

Updated: 2021-10-02

## Daniel R. Chavas

### Bio

I am currently Associate Professor of Atmospheric Science at Purdue University in the Department of Earth, Atmospheric, and Planetary Sciences. I research the physics tropical cyclones and severe thunderstorms and why the climate system produces them. I work across theory, idealized numerical models, and observations. Before starting at Purdue, I was an NSF Postdoctoral Research Fellow in Civil and Environmental Engineering at Princeton University, and I received my PhD in Atmospheric Science from MIT and BS in Atmospheric and Oceanic Sciences and Applied Mathematics from the University of Wisconsin-Madison.

### Current Affiliation

Department of Earth, Atmospheric, and Planetary Sciences  
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### Education

- **Massachusetts Institute of Technology**, Cambridge, MA (2008–2013)  
Ph.D. in Atmospheric Science (May 2013)  
Advisor: Kerry Emanuel  
Department of Energy Office of Science Graduate Research Fellow
- **University of Wisconsin-Madison**, Madison, WI (2003–2007)  
B.S. in Atmospheric and Oceanic Sciences (May 2007)  
B.S. in Applied Mathematics (May 2007)

### Employment

- **Purdue University**, West Lafayette, IN (2021-present)  
Department of Earth, Atmospheric, and Planetary Sciences  
Title: Associate Professor
- **Purdue University**, West Lafayette, IN (2016-2021)  
Department of Earth, Atmospheric, and Planetary Sciences  
Title: Assistant Professor
- **Princeton University**, Princeton, NJ (2013-2015)  
Title: NSF AGS Postdoctoral Research Fellow
- **Joint Global Change Research Institute, Pacific Northwest National Laboratory / University of Maryland**, College Park, MD (2008)  
Title: Research Associate
- **World Climate Programme, World Meteorological Organization**, Geneva, Switzerland (2007)  
Title: Intern

### Research Interests

Climate and extreme weather; tropical cyclones; severe convective storms; tornadoes; ice storms; weather and climate variability; climate change; risk analysis; societal impacts

### **Professional Memberships**

- Member, American Meteorological Society Committee on Tropical Cyclones and Tropical Meteorology (01/2017-01/2023)
- Member, American Meteorological Society
- Member, American Geophysical Union
- Member, Purdue Climate Change Research Center

### **PhD Students Supervised**

- Aaron Kruskie, EAPS Ph.D., began 08/2021, Ph. D. expected 05/2026
- Kuan-Yu Lu, EAPS Ph.D., began 08/2019, Ph. D. expected 05/2023
- Funing Li, EAPS Ph.D., began 08/2018, Ph. D. expected 05/2023
- Jie Chen, EAPS Ph.D., awarded 05/2021
- Saiprasanth Bhalachandran, EAPS Ph.D., awarded 05/2019

### **MS Students Supervised**

- Shawn Simmons, EAPS M.S., awarded 2018

### **Undergraduate Students Supervised**

- Valeria Garcia (EAPS), 06/2021-present
- Julianna Heptinstall (EAPS), 06/2021-07/2021
- Isaac Davis (Physics; EAPS minor), 09/2020-07/2021
- Noah Tewksbury (EAPS), 01/2019-12/2020
- Katie O'Malley (Chem), 05/2019-08/2019
- Heather Craker (EAPS), 01/2019-08/2019
- Will McNulty (EE; EAPS minor), 09/2017-05/2018
- Zhanxiang Hua (EE; EAPS minor), 01/2017-08/2018
- Evan Alexa (EAPS), 06/2017-08/2017
- Corey Combs (EAPS), 06/2017-08/2017
- Justin Buckingham (EAPS), 08/2016-05/2017
- Derrek Dalman (EAPS), 01/2017-05/2017
- Doug Miller (EAPS), 01/2016-08/2016

### **Post-doctoral Researchers Supervised**

- Dr. Jhordanne Jones (hired), 09/2021-present
- Dr. Zachary Johnson, 01/2021-present
- Dr. Jilong Chen, 12/2019-10/2020
- Dr. Kimberly Hoogewind, 11/2017-10/2018

### **Teaching experience**

- EAPS 22500 *Introduction to Science of the Atmosphere* (UG)  
Fall 2016 (Student eval: 4.5/5), Fall 2017 (4.8/5); Fall 2019 (4.9/5); Fall 2020
- EAPS 53000 *Extreme Weather and Climate: Science and Risk* (G/UG)  
Spring 2019 (Student eval: 4.8/5), co-teach with Prof. Nateghi (IE/EEE)
- EAPS 53600 *Introduction to General Circulation of the Atmosphere* (G/UG)  
Spring 2020
- EAPS 59100 *Dynamics of the Tropical and Extratropical Atmosphere* (G)  
Spring 2018 (Student eval: 5/5)
- EAPS 59100 *Extreme Weather and Climate: Science and Risk* (G/UG)

Spring 2017 (Student eval: 5/5)

## Publications

I have published papers in a variety of journals, most of which are considered at or near the top of my field. My current “h-index” (Web of Science) is 15. Total citations is 986. Citation graphic from Publons on the right (<https://publons.com/researcher/3609346/daniel-chavas/>).



Guide to notations:

- Primary author(s) are indicated by an asterisk (\*).
- Post docs = “P”, graduate students = “G” and undergraduate students = “U”.
- Underlined = Chavas is primary advisor.

Links to selected submitted and all published papers are available on Chavas’ website:

<https://web.ics.purdue.edu/~dchavas/research.html>

47) Lu K.<sup>\*G</sup> and **D. R. Chavas**. Tropical cyclone size is strongly limited by the Rhines scale: experiments with a barotropic model. Submitted.

46) **Chavas D.R.**<sup>\*</sup> and J. A. Knaff. A simple model for predicting the hurricane radius of maximum wind from outer size. Submitted.

45) Yang Q., Lee C.-Y., Tippet M. K., **Chavas D.R.**, and T. R. Knutson. XGBoost-based hurricane wind reconstruction. Submitted.

44) Peters J.<sup>\*</sup>, Mulholland J., and **D. R. Chavas** (2021). Generalized lapse rate formulas for use in entraining CAPE calculations. Journal of the Atmospheric Sciences. J. Atmos. Sci., Early online release.

43) Chen J.<sup>\*G</sup> and **D. R. Chavas**. Can existing theory predict the response of tropical cyclone intensity to idealized landfall? J. Atmos. Sci., Early online release.

42) Li F.<sup>\*G</sup>, **Chavas D. R.**, Reed K. A., Rosenbloom N., and D. Dawson II (2021). The role of elevated terrain and the Gulf of Mexico in the production of severe local storm environments over North America. J. Clim., 34(19), pp.7799–7819

41) Peters J.<sup>\*</sup> and **D. R. Chavas**. Evaluating the conservation of energy variables in simulations of deep moist convection. In revision.

40) Richter D. H.<sup>\*</sup>, Wainwright C., Stern D., Bryan G., and **D. R. Chavas** (2021). Potential low bias in high-wind drag coefficient inferred from dropsonde data in hurricanes. J. Atmos. Sci., 78(7), pp.2339–2352.

39) Li F.<sup>\*G</sup> and **D. R. Chavas** (2021). Midlatitude continental CAPE is predictable from large-scale environmental parameters. Geophys. Res. Lett., p.e2020GL091799.

- 38) **Chavas D. R.** \* and D. T. Dawson II (2021). An idealized physical model for the severe convective storm environmental sounding. *J. Atmos. Sci.*, 78(2), pp.653-670.
- 37) **Chavas D. R.** \* and J. Chen<sup>G</sup> (2020). News and Views: Tropical cyclones could last longer after landfall in a warming world. *Nature*, 587, pp.200-201.
- 36) Vu T. \*, Kieu C, **Chavas D. R.**, and Q. Wang (2020). A Numerical Study of the Global Formation of Tropical Cyclones. 13(1), *J. Adv. Mod. Earth Sys.*, p.e2020MS002207.
- 35) Ramsay H. \*, Singh M., and **D. R. Chavas** (2020). Effects of surface warming on tropical cyclone formation and intensification rates in idealized simulations. *J. Adv. Mod. Earth Sys.*, 12(10), p.e2020MS002086.
- 34) Alemazkour N. \*, Rachunok B., **Chavas D. R.**, Staid A., Nateghi R., Tootkaboni M., and A. Louhghalam (2020). Hurricane-induced outage risk under climate change is primarily driven by the uncertainty in projections of future hurricane frequency. *Sci. Rep.*, 10, 15270.
- 33) Komacek T. \*, **Chavas D. R.**, and D. Abbot (2020). Hurricane genesis is favorable on terrestrial exoplanets orbiting late-type M dwarf stars. *The Astrophysical Journal*, 898(2), p.115.
- 32) Li F.<sup>\*G</sup>, **Chavas D. R.**, Reed K. A., and D. Dawson II (2020). Climatology of severe local storm environments and synoptic-scale features over North America in ERA5 reanalysis and CAM6 simulation. *J. Clim.*, 33(19), pp.8339–8365.
- 31) Chen J.<sup>\*G</sup> and **D. R. Chavas** (2020). The transient responses of an axisymmetric tropical cyclone to instantaneous surface roughening and drying. *J. Atmos. Sci.*, 77(8), pp.2807–2834.
- 30) Stansfield A. M. \*, Reed K. A., Zarzycki C. M., Ullrich P. A., and **D. R. Chavas** (2020). The influence of high-resolution grid extent on tropical cyclone precipitation over the Eastern United States. *J. Hydromet.*, 21(7), pp.1425–1445.
- 29) O'Neill M. \* and **D. R. Chavas** (2020). Inertial waves in axisymmetric tropical cyclones. *J. Atmos. Sci.*, 77(7), pp.2501-2517.
- 28) Hoogewind K.<sup>\*P</sup>, **Chavas D. R.**, Schenkel B. A., and M. O'Neill (2020). Exploring environmental constraints on the observed global tropical cyclone count. *J. Clim.* 33(5), pp.1725-1745.
- 27) Bhalachandran S.<sup>\*G</sup>, **Chavas D. R.**, Marks Jr. F., Dubey S., Shreevastava A., and T.N. Krishnamurti (2020). Characterizing the energetics of vortex-scale and sub-vortex-scale asymmetries during tropical cyclone rapid intensity changes. *J. Atmos. Sci.*, 77(1), pp.315-336.
- 26) **Chavas D. R.** \* and K. A. Reed (2019). Dynamical aquaplanet experiments with uniform thermal forcing: system dynamics and implications for tropical cyclone genesis and size. *J. Atmos. Sci.*, 76(8), pp.2257-2274.
- 25) Cronin T. W. \* and **D. R. Chavas** (2019). Dry and semi-dry tropical cyclones. *J. Atmos. Sci.*, 76(8), pp.2193-2212.
- 24) Hua Z.<sup>\*U</sup> and **D. R. Chavas** (2019). The empirical dependence of tornadogenesis on elevation roughness: Historical record analysis using Bayes' Law in Arkansas. *J. Appl. Met. Clim.*, 58(2), pp.401-411.

- 23) Zhang J. \*, Lin Y., **Chavas D. R.**, and W. Mei (2019). Tropical cyclone cold wake size and its applications to power dissipation and ocean heat uptake estimates. *Geophys. Res. Lett.*, 46(16), pp.10177-10185.
- 22) Xian S. \*, Feng K., Lin N., Marsooli R., **Chavas D. R.**, Chen J.<sup>G</sup>, and A. Hatzikyriakou (2018). Brief communication: Rapid assessment of damaged residential buildings in the Florida Keys after Hurricane Irma. *Nat. Haz. Earth Sys. Sci.*, 18(7), pp.2041-2045.
- 21) Schenkel B. \* A., Lin N., **Chavas D. R.**, Vecchi G. A., Oppenheimer M., and A. Brammer (2018). Lifetime evolution of outer tropical cyclone size and structure as diagnosed from reanalysis and climate model data. *J. Clim.*, 31(19), pp.7985-8004.
- 20) Lu P. \*, Lin N., Emanuel K. A., **Chavas D. R.**, and J. Smith (2018). Assessing Hurricane Rainfall mechanisms using a physics-based model: Hurricanes Isabel (2003) and Irene (2011). *J. Atmos. Sci.*, 75(8), pp.2337-2358.
- 19) McNulty, W.<sup>\*U</sup> and **D. R. Chavas** (2018). Covariation of snowfall patterns in the northeastern United States with the location of the Gulf Stream. *The Journal of Purdue Undergraduate Research*, 8(1), p.22.
- 18) **Chavas D. R.** \*, Reed K. A., and J. A. Knaff (2017). Physical understanding of the tropical cyclone wind-pressure relationship. *Nat. Comm.*, 8(1), pp.1-11.
- 17) Schenkel B. A. \*, Lin N., **Chavas D. R.**, Oppenheimer M., and A. Brammer (2017). Evaluating outer tropical cyclone size in reanalysis datasets using QuikSCAT Data. *J. Clim.*, 30(21), pp.8745-8762.
- 16) **Chavas D. R.** \* (2017). A simple derivation of tropical cyclone ventilation theory and its application to capped surface entropy fluxes. *J. Atmos. Sci.*, 74(9), pp.2989-2996.
- 15) **Chavas, D. R.** \* and N. Lin (2016). A model for the complete radial structure of the tropical cyclone wind field. Part II: Wind field variability. *J. Atmos. Sci.*, 73(8), pp.3093-3113.
- 14) **Chavas, D. R.** \*, Lin, N., Dong, W., and Y. Lin (2016). Observed tropical cyclone size revisited. *J. Clim.*, 29(8), pp.2923-2939.
- 13) Hart, R. E. \*, **Chavas D. R.**, and M. P. Guishard (2016). The arbitrary definition of the current Atlantic major hurricane landfall drought. *Bull. Amer. Met. Soc.*, 97(5), pp.713-722.
- 12) Vigh J. L. \*, Gilleland E., Williams C. L., **Chavas D. R.**, Dorst N. M., Done J. M., Holland G. J., and B. G. Brown (2016). A new historical database of tropical cyclone position, intensity, and size parameters optimized for wind risk modeling. *32nd Conf. on Hurricanes and Tropical Meteorology*, San Juan, Puerto Rico, Amer. Meteor. Soc., 12C.2.
- 11) Reed, K. \* and **D. R. Chavas** (2015). Uniformly-rotating global radiative-convective equilibrium in the Community Atmosphere Model, version 5. *J. Adv. Mod. Earth Sys.*, 7(4), pp.1938-1955.
- 10) Knutson T. R. \*, Sirutis J. J., Zhao M., Tuleya R. E., Bender M., Vecchi G. A., Villarini G., and **D. R. Chavas** (2015). Global projections of intense tropical cyclone activity for the late 21st century from dynamical downscaling of CMIP5/RCP4.5 scenarios. *J. Clim.*, 28(18), pp.7203-7224.

- 9) **Chavas D. R.**\*, Lin N., and K. A. Emanuel (2015). A complete tropical cyclone radial wind structure model. Part I: Comparison with observed structure. *J. Atmos. Sci.*, 72(9), pp.3647-3662.
- 8) **Chavas D. R.**\* and J. Vigh (2014). QSCAT-R: the QuikSCAT tropical cyclone radial structure dataset. NCAR Technical Note, TN-513+STR, 27 pp.
- 7) Elsner, J. B.\*, Jagger T. H., Widen H. M., and **D. R. Chavas** (2014). Daily tornado frequency distributions in the United States. *Env. Res. Lett.*, 9(2), 024018.
- 6) **Chavas, D. R.**\* and K. A. Emanuel (2014). Equilibrium tropical cyclone size in an idealized state of axisymmetric radiative-convective equilibrium. *J. Atmos. Sci.*, 71(5), pp.1663-1680.
- 5) **Chavas, D. R.**\*, Yonekura E., Karamperidou C., Cavanaugh N., and K. Serafin (2013). U.S. hurricanes and economic damage: extreme value perspective. *Nat. Haz. Rev.*, 14(4), pp.237-246.
- 4) Lin, N.\* and **D. R. Chavas** (2012). On hurricane parametric wind and applications in storm surge modeling. *J. Geophys. Res: Atmos.*, 117, D09120.
- 3) **Chavas, D. R.**\* and K. A. Emanuel (2010). A QuikSCAT climatology of tropical cyclone size. *Geophys. Res. Lett.*, 37(18), L18816.
- 2) Dean, L.\*, Emanuel K. A., and **D. R. Chavas** (2009). On the size distribution of Atlantic tropical cyclones. *Geophys. Res. Lett.*, 36(14), L14803.
- 1) **Chavas, D. R.**\*, Izaurrealde R. C., Thomson A. M., and X. Gao (2009). Long-term climate change impacts on agricultural productivity in eastern China. *Ag. For. Met.*, 149(6-7), pp.1118-1128.

### **In preparation**

- Schenkel B., **Chavas D. R.**, Lin N., Vecchi G., and T. Knutson. North Atlantic tropical cyclone outer size and structure under climate change.
- Johnson Z.\*, **Chavas D. R.**, and H. Ramsay. Statistical framework for Western Pacific landfall risk through modulation of the Pacific subtropical high and ENSO.

### **Non-refereed**

- **Chavas D. R.**\*, Reed K. A., and J. A. Knaff (2018). Conference notebook: Physical understanding of the tropical cyclone wind-pressure relationship. *Bull. Amer. Meteo. Soc.*, 99(12), p.2449.
- Chavas, D. R., “Seasonal climate prediction dissemination to rural farmers in sub-Saharan Africa: a ‘bottom-up’ perspective and the emergence of the mobile phone.” Discussion paper, World Meteorological Organization, Geneva, Switzerland, Dec 2008.

### **Internal service**

#### *Purdue Graduate MS/PhD Committees*

- Colin Hamill, EAPS Ph.D., expected 2025
- Qin Jiang, EAPS Ph.D., expected 2024
- Chen Zhang, EAPS Ph.D., expected 2022
- Marcus Terrell, EAPS M.S., awarded 2021
- Xinyue Wang, EAPS Ph.D., awarded 2020
- Andrea Orton, EAPS Ph.D., awarded 2020
- Bithi De, EAPS Ph.D., awarded 2019

- Rene Paul Acosta, EAPS Ph.D., awarded 2018
- Jonathan Buzan, EAPS Ph.D., awarded 2018
- Kevin Burris, EAPS M.S., awarded 2018

*Committee memberships:*

- Chair, EAPS Diversity and Inclusion Committee (2021-present)
- EAPS Ombudsperson (2021-present)
- Member, EAPS Faculty Search in Large-scale atmospheric dynamics (2021-present)
- Member, Midwest Regional Climate Center Associate Director search (2021)
- Co-chair, EAPS Faculty Search in Large-scale atmospheric dynamics (2019-2020)
- EAPS Diversity and Inclusion Committee (2019-2021)
- Chair, EAPS Seminar Committee (2017-2020)
- EAPS Seminar Committee (2020-present)
- EAPS Strategic Planning Committee (2016-2018)
- EAPS Senior Undergraduate Advisor Hiring Committee (2017)
- EAPS Outreach Committee (2016)

*EAPS guest lectures:*

- EAPS 11700 Introduction to Atmospheric Science: “Hurricane Ida (and climate change?)” (2021-09)
- EAPS 13700 Freshman Seminar in Earth and Atmospheric Sciences: “Hurricanes” (11/2017)
- EAPS 23000 Laboratory in Atmospheric Science: GFD Rotating Tank lab (09/2017)
- EAPS 10600 Geosciences in the Cinema: “Climate change science” (04/2017)
- EAPS 13700 Freshman Seminar in Earth and Atmospheric Sciences: “Hurricanes” (03/2017)
- EAPS 36400 Great Issues: “The meteorology of Hurricane Sandy” (01/2017)
- EAPS 36400 Great Issues: “The meteorology of Hurricane Sandy” (02/2016)
- EAPS 13700 Freshman Seminar in Earth and Atmospheric Sciences: “Hurricanes” (04/2016)

*College:*

- Feature interview in Purdue College of Science Insights Magazine Fall 2018: <https://www.science.purdue.edu/insights/fall-2018/hurricane-irma.html>
- Guest for “Superheroes of Science” Purdue College of Science podcast led by Steven Smith and Sarah Nern (09/2019)
- Physics REU research seminar “Using imaginary worlds to understand hurricanes on Earth” (07/2019)
- Faculty lunch discussion with the Dean (04/2019)
- Physics REU research seminar “Using imaginary worlds to understand hurricanes on Earth” (07/2017)

*Guest lectures across campus:*

- AE 25000 Economic Geography of World Food and Resources: “The science of climate change” (01/2019)
- AE 25000 Economic Geography of World Food and Resources: “The science of climate change” (01/2018)
- AE 25000 Economic Geography of World Food and Resources: “The science of climate change” (01/2017)

*Other activities:*

- Mentor, Purdue Emerging Leaders Science Scholars undergraduate diversity program (2 mentees in 2021-2022)
- Lead developer and faculty organizer for weekly “Storm Snack” ATMS research discussions (09/2016-05/2021)
- Lead organizer ATMS Faculty meetings (09/2018-present)
- Research presentation at Purdue EAPS StormSnack meeting (02/2020)
- Faculty Liaison, Ayelet Bernstein Purdue Elementary Education Greenhouse Effect demonstration project (04/2019)
- Research presentation at Purdue EAPS StormSnack meeting (01/2019)
- Research presentation at Purdue Undergraduate Meteorology Association (PUMA) meeting (11/2018)
- Lead author of Purdue EAPS White Paper “Natural Hazards: Severe Weather Science Initiative (SWSI)” for the College of Science (12/2017)
- “Weather in a Tank” demonstrations using the Geophysical Fluid Dynamics mobile rotating fluid tank at the EAPS 50<sup>th</sup> anniversary Jubilee Open House (09/2017)

## External service

### *External Graduate MS/PhD Committees*

- Dazhi Xi, Princeton Civil and Environmental Engineering Ph.D., expected 2022
- Pavan Harika Raavi, University of Melbourne School of Earth Sciences Ph.D., expected 2020
- Renzhi Jing, Princeton Civil and Environmental Engineering Ph.D., awarded 2019
- Ping Lu, Princeton Civil and Environmental Engineering Ph.D., awarded 2018

### *Professional activities:*

- Professional memberships
  - Member, American Meteorological Society Committee on Tropical Cyclones and Tropical Meteorology
  - Member, American Meteorological Society
  - Member, American Geophysical Union
  - Member, Purdue Climate Change Research Center
- Peer reviewer of 60+ manuscripts from the following journals: *Nature*, *Nature Communications*, *Journal of the Atmospheric Sciences*, *Quarterly Journal of the Royal Meteorological Society*, *Journal of Climate*, *Monthly Weather Review*, *Natural Hazards Review*, *Natural Hazards*, *Climatic Change*, *Environmental Research Letters*, *Weather and Forecasting*, *Environmental Fluid Mechanics*, *Geophysical Fluid Dynamics*, *Journal of Geophysical Research – Atmospheres*, *Climate Dynamics*, *Journal of Advances in Modeling Earth Systems*.
  - AGU 2020 Editors’ Citation for Excellence in Refereeing for Geophysical Research Letters. <https://eos.org/agu-news/in-appreciation-of-agus-outstanding-reviewers-of-2020>
- Science organizing committees for workshops and conferences
  - Lead organizer, Purdue Ice Storm Risks Workshop, May 2020 (postponed to Fall 2021 due to Covid-19)
  - American Meteorological Society Conference on Hurricanes and Tropical Meteorology 2020
  - American Meteorological Society Conference on Hurricanes and Tropical Meteorology 2018
  - Student Award Committee, Symposium on Hurricane Risk in a Changing Climate, June 2020 (postponed to June 2021 due to Covid-19).



- Structure Change Processes Working Group, 8<sup>th</sup> International Workshop on Tropical Cyclones (2014)
- Chair, Max Eaton Student Award Committee, 31<sup>st</sup> AMS Hurricanes and Tropical Meteorology Conference (2014)
- Scientific governing committees
  - American Meteorological Society Committee on Tropical Cyclones and Tropical Meteorology (2016-present)

## Outreach

- Purdue Polytechnic High School Indianapolis-Downtown virtual guest lecture “Weather and Climate” (03/2021)
- “Climate Scientists with Dan Jones” podcast episode “Dan Chavas: tropical cyclones, exoplanet hurricanes, and his pathway into research” (11/2020)  
<https://podcasts.apple.com/gb/podcast/dan-chavas-tropical-cyclones-exoplanet-hurricanes-his/id1352839509?i=1000499804069>
- “The jet stream” high school virtual mini-lecture, GFD tank demo, and data lab, organized by Steven Smith and Sarah Nern (11/2020)
- Purdue Polytechnic High School Indianapolis-Downtown virtual guest lecture “Weather and Climate” (10/2020)
- Interview with Richard Morgan (FOX 59 / CBS 4 Indy) on Lake Ice article (03/2019)  
<https://cbs4indy.com/2019/04/05/warmer-winters-mean-less-ice-and-more-ice-safety/>
- “Weather in a Tank” demonstrations using the Geophysical Fluid Dynamics mobile rotating fluid tank at AP Science Fridays for AP Environmental Science high school students (11/2018)
- Indiana State Museum extreme weather demonstration exhibitor for Nature Unleashed exhibit (03/2017)
- Tornado chamber demonstration and presentation on “The Science of Tornadoes” for Taste of Science event on climate change at Black Acre Brewery in Indianapolis, IN (04/2017)
- Subject matter expert evaluator for Climate Feedback (now Science Feedback), an organization that seeks to improve the representation of climate science information in public journalism (2014-present)
- Global warming information email for Jada Gaston at Kenyon Woods Middle School (05/2016)

## Press

- Quotes following Nature News and Views article (**Chavas and Chen 2020**) discussing new paper on hurricanes lasting longer after landfall in a warming world:
  - <https://www.nationalgeographic.com/environment/article/hurricanes-lasting-longer-climate-change-study-finds>
  - <https://www.nytimes.com/2020/11/11/climate/hurricanes-climate-change-patterns.html>
  - <https://www.scientificamerican.com/article/as-the-oceans-warm-hurricanes-stay-stronger-longer/>
- NSF CAREER award (2020): Chavas’ research grant aims to tackle fundamental understanding of the large-scale circulations that steer hurricanes into land.
  - <https://www.eaps.purdue.edu/news/articles/2020/chavas-award.html>
- Press for Cronin and Chavas (2019) publication: Chavas’ paper demonstrates that hurricanes can exist in climates without water, opening up the possibility that hurricanes may occur on many other planets in the universe, too.
  - <https://www.space.com/extraterrestrial-hurricanes-on-alien-planets.html>

- <https://www.techexplorist.com/cold-dry-planets-hurricanes/25185/>
- <https://www.sciencedaily.com/releases/2019/07/190724111116.htm>
- <https://phys.org/news/2019-07-cold-planets-lot-hurricanes.html>
- <https://www.accuweather.com/en/weather-news/could-hurricanes-swirl-on-cold-dry-alien-planets/468723>
- <https://www.purdue.edu/newsroom/releases/2019/Q3/cold,-dry-planets-could-have-a-lot-of-hurricanes.html>
- Purdue interview on the VORTEX Southeast tornado field campaign (05/2019): tornado activity has gradually shifted toward the southeast U.S., yet we do not currently understand why.
  - <https://www.purdue.edu/newsroom/releases/2019/Q2/the-center-of-tornado-activity-is-shifting.-these-researchers-want-to-know-why..html>
- Feature interview in Purdue Giant Leaps 150<sup>th</sup> anniversary celebration (01/2019): Chavas' research seeks to understand why extreme weather emerges within our climate system in general
  - <https://takegiantleaps.com/to-understand-climate-change-we-need-to-understand-weather-now/>
- Feature interview in Purdue College of Science Insights Magazine (Fall 2018): Chavas' lab takes data from inside Hurricane Irma and from its aftermath to better understand how hurricanes cause damage.
  - <https://www.science.purdue.edu/insights/fall-2018/hurricane-irma.html>
- Hurricane Florence USA Today article (09/2018): Chavas' research explains why the traditional scale for hurricane intensity based on maximum wind speed is deficient
  - <https://www.usatoday.com/story/news/nation/2018/09/19/hurricane-florence-winds-not-best-way-measure-storms-ferocity/1349957002/>
- Hurricane Lane Purdue news tip (08/2018): Chavas explains why changes in hurricane intensity are especially difficult to forecast
  - <https://www.purdue.edu/newsroom/releases/2018/Q3/hurricane-lane-weakens-from-category-5-to-2.-why-was-the-storm-so-unpredictable.html>
- Feature interview in Purdue Alumnus magazine's "The Big Idea" article (10/2016): Chavas provides his transformative vision for our collective future
  - <https://www.purduealumnus.org/features/the-big-idea/>
- Press for Chavas et al. (2017) publication (11/2017): Chavas' research solves the physics for why minimum central pressure may be a more useful measure of hurricane intensity
  - [https://www.purdue.edu/science/about/news\\_and\\_publications/articles/hurricane-predict-chavas.html](https://www.purdue.edu/science/about/news_and_publications/articles/hurricane-predict-chavas.html)
  - <https://www.sciencedaily.com/releases/2017/11/171108092006.htm>
  - <https://www.usatoday.com/story/weather/2017/11/08/wind-speed-isnt-best-way-measure-hurricane-ferocity/845203001>
- New York Times article on Hart et al. (2016) publication (09/2016): Chavas' research demonstrates how caution is warranted in interpreting trends in hurricane landfall
  - <http://www.nytimes.com/2016/09/03/us/hurricanes-global-warming.html>

## Conferences/Presentations

*Invited*

- Symposium on Hurricane Risk in a Changing Climate, June 2022, Key Largo, FL. “A simple model to predict the tropical cyclone radius of maximum wind from outer size.” (postponed from June 2020 due to Covid-19)
- NOAA Princeton/GFDL Virtual Formal Seminar Series seminar, March 2022.
- University of Wisconsin-Madison, Department of Atmospheric and Oceanic Sciences seminar, Spring 2022.
- New York University Center for Atmosphere Ocean Science seminar, November 2021.
- University of California-Davis Department of Atmospheric Science seminar, May 2021. “Using imaginary worlds to understand tropical cyclones on Earth.”
- Indiana University Purdue University Indianapolis Department of Physics seminar, March 2021. “Using imaginary worlds to understand tropical cyclones on Earth.”
- Harvard University Department of Earth and Planetary Sciences ClimaTea seminar, Oct 2020. “Using imaginary worlds to understand tropical cyclones on Earth.”
- Okinawa Institute of Science and Technology, March 2020 (postponed due to Covid-19), Okinawa, Japan. Seminar and short course on tropical cyclones.
- University of Notre Dame Department of Civil & Environmental Engineering & Earth Sciences seminar, April 2019. “Using imaginary worlds to understand tropical cyclones on Earth.”
- University of Chicago Department of Geophysical Sciences seminar, November 2018. “Using imaginary worlds to understand tropical cyclones on Earth.”
- Columbia University Lamont Doherty Earth Observatory, March 2018. “Using global models to understand the tropical cyclone.”
- Indiana University Department of Earth and Atmospheric Sciences, March 2018. “Using global models to understand the tropical cyclone.”
- MIT Program in Atmospheres, Oceans, and Climate, February 2018. “Using global models to understand the tropical cyclone.”
- University of Illinois Urbana-Champaign Department of Atmospheric Sciences, November 2017. “Physical understanding of the tropical cyclone wind-pressure relationship.”
- Purdue University Department of Agricultural Economics, May 2017. “Tropical cyclone physics, hazards, and risk”.
- Iowa State University Department of Earth and Geological Sciences, April 2017. “Using imaginary worlds to understand our own: the tropical cyclone low-level wind field”.
- Risk Prediction Initiative Research Update Workshop, June 2015, London, England. “A model for the complete tropical cyclone wind field.”
- International Summit on Hurricanes and Climate Change, June 2015, Crete, Greece. “A model for the complete tropical cyclone wind field.”
- AIR Seminar, AIR Worldwide, May 2015, Boston, MA. “A model for the complete tropical cyclone wind field.”
- Columbia University Applied Physics and Applied Mathematics SEAS Colloquium, May 2015, New York, NY. “A model for the complete tropical cyclone wind field.”
- Princeton University Civil and Environmental Engineering Brown Bag Seminar, October 2014. “Modeling the hurricane wind field.”
- National Center for Atmospheric Research (NCAR) Mesoscale and Microscale Meteorology Seminar, June 2014, Boulder, CO. “A complete solution for the radial wind structure of a tropical cyclone.”

- University at Albany Department of Atmospheric and Environmental Sciences Seminar, April 2014, Albany, NY. “Equilibrium tropical cyclone size and structure in models, theory and observations.”
- Princeton University Civil and Environmental Engineering Brown Bag Seminar, February 2014. “A complete physics-based hurricane radial wind profile constrained by observations.”
- National Center for Atmospheric Research (NCAR) Seminar, April 2013, Boulder, CO. “Equilibrium tropical cyclone size in radiative-convective equilibrium.”

*Other*

- AMS Conference on Hurricanes and Tropical Meteorology, May 2020 (postponed to 2021 due to Covid-19), New Orleans, LA. “Dynamical aquaplanet experiments with uniform thermal forcing: system dynamics and implications for tropical cyclone size.”
- AMS Conference on Hurricanes and Tropical Meteorology, May 2020 (postponed to 2021 due to Covid-19), New Orleans, LA. “A simple physically-based model to predict the radius of maximum wind from outer size.”
- AMS Conference on Hurricanes and Tropical Meteorology, May 2020 (postponed to 2021 due to Covid-19), New Orleans, LA. “Is inter-storm interaction important for tropical cyclone genesis and size? Beta-plane experiments with uniform thermal forcing.”
- American Meteorological Society Annual Meeting, January 2020, Boston, MA. “Testing a Physics-based Model of the Thermodynamic Environment in Supercell Simulation Experiments.”
- American Meteorological Society Annual Meeting, January 2020, Boston, MA. “Investigating the Geographic Controls of Severe Local Storm Environments: From Real World to Reduced Complexity”. Reed K.A., Chavas D. R., Li F., and D. T. Dawson II.
- American Meteorological Society Annual Meeting, January 2020, Boston, MA. “Testing a Physics-based Model of the Thermodynamic Environment in Supercell Simulation Experiments.”
- AGU Fall Meeting, December 2019, San Francisco, CA. “Log-law wind profiles for the prediction of the drag coefficient and their radial dependence in tropical cyclones.” Wang G., Chavas D. R., Bryan G., Stern D. P., and D. H. Richter.
- AGU Fall Meeting, December 2019, San Francisco, CA. “The Transient Responses of An Axisymmetric Tropical Cyclone to Instantaneous Surface Roughening and Drying.” Chen J. and D. R. Chavas.
- AGU Fall Meeting, December 2019, San Francisco, CA. “An Exploration of Extreme Precipitation from Tropical Cyclones over the Eastern United States in Variable-Resolution CAM.” Stansfield A. M., Reed K. A., Zarzycki C. M., Ullrich P. A., and D. R. Chavas.
- AGU Fall Meeting, December 2019, San Francisco, CA. “Geographic Controls of Severe Local Storm Environments over North America: Role of the Rocky Mountains and the Gulf of Mexico.” Li F., Chavas D. R., Reed K. A., and D. T. Dawson II.
- AGU Fall Meeting, December 2019, San Francisco, CA. “Sensitivity of tropical cyclone formation rate to surface warming in idealized numerical simulations.” Ramsay H., Singh M., and D. R. Chavas.
- Lake Michigan Exoplanet Workshop, November 2019, University of Chicago, Chicago, IL. “Are large internally-heated Earth-like planets covered in hurricanes?”
- Cyclone workshop, October 2019, Seon, Germany. “What Sets the Dynamical Dependence of Tropical Cyclone Genesis and Size on latitude? Dynamical Experiments in a World Where Cyclones Reach the Poles.”

- Atmosphere Ocean Fluid Dynamics, June 2019, Portland, ME. “Dynamical aquaplanet experiments with uniform thermal forcing: system dynamics and implications for tropical cyclone genesis and size.”
- Atmosphere Ocean Fluid Dynamics, June 2019, Portland, ME. “High Latitude Inertial Waves in Axisymmetric Tropical Cyclones.” O’Neill M. and D. R. Chavas.
- Atmosphere Ocean Fluid Dynamics, June 2019, Portland, ME. “Sensitivity of tropical cyclone formation rate to surface warming in idealized numerical simulations.” Ramsay H., Singh M., and D. R. Chavas.
- Atmosphere Ocean Fluid Dynamics, June 2019, Portland, ME. “Characterizing the Energetics of Multi-Scale Asymmetries during Tropical Cyclone Rapid Intensity Changes.” Bhalachandran S., Chavas D. R., Marks F. D., Dubey S., Shreevastava A., and T. N. Krishnamurti.
- Atmosphere Ocean Fluid Dynamics, June 2019, Portland, ME. “Geographic Controls of Hazardous Convective Weather Environments over North America.” Li F., Chavas D. R., and K. A. Reed.
- Atmosphere Ocean Fluid Dynamics, June 2019, Portland, ME. “Understanding the Inland Evolution of Hurricane Low-Level Wind Field through Idealized Numerical Simulations.” Chen J. and D. R. Chavas.
- American Meteorological Society Annual Meeting, January 2019, Phoenix, AZ. “Understanding Controls of Severe Local Storm Environments over North America: Role of Elevated Terrain and the Gulf of Mexico”. Reed K.A., Chavas D. R., and F. Li.
- AGU Fall Meeting, December 2018, Washington DC. “Understanding the Topographic Controls of Severe Local Storm Environments over North America”. Reed K. A., Chavas D. R., and F. Li.
- AGU Fall Meeting, December 2018, Washington DC. “Dry and Semi-Dry Tropical Cyclones.” Cronin T. W. and D. R. Chavas.
- AGU Fall Meeting, December 2018, Washington DC. “On The Upper Limit Of The Global Number Of Tropical Cyclones.” Vu T. A., Kieu C., and D. R. Chavas.
- AGU Fall Meeting, December 2018, Washington DC. “Understanding Land Surface Controls of Severe Local Storm Environments over North America: Role of Elevated Terrain and the Gulf of Mexico.”
- AMS Conference on Severe Local Storms, October 2018, Stowe, VT. “Understanding the Topographic controls of severe local storm environments in the United States”
- AMS Conference on Severe Local Storms, October 2018, Stowe, VT. “Understanding the geographic controls of severe local storm environments in the United States: Role of the Gulf of Mexico.”
- AMS Conference on Severe Local Storms, October 2018, Stowe, VT. “Intercomparison of spatiotemporal variability in severe weather environmental proxies and tornado activity over the United States.” Simmons S. W. and D. R. Chavas.
- AMS Conference on Severe Local Storms, October 2018, Stowe, VT. “The dependence of tornadogenesis on terrain roughness: historical record analysis using Bayes' Law.” Hua Z. and D. R. Chavas.
- AMS Conference on Hurricanes and Tropical Meteorology, April 2018, Ponte Vedra Beach, Florida. “Physical understanding of the tropical cyclone wind-pressure relationship.”
- AMS Conference on Hurricanes and Tropical Meteorology, April 2018, Ponte Vedra Beach, Florida. “The Dynamical Dependence of Tropical Cyclones in Aquaplanet Climate Experiments Under Uniform Thermal Forcing.”
- AMS Conference on Hurricanes and Tropical Meteorology, April 2018, Ponte Vedra Beach, Florida. “Dry and Semi-Dry Tropical Cyclones.” Cronin T. W. and D. R. Chavas.

- AMS Conference on Hurricanes and Tropical Meteorology, April 2018, Ponte Vedra Beach, Florida. “The Impact of Environmental Inertial Stability on the Secondary Circulation of Axisymmetric Tropical Cyclones.” O’Neill M. O. and D. R. Chavas.
- AMS Conference on Hurricanes and Tropical Meteorology, April 2018, Ponte Vedra Beach, Florida. “Will Outer Tropical Cyclone Size Change due to Anthropogenic Warming?” Schenkel B. A., Lin N., Chavas D. R., Vecchi G. A., Knutson T. R., and M. Oppenheimer M.
- AMS Conference on Hurricanes and Tropical Meteorology, April 2018, Ponte Vedra Beach, Florida. “Why Are There Approximately 100 Tropical Cyclones Annually on Earth?” Kieu C., Vu T. A., and D. R. Chavas.
- AMS Conference on Hurricanes and Tropical Meteorology, April 2018, Ponte Vedra Beach, Florida. “Tropical Cyclone Structure and Size across Climates.” Korty R. and D. R. Chavas.
- AMS Conference on Hurricanes and Tropical Meteorology, April 2018, Ponte Vedra Beach, Florida. “Understanding the Inland Evolution of Tropical Cyclone Wind Field through Idealized Numerical Modeling Experiments.” Chen J. and D. R. Chavas.
- AMS Conference on Hurricanes and Tropical Meteorology, April 2018, Ponte Vedra Beach, Florida. “Thermodynamic Constraints on Observed Global Tropical Cyclone Count.” Hoogewind K., Chavas D. R., Schenkel B. A., and M. O’Neill.
- American Meteorological Society Annual Meeting, January 2018, Austin, TX. “A Simple Statistical Model for the Lifetime Evolution of Outer Tropical Cyclone Size”. Schenkel B. A., Lin N., Chavas D. R., Oppenheimer M., and A. Brammer.
- AGU Fall Meeting, December 2017, New Orleans, LA. “The dependence of tropical cyclone count and size on rotation rate.”
- AGU Fall Meeting, December 2017, New Orleans, LA. “The impact of environmental inertial stability on the secondary circulation of axisymmetric tropical cyclones.” O’Neill M. and D. R. Chavas.
- AGU Fall Meeting, December 2017, New Orleans, LA. “Will Outer Tropical Cyclone Size Change due to Anthropogenic Warming?” Schenkel B. A., Lin N., Chavas D. R., Vecchi G. A., Knutson T. R., and M. Oppenheimer M.
- AGU Fall Meeting, December 2017, New Orleans, LA. “Understanding the Geographic Controls of Hazardous Convective Weather Environments in the United States.” Reed K. A. and D. R. Chavas.
- AGU Fall Meeting, December 2017, New Orleans, LA. “Dry and Semi-Dry Tropical Cyclones.” Cronin T. W. and D. R. Chavas.
- Cyclone Workshop, October 2017, Montreal, CA. “Physical understanding of the tropical cyclone wind-pressure relationship.”
- International Summit on Hurricanes and Climate Change, June 2017, Crete, Greece. “Understanding the relationship between the maximum wind speed and minimum central pressure in a tropical cyclone.”
- Atmosphere Ocean Fluid Dynamics, June 2017, Portland, OR. “The dependence of tropical cyclone size on rotation rate: a time-dependent view.”
- Atmosphere Ocean Fluid Dynamics, June 2017, Portland, OR. “Dry and Semi-Dry Tropical Cyclones in Radiative-Convective Equilibrium.” Cronin T. W. and D. R. Chavas.
- AGU Fall Meeting, December 2016, San Francisco, CA. “On the central pressure deficit of a tropical cyclone.”

- AMS Severe Local Storms Conference, November 2016, Portland, OR. “On the spatiotemporal distribution of tornadic environments over North America.”
- WCRP Model Hierarchies Workshop, Princeton University, October 2016, Princeton, NJ. “Using model hierarchies to understand the tropical cyclone.”
- AMS Conference on Hurricanes and Tropical Meteorology, April 2016, Puerto Rico. “The tropical cyclone wind field and its variability: Perspective from the outside in.”
- AGU Fall Meeting, December 2015, San Francisco, CA. “Uniformly-rotating radiative-convective equilibrium in CAM5.”
- Cyclone Workshop, October 2015, Monterey, CA. “The tropical cyclone wind field and its variability: Perspective from the outside in.”
- Risk Prediction Initiative Research Update Workshop, June 2015, London, England. “A model for the complete tropical cyclone wind field.”
- International Summit on Hurricanes and Climate Change, June 2015, Crete, Greece. “A model for the complete tropical cyclone wind field.”
- AIR Seminar, AIR Worldwide, May 2015, Boston, MA. “A model for the complete tropical cyclone wind field.”
- Columbia University Applied Physics and Applied Mathematics SEAS Colloquium, May 2015, New York, NY. “A model for the complete tropical cyclone wind field.”
- AGU Fall Meeting, December 2014, San Francisco, CA. “A complete tropical cyclone radial wind structure model and comprehensive comparison with observations”.
- Princeton University Civil and Environmental Engineering Brown Bag Seminar, October 2014. “Modeling the hurricane wind field.”
- National Center for Atmospheric Research (NCAR) Mesoscale and Microscale Meteorology Seminar, June 2014, Boulder, CO. “A complete solution for the radial wind structure of a tropical cyclone.”
- University at Albany Department of Atmospheric and Environmental Sciences Seminar, April 2014, Albany, NY. “Equilibrium tropical cyclone size and structure in models, theory and observations.”
- AMS Conference on Hurricanes and Tropical Meteorology, April 2014, San Diego, CA. “Beyond the wind radius: a complete, observationally-constrained tropical cyclone radial wind profile.”
- Princeton University Civil and Environmental Engineering Brown Bag Seminar, February 2014. “A complete physics-based hurricane radial wind profile constrained by observations.”
- Atmosphere Ocean Fluid Dynamics, June 2013, Rhode Island. “Equilibrium tropical cyclone size in radiative-convective equilibrium.”
- Northeast Tropical Workshop, May 2013, Rensselaerville, NY. “Equilibrium tropical cyclone size in radiative-convective equilibrium.”
- National Center for Atmospheric Research (NCAR) Seminar, April 2013, Boulder, CO. “Equilibrium tropical cyclone size in radiative-convective equilibrium.”
- AMS Conference on Hurricanes and Tropical Meteorology, April 2012, Ponte Vedra Beach, FL. “Equilibrium tropical cyclone size in a highly-idealized state of axisymmetric radiative-convective equilibrium.” Max Eaton Student Award winner.
- AMS Annual Meeting, January 2012, New Orleans, LA. "U.S. Hurricanes and economic damage: an extreme value perspective."
- International Summit on Hurricanes and Climate Change, July 2011, Rhodes, Greece. “Idealized tropical cyclogenesis experiments in a cloud resolving model in radiative-convective equilibrium.”

- Risk Prediction Initiative Research Update Workshop, October 2010, Bermuda. "Sometimes they're big, often they're small: a high-resolution historical dataset of tropical cyclone size."
- AMS Conference on Hurricanes and Tropical Meteorology, May 2010, Tucson, AZ. "A QuikSCAT climatology of tropical cyclone size."
- AGU Fall Meeting, December 2008, San Francisco, CA. "Assessment of Long-Term Climate Change Impacts on Agricultural Productivity in Eastern China Using High-Resolution Regional Climate Model Output."
- Cyclone Workshop, September 2008, Montreal, Canada. "A quasi-geostrophic potential vorticity view of the structure and development of African easterly waves."
- AMS Conference on Hurricanes and Tropical Meteorology, April 2006, Monterey, CA. "Diagnosis of African Easterly Wave Structure and Development using Quasi-Geostrophic Potential Vorticity."

### **Awards**

2021 Jun	Editors' Citation for Excellence in Refereeing for Geophysical Research Letters
2020 May	NSF Faculty Early Career Development (CAREER) 5-year award
2019 Apr	Outstanding Contributions to Undergraduate Teaching by an Assistant Professor in the College of Science
2018 Jan	Purdue College of Science Undergraduate Advising Award
2013 Jul	NSF AGS Postdoctoral Fellowship awardee
2013 Mar	NCAR ASP Postdoctoral Fellowship awardee
2012 Apr	Max Eaton Student Award, 30th Conf. on Hurricanes and Tropical Met.
2010 Dec	WxChallenge Top Forecaster Award, Category 1/2
2008-2009	American Meteorological Society Graduate Research Fellowship
2008-2009	Praecis MIT Presidential Graduate Fellowship
2006-2007	Barry Goldwater National Scholar
2005-2006	Hilldale Undergraduate/Faculty Research Fellowship
2005 May	National Weather Association David Sankey Memorial Award
2005 May	Horn Award, UW-Madison Atmospheric and Oceanic Sciences
2005 Mar	Florence Waste Pulver Scholarship, UW-Madison
2003-2007	Wisconsin Academic Excellence Scholarship

### **Grants/Projects (co-PI/PI)**

2021 Oct	Purdue Covid Disruption Fund (Lead PI)
2021 Feb	Purdue Instructional Equipment grant (co-PI)
2020 Jun	HRD Hurricane Field Program IFEX TC Diurnal Cycle Experiment (co-PI)
2020 May	NASA FINESST award (Lead PI; F. Li PhD student)
2020 May	NSF Faculty Early Career Development (CAREER) 5-year award (PI)
2019 Jun	HRD Hurricane Field Program IFEX TC Diurnal Cycle Experiment (co-PI)
2019 May	PCCRC 1-year Collaborative Seed Grant (Lead PI)
2018 Aug	NSF ENG 3-year grant (co-PI)
2018 May	Ross Graduate Fellowship-Assistantship (Geeta Nain)
2017 Jan	Blosser, Russell O. Memorial Fellowship (Jie Chen)
2017 Sep	NSF PREEVENTS 3-year grant (Lead PI)
2016 Aug	NOAA NSSL VORTEX-SE 1-year grant (co-PI)
2015 Mar	Purdue Instructional Education grant (Lead PI)
2015 Aug	NOAA NSSL VORTEX-SE 1-year grant (co-PI)
2013 Nov	NSF AGS Postdoctoral Fellowship (PI, Princeton University)



2010-2013 DOE Office of Science Graduate Research Fellowship (MIT)