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Honoring air quality achievements



HAAGEN-SMIT *CLEAN AIR AWARDS*

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CALEPA HEADQUARTERS
SACRAMENTO, CALIFORNIA



**THE HAAGEN-SMIT CLEAN AIR AWARDS
ARE GIVEN ANNUALLY TO SCIENTISTS,
POLICY MAKERS, COMMUNITY LEADERS,
AND EDUCATORS FROM CALIFORNIA AND
AROUND THE WORLD WHO HAVE MADE
SIGNIFICANT LIFETIME CONTRIBUTIONS
TO THE ADVANCEMENT OF CLEAN AIR AND
CLIMATE CHANGE SCIENCE, TECHNOLOGY,
AND POLICY, THEREBY FURTHERING THE
PROTECTION OF PUBLIC HEALTH AND
PROSPERITY FOR ALL.**

Since 2001, the Air Resources Board has annually bestowed the distinguished Haagen-Smit Clean Air Awards. The awards are given to extraordinary individuals to recognize significant career accomplishments in at least one of these air quality categories: research, environmental policy, science and technology, public education and community service. Over the past 13 years there have been 37 acclaimed recipients. In light of the global connection between air quality and climate change, the scope of the program has now expanded to include an international focus and a focus on climate change science and mitigation.

PAST WINNERS

Alphabetical Order by Last Name

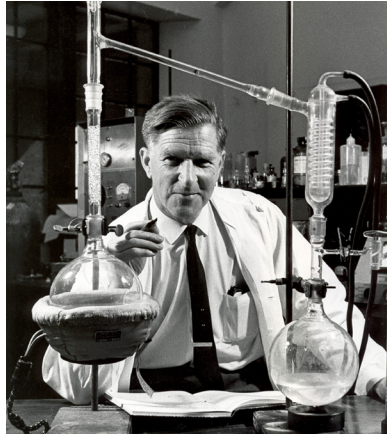
Arey, Janet · 2011	Lents, James · 2013
Atkinson, Roger · 2004	Lloyd, Alan · 2007
Bates, David · 2004	Loveridge, Ron · 2012
Belian, Timothy · 2005	Moore, Curtis · 2005
Billings, Leon · 2004	Nichols, Mary · 2002
Boyd, James · 2006	Oge, Margo · 2009
Cackette, Tom · 2012	Ohno, Teruyuki · 2013
Carter, William · 2005	Pavley, Fran · 2007
Chow, Judith · 2011	Peters, John · 2009
Denton, Joan · 2010	Pitts, James · 2002
Edgar, Bradley · 2010	Sawyer, Robert · 2008
Farrell, Alex · 2008	Seinfeld, John · 2003
Finlayson-Pitts, Barbara · 2013	Sharpless, Jananne · 2011
Friedrich, Axel · 2006	Sher, Byron · 2001
Froines, John · 2010	Walsh, Michael · 2003
Hansen, James · 2007	Wedaa, Henry · 2008
Holmes, John · 2001	White, V. John · 2003
Hricko, Andrea · 2012	Winer, Arthur · 2006
Johnson, Timothy · 2009	

“WE SHOULD HAVE LEARNED BY NOW THAT WE CANNOT HOPE TO CHANGE THE LAWS OF NATURE, BUT WE CAN CHANGE HUMAN INSTITUTIONS. THE ROAD IS NOT AN EASY ONE, BUT THE REWARD ... IS WORTH THE EFFORT.”

– DR. ARIE HAAGEN-SMIT

Dr. Arie Haagen-Smit

Dr. Arie Haagen-Smit, a native of the Netherlands, was a leader in developing air quality standards based on his research efforts. Known by many as the “father” of air pollution control, Dr. Haagen-Smit was a graduate of the University of Utrecht and a biochemistry professor at the California Institute of Technology in Pasadena for 16 years before beginning his air pollution research in 1948. At Caltech, Dr. Haagen-Smit studied the physiological aspects of natural products like rubber and pineapples. This work led to studies with his colleagues investigating the flavor components of wine, onions and garlic. His training and expertise in microchemistry, along with his natural curiosity, brought him to the forefront of air pollution research when he was asked by the county of Los Angeles to investigate the chemical nature of what we now call smog. Noticeably different from earlier accounts of haze and dust in London, which was caused by coal, the eye-irritating haze in Los Angeles was brown and almost odorless. Dr. Haagen-Smit applied his technique of studying plant chemistry in enclosed clear chambers exposed to sunlight to figure out what caused smog in the Los Angeles air basin.



Through a series of experiments, he concluded that most of California’s smog resulted from photochemistry – when substances in the exhaust from motor vehicles and the smokestacks of industrial facilities react with sunlight to create ozone. This breakthrough provided the scientific foundation for the development of both California’s, and the nation’s air pollution control programs. In recognition of this contribution, Dr. Haagen-Smit received the National Medal of Science in 1973, the nation’s highest scientific honor. He became the Air Resources Board’s first chairman in 1968 after serving eight years as an original board member of Air Resources Board’s predecessor, the Motor Vehicle Pollution Control Board. Dr. Haagen-Smit passed away in 1977, but his legacy lives on.

2014 HAAGEN-SMIT CLEAN AIR AWARD RECIPIENTS



Donald R. Blake, Ph.D

University of California, Irvine
Atmospheric Chemistry Research



Kirk R. Smith, Ph.D.

University of California, Berkeley
International Air Pollution Research



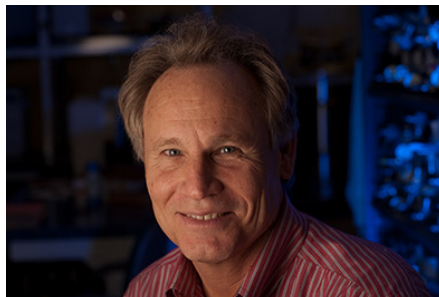
John C. Wall, Sc.D.

Cummins, Inc.
Emission Control Technology

Dr. Donald R. Blake

Atmospheric Chemistry Research

Dr. Donald Blake is a Professor of Chemistry at the University of California, Irvine. Professor Blake has spent over 30 years in the field of atmospheric chemistry research and is a world-renowned leader and innovator in sampling and analysis of atmospheric trace gases. Professor Blake has guided over 30 Ph.D. candidates during his career, and has authored and co-authored nearly 500 published scientific journal articles.



Professor Blake has carried out internationally acclaimed measurements of atmospheric volatile organic compounds (VOCs) that have provided unique and critical insights into their roles in air pollution and climate change. These measurements have been used to document that chlorofluorocarbon (CFC) emissions were decreasing as expected from regulatory efforts, and to determine that elevated air pollution in some cities such as Mexico City and Santiago, Chile was attributable to propane use rather than automobile exhaust as previously thought. Leading a diverse research team, Professor Blake has conducted the longest-running global measurements of key greenhouse gases such as methane and the CFCs, with unprecedented accuracy and precision. CFCs not only lead to upper atmosphere ozone

DR. BLAKE IS A WORLD-RENOWNED LEADER AND INNOVATOR IN SAMPLING AND ANALYSIS OF ATMOSPHERIC TRACE GASES.

destruction but are also potent greenhouse gases, so such measurements are critical for future predictions.

Professor Blake's work adapting and advancing the capabilities of atmospheric sampling continues to play an important role in validating satellite measurements and deepening our understanding of atmospheric chemistry.

Not only a renowned scientist, he has the ability to translate his scientific findings into public policy implications as well as fostering public understandings of air pollution and climate change impacts. He was one of

Cookstoves, driving further research and policy actions.

Professor Smith's research and influence spans beyond the field of household air pollution to energy and climate. He was a key participant in the Global Energy Assessment and was lead author of the health chapter in the Intergovernmental Panel on Climate Change's Fifth Assessment Report prepared by the Working Group on Impacts. He serves on a number of national and international scientific advisory committees including the National Research Council's Board on Atmospheric Science and Climate, the Executive Committee for the World Health Organization's Air Quality Guidelines, and the International Comparative Risk Assessment of the Global Burden of Disease Project.

He was elected as a member of the U.S. National Academy of Sciences in 1997. In 2009, he received the Heinz Prize in Environment and in 2012 was awarded the Tyler Prize for Environmental Achievement. We are proud to present Professor Kirk Smith a Haagen-Smit Clean Air Award.

Dr. Kirk R. Smith

International Air Pollution Research

Dr. Kirk R. Smith is the Professor of Global Environmental Health at the University of California, Berkeley and is founder and director of the campus-wide Masters Program in Global Health and Environment. He holds visiting professorships in India and China where he has worked since the early 1980s collecting field measurements, pursuing quantitative research, and working closely with medical and engineering professionals to bring clean air to residents of developing countries, particularly those who, by virtue of their household circumstances, suffer extremely high exposures to smoke from solid-fuel burning in traditional cookstoves.



Professor Smith's research and innovation has set out to improve the health of rural women and children. His foresight in the design of low-cost field-based instrumentation and protocols to capture the complexity in household air pollution (HAP) exposure profiles for vulnerable populations and application of novel methods brought rigor to the field and continue to further our understanding of HAP. His exposure research was critical in

DR. SMITH IS A LEADER IN RESEARCH AND INTERNATIONAL EFFORTS IN THE AREA OF HOUSEHOLD AIR POLLUTION FROM SOLID-FUEL BURNING TRADITIONAL COOKSTOVES.

the development of global burden of disease estimates by the World Health Organization, which now ascribes more than four million premature deaths to household smoke from solid fuels. He has documented the associated risk for pneumonia and adverse birth outcomes in children, and for cataracts, tuberculosis, heart disease, and chronic lung disease in women.

Professor Smith's leadership in the field provided the attention it needed and in 2003 the U.S. EPA initiated the Partnership for Clean Indoor Air and in 2010 the United Nations Foundations founded the Global Alliance for Clean

the initiators of the NASA SARP (Student Airborne Research Program), in which undergraduates from around the United States come to Irvine for an 8-week summer program to collect samples on the NASA DC-8 aircraft and then analyze them in a laboratory. The NASA SARP provides hands-on experience connecting VOC and CFC impacts and student interest in the sciences.

Professor Blake was awarded the Nobel Peace Prize in 2007 along with 2,500 other scientists for their work on the International Panel on Climate Change report. He has received other awards for his accomplishments, including election as a Fellow of the American Association for the Advancement in Science in 2008 and of the American Geophysical Union in 2009. In 2013, he received the American Chemical Society's Award for Creative Advances in Environmental Science and Technology. We are proud to present Professor Donald Blake a Haagen-Smit Clean Air Award.

John C. Wall, Sc.D.

Emission Control Technology

Dr. John C. Wall has served as the Vice President – Chief Technical Officer for Cummins Inc., since 2000. Cummins, Inc. designs, manufactures, distributes, and services diesel and natural gas engines and related technologies, including fuel systems, controls, air handling, filtration, emission solutions, and electrical power generation systems globally. Dr. Wall began his career at Cummins in 1986 after working in fuels research at Chevron Research Company, where his research team was the first to quantify the contribution of fuel sulfur to diesel particulate emissions. As Chief Technical Officer of Cummins, Dr. Wall leads an international technical organization with over 6,000 engineers in 17 major technical centers around the world, including the U.S., U.K., India, China, and Brazil, playing a major role in the policy and technological advancements in diesel emissions. He has consistently promoted a proactive environmentally conscious position for the industry.



was the first to introduce NO_x adsorber technology for heavy-duty diesel engines and the first to certify to the California and U.S. EPA 2010 emission standards with both diesel and natural gas products in 2007, three years ahead of the regulatory schedule. Cummins' 2013 engines met the first U.S. EPA greenhouse gas standards one year ahead of the regulatory schedule. His involvement extends globally to other countries as they have implemented clean air programs and to an even broader set of energy and environmental policies.

Throughout his career, Dr. Wall has been a trusted advisor and advocate for clean air programs to the U.S. EPA, Purdue University, Massachusetts Institute of Technology, National Academy of Engineering, and California Air Resources Board. He is a member of the National Academy of Engineering, a Fellow of the Society of Automotive Engineers (SAE) and has been awarded the SAE Horning Memorial Award and Arch T. Colwell Merit Award for research in the area of diesel fuel effects on emissions, and the American Society of Mechanical Engineers (ASME) Soichiro Honda Medal for outstanding leadership in the research, design, development, and production of low-emission, fuel-efficient diesel engines. We are proud to present Dr. John Wall a Haagen-Smit Clean Air Award.

DR. WALL HAS PLAYED A LEADERSHIP ROLE IN THE DEVELOPMENT AND IMPLEMENTATION OF ALL THE MAJOR TECHNOLOGY ADVANCEMENTS ULTIMATELY LEADING TO NEAR-ZERO LEVELS OF EMISSIONS FROM PARTICULATE MATTER AND LOW LEVELS OF EMISSIONS FOR OXIDES OF NITROGEN FROM BOTH ON- AND OFF-HIGHWAY ENGINES.

Dr. Wall has played a leadership role in the development and implementation of all the major technology advancements ultimately leading to the near-zero levels of emissions of particulate matter and low levels of emissions for oxides of nitrogen (NO_x) from both on- and off-highway engines. In 2002, Cummins was the first company to introduce cooled exhaust gas recirculation technology on commercial heavy-duty vehicles. Cummins