JASON C. GOODMAN

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Date of Birth: April 25, 1973

Education

Ph.D., 2001, **Massachusetts Institute of Technology** (Climate Physics and Chemistry). Thesis advisor: John Marshall. Thesis title: "Influence of atmosphere-ocean coupling on interannual climate variability."

B.A., 1995, **Carleton College**, (Physics) Degree with distinction, magna cum laude, Phi Beta Kappa.

Research Interests

- Interannual atmosphere-ocean climate variability (intrinsic vs. ocean-forced variability of annular modes and other mid-latitude atmospheric patterns)
- Paleoclimate modeling ("Snowball Earth" atmosphere/ocean/ice interaction)
- Planetary oceanography (liquid interiors of the icy moons of Jupiter and Saturn)

Professional Experience, 1995-present

2003-Present: Assistant Scientist, Department of Physical Oceanography, Woods Hole Oceanographic Institution.

2001-2003: Postdoctoral Research Associate, Department of Geophysical Sciences, University of Chicago. Supervisor: Raymond T. Pierrehumbert.

1997–2000: Teaching Assistant, Massachusetts Institute of Technology. Professors: John Marshall, Jochem Marotzke.

1995-2000: Research Assistant, Massachusetts Institute of Technology. Advisor: John Marshall.

1997: CTD watchstander, R/V *Knorr* (cruise 147V), Labrador Sea. Chief Scientist: Robert Pickart.

1996: CTD watchstander, R/V *Endeavour* (cruise 286, leg III), Gulf Stream. Chief Scientist: Robert Pickart.

Publications and Manuscripts for Peer-Reviewed Journals

Goodman, J. C. and G. C. Collins, 2006. Flow of Warm Ice in a Melt-Through Model of Europa's Ice Shell. In preparation.

Goodman, J. C. and G. C. Collins, 2006. Enceladus's South Polar Sea. Submitted to *Icarus*.

Goodman, J. C. and A. Czaja, 2006. Why the West Wind Wobbles: Viewing Annular Modes as Stochastically-Excited Potential Vorticity Reservoirs. Submitted to *Quarterly Journal of the Royal Meteorological Society.*

Goodman, J. C., 2006. Through Thick and Thin: Marine and Meteoric Ice in a 'Snowball Earth' Climate. *Geophysical Research Letters* 33, L16701, doi: 10.1029/2006GL026840.

Goodman, J. C., G. C. Collins, J. Marshall, and R. T. Pierrehumbert, 2004. Hydrothermal plume dynamics on Europa: Implications for Chaos Formation. *Journal of Geophysical Research — Planets* 109:E03008, doi: 10.1029/2003JE002073.

Goodman, J. C. and R. T. Pierrehumbert, 2003. Glacial flow of Floating Marine Ice in 'Snowball Earth'. *Journal of Geophysical Research* 108:C10, 3308, doi: 10.1029/2002JC001471.

Goodman, J. C. and J. Marshall, 2003. The role of neutral singular vectors in middle-latitude air–sea coupling. *Journal of Climate*, 16, 88–102.

Goodman, J. C. and J. Marshall, 2002. Using neutral singular vectors to study low-frequency atmospheric variability. *Journal of the Atmospheric Sciences*, 59(22), 3206–3222.

Marshall, J., H. Johnson, and J. Goodman, 2001. A study of the interaction of the North Atlantic Oscillation with ocean circulation. *Journal of Climate*, 14, 1399–1421.

Goodman, J. and J. Marshall, 1999. A model of decadal middle-latitude atmosphere–ocean coupled modes. *Journal of Climate*, 12, 621–641.

Funded Research Projects

Goodman, J. C., Impact of Marine Ice Dynamics on Simulations of Snowball Earth Climate. WHOI Independent Study Award, 2003.

Goodman, J. C. and G. C. Collins, Dynamics of Hydrothermal Plumes on Europa: Implications for Surface Geology annd Potential Bioenergetics. NASA Exobiology Program, 2004-2006.

Goodman, J. C., A Control Theory Approach to Atmospheric-Ocean Interaction. WHOI Ocean and Climate Change Institute Award, 2004.

Goodman, J. C. and J. Lin, Generation Processes for the 2004 Indian Ocean Tsunami. WHOI Interdisciplinary Study Award, 2005.

Other Publications

Goodman, J. C., 2006. Why the West Wind Wobbles: Understanding Random Changes in Wintertime Climate. to appear in *Oceanus*.

Conference Abstracts and Short Presentations

Goodman, J. C., 2006. Through Thick and Thin: Marine and Meteoric Ice in a 'Snowball Earth' Climate. Snowball Earth Conference, Ascona, Switzerland.

Collins, G. C. and J. C. Goodman, 2006. Internal Melting and the Shape of Enceladus. American Astronomical Society Division for Planetary Sciences Annual Meeting, Pasadena CA.

Goodman, J. C. and A. Czaja, 2005. Why the West Wind Wobbles: Stochastic Potential Vorticity Forcing of Annular Modes. American Geophhysical Union Fall Meeting, San Francisco CA.

Goodman, J. C. and G. C. Collins, 2004. Dynamics of Hydrothermal Plumes on Europa: Laboratory and Numerical Simulations. NASA Exobiology Principal Investigator's Symposium VIII, Moffett Field, CA.

Goodman, J. C., G. C. Collins, R. T. Pierrehumbert, and J. Marshall, 2003. Dynamics of Hydrothermal Plumes: Implications for Chaos Formation. Lunar and Planetary Science Conference XXXIV, Houston TX.

Collins, G. C., J. C. Goodman, and R. T. Pierrehumbert, 2003. Can Hydrothermal Plumes Melt Through Europa's Ice Shell? Lunar and Planetary Science Conference XXXIV, Houston TX.

Goodman, J. C. and R. T. Pierrehumbert, 2002. Glacial Flow of Floating Marine Ice in "Snowball Earth". American Geophysical Union Fall Meeting, San Francisco, CA.

Goodman, J. C. and J. Marshall, 2001. Using singular vectors to study low-frequency atmospheric variability. American Geophysical Union Spring Meeting, Boston, MA.

Goodman, J. C. and J. Marshall, 1999. Interaction of atmospheric `neutral vectors'' with oceanic rossby waves leads to midlatitude coupled interannual variability. AGU Ocean Sciences, San Antonio, TX.

Longer Seminars and Invited Talks

Goodman, J. C., 2006. Why the West Wind Wobbles: Stochastic Potential Vorticity Forcing of Annular Modes. WHOI Physical Oceanography Departmental Seminar, Woods Hole MA.

Goodman, J. C., 2004. Driving Forces for Planetary Oceans. American Association for the Advancement of Science Annual Meeting, Seattle WA.

Goodman, J. C., 2002. Convective Fluid Dynamics and Ice-Ocean Interactions within Jupiter's Moon Europa. MIT Atmospheric Sciences Seminar, Cambridge MA.

Goodman, J. C. and R. T. Pierrehumbert, 2002. Ice Shelf Dynamics on Snowball Earth. WHOI Geology and Geophysics Department Special Seminar, Woods Hole MA.

Goodman, J. C., 2002. Dissecting Interannual Climate Variability: Ocean Forcing and Preferred Atmospheric Modes. WHOI Physical Oceanography Departmental Seminar, Woods Hole MA.

Goodman, J. C., 2002. Convective Fluid Dynamics and Ice-Ocean Interactions within Jupiter's Moon Europa. University of Chicago Department of Geophysical Sciences Departmental Seminar, Chicago IL.

Goodman, J. C., 2002. Using Singular Vectors to Study Low-Frequency Atmospheric Variability. Joint Institute for the Study of Atmosphere and Ocean Seminar, University of Washington, Seattle WA.

Goodman, J. C., 2002. Ice Shelf Dynamics on Snowball Earth. University of Illinois Urbana-Champlain Department of Atmospheric Sciences, Urbana, IL.

Education / Mentoring Activities, 2003-present

Summer Student Fellow advisor for Daniel Carlson, 2004. Project title: Laboratory Models for Hydrothermal Plumes, with Applications to Europa's Liquid Interior.

Summer Student Fellow advisor for Solomon Hsiang, 2005. Project title: Ozone Chemistry during Global Glaciations: A Possible Climate Feedback.

Institute Committees and Organizational Activities

Informal team leader for "Pikmin" high-performance computing cluster collaboration (5 PIs in WHOI PO and USGS), 2004-present

PO representative on Information Technology Advisory Committee, 2005-present.

Co-organizer, DOEI/COI Workshop, "Interactions between Tsunamis and Underwater Geological Processes" 2006.

Review panel for WHOI Interdisciplinary, Independent Study, and Wheeler awards, 2006.

Other Professional Activities

Outer Planets Assessment Group Meeting, Arlington, VA, 2005. Advise NASA on scientific priorities for outer planet exploration.

Member, American Geophysical Union.

Reviewer of manuscripts for *Journal of Physical Oceanography*, *Journal of Climate*, *Journal of Geophysical Research* (*Atmospheres*, *Oceans*, and *Planets*), *Geophysical Research Letters*, and *Icarus*, and proposals for the National Science Foundation.