

# Official CV, including only publications since retirement

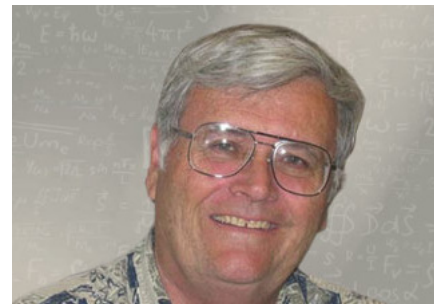
## **THOMAS A. CAHILL**

Professor, Physics (recalled), Atmospheric Sciences (Emeritus)

Director, DELTA “ $\delta$  Group” (Detection and Evaluation of Long-range Transport of Aerosols)

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Appointment of the Speaker of the Assembly for the scientist position on the California Inspection and Maintenance Review Committee

Date of Birth: March 1937, Place of Birth: Paterson, NJ

### ***Professional Preparation***

1965 Ph.D. in Physics, University of California, Los Angeles

1961 M.A. in Physics, University of California, Los Angeles

1959 B.A. in Physics, Holy Cross College, Worcester, MA

### ***Professional Experience***

2003 – present Professor (recalled), Department of Physics, UC Davis

1999 – 2003 Research Professor, College of Engineering, UC Davis

1997 – present Founder and Director,  $\delta$  Group (Determination of Extinction and Long Range Transport of Aerosols), University of California, Davis

1992 – 1997 Consultant, UN Global Atmospheric Watch Program (Kuwait; Aerosols; Quality Assurance) and Principal Investigator, World Bank Middle Eastern Aerosol Network (five sites)

1977 – 1997 Designer and Principal Investigator, US EPA and IMPROVE Program, Aerosols at National Parks and Monuments (76 sites)

1970 – 1997 Founder and head of the Air Quality Group at Crocker Nuclear Laboratory, University of California, Davis

1980 – 1989 Director, Crocker Nuclear Laboratory, University of California, Davis

1993 – 1994 Professor of Atmospheric Sciences and Physics, University of California, Davis

1972 – 1975 Director, Institute of Ecology, University of California, Davis

1967 – 1993 Professor of Physics, University of California, Davis

1966 – 1967 NATO Fellow, Centre d'Etudes Nucleaires, Saclay, France; OAS Fellow Chile 1968

1965 – 1966 Adjunct Professor, Physics, UCLA

### ***Selected Awards and Honors***

UC Davis Academic Senate Public Service Award 1994, American Lung Association Outstanding Scientist Volunteer 2002, Who's Who in the World 2003 – present; Appointed by the Speaker of the Assembly to the California Inspection and Maintenance Review Committee, (2006 – 2012), UC Davis Distinguished Emeritus Professor Award (2013 – 2014)

**List of Graduate Students, Ph.D. granted  
(Last 10 years, Major Professor)**

K. Bowers (Ecology); T. E. Gill (Earth Science and Resources); R. Givati (Atmospheric Sciences); P. Rezendes, R. Rickards, Roger Miller (Physics); E. Winegar (Chemistry), R.A. VanCuren (Geography), Jason Snyder (Geography)

**Additional Recent Activities**

2003 – present PI or co-PI in 12 studies – 1999-2004 ACE-Asia Scientific Planning Team (China 1999; Korea 1998; Japan 1997; PI NSF China and Japan 2001), Kyoto University research Fellow; Studies of World Trade Center collapse aerosols, Greenland Ice Cap aerosols (NSF Polar), Lake Tahoe highway aerosols (CalTrans/TRPA), San Joaquin Valley aerosols and asthma (Cal ARB), Hamilton County (Cincinnati) aerosols from highways, Roseville rail yard (EPA Region IX), and Lake Tahoe aerosols (EPA Region IX), Wilmington, LA, port aerosols (Ca Toxics), Beijing Olympics (NOAA), San Luis Obispo Oceano Dunes (SLOAPCD and EPA Region IX), Watt Ave/Sacramento Aerosols (ARB/ Sac Metropolitan AQMD): Aerosols and environmental justice, LA Ports (DTSC)

Supporting Scientist as head of the DELTA Group, on studies of Baghdad aerosols and soldier's health (DOD), Tuscarora Tunnel Aerosols (HEI), a Chilean Cu smelter, dust storms in Australia, a Czech coal-fired power plant, diesel exhaust (NREL), aerosols and orcas in the San Juan Strait (NMF), asthma in El Paso, Texas (NIH), and Alaskan Volcanoes (AVO);

**Public Service and Testimony since Retirement**

Expert testimony for the State Lands Commission, Mono Lake hearings before the California Water Resources Board (1994) (pro bono)

Submitted extensive testimony on the anticipated failure of proposed activities at Owens (dry) Lake (1997) \$1.2 billion has been spent, and the dust storms are worse.

Congressional Hearings testimony on the World Trade Center Collapse (2002) (pro bono)

Expert for the California Attorney General in air quality impacts of the Sierra Pacific Industries Lincoln co-gen facility

Appointed member of the California Inspection and Maintenance Review Committee 2006 – 2011 (pro bono)

Scientific support and testimony for legal victories and settlements, Sierra Pacific co-gen (Lincoln), Terminal island car shredder, Exide battery plant, totaling roughly \$15 million.

**Current and Recent Research Studies**

**A. Inventions and developments**

1. Designed, built, and calibrated a new aerosol analysis beam line 10.3.1 at the Advanced Light Source, Lawrence Berkeley NL (1997 – present)
2. Developed unique aerosol sampling capabilities for the difficult conditions on the Greenland summit site (2003 – present)
3. Designed, built, and calibrated a new aerosol analysis beam line 2.2 at the Stanford Synchrotron Radiation Lightsource, SLAC, Stanford NL (2011 – present)



**Recent talks at scientific meetings**

May 2014, CMDL Meeting on global climate, Boulder CO

June 2014 Goldschmidt meeting on geochemistry, Sutter's Mill meteorite, Sacramento, CA

June, 2014 Impact of ship aerosols on human health in Los Angeles, Air and Waste Management, Assoc., Long Beach, CA

**General Publications:** Science fiction novels (all at Amazon, Barnes and Noble, and local book stores)

1. *Annals of the Omega Project* (trilogy) (2012)
2. *Ark Asteroid* trilogy:
  - a. *Ark: Asteroid Impact* (2013)
  - b. *Ark: Diaspora* (2013)
  - c. *Ark: Post-Asteroid Eden* (2014)
3. *Greenhouse Redemption of the Planet Kraal* (2014)

**Magazine articles:**

1. "The Bag," about my World Trade Center work, *Esquire* (April 2007)
2. "Catholics at Work," *America* magazine (2009)
3. "A Greater Reality," *America* magazine (October 14, 2014)

Selected refereed publications of Professor Thomas A. Cahill since retirement, 1994. Total peer-reviewed publications since retirement are 63, including journal articles, 44, and conference reports, 19.

Cahill, Thomas A., David E. Barnes, Jonathan A Lawton, Roger Miller, Nicholas Spada, Robert D. Willis and Sue Kimbrough. "**Transition Metals in Coarse, Fine, Very Fine and Ultra-fine Particles From an Interstate Highway Transect Near Detroit,**" *Atmospheric Environment* 145 (2016): 158 – 175.

Cahill, Thomas A., David E. Barnes, Leann Wuest, Sean Barberie, David Gribble, David Buscho, Jason Snyder, Roger S. Miller, and intern Camille De la Croix. "**Artificial Ultra-fine Aerosol Tracers for Highway Transect Studies,**" *Atmospheric Environment* 136 (JULY 2016): 21 – 4.

Cahill, T.A., Barberie, S, and Yin, Q-Z. "**Elemental Comparison Between Sutter's Mill and Murchison,**" Goldschmidt Geochemistry Conference, Sacramento (2014).

Barberie, Sean R., Christopher R. Iceman, Catherine F. Cahill, and Thomas M. Cahill. "**Evaluation of Different Synchrotron Beamline Configurations for X-ray Fluorescence Analysis of Environmental Samples.**" *Anal. Chem.*, 86 (2014): 8253–8260, Adx.doi.org/10.1021/ac5016535.

Cahill, Thomas A., David E. Barnes, Nicholas J. Spada. "**Seasonal Variability of Ultra-fine Metals Downwind of a Heavily Traveled Secondary Road,**" *Atmospheric Environment* 94 (2014) 173 – 179.

Cahill, Thomas M. "**Annual Cycle of Size-resolved Organic Aerosol Characterization in an Urbanized Desert Environment,**" *Atmos. Environ.* 71 (2013): 226 – 233.

Baldauf, Richard, Greg McPherson, Linda Wheaton, Max Zhabg, Tom Cahill, Chad Bailey, Christina Hemphill-Fuller, Earl Withycombe, and Kori Titus. "**Integrating Vegetation and Green Infrastructure into Sustainable Transportation Planning,**" *Transportation Research Bulletin*, National Academy of Sciences (2013).

Cahill, Thomas M., and Thomas A. Cahill. **Seasonal variability of particle-associated organic compounds near a heavily traveled secondary road.** *Aerosol Science and Technology*: (2013) doi: 10.1080/02786826.2013.857757.

Jenniskens, Peter, Marc D. Fries, Qing-Zhu Yin, Michael Zolensky, Alexander N. Krot, Scott A. Sandford, Derek Sears, Robert Beauford, Denton S. Ebel, Jon M. Friedrich, Kazuhide Nagashima, Josh Wimpenny, Akane Yamakawa, Kunihiro Nishiizumi, Yasunori Hamajima, Marc W. Caffee, Kees C. Welten, Matthias Laubenstein, Andrew M. Davis, Steven B. Simon, Philipp R. Heck, Edward D. Young, Issaku E. Kohl, Mark H. Thiemens, Morgan H. Nunn, Takashi Mikouchi, Kenji Hagiya, Kazumasa Ohsumi, Thomas A. Cahill, Jonathan A. Lawton, David Barnes, Andrew Steele, Pierre Rochette, Kenneth L. Verosub, Jérôme Gattacceca, George Cooper, Daniel P. Glavin, Aaron S. Burton, Jason P. Dworkin, Jamie E. Elsila, Sandra Pizzarello, Ryan Ogliore, Phillipe Schmitt-Kopplin, Mourad Harir, Norbert Hertkorn, Alexander Verchovsky, Monica Grady, Keisuke Nagao, Ryuji Okazaki, Hiroyuki Takechi, Takahiro Hiroi, Ken Smith, Elizabeth A. Silber, Peter G. Brown, Jim Albers, Doug Klotz, Mike Hankey, Robert Matson, Jeffrey A. Fries, Richard J. Walker, Igor Puchtel, Cin-Ty A. Lee, Monica E. Erdman, Gary R. Eppich, Sarah Roeske, Zelimir Gabelica, Michael Lerche, Michel Nuevo, Beverly Girten, Simon P. Worden. **“Radar-enabled Recovery of the Sutter’s Mill Meteorite, a Carbonaceous Chondrite Regolith Breccia,”** *Science*, 338:1583-1587 (2012) doi: 10.1126/science.1227163

VanCuren, Richard, Thomas Cahill, John Burkhart, David Barnes, Yongjing Zhao, Kevin Perry, Steven Cliff, and Joe McConnell. **“Aerosols and Their Sources at Summit Greenland – First Results of Continuous Size- and Time-resolved Sampling.”** *Atmospheric Environment*, 52 (2012): 82-97 doi:10.1016/j.atmosenv.2011.10.047.

Barberie, Sean R., Christopher R. Iceman, Catherine F. Cahill, and Thomas M. Cahill. **“Evaluation of Different Synchrotron Beamline Configurations for X-ray Fluorescence Analysis of Environmental Samples,”** *Anal. Chem.*, 86 (2014): 8253–8260, Adx.doi.org/10.1021/ac5016535.

Cahill, Thomas A., David E. Barnes, Nicholas J. Spada. **“Seasonal Variability of Ultra-fine Metals Downwind of a Heavily Traveled Secondary Road,”** *Atmospheric Environment* 94 (2014): 173 - 179.

Baldauf, Richard, Greg McPherson, Linda Eaton, Max Zhang, Tom Cahill, Chad Bailey, Christina Hemphill-Fuller, Earl Withycombe, and Kori Titus. **“Integrating Vegetation and Green Infrastructure into Sustainable Transportation Planning,”** *Transportation Research Bulletin* (2013), National Academy of Sciences.

Cahill, Thomas M., and Thomas A. Cahill. **“Seasonal Variability of Particle-associated Organic Compounds Near a Heavily Traveled Secondary Road.”** *Aerosol Science and Technology*, (2013) accepted manuscript (2013), doi: 10.1080/02786826.2013.857757.

Barberie, S. R., T.A. Cahill, C.F. Cahill, T.M. Cahill, C.R. Iceman, and D.E. Barnes. **“UC Davis XIPLINE (“zipline”) End-station at the Stanford Synchrotron Radiation Lightsource: Development and Experimental Results.”** *Nucl. Instrum. Meth. Phys. Res. A: Accelerators, Spectrometers, Detectors and Associated Equipment* ,729 (2013): 930-933 doi:10.1016/j.nima.2013.08.043.

Jenniskens, Peter (NASA), ... Thomas A. Cahill, David Barnes, Jonathan Lawton (UC Davis) and 66 additional authors. **“Radar Enabled Recovery of Sutter’s Mill: A Unique Carbonaceous Chondrite Regolith Breccia,”** *Science Magazine* 338 (2012): 1583-1587, doi: 10.1126/science.1227163.

VanCuren, Richard A., Thomas A. Cahill, John Burkhart, David Barnes, Yongjing Zhao, Kevin Perry, Steven Cliff, and Joe McConnell. **“Aerosols and Their Sources at Summit Greenland – First Results of Continuous Size- 1 and Time-resolved Sampling,”** *Atmospheric Environment* (2011).

Cahill, Thomas A., David E. Barnes, Earl Withycombe, and Mitchell Watnik. **“Very Fine and Ultra-fine Metals and Ischemic Heart Disease in the California Central Valley 2: 1974 – 1991,”** *Aerosol Science and Technology* 45, 1135-1142 (2011)

Cahill, Thomas A., David E. Barnes, Nicholas J. Spada, Jonathan A. Lawton, and Thomas M. Cahill. **“Very Fine and Ultra-fine Metals and Ischemic Heart Disease in the California Central Valley 1: 2003 – 2007,”** *Aerosol Science and Technology* 45 (2011): 1125-1134.

Cahill, Thomas A., Thomas M. Cahill, David E. Barnes, Nicholas J. Spada, and Roger Miller. **“Inorganic and Organic Aerosols Downwind of California’s Roseville Railyard,”** *Aerosol Science and Technology* 45 (2011): 1049-1059.

Cahill, Catherine F., Peter G. Rinkleff, Jonathan Dehn, Peter V. Webley, Thomas A. Cahill, and David E. Barnes. **“Aerosol Measurements From a Recent Alaskan Volcanic Eruption: Implications for Ash Transport Predictions,”** *J. Volcanology and Geothermal Research* 198 (2010): 76–80.

Cahill, Catherine F., Thomas A. Cahill, and Kevin D. Perry. **“The Size- and Time-resolved Composition of Aerosols From a Sub-Arctic Boreal Fire Prescribed Burn.”** *Atmospheric Environment* 42 (2009): 7553-7559.

Gertler, Alan W., Andrzej Bytnerowicz, Thomas A. Cahill, Michael Arbaugh, Steven Cliff, Jülide Kahyaoglu-Koračin, Leland Tarney, Rocio Alonso, and Witold Fraczek. **“Local Air Pollutants Threaten Lake Tahoe’s Clarity.”** *California Agriculture*, Vol. 60 Num. 2 (2006): 49-58.

Cahill, Thomas A., Steven S. Cliff, Michael Jimenez-Cruz, James F. Shackelford, Michael Dunlap, Michael Meier, Peter B. Kelly, Sarah Riddle, Jodye Selco, Graham Bench, Patrick Grant, Dawn Ueda, Kevin D. Perry, and Robert Leifer. **“Analysis of Aerosols From the World Trade Center Collapse Site, New York, October 2 to October 30, 2001.”** *Aerosol Science and Technology* 38 (2004): 165–183.

Han, J.S, K.J. Moon, J.Y. Ahn, Y.D. Hong, Y.J Kim, S. Y. Rhu, Steven S. Cliff, and Thomas A. Cahill. **“Characteristics of Ion Components and Trace Elements of Fine Particles at Gosan, Korea, in Springtime from 2001 to 2002,”** *Environmental Monitoring and Assessment*, 92 (2004): 73, doi.org/10.1023/B:EMAS.0000014510.21563.50.

Seinfeld, J.H., G.R. Carmichael, R. Arimoto, W.C. Conant, F.J. Brechtel, T.S. Bates, T.A. Cahill, A.D. Clarke, B.J. Flatau, B.J. Huebert, J. Kim, K.M. Markowicz, S.J. Masonis, P.K. Quinn, L.M. Russell, P.B. Russell, A. Shimizu, Y. Shinozuka, C.H. Song, Y. Tang, I. Uno, A.M. Vogelmann, R.J. Weber, J-H. Woo, and Y. Zhang. **“ACE-Asia: Regional Climatic and Atmospheric Chemical Effects of Asian Dust and Pollution,”** *Bulletin American Meteorological Society* 85, no. 3 (March 2004): 367.

Cahill, T. A., S.S. Cliff, J.F. Shackelford, M. Meier, K.D. Perry, G. Bench, and R. Leifer. **“Very Fine Aerosols From the World Trade Center Collapse Piles: Anaerobic Incineration?”** *Advances in Chemistry* (2004).

Leifer, R. Z., G. Bench, and T. A. Cahill. **“Characterization of the Plumes Passing Over Lower Manhattan After the WTC,”** *Advances in Chemistry* (2004).

Gill, Thomas E., Thomas A. Cahill, Scott A. Copeland, and Bruce R. White. **“Sand Fences for Control**

- of Wind Erosion and Dust Emission at Owens lake, CA: Full-scale Testing, Field Deployment, and Evaluation of Effectiveness, Dispersion Particulate A12.1, 2773-2780 (2003),”** *11<sup>th</sup> International Conference on Wind Engineering Texas Tech (2002)*.
- Shackelford, J.F., P.B. Kelly, S.S. Cliff, M. Jimenez-Cruz, and T.A. Cahill. **“Characterizing Particulate Emissions Using Micrometer-scale X-ray Fluorescence.”** *Ceramic Transitions* 143 (2003): 59–66.
- Reuter, John E., Thomas A. Cahill, Steven S. Cliff, Charles R. Goldman, Alan C. Heyvaert, Alan D. Jassby, Susan Lindstrom, and Davis M. Rizzo. **“An Integrated Watershed Approach to Studying Ecosystem Health at Lake Tahoe, CA-NV,”** in *Managing for Healthy Ecosystems*, eds. Rapport et al., 1283–1298, New York: CRC Press, 2003.
- VanCuren, Richard A., and Thomas A. Cahill. **“Asian Aerosols in North America: Frequency and Concentration of Fine Dust,”** *Journal Geophysical Research* 107, no. D24 (2002): 4804.
- Bench, Graham, Patrick Grant, Dawn Ueda, Steven Cliff, Kevin Perry, and Thomas A. Cahill. **“The Use of STIM and PESA to Measure Profiles of Aerosol Mass and Hydrogen Content, Respectively, Across Mylar Rotating Drums Impactor Samples.”** *Aerosol Science and Technology* 36 (2002):642-651.
- Miller, Alan E., and Thomas A. Cahill. **“Size and Compositional Analyses of Biologically Active Aerosols from a CO<sub>2</sub> and Diode Laser Plume.”** *International Journal of PIXE*. Vol. 9, nos. 3 & 4.5 (2000).
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- Perry, Kevin D., Thomas A. Cahill, Russell C. Schnell, and Joyce M. Harris. **“Long-range Transport of Anthropogenic Aerosols to the NOAA Baseline Station at Mauna Loa Observatory, Hawaii.”** *Journal of Geophysical Research Atmospheres*. Vol. 104, no. D15 (1999) 18,521–18,533.
- Cahill, Thomas A., and Robert A. Eldred. **“Particulate Selenium in the Atmosphere.”** *Environmental Chemistry of Selenium*, eds. W.T. Frankenberger and R.A. Engberg, Marcel Dekker, 613–632. New York: Marcel Dekker (1998).
- Turn, S.Q., B.M. Jenkins, J.C. Chow, L.C. Pritchett, D. Campbell, T. Cahill, and S. A. Whalen. **“Elemental Characterization of Particulate Matter Emitted From Biomass Burning: Wind Tunnel Derived Source Profiles for Herbaceous and Wood Fuels.”** *Journal of Geophysical Research*, 102 (1997): 3683-3699.
- Eldred, Robert A., and Thomas Cahill. **“Sulfate Sampling Artifact From SO<sub>2</sub> and Alkaline Soil.”** *Environmental Science & Technology*. Vol. 31, No. 5 (1997) 1320-1324.
- Cahill, T.A., and J. Zubillaga. **“The Role of Ion Beam Based Analyses in Global Climate Research.”** *Application of Accelerators I Research and Industry*, Proceedings of the Fourteenth International Conference, Denton Texas, Part One (1997), 525-529.
- Perry, Kevin, T.A. Cahill, R.A. Eldred, D.D. Dutcher, and T.E. Gill. **Long-range Transport of North African Dust to the Eastern United States.”** *Journal of Geophysical Research-Atmospheres*, 102, D10 (1996): 11,225–11,238.
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- Cahill, Thomas A., Roberto Morales, and Javiere Miranda. **“Comparative Aerosol Studies of Pacific Rim Cities – Santiago, Chile (1987); Mexico City (1987-1990); and Los Angeles, USA (1973-1987).”** 1996 *Atmospheric Environment* 30, no. 5 (1996): 747–749.
- Cahill, T.A., P. Wakabayashi, and T. James. **“Chemical State of Sulfate at Shenandoah National Park During Summer 1991.”** *Nuclear Instruments and Methods in Physics Research B: Beam Interactions with Materials and Atoms*, 109/110 (1996): 542–547.
- Cahill, Thomas A., John J. Carroll, Dave Campbell, Thomas E. Gill. **“Status of the Sierra Nevada, Chapter 48, Air Quality.”** *Sierra Nevada Ecosystem Project, Final Report to Congress*. Wildland Resources Center Report no. 37, University of California, Davis. Volume II (1996): 1227–1261.
- Miranda, J., E. Andrade, A. Lopez-Suarez, R. Ledesma, T.A. Cahill, P.H. Wakabayashi. **“A Receptor Model for Atmospheric Aerosols From a Southwestern Site in Mexico City.”** *Atmospheric Environment* 30, no. 20 (1996): 3471–3479.
- Cahill, Thomas A. **“Compositional Analysis of Atmospheric Aerosols.”** 1995 *Particle Induced X-Ray Emission Spectrometry*, eds. Sven A. E. Johansson, John L. Campbell, and Klas G. Malmqvist, 237–311. *Chemical Analysis Series*, vol. 133. Somerset, NJ: John Wiley & Sons Inc.
- Perry, Kevin D., and Thomas A. Cahill. **“Spatial and Temporal Patterns of Fine (PM \*2.5) Particles in Western Washington State.”** *Atmospheric Environment* (1995).
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- Malm, W. C., K.A. Gebhart, J. Molenar, T.A. Cahill, R.E. Eldred, and D. Huffman. **“Examining the Relationship Between Atmospheric Aerosols and Extinction at Mount Rainier National Park.”** *Atmospheric Environment* 28, no. 2 (1994): 347–360.
- Eldred, Robert A., and Thomas A. Cahill. **“Trends in Elemental Concentrations of Fine Particles at Remote Sites in the United States.”** *Atmospheric Environment* 28, no. 5 (1994): 1009–1019.
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- Miranda, Javier, Thomas A. Cahill, and J. Roberto Morales. **“Determination of Elemental Concentrations in Atmospheric Aerosols in Mexico City Using Proton-induced X-ray Emission, Proton Elastic Scattering, and Laser Absorption.”** *Atmospheric Environment* 28, no. 14 (1994): 2299–2306.