Timothy W Cronin
Curriculum Vitae

Department of Earth, Atmospheric, and Planetary Sciences
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Cambridge, MA 02139
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Employment

2017-	Kerr-McGee Career Development Assistant Professor, MIT
2016-2017	Assistant Professor, MIT
2014-2016	NOAA Environment Postdoctoral Fellow, Harvard University
2014	Postdoctoral Associate, MIT
2006-2009	Research Assistant, Ecosystems Center, Marine Biological Laboratory, Woods Hole
2005	Summer Research Assistant, Swarthmore College

Education

2009-2014	**Massachusetts Institute of Technology** Ph.D., Climate Physics and Chemistry
2002-2006	**Swarthmore College** B.A. with High Honors, Physics Major, Math Minor

Publications

Cronin, T.W., and A. Wing *(in revision at Journal of Advances in Modeling Earth Systems*): Clouds, Circulation, and Climate Sensitivity in a Radiative-Convective Equilibrium Channel Model.

Rose, B., **T.W. Cronin**, and C. Bitz (2017): Ice caps and ice belts: the effects of obliquity on ice-albedo feedback. *The Astrophysical Journal*, doi: 10.3847/1538-4357/aa8306.

Cronin, T.W., H. Li, and E. Tziperman (2017): Suppression of Arctic air formation with climate warming: Investigation with a 2-dimensional cloud-resolving model. *Journal of the Atmospheric Sciences*, doi: 10.1175/JAS-D-16-0193.1.

Birch, L., **T.W. Cronin**, and E. Tziperman (2017): Glacial Inception on Baffin Island: The Role of Insolation, Meteorology, and Topography. *Journal of Climate*, doi: 10.1175/JCLI-D-16-0576.1.

Beucler, T., and **T.W. Cronin** (2016): Moisture-Radiative Cooling Instability. *Journal of Advances in Modeling Earth Systems*, 8, 1620-1640, doi: 10.1002/2016MS000763.

Wing, A., and **T.W. Cronin** (2016): Self-aggregation of convection in long channel geometry. *The Quarterly Journal of the Royal Meteorological Society*, 142, 1-15, doi: 10.1002/qj.2628.

Cronin, T.W., and M. Jansen (2015): Analytic radiative-advective equilibrium as a model for high-latitude climate*, Geophysical Research Letters*, 42, doi: 10.1002/2015GL067172.

Payne, A., M. Jansen, and **T.W. Cronin** (2015): Conceptual model analysis of the influence of temperature feedbacks on polar amplification, *Geophysical Research Letters*, 42, 9561–9570*,* doi: 10.1002/2015GL065889*.*

Cronin, T.W., and E. Tziperman (2015): Low clouds suppress Arctic air formation and amplify high-latitude continental winter warming. *PNAS*, 112, 11490–11495, doi: 10.1073/pnas.1510937112.

Cronin, T.W., K. Emanuel, and P. Molnar (2015): Island Precipitation Enhancement and the Diurnal Cycle in Radiative-Convective Equilibrium. *The Quarterly Journal of the Royal Meteorological Society,* 141, 1017-1034, doi: 10.1002/qj.2443.

Molnar, P., and **T.W. Cronin** (2015): Growth of the Maritime Continent and its Possible Contribution to Recurring Ice Ages. *Paleoceanography*, 30, 196-225, doi: 10.1002/2014PA002752.

Cronin, T.W. (2014): On the Choice of Average Solar Zenith Angle. *Journal of the Atmospheric Sciences*, 71, 2994-3003, doi:10.1175/JAS-D-13-0392.1.

Cronin, T.W., and K. Emanuel (2013): The climate time scale in the approach to radiative-convective equilibrium. *Journal of Advances in Modeling Earth Systems,* 5, 843-849, doi: 10.1002/jame.20049.

Cronin, T.W. (2013): A sensitivity theory for the equilibrium boundary layer over land. *Journal of Advances in Modeling Earth Systems,* 5, 764-784, doi: 10.1002/jame.20048.

Reilly, J., J. Melillo, D. Kicklighter, A. Gurgel, S. Paltsev, **T.W. Cronin**, A. Sokolov, and A. Schlosser (2012), Using land to mitigate climate change: Hitting the target, recognizing the trade-offs. *Environmental Science and Technology*, 46, 5672-5679, doi: 10.1021/es2034729.

Felzer, B., **T.W. Cronin**, J. Melillo, D. Kicklighter, C.A. Schlosser, and S.R. Dangal (2011): Nitrogen effect on carbon-water coupling in forests, grasslands, and shrublands in the arid western U.S. *Journal of Geophysical Research - Biogeosciences*, 116, G03023, doi:10.1029/2010JG001621.

Gurgel, A., **T.W. Cronin**, J. Reilly, S. Paltsev, D. Kicklighter, and J. Melillo (2011): Food, Fuel, Forests, and the Pricing of Ecosystem Services. *American Journal of Agricultural Economics*, 93, 342-348, doi: 10.1093/ajae/aaq087.

Galford, G., J. Melillo, D. Kicklighter, J. Mustard, **T.W. Cronin**, C. E. P. Cerri, and C.C. Cerri (2011): Historical carbon emissions and uptake from the agricultural frontier of the Brazilian Amazon. *Ecological Applications,* 21, 750-763, doi: 10.1890/09-1957.1.

Galford, G., J. Melillo, D. Kicklighter, **T.W. Cronin**, C. E. P. Cerri, J. Mustard, and C.C. Cerri (2010): Greenhouse gas emissions from alternative futures of deforestation and agricultural management in the southern Amazon. *PNAS,* 107, 19649–19654, doi: 10.1073/pnas.1000780107.

Melillo, J., J. Reilly, D. Kicklighter, A. Gurgel, **T.W. Cronin**, S. Paltsev, B. Felzer, X. Wang, A. Sokolov, and C.A. Schlosser (2009): Indirect Emissions from Biofuels: How Important? *Science*, 326, 1397-1399, doi: 10.1126/science.1180251.

Felzer, B., **T.W. Cronin**, J. Melillo, D. Kicklighter, and C.A. Schlosser (2009): Importance of carbon-nitrogen interactions and ozone on ecosystem hydrology during the 21st century. *Journal of Geophysical Research - Biogeosciences,* 114, G01020, doi: 10.1029/2008JG000826.

Sokolov, A., D. Kicklighter, J. Melillo, B. Felzer, C.A. Schlosser, and **T.W. Cronin** (2008): Consequences of considering carbon-nitrogen interactions on the feedbacks between climate and the terrestrial carbon cycle. *Journal of Climate*, 21, 3776-3796, doi: 10.1175/2008JCLI2038.1.

Felzer, B.S., **T.W. Cronin**, J. Reilly, J. Melillo, and X. Wang (2007): Impact of ozone on trees and crops. *Comptes Rendus de l'Academie des Sciences - Geoscience*, 339, 784-798, doi: 10.1016/j.crte.2007.08.008.

Bug, A., **T.W. Cronin**, P. Sterne, and Z. Wolfson (2007): Simulation of Positronium: Toward more realistic models of void spaces in materials. *Radiation Physics and Chemistry*, 76, 237-242.

Doctoral Thesis

Cronin, T.W. (2014): Land-Atmosphere Interaction and Radiative-Convective Equilibrium; Massachusetts Institute of Technology.

Undergraduate Thesis

Cronin, T.W. (2006): Path Integral Monte Carlo Simulation of Positronium in Cylindrical Pore Spaces; Swarthmore College Department of Physics & Astronomy.

Postdoctoral Researchers Supervised

Daniel Koll (2017-present)
Nicholas Lutsko (2017-present)

Ph.D. Students Supervised

Tristan Abbott (2016-present)

Tom Beucler (2016-present; co-advised with Kerry Emanuel)
Leah Birch (2014-present; Harvard, co-advised with Eli Tziperman)

Undergraduate Students Supervised

Harrison Li (2015-2016; Harvard PRISE summer fellow, with Eli Tziperman)

Teaching

2017	Introduction to Atmosphere, Ocean, and Climate Dynamics (MIT 12.003)
2016	Atmospheric Radiation and Convection (MIT 12.815)
2013-2014	Content Production and Course Operations team, "Global Warming Science" (MITx 12.340x, 2014)
2012, 2013	Teaching Assistant, "Theoretical Environmental Analysis" (MIT 12.009)
2011	Teaching Assistant, "Atmosphere, Ocean, and Climate Dynamics" (MIT 12.003)
2011	Teaching Assistant, "Global Warming Science" (MIT 12.340)

Conference Presentations

2017	AGU Fall Meeting, Arctic Air Mass Transformations Workshop, AMS Conference on Atmosphere and Ocean Fluid Dynamics
2016	AGU Fall Meeting, Princeton Model Hierarchies Workshop, NOAA Summer Institute, AMS Conference on Hurricanes and Tropical Meteorology
2015	AGU Fall Meeting, AMS Conference on Atmosphere and Ocean Fluid Dynamics, NE Tropical Workshop, Caltech Workshop on Monsoons: Past, Present, and Future
2014	AGU Fall Meeting, AMS Conference on Hurricanes and Tropical Meteorology
2013	AGU Fall Meeting, Graduate Climate Conference, AMS Conference on Atmosphere and Ocean Fluid Dynamics, NE Tropical Workshop
2012	AGU Fall Meeting, Graduate Climate Conference, AMS Conference on Hurricanes and Tropical Meteorology, AMS Annual meeting
2010	AGU Fall Meeting
2008	AGU Fall Meeting
2005	Workshop on Positron and Positronium Chemistry

Invited Talks

2017	SUNY Stony Brook, Florida State University, Purdue, Swarthmore, Imperial
2016	Weizmann Institute of Science, SUNY Albany, Laboratoire de Météorologie Dynamique, Max-Planck-Institut für Meteorologie, UC Berkeley, University of Washington
2015	Brown, McGill, University of Chicago, MIT, Columbia
2014	MIT, Caltech
2013	Yale

Awards

2017-2020	Kerr-McGee Career Development Assistant Professorship
2017	Ally of Nature Fund Award
2014-2016	NOAA Climate and Global Change Postdoctoral Fellowship
2014-2016	Harvard University Center for the Environment Postdoctoral Fellowship
2013	Award for Excellence in Teaching, for role as Teaching Assistant in Spring 2013 course "Theoretical Environmental Analysis", EAPS, MIT
2011-2012	Martin Fellow, Martin Family Society of Fellows for Sustainability, MITEI
2010	Climate Co-Lab finalist and presenter to US Congress, MIT Center for Collective Intelligence
2009-2010	Presidential Fellow, MIT
2009	Jule Charney Prize (outstanding incoming graduate student), MIT Program in Atmospheres, Oceans, and Climate
2006	LeRoy Apker Award finalist (outstanding achievement in physics as an undergraduate), American Physical Society
2006	Lang Award (outstanding academic accomplishment), Swarthmore College

Grants

2017-2020	NSF AGS-1740533: "Collaborative Research: Convection and Rainfall Enhancement over Mountainous Tropical Islands"
2017-2018	MIT ESI Curriculum Grant: "Introduction to atmospheres, oceans, and climate"
2016-2019	NSF AGS-1623218: "Collaborative Research: Using a Hierarchy of Models to Constrain the Temperature Dependence of Climate Sensitivity"

Professional Memberships

American Geophysical Union
American Meteorological Society

Professional Service

Ph.D. Thesis committee member: Tom Beucler, Leah Birch (Harvard), Brian Green
Generals exam committee member: Rohini Shivamoggi, Margaret Duffy, Catherine Wilka
PAOC graduate admissions committee (2017)
PAOC colloquium committee (2016-2017)
Advisor, WGBH/NASA project "Bringing the Universe to America's Classrooms"
Reviewer: (journals) *Earth System Dynamics, Geophysical Research Letters, PNAS*, *Journal of Advances in Modeling Earth Systems, Journal of Climate*, *Journal of Geophysical Research*, *Journal of the Atmospheric Sciences*, *Quarterly Journal of the Royal Meteorological Society*
(funding agencies) *National Science Foundation, US-Israel Binational Science Foundation*

Service as Postdoc and Graduate Student

Harvard: ClimaTea Seminar co-organizer, 2015
MIT: Graduate Climate Conference organizing committee (2011, 2013 abstract chair)
MIT: MASS Seminar organizing committee (spring 2012, fall 2012, spring 2013)
MIT: WxChallenge forecasting competition, member of team (2010-2014, 2016-2017),
individual rankings: 141/1192 (2010-2011), 56/1314 (2011-2012),
35/1424 (2012-2013), 83/1289 (2013-2014), 172/1136 (2016-2017)
MIT: PAOC Retreat organizing committee (2010, 2011)

Outreach Activities

Advisor, WGBH/NASA Project "Bringing the Universe to America's Classrooms", 2017
Science Fair Judge, KIPP Academy Lynn, 2012, 2013, 2014, 2016
Science Fair Judge, Falmouth Academy, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017
Community Garden Coordinator, Leland Street Herb Garden, Nov. 2010 – Sept. 2016
Alumni Panel on Sustainability, Falmouth Academy, 7 Jan. 2011

Personal Hobbies

Running, Cooking, Pottery, Gardening, Woodworking