

EMILY ANN CARTER

PROFESSIONAL ADDRESS

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EDUCATION

Caltech	Physical Chemistry (W. A. Goddard III, Advisor)	Ph.D. 1987
UC Berkeley	Chemistry (High Honors)	B.S. 1982

PROFESSIONAL POSITIONS

2019-present	Executive Vice Chancellor and Provost, University of California, Los Angeles (https://evc.ucla.edu)
2019-present	Distinguished Professor in Chemical and Biomolecular Engineering, University of California, Los Angeles
2019-present	Gerhard R. Andlinger Professor in Energy and the Environment, Emeritus, Professor of Mechanical and Aerospace Engineering and Applied and Computational Mathematics, Emeritus, and Senior Scholar in Mechanical and Aerospace Engineering, Princeton University
2016-2019	Dean, School of Engineering and Applied Science, Princeton University (https://engineering.princeton.edu)
2011-2019	Gerhard R. Andlinger Professor in Energy and the Environment, Princeton University
2011-2019	Associated Faculty in the Princeton Environmental Institute, Princeton University
2010-2016	Founding Director, Andlinger Center for Energy and the Environment, Princeton University (https://acee.princeton.edu)
2006-2011	Arthur W. Marks '19 Professor, Princeton University
2004-2019	Associated Faculty in Chemistry, Chemical and Biological Engineering, Princeton Institute for Computational Science and Engineering, Princeton Institute for the Science and Technology of Materials, Princeton University
2004-2019	Professor of Mechanical and Aerospace Engineering and Applied and Computational Mathematics, Princeton University
2002-2004	Professor of Chemistry and Materials Science, University of California, Los Angeles
2001	Visiting Associate in Aeronautics, Division of Engineering and Applied Science, California Institute of Technology
1999	Visiting Scholar, Department of Physics, Harvard University
1996	Dr. Lee Visiting Research Fellow in the Sciences, Christ Church, Oxford University
1994-2002	Professor of Physical Chemistry, University of California, Los Angeles
1992-1994	Associate Professor of Physical Chemistry, University of California, Los Angeles

- 1988-1992 Assistant Professor of Physical Chemistry, University of California, Los Angeles
- 1987-1988 Postdoctoral Research Associate in Chemistry, University of Colorado, Boulder (J. T. Hynes, Advisor)

CURRENT RESEARCH ACTIVITIES

Development of efficient and accurate quantum mechanics simulation techniques, including embedded correlated wavefunction and orbital-free density functional theories. Discovery and design of molecules and materials for sustainable energy, including converting sunlight to electricity and producing chemicals and fuels from renewable energy. Delivered over 560 invited/plenary lectures at conferences, universities, companies, and government laboratories worldwide. Coauthored over 400 peer-reviewed published research articles, patents, and codes (for the latter, see: <https://github.com/EACcodes>). Trained 50 postdoctoral fellows and trained/graduated 39 Ph.D.s in chemistry, chemical engineering, physics, applied mathematics, electrical engineering, and mechanical and aerospace engineering over a period of 31 years. See, e.g., *Google Scholar*: <https://scholar.google.com/citations?user=vluc7z8AAAAAJ&hl=en>

SELECTED AWARDS AND HONORS

- 2019 John Scott Award, Board of City Trusts, Philadelphia, PA (oldest science prize in the USA)
- 2019 Camille and Henry Dreyfus Lectureship Award, University of Basel, Switzerland
- 2019 Graduate Mentoring Award, McGraw Center for Teaching and Learning, Princeton University
- 2019 Distinguished Alumni Award, California Institute of Technology
- 2018 CME Leadership Award for Interdisciplinary Innovation, New York Section of the American Chemical Society
- 2018 ACS Award in Theoretical Chemistry, American Chemical Society
- 2017 Irving Langmuir Prize in Chemical Physics, American Physical Society
- 2017 Outstanding Referee of the Physical Review journals
- 2016 Fred Kavli Innovations in Chemistry Lecturer, American Chemical Society
- 2016 Member, National Academy of Engineering
- 2015 2015-16 Joseph O. Hirschfelder Prize in Theoretical Chemistry, Theoretical Chemistry Institute at the University of Wisconsin, Madison
- 2014 Fellow, National Academy of Inventors
- 2014 2014 Ira Remsen Award, Maryland Section of the American Chemical Society, Johns Hopkins University
- 2014 Linnett Visiting Professor of Chemistry, University of Cambridge
- 2013 Hoyt C. Hottel Lecturer in Chemical Engineering, Massachusetts Institute of Technology
- 2013 Kenneth S. Pitzer Lecturer, Department of Chemistry, University of California, Berkeley
- 2013 Mathematics of Planet Earth Simons Public Lecturer, Institute for Pure and Applied Mathematics, University of California, Los Angeles

- 2013 Sigillo D'Oro (Golden Sigillum) Medal, Italian Chemical Society, Scuola Normale Superiore, Pisa, Italy
- 2013 Article selected for *The Journal of Chemical Physics* 80th Anniversary Collection (Chen Huang and Emily A. Carter, "Potential-functional embedding theory for molecules and materials," *J. Chem. Phys.*, **135**, 194104 (2011).)
- 2012 Docteur Honoris Causa from L'École Polytechnique Fédérale de Lausanne, Switzerland
- 2012 Fellow, American Chemical Society
- 2012 Honorary Mathematical and Physical Sciences Distinguished Lecturer, U.S. National Science Foundation
- 2011 MIT Distinguished Speaker in Computational Science and Engineering, Massachusetts Institute of Technology
- 2011 August Wilhelm von Hofmann Lecture Award, German Chemical Society
- 2011 Jerome B. Cohen Lecturer in Materials Science and Engineering, Northwestern University
- 2009 Member, International Academy of Quantum Molecular Science
- 2008 EaSTChem Visiting Fellow, Universities of Edinburgh and St. Andrews, Scotland
- 2008 Member, National Academy of Sciences
- 2008 Fellow, American Academy of Arts & Sciences
- 2008 Welch Distinguished Lecturer in Chemistry
- 2007 American Chemical Society Award for Computers in Chemical and Pharmaceutical Research
- 2004 Fellow, Institute of Physics
- 2000 Fellow, American Association for the Advancement of Science
- 1998 Fellow, American Physical Society
- 1996 Dr. Lee Visiting Research Fellowship in the Sciences, Christ Church, Oxford University
- 1995 Peter Mark Memorial Award, American Vacuum Society
- 1993 Medal of the International Academy of Quantum Molecular Science
- 1993 Exxon Faculty Fellowship in Solid State Chemistry, American Chemical Society
Inorganic Division Award
- 1993 Alfred P. Sloan Research Fellow
- 1992 Camille and Henry Dreyfus Teacher-Scholar Award
- 1988 National Science Foundation Presidential Young Investigator Award
- 1982 National Science Foundation Predoctoral Fellowship
- 1982 Phi Beta Kappa, UC Berkeley

SELECTED PROFESSIONAL SERVICE

Editorial Advisory Boards

Advanced Theory and Simulations, 2017-; *Journal of the American Chemical Society*, 2017-2023; *ACS Central Science*, 2015- (Inaugural); *Journal of Physical Chemistry Letters*, 2014-15; *Journal of Chemical Theory and Computation*, 2010-2019; *Annual Review of Physical Chemistry*, 2006-2010; *Accounts of Chemical Research*, 2005-2007; *SIAM Journal on Multiscale Modeling, and Simulation*, 2001-2007; *Modelling and Simulation in Materials Science and Engineering*, 2001-2012; *ChemPhysChem*, 2000-2014; *Journal of Chemical Physics*, 2000-2002; *Chemical Physics Letters*, 1998-2009; *Encyclopedia of Chemical Physics and Physical Chemistry*, 1999-2001; *Journal of Physical Chemistry*, 1995-2000; *Surface Science*, 1994-1999; *Molecular Simulation*, 1991-1996

Editor-in-Chief Search Committees

Science, 2012-2013; *Journal of Chemical Physics*, 2007-2008; *Journal of Physical Chemistry*, 2003-2004

Guest/Specialist Editorships

Accounts of Chemical Research Special Issue on Computational and Theoretical Chemistry, 2004-2005; *Journal of Physical Chemistry William A. Goddard issue*, 1999-2000; *Computer Physics Communications*, 1993-1994

Scientific Advisory Boards

Lawrence Berkeley National Laboratory Advisory Board, UC Berkeley, 2016-22; *Secretary of Energy Advisory Board Task Force on CO₂ Utilization*, 2016; *Molecular Sciences Software Institute Advisory Board*, 2016-2017; *National Academy of Sciences (NAS) Board on Energy and Environmental Systems*, 2014-17; *SLAC National Accelerator Laboratory Scientific Policy Committee*, Stanford, 2014-16; *National Science Foundation (NSF) Mathematical and Physical Sciences (MPS) Advisory Council*, 2012-15; *Department of Energy – Basic Energy Sciences Council on Chemical and Biochemical Sciences*, 2008-13 (Chair, 2012-13); *International Advisory Board of the Winton Programme for the Physics of Sustainability*, Cambridge University, 2011-2017; *NAS Board on Chemical Sciences and Technology*, 2010-12; *American Chemical Society Physical Chemistry Division Energy Subdivision (Chair-Elect and Chair)*, 2009-11; *International Scientific Advisory Board, Centre of Excellence in Theoretical and Computational Chemistry*, Norway, 2007-10; *Steering Committee for the Thomas Young Centre for Theory and Simulation of Materials*, London, 2006-12; *American Physical Society Division of Chemical Physics (Vice-Chair, Chair-Elect, Chair)*, 2002-5; *NSF MPS Theory Steering Committee*, 2004-5; *Los Alamos National Laboratory Theoretical Division Advisory and Review Committee*, 2000-2005.

Co-author of <https://energy.gov/seab/downloads/final-report-task-force-co2-utilization>

National Academies of Sciences, Engineering, and Medicine (NASEM) Committees

Member: 2018-19 *Gulf Research Program External Review Committee*, 2015 *NAS Award in Chemical Sciences*, 2013 *NAS Award in Chemistry in Service to Society*, 2012-2014 *NAS Class Membership Committees*

Major Conference Chair Positions

American Conference on Theoretical Chemistry, 2005; *Division of Chemical Physics, American Physical Society March Meeting*, Montreal, Canada, 22-26 March, 2004

SELECTED OUTREACH ACTIVITIES

May 9, 2019 – *College of Science and Technology Spring Commencement Speaker*, Temple University, Philadelphia, PA

January 24, 2019 – Interview with Yahoo! Finance: [The focus on the 4th Industrial Revolution at Davos](#)

January 24, 2019 – Panelist, CNBC Presents: A Just Energy Transition for the World, *World Economic Forum Annual Meeting*, Davos, Switzerland

January 24, 2019 – Panelist, Promise and Progress in Bioengineering, *World Economic Forum Annual Meeting*, Davos, Switzerland

January 21, 2019 – Interview with Bloomberg TV on [Engineering's value to society](#)

September 19, 2018 – Interview with *ACS Energy Letters* Editor-in-Chief, Prashant V. Kamat, "[A Conversation with Emily Carter](#)," *ACS Energy Lett.* **3**, 2470 (2018).

October 18, 2017 – Organizing Committee Member and Panel Chair, New Directions in Carbon Dioxide Utilization, The Royal Society of London 2017 Sackler Forum on Dealing with Carbon Dioxide at Scale, Buckinghamshire, UK

January 19, 2017 – IdeasLab panelist, Responding to Climate Change, *World Economic Forum Annual Meeting 2017*, Davos, Switzerland

January 18, 2017 – Panelist, Income Inequality and Opportunities to Improve the Human Condition, with Economics Nobel Sir Angus Deaton and Microsoft's Bill Gates, *World Economic Forum Annual Meeting 2017*, Davos, Switzerland

January 18, 2017 – Interview with Reuters Money on [climate change, innovation, and women in tech](#), aired via Facebook Live

January 19, 2016 – Author, Op-Ed in the Houston Chronicle entitled "[In era of cheap oil, our choices are clear: consume more or spark change](#)

June 23, 2015 – Invited Speaker, *Science & Storytelling NYC: NAS Speed Dating*, Google NY

June 19, 2013 – Panelist, *Senate/NAS Science and Technology Policy Forum on Energy*, Capitol Hill, Washington, DC

May 25, 2011 – Panelist, *A View from Senior EFRC Representatives, Science for our Nation's Energy Future, Energy Frontier Research Centers Summit & Forum*, Washington, DC

March 1, 2011 – Discussant, *The Sunlight Derby – How to Win the Never-ending Race to Optimize Energy Risk in the 21st Century*, JP Morgan Chase Global Markets Symposium, Key Biscayne, FL

November 17, 2009 – Speaker, *Capitol Hill press conference about the impact of American Recovery and Reinvestment Act of 2009 investments in basic scientific research*, Washington, DC

CURRENT RESEARCH GROUP

Undergraduates: Olivia Long (physics, Princeton); Norleakvisoth Lim (chemical engineering, UCLA)

Postdoctoral Fellows: John Mark Martirez, Sai Gautam Gopalakrishnan, Shenzhen Xu, Lesheng Li, Junwei (Lucas) Bao, Qing Zhao, Ananth Rajan Govind, and Robert Wexler (four chemists, two materials engineers, one chemical engineer, and one mechanical engineer)

CURRENT EXTRAMURAL RESEARCH FUNDING

Air Force Office of Scientific Research

Department of Energy, Basic Energy Sciences

Department of Energy, Advanced Scientific Computing Research

Department of Energy, Energy Efficiency and Renewable Energy

Department of Defense Multidisciplinary University Research Initiative