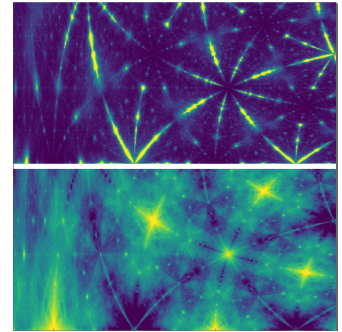




David Morison

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I am a physicist with over a decade of experience in scientific computing and data science, and recently I defended my Ph.D. dissertation *Spectral Analysis of Transport in Periodic, Quasiperiodic and Random Systems*.

Skills and Strengths

- Python, Matlab, Fortran
- Neural Net, Kalman Filter, Kriging/Optimal Interpolation, Spectral Clustering
- Linux/Unix, Vim, Shell Scripts & Makefiles, Command Line Tools
- Inverse Problems, Bulk Transport in Composites, Wave Propagation

Education

- Ph.D. in Physics, University of Utah, Salt Lake City, USA (2021)
- B.A. in Physics and Applied Math, University of California, Berkeley, USA (2002)

Accomplishments

- Designed a class of composites that exhibit an “order-to-disorder transition” (publication 6)
- Derived a correspondence between percolation and algebraic connectivity (publication 7)
- Grew MgSO_4 ice to explore the potential for microbial habitability in the icy crust of Europa
- Developed a new model of wave attenuation in the marginal ice zone
- Created an invertible model of blood flow through the brain and it’s measurement with ultrasound
- Designed and wrote a radiative transfer model (publication 3)
- Developed a method of buoy drift prediction; successfully tested in the Sea of Japan
- Validated a radar model utilized by the U.S. Navy for engineering and design purposes
- Translated and validated an analytic model of acoustic underwater bottom reflection
- Demonstrated a method for assimilating weather observations into ensemble forecasts
This method is computationally cheaper than established methods e.g. ensemble Kalman filter.
- Demonstrated the prediction of over the horizon radar ducting, using satellite data
- Studied potential acoustic propagation from hydrothermal vents
- Developed a simulation of the motion of tethered and driven oceanographic instruments
I deployed this simulation aboard R.V. Nathaniel B. Palmer during the 2005 MaudNESS cruise.

Employment History

Teaching and Research Assistant (2015 – present)

Physics and Astronomy Department

University of Utah

Graduate Advisor: Ken Golden

Physicist IV (2006 – 2015)

Applied Physics Laboratory

University of Washington

The Center for Environmental and Information Systems

Supervisors: David Jones, Bob Miyamoto,
Marc Stewart, Greg Anderson, Scott Sandgathe

Polar Science Center

Supervisors: Bonnie Light, James Morison

Center for Industrial and Medical Ultrasound

Supervisors: Pierre Mourad, Caren Marzban

Scientific Staff: Modeling (2005)

Research Vessel Nathaniel B. Palmer

Weddell Sea in Southern Ocean

Supervisor: Ramsey Harcourt

Field Work (2004)

Norwegian Coast Guard Vessel

Van Mijenfjorden of Svalbard

Supervisor: Frank Nilsen

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Maintenance Manager (2001)

Cloyne Court Hotel and Casino

Berkeley California

University Students' Cooperative Association

Expedition Experience

- Aboard CCGS Des Groseilliers, deploying oceanographic instruments (SHEBA 1998)
- Aboard a NoCGV in Van Mijenfjorden in Svalbard, collecting data with a tethered ROV (2004)
- Aboard RV Nathaniel B. Palmer interfaced with ships data (MaudNESS 2005)

Publications

- 1) Caren Marzban, Paul R. Illian, David Morison and Pierre D. Mourad, A Double-Gaussian, Percentile-Based Method for Estimating Maximum Blood Flow Velocity, *Journal of Ultrasound in Medicine*, 32(11) pp. 1913-20, 2013

- 2) Caren Marzban, Paul R. Illian, David Morison, Anne Moore, Michel Kliot, Marek Czosnyka and Pierre D. Mourad, A Method for Estimating Zero-Flow Pressure and Intracranial Pressure, *Journal of Neurosurgical Anesthesiology*, 25(1) pp. 25-32, 2013

- 3) Maria Zatko, Joseph Erbland, Joel Savarino, Lei Genga, Lauren Easley, Andrew Schauer, Timothy Bates, Patricia K. Quinn, Bonnie Light, David Morison, Hans D. Osthoff, Seth Lyman, William Neff, Bin Yuan and Becky Alexander, The Magnitude of the Snow-Sourced Reactive Nitrogen Flux to the Boundary Layer in the Uintah Basin, Utah, USA, *Journal of Atmospheric Chemistry and Physics*, 6 pp. 13837-13851, 2016

- 4) Sarah Dewey, James Morison, Ronald Kwok, Suzanne Dickinson, David Morison and Roger Andersen, Arctic Ice-Ocean Coupling and Gyre Equilibration Observed With Remote Sensing, *Geophysical Research Letters*, 45(3) pp. 1499-1508, 2018

- 5) James Morison, Ron Kwok, Suzanne Dickinson, Roger Andersen, Cecilia Peralta- Ferriz, David Morison, Ignatius Rigor, Sarah Dewey and John Guthrie, The Cyclonic Mode of Arctic Ocean Circulation, *Journal of Physical Oceanography*, (in press 2021)

- 6) David Morison, N. Benjamin Murphy, Elena Cherkaev and Kenneth M. Golden, Order to Disorder in Quasiperiodic Composites (submitted)

- 7) David Morison, N. Benjamin Murphy, Elena Cherkaev and Kenneth M. Golden, Two Perspectives on Percolation Transitions (in preparation)