

Curriculum Vitae
CHARLES S. ZENDER

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SPECIALTIES AND INTERESTS

Atmospheric Physics, Cloud and Aerosol Microphysics and Chemistry, Deposition, Erosion, Global Climate and Climate Change, Natural Aerosols, Particle Composition and Optical Properties, Particle Scavenging, Radiative Transfer and Radiative Forcing

PROFESSIONAL APPOINTMENTS

- 2005–now University of California at Irvine – Associate Professor of Earth System Science
- 1999–2005 University of California at Irvine – Assistant Professor of Earth System Science
- 2000–2006 National Center for Atmospheric Research (NCAR), Boulder, CO – Affiliate Scientist of the Climate and Global Dynamics (CGD) Division
- 1998–1999 NCAR – Visiting Scientist in Atmospheric Chemistry and CGD Divisions
- 1996–1998 NCAR – Postdoctoral fellow in Advanced Study Program
- 1991–1996 University of Colorado at Boulder and NCAR CGD – Graduate research assistant
- 1991 College of the Atlantic, Bar Harbor, ME – Visiting Faculty in Physical Sciences
- 1989–1990 Smithsonian Astrophysical Observatory, Cambridge, MA – Physicist, Technician

EDUCATION

- Ph.D. (1996) Atmospheric Sciences, University of Colorado, Boulder. “Representation of tropical cirrus anvil in climate models”, Advisors: Jeffrey Kiehl and Gary Thomas
- M.S. (1993) Atmospheric Sciences, University of Colorado, Boulder.
- B.A. (1990) Physics, Harvard University

REFEREED PUBLICATIONS

- Zender, C. S., and J. T. Kiehl (1994), Radiative sensitivities of tropical anvils to small ice crystals, *J. Geophys. Res.*, **99**(D12), 25869–25880.
- Zender, C. S., B. Bush, S. K. Pope, A. Bucholtz, W. D. Collins, J. T. Kiehl, F. P. J. Valero, and J. Vitko Jr. (1997), Atmospheric absorption during the Atmospheric Radiation Measurement (ARM) Enhanced Shortwave Experiment (ARESE), *J. Geophys. Res.*, **102**(D25), 29901–29915.
- Zender, C. S., and J. T. Kiehl (1997), Sensitivity of climate simulations to radiative effects of tropical anvil structure, *J. Geophys. Res.*, **102**(D20), 23793–23803.
- Cess, R. D., M. Zhang, F. P. J. Valero, S. K. Pope, A. Bucholtz, B. Bush, C. S. Zender, and J. Vitko Jr. (1999), Absorption of solar radiation by the cloudy atmosphere: Further interpretations of collocated aircraft measurements, *J. Geophys. Res.*, **104**(D2), 2059–2066.
- Zender, C. S. (1999), Global climatology of abundance and solar absorption of oxygen collision complexes, *J. Geophys. Res.*, **104**(D20), 24471–24484.

- Collins, W. D., P. J. Rasch, B. E. Eaton, B. Khattatov, J.-F. Lamarque, and C. S. Zender (2001), Forecasting aerosols using a chemical transport model with assimilation of satellite aerosol retrievals: Methodology for INDOEX, *J. Geophys. Res.*, **106**(D7), 7313–7336.
- Yu, S., C. S. Zender, and V. K. Saxena (2001), Direct radiative forcing and atmospheric absorption by boundary layer aerosol in the southeastern US: model estimates on the basis of new observations, *Atmos. Env.*, **35**(23), 3967–3976.
- Grini, A., C. S. Zender, and P. Colarco (2002), Saltation sandblasting behavior during mineral dust aerosol production, *Geophys. Res. Lett.*, **29**(18), 1868, doi:10.1029/2002GL015248.
- Collins, W. D., P. J. Rasch, B. E. Eaton, D. W. Fillmore, J. T. Kiehl, C. T. Beck, and C. S. Zender (2002), Simulation of Aerosol Distributions and Radiative Forcing for INDOEX: Regional Climate Impacts, *J. Geophys. Res.*, **107**(D19), 8028, doi:10.1029/2000JD000032.
- Mahowald, N. M., C. S. Zender, C. Luo, D. Savoie, O. Torres, and J. del Corral (2002), Understanding the 30 year Barbados desert dust record, *J. Geophys. Res.*, **107**(D21), 4561, doi:10.1029/2002JD002097.
- Zender, C. S., H. Bian, and D. Newman (2003), Mineral Dust Entrainment And Deposition (DEAD) model: Description and 1990s dust climatology, *J. Geophys. Res.*, **108**(D14), 4416, doi:10.1029/2002JD002775.
- Bian, H., and C. S. Zender (2003), Mineral dust and global tropospheric chemistry: Relative roles of photolysis and heterogeneous uptake, *J. Geophys. Res.*, **108**(D21), 4672, doi:10.1029/2002JD003143.
- Zender, C. S., D. Newman, and O. Torres (2003), Spatial Heterogeneity in Aeolian Erodibility: Uniform, Topographic, Geomorphic, and Hydrologic Hypotheses, *J. Geophys. Res.*, **108**(D17), 4543, doi:10.1029/2002JD003039.
- Ammann C. M., J. T. Kiehl, C. S. Zender, B. L. Otto-Bliesner, and R. S. Bradley (2004): Coupled simulations of the 20th century including external forcing, In Press in *J. Climate*.
- Ammann, C. M., G. A. Meehl, W. M. Washington, and C. S. Zender (2003), A Monthly and Latitudinally Varying Volcanic Forcing Dataset in Simulations of 20th Century Climate, *Geophys. Res. Lett.*, **30**(12), 1657, doi:10.1029/2003GL016875.
- Grini, A., and C. S. Zender (2004), Roles of saltation, sandblasting, and wind speed variability on mineral dust aerosol size distribution during the Puerto Rican Dust Experiment (PRIDE), *J. Geophys. Res.*, **109**(D7), D07202, doi:10.1029/2003JD004233.
- Bian, H., and C. S. Zender (2003), Heterogeneous impact of dust on tropospheric ozone: Sensitivity to season, species, and uptake rates, Submitted to *J. Geophys. Res.*.
- Grini, A., G. Myhre, C. S. Zender, and I. S. A. Isaksen (2005), Model simulations of dust sources and transport in the global troposphere, *J. Geophys. Res.*, **110**(D2), D02205, doi:10.1029/2004JD005037.
- Zender, C. S., R. Miller, and I. Tegen (2004), Quantifying Mineral Dust Mass Budgets: Terminology, Constraints, and Current Estimates, *Eos Trans. AGU*, **85**(48), 509–512.
- Flanner, M. G., and C. S. Zender (2005), Snowpack Radiative Heating: Influence on Tibetan Plateau Climate, *Geophys. Res. Lett.*, **32**(6), L06501, doi:10.1029/2004GL022076.
- Zender, C. S., and E. Y. Kwon (2005), Regional Contrasts in Dust Emission Responses to Climate, *J. Geophys. Res.*, **110**(D13), D13201, doi:10.1029/2004JD005501.
- Zender, C. S., and J. Talamantes (2006), Solar Absorption by Mie Resonances in Cloud Droplets, *J. Quant. Spectrosc. Radiat. Transfer*, **98**(1), 122–129, doi:10.1016/j.jqsrt.2005.05.084.
- Zender, C. S., and J. Talamantes (2006), Climate controls on valley fever incidence in Kern County, California, *Int. J. Biometeorol.*, **59**(3), 174–182, doi:10.1007/s00484-005-0007-6.
- Flanner, M. G., and C. S. Zender (2006), Linking Snowpack Microphysics and Albedo Evolution, In Press in *J. Geophys. Res.*.

- Cakmur, R. V., R. L. Miller, J. Perlwitz, D. Koch, I. V. Geogdzhayev, P. Ginoux, I. Tegen, and C. S. Zender (2006), Constraining the Magnitude of the Global Dust Cycle by Minimizing the Difference Between a Model and Observations, In Press in *J. Geophys. Res.*.
- Mahowald, N. M., D. Muhs, S. Levis, P. Rasch, M. Yoshioka, and C. S. Zender (2006), Change in atmospheric mineral aerosols in response to climate: last glacial period, pre-industrial, modern and doubled carbon dioxide climates, In Press in *J. Geophys. Res.*.
- Washington, R., M. C. Todd, G. Lizcano, I. Tegen, C. Flamant, I. Koren, P. Ginoux, S. Engelstaedter, C. Bristow, C. Zender, A. Goudie, A. Warren, J. M. Prospero (2006), Links between topography, wind, deflation, lakes and dust: The case of the Bodélé Depression, Chad, In Press in *Geophys. Res. Lett.*.

CURRENT FUNDING

- PI NASA NAG5-10546 “Influence of Mineral Dust Aerosol on the Chemical Composition of the Atmosphere”, 1/1/2001–12/31/2004
- Co-PI NSF ATM-0214430 “Collaborative Proposal: Using Measurements from the Columbia Plateau Eolian System to Improve Global-Scale Models of Mineral-Dust Aerosols”, PI: A. Busacca, 8/1/2002–7/31/2005
- PI NSF ATM-0321380 “Acquisition of an Earth System Modeling Facility for Coupled Climate, Chemistry, and Biogeochemistry Studies”, 8/1/2003–7/31/2006.
- Co-I NSF CNS-0421554 “HIPerWall: A High-Performance Visualization System for Collaborative Earth System Sciences”, 9/1/2004–8/31/2007.
- PI NSF IIS-0431203 “SEI(GEO): Scientific Data Operators Optimized for Distributed Interactive and Batch Analysis of Tera-Scale Geophysical Data”, 9/1/2004–8/31/2007.

SERVICE

- Member, [California Climate Change Advisory Committee](#), 2004–present
- Peer-review for CRDF, *Frontiers in Eco. Evol.*, *Geophys. Res. Lett.*, *Global Biogeochem. Cycles*, *Global Plan. Change*, *J. Arid. Env.*, *J. Atmos. Sci.*, *J. Climate*, *J. Geophys. Res. Atmospheres*, *J. Geophys. Res. Solid Earth*, *Kuwait J. Sci. Eng.*, *Mon. Weather Rev.*, NASA (GMAP, IDS, RSP, TCP), *Nature*, NERC (UK), NOAA (OAR, OGP), NSF (ATM, CHE, MRI, SEI-GEO Panel), *Q. J. R. Meteorol. Soc.*, *Tellus*, USGCRP/IPCC (TAR), USCCSP/IPCC (AR4)
- Maintainer of NCAR CCM Column Radiation Model (<http://www.cgd.ucar.edu/cms/crm>). 1996–present.
- Author and administrator of NCO netCDF Operators (<http://nco.sourceforge.net>), a freely available geophysical data manipulation toolkit. 1995–present.
- Author and maintainer of Enhanced Absorption Bibliography (http://dust.ess.uci.edu/ppr/bib_aca.pdf). 1997–present.

HONORS

- Outstanding Student Presentation in Atmospheric Sciences Section, Fall AGU Meeting, San Francisco CA, 1995
- Outstanding Contributions to Undergraduate Education Award, UC Irvine, 2001–2002

COURSES TAUGHT

Earth System Science 5, The Atmosphere: Spring 2000, 2001, 2002, 2003, 2004, 2005
Earth System Science 199, Undergraduate Research: Spring 2000, Fall 2000, Spring 2002,
Fall 2002
Earth System Science 200B, Earth System Physics: Fall 2002, 2003, 2004
Earth System Science 204B, The Planetary Boundary Layer: Winter 2004, 2005
Earth System Science 236, Radiative Transfer & Remote Sensing: Winter 2001
Earth System Science 282, Topics in Climate, Aerosol-Cloud-Climate Interactions: Winter
2002
Earth System Science 286, Topics in Biogeochemistry, Chemistry, Composition, and Climate:
Fall 2002
Earth System Science 298, Practicum in Earth System Science: Spring 2003

STUDENTS

Member of Thesis committee: Aaron Berg (UCI), Huisheng Bian (UCI), Sarah Bortz (UCI),
Alf Grini (University of Oslo), Brian Kahn (UCLA), Marco Rodriguez (UCI)
Chair of Thesis committee: Mark Flanner (UCI), Eun Young Kwon (UCI)
Postdoctoral scholars supervised: Huisheng Bian (now at NASA GSFC).
Total number of graduate students supervised: 3.
Total number of postgraduate scholars sponsored: 1.

COLLABORATORS

C. A. Ammann (NCAR), H. Bian (NASA/UMBC), G. B. Bonan (NCAR), A. Busacca
(WSU), P. Chavez (USGS), P. Colarco (NASA GSFC), W. D. Collins (NCAR), J. Famiglietti
(UCI), D. Gaylord (WSU), A. Grini (U. Oslo), J. T. Kiehl (NCAR), F. Kuester (UCI), N. M.
Mahowald (NCAR), J. Meyer (UCI), J. K. Moore (UCI), G. Okin (U. Virginia), R. Pajarola
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GSFC), F. P. J. Valero (Scripps), S. Yu (Duke)