

Biographical Sketch
CHARLES S. (CHARLIE) ZENDER

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a. HISTORY OF EMPLOYMENT

7/12– Professor of Computer Science, University of California, Irvine (UCI)
7/10– Professor of Earth System Science, UCI
9/10–8/13 Vice Chair of Graduate Studies, Department of Earth System Science, UCI
7/05–6/10 Associate Professor of Earth System Science, UCI
8/07–8/08 Visiting Researcher, Laboratoire de Glaciologie et Géophysique de
l'Environnement (CNRS/LGGE), Grenoble, France
3/00–2/06 Affiliate Scientist, Climate and Global Dynamics (CGD) Division, National
Center for Atmospheric Research (NCAR), Boulder, CO
7/99–6/05 Assistant Professor of Earth System Science, UCI
7/98–9/99 Visiting Scientist, Atmospheric Chemistry and CGD Divisions, NCAR
7/96–6/98 Postdoctoral Fellow, Advanced Studies Program, NCAR
8/91–6/96 Graduate Research Assistant, University of Colorado at Boulder and NCAR

b. DEGREES

Harvard University, Cambridge MA	Physics	B.A.	1990
University of Colorado at Boulder	Atmospheric Science	Ph.D.	1996
NCAR Advanced Studies Program	Clouds & Aerosols	Postdoc	1996–1998

c. NARRATIVE OF RESEARCH EXPERIENCE

I am a physicist who studies climate to help piece together the climate puzzle so that as people alter Earth, intentionally or not, we better understand the likely outcomes. Rapid changes like vanishing snow and ice, blowing dust, and burning forests fascinate me most, because fast processes often indicate pressure points to which Earth is sensitive. Recently we discovered that nothing heats the planet faster than the pollution that darkens snow. This has helped spur the policy shift to reduce soot emissions. My current research includes desert dust and fire-emitted soot particulates, snowpack lifecycle, reflectance, and emission, wind-dispersal of nutrients and pathogens, wind-drag effects on deserts and oceans, wind-induced melt, and ice shelf hydrofracture. Better understanding of these processes will improve predictions of dust storms, disease endemicity, seasonal snowpack, and ice shelf disintegration.

I love to accelerate large-scale analysis techniques for data in the predominant geoscience storage formats. Many in AGU, across all sections, use my netCDF Operators (NCO) software to manipulate and analyze research data. Developing and supporting NCO has enhanced my understanding of the informatics needs, trends, and opportunities for AGU researchers.

d. KEY PUBS

92 peer-reviewed articles at <https://publons.com/researcher/2738327>. Boldfaced **author** is/was in our group as a *graduate student, †post-doc, ‡researcher:

Hartnett, E. J., **C. S. Zender**, W. I. Fisher, D. Heimbigner, et al. (2021), Quantization and Next-Generation Zlib Compression in netCDF Files, AGU Fall Meeting, [PDF](#).

‡**Wang, W.**, **C. S. Zender**, D. van As, R. S. Fausto, and ***M. .K Laffin** (2021), Greenland surface melt dominated by solar and sensible heating, *Geophys. Res. Lett.*, [PDF](#).

†**Dang, C.**, **C. S. Zender**, ***M. G. Flanner** (2019), Intercomparison and improvement of two-stream shortwave radiative transfer schemes in Earth system models for a unified treatment of cryospheric surfaces, *The Cryosphere*, [PDF](#).

***Gorris, M. E.**, K. K. Treseder, **C. S. Zender**, and J. T. Randerson (2019), Expansion of coccidioidomycosis endemic regions in response to climate change in the United States during the 21st century. *GeoHealth*, [PDF](#).

Zender, C. S. (2016), Bit Grooming: Statistically accurate precision-preserving quantization with compression, evaluated in the netCDF Operators, *Geosci. Model Dev.*, [PDF](#).

Zender, C. S. (2008), Analysis of Self-describing Gridded Geoscience Data with netCDF Operators (NCO), *Environ. Modell. Softw.*, [PDF](#).

Zender, C. S., and ‡**H. J. Mangalam** (2007), Scaling Properties of Common Statistical Operators for Gridded Datasets, *Int. J. High Perform. Comput. Appl.*, [PDF](#).

***Wang, D. L.**, **C. S. Zender**, and S. F. Jenks (2007), Server-side parallel data reduction and analysis, IEEE Lecture Notes in Computer Science, [PDF](#).

Zender, C. S., †**H. Bian**, and ‡**D. Newman** (2003), Mineral Dust Entrainment And Deposition (DEAD) model: Description and 1990s dust climatology, *J. Geophys. Res.*, [PDF](#).

Zender, C. S. (1999), Global climatology of abundance and solar absorption of oxygen collision complexes, *J. Geophys. Res.*, [PDF](#).

e. HONORS

1. SourceForge.net Community Choice Award for netCDF Operators (NCO), 2022.
2. Leptoukh Lecturer Award, Earth and Space Science Informatics Section, AGU, 2021.
3. Kavli Frontiers Fellow, US National Academy of Sciences: 2009, 2010, 2011.
4. Presented invited testimony “Arctic Climate Effects of Black Carbon” to Oversight and Government Reform Committee, US Congress, 2007.
5. NASA New Investigator Program (NIP) Award, 2001–2004.
6. Outstanding Contributions to Undergraduate Education Award, ESS Dept., UCI, 2002.
7. Outstanding Student Presentation in Atmospheric Sciences, AGU, 1995.

f. MEMBERSHIPS

1. American Geophysical Union (AGU), 1993—
2. European Geosciences Union (EGU), 2004, 2008, 2012, 2016, 2022.

g. MENTORING

Primary mentor of research associates (5), postdocs (8), graduate students (10), undergraduates (13), high school students (1).