

Daniel M. Abrams

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(a) Professional preparation

Massachusetts Institute of Technology (Cambridge, MA) Postdoctoral Research Fellow in Mathematical Sciences Department of Earth, Atmospheric and Planetary Sciences	2006–2009
Cornell University (Ithaca, NY) Ph.D. in Theoretical and Applied Mechanics, May 2006	2001–2006
California Institute of Technology (Pasadena, CA) Bachelor of Science with honors in Applied Physics, June 2000	1996–2000

(b) Appointments

Northwestern University Department of Engineering Sciences and Applied Mathematics <i>Associate Professor</i>	2015–Present
Northwestern Institute on Complex Systems (NICO) <i>Faculty member, member of executive committee 2015–present</i>	2011–Present
Northwestern University Department of Physics and Astronomy <i>Faculty member (by courtesy)</i>	2013–Present
Northwestern University Department of Engineering Sciences and Applied Mathematics <i>Assistant Professor</i>	2009–2015
James S. McDonnell Foundation <i>Scholar, Complex Systems</i>	2010–2015
Northwestern University Searle Center for Teaching Excellence <i>Searle Fellow</i>	2011–2012
Fulbright Program / Council for International Exchange of Scholars <i>Visiting Scholar, UNSAAC University Department of Physics, Cusco, Peru</i>	2010
NSF / MIT Department of Earth, Atmospheric, and Planetary Sciences <i>Mathematical Sciences Postdoctoral Research Fellow</i>	2006–2009
NSF East Asia and Pacific Summer Institute Fellow (SNU, Seoul, Korea)	Summer 2006
NSF Graduate Research Fellow	2003–2006
US ED Foreign Language Area Study Grantee (Quechua)	Summer 2003
Field Research Fellow, US Antarctic Program Project S-157 (Ice Stream C, Antarctica)	2000–2001

(c) Products/Publications (10) Total cites = 3341, h-index = 20 (Google Scholar, 10/04/18)

- 1) S.M. Clifton, E. Herbers, J. Chen, and D.M. Abrams, "The tipping point: A mathematical model for the profit-driven abandonment of restaurant tipping," *Chaos* **28**, 023109 (2018).
[\[doi:10.1063/1.5004711\]](https://doi.org/10.1063/1.5004711). [journal article, published]

- 2) T. Kotwal, X. Jiang, and D.M. Abrams, "Connecting the Kuramoto model and the chimera state," *Physical Review Letters* **119** (26), 264101 (2017). [[doi:10.1103/PhysRevLett.119.264101](https://doi.org/10.1103/PhysRevLett.119.264101)]. [*journal article, published*]
- 3) S.M. Clifton, R.I. Braun, and D.M. Abrams, "Handicap principle implies emergence of dimorphic ornaments," *Proceedings of the Royal Society B* **283**, 1970 (2016). [[doi:10.1098/rspb.2016.1970](https://doi.org/10.1098/rspb.2016.1970)] [*journal article, published*]
- 4) S.H. Lee, R. Ffrancon, D.M. Abrams, B.J. Kim and M.A. Porter, "Matchmaker, matchmaker, make me a match: Migration of populations via marriages in the past," *Physical Review X* **4**, 041009 (2014). [[doi:10.1103/PhysRevX.4.041009](https://doi.org/10.1103/PhysRevX.4.041009)] [*journal article, published*]
- 5) D.M. Abrams, A. Slawik, and K. Srinivasan, "Nonlinear oscillations and bifurcations in silicon photonic microresonators," *Physical Review Letters* **112**, 123901 (2014). [[doi:10.1103/PhysRevLett.112.123901](https://doi.org/10.1103/PhysRevLett.112.123901)] [*journal article, published*]
- 6) D.M. Abrams and M.J. Panaggio, "A model balancing cooperation and competition can explain our right-handed world and the dominance of left-handed athletes," *Journal of the Royal Society Interface* **09** (75), 2718-2722 (2012). [[doi:10.1098/rsif.2012.0211](https://doi.org/10.1098/rsif.2012.0211)] [*journal article, published*]
- 7) A.P. Petroff, O. Devauchelle, D.M. Abrams, A.E. Lobkovsky, A. Kudrolli and D. H. Rothman. "Geometry of valley growth," *Journal of Fluid Mechanics* **673**, 245–254 (2011). [[doi:10.1017/S002211201100053X](https://doi.org/10.1017/S002211201100053X)] [*journal article, published*]
- 8) D.M. Abrams, A.E. Lobkovsky, A.P. Petroff, K.M. Straub, B. McElroy, D.C. Mohrig, A. Kudrolli, and D.H. Rothman, "Growth laws for channel networks incised by groundwater flow," *Nature Geoscience* **2**, 193–196 (2009). [[doi:10.1038/ngeo432](https://doi.org/10.1038/ngeo432)] [*journal article, published*]
- 9) S.H. Strogatz, D.M. Abrams, F.A. McRobie, B. Eckhardt, and E. Ott, "Crowd synchrony on the Millennium Bridge," *Nature* **438**, 43 (2005). [[doi:10.1038/438043a](https://doi.org/10.1038/438043a)] [*journal article, published*]
- 10) D.M. Abrams and S.H. Strogatz, "Modelling the dynamics of language death," *Nature* **424**, 900 (2003). [[doi:10.1038/424900a](https://doi.org/10.1038/424900a)] [*journal article, published*]

(d) Synergistic activities

Teaching and training:

- Co-editor-in-chief of SIAM Dynamical Systems magazine and DSWeb web site (2016-present).
- Mentored 13 undergraduate and 8 graduate student researchers (ongoing).
- Worked with School of the Art Institute of Chicago on new collaborative course "Data as art" (2013).

Development of research tools:

Created and distributed numerical simulation notes and code: coupled oscillator systems (2008), chaotic Taylor-Couette fluid system (2002).

Development of databases to support research and education:

Compiled shared databases on language competition (2003-2004), evolution of religious affiliation (2010-2011), handedness in athletics (2011), international smoking dynamics (2014), and US obesity dynamics (2017).

Broadening participation of underrepresented groups:

- Lectured on math, science, computer skills, and the US educational system at civil institutions in Bolivia, Peru, and Nicaragua (2003-2010). Translated large portions of book "Nonlinear Dynamics and Chaos" into Spanish (2010).
- Participated in Schuler Scholar Outreach Program to promote math to underserved high school students (2013-2015).
- Panelist for Graduate Research Opportunities for Women (GROW) conference for undergraduate women in math (2016, 2017).