the next generation of scientific leaders. Help us to ensure that the department continues to be a leader in weather, climate and air quality.

Yes, I want to support the Department of Atmospheric Sciences! I have enclosed \$_____ to support

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Please send your check, payable to the "University of Washington" to:
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50th Anniversary Reunion, January 2004

by Professor Dale Durran

About 150 alumni, faculty, staff and students gathered on January 13, 2004 to celebrate the 50th Anniversary of the Department of Atmospheric Sciences. Old acquaintances were renewed and new friendships were sparked over dinner and drinks at the UW Faculty Club overlooking Lake Washington. After the meal, former chairman Norbert Untersteiner recounted the history of the department with wit and historic photos, and three of our



Bob Fleagle with former student, Peggy LeMone



L-R: Eric Maloney, John Martin, David Battisti, Joe Barsugli



Kristina Katsaros, Tim Liu, Bob Reeves

current students, Kevin Rennert, Kim Comstock and Ryan Eastman briefly described their research and experiences in the department. A few photos from the dinner appear below.

By popular demand, we will organize reunions at future AMS Annual Meetings. Look for further details by email or at the conference information booth about our reunion at the 2005 Annual Meeting in San Diego. We hope to see you there.



Yuan Zhang and Elena Yulaeva



Dick Reed, David Battisti, C.P. Chang in background



Marianne and Joost Businger

Faculty Honors



Professor Peter Hobbs and Art Rangno

- Professor Peter Hobbs and Arthur Rangno have been officially recognized by the Guinness Book of Records for measuring the largest raindrops ever observed. The raindrops, which were at least 8.8 mm in maximum dimensions and possibly as large as 1 cm, were observed from a research aircraft over the Amazon Basin and also over the Marshall Islands.

The observations were reported in *Geophysical Research Letters* on 13 July 2004. Contacted by our Special Correspondent, Hobbs commented "Well I suppose it all comes down to this: after publishing over 350 papers and writing several books, the only thing for which I might possibly be remembered is observing the largest raindrop!"

- Professor Clifford Mass and Professor Christopher Bretherton were elected AMS Fellows in 2004.

- July 2004 Professor Peter Hobbs was made an Honorary Member of the ICCP. The only other Honorary Members are Horace Byers (deceased), Sir John Mason, and Hans Pruppacher.

- Cloud and Aerosol Research Group (CARG) reports are now available online at the CARG homepage: <http://cargsun2.atmos.washington.edu>.

Alumni Profile - Kristina Katsaros

by Professor Robert Fleagle

In autumn of 1957, Kristina Sander entered the University as an undergraduate student. The Swedish lilt of her excellent English immediately charmed the Department, and to this day that indicator of her spirit and personality marks her presence in any group. In 1960 she was awarded her B.S. degree and received the Department's Best Senior Award. Immigration law required that she return to Sweden, so Kristina and her new husband Mike Katsaros spent the following two years there.

Kristina began graduate study here in 1962 as one of Konrad Buettner's intrepid band of graduate student field researchers while at the same time beginning to raise a family. Her Ph.D. thesis on the temperature and salinity of the sea surface was completed in 1969, after which she began her research career working part-time on a series of projects concerned with air-sea interaction. In 1977 she was appointed to the teaching faculty half-time and was promoted to Professor in 1990.

Kristina has participated in an extensive list of air-sea interaction field programs and has collaborated with colleagues from many institutions and

countries. From 1976 to 1992 she was responsible for the summer course in Air-Sea Interaction (Atm Sci 462); and over that period, with support from NATO and NOAA, brought many students for the course from European and Asian countries. She has supervised the research of ten Master's students and five Ph.D. students.

In the early 1970's Kristina and Mike bought an old barn on Whidbey Island and proceeded to convert it over the next two decades into a spacious and fascinating home for family and visitors from far and near. Students, faculty, and visitors have enjoyed many social occasions there - contributing much to the spirit of helpfulness and warmth, that is sometimes described as characteristic of the Department.

Kristina has held short-term appointments as Visiting Scientist and Visiting Professor variously at Riso, Denmark; KNMI, The Netherlands; University of Paris; University of Qingdao, Qingdao, China; and University of Lisbon. From 1991 to 1997 she served as Director of the Department d'Océanographie Spatiale in Brest, France; while continuing to teach one course per year here and to supervise students. In 1997, she was appointed as Director of NOAA's



Professor Kristina Katsaros, University of Helsinki, Helsinki, Finland, May 10, 2004.

Atlantic Oceanographic and Meteorological Laboratory in Miami, Florida; at that time she resigned her Professorship and became an Affiliate Professor in this Department. In 2003, she retired from NOAA and returned to the Northwest and to part-time affiliation with the Department.

Kristina has been active as a member of NASA panels and committees and of other national organizations, and as a Council Member of the AMS. Currently she is Secretary of the Atmospheric and Hydrospheric Section of the AAAS. She received the AMS Sverdrup Award in 1997 and was elected to the National Academy of Engineering in 2001.

Corrections

Sasa Gabersek, '02 is employed at the University of Ljubljana (Slovenia), not at the U. of Zagreb (Croatia) as reported in the 2003 edition of Atmospheric Circulation.

M. J. McDermott's, '01 first name is Mary Jean not Mary Jane as reported in the 2003 edition of Atmospheric Circulation.

Alumni News

Rajul Pandya, Ph.D. '96, has been named Director of SOARS at UCAR.

Brian Mapes, Ph.D. '92, won the AMS Clarence Leroy Meisinger Award.

Margaret LeMone, Ph.D. '72, won the AMS Charles E. Anderson Award.

Eric Gritmit, M.S. '02, and Kari Gritmit became proud parents of Abigail (Abby) Marie Gritmit, born on July 14, 2004 at 7 lbs 5 oz.

Matt Carr, Ph.D. '01, and Holly Carr are moving to Washington, D.C. for one year.

Michelle Lambertson (Welborn), B.S. '94, is working on her masters degree in the Atmospheric Sciences Department at Ohio State.

Andrew Gettleman, Ph.D. '99, won the Editor's Award from the Journal of the Atmospheric Sciences.

Alum receives medal for heroism

The U.S. Department of Commerce presented Julia Ruthford with a gold medal, the Department of Commerce's most distinguished annual employee award, on December 5, 2003 for rescuing three young men from the chilly waters of Henderson Bay in Puget Sound.

Julia Ruthford, a meteorologist in the Juneau Weather Forecast Office graduated from the Atmospheric Sciences Department at the University of Washington with a B.S. in 1998 and was a former summer student employee at NWS Forecast Office in Seattle, Washington.

Julia was home for the holidays and windsurfing on December 27,

2002 in a full wetsuit near the Tacoma Narrows Bridge when she saw a catamaran flip over.

The NWS had posted wind speeds in excess of 40 mph on that day for Puget Sound and adjacent counties. Julia expertly sailed over to check the condition of the two men who quickly drifted about 100 yards from the boat in the high winds and rough seas, and then sailed back to the third man and helped him right the boat. Abandoning her own board, she climbed into the boat, sailed over to the other two men, and pulled them out of the water. She then sailed all three back to shore where paramedics took over and delivered the men to a local hospital.



Julia Ruthford, '98 surfing on Gastinau Channel, Alaska. Photo courtesy of Brian Wallace, Juneau Empire, August 8, 2002.

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