John Bradley Marston
Professor of Physics
Associate Director of the Brown Theoretical Physics Center

Education

Cornell University: IBM Postdoctoral Fellow, August 1989 to July 1991.
Advisors: Barbara Cooper and Chris Henley.
Princeton University: Doctor of Philosophy in Physics, June 1989.
Ph.D. Thesis Title: *A Systematic Approach to the Hubbard Problem.*
Ph.D. Thesis Advisor: Ian Affleck.
California Institute of Technology: Bachelor of Science with Honors in Physics, June 1984.
Senior Thesis: *Beyond Time Dependent Hartree Fock: The Calculation of Fluctuations.*
Senior Thesis Advisor: Steve Koonin.

Professional Appointments

Brown University: Professor of Physics. Associate Professor from July 1997 to June 2002.
Assistant Professor from July 1991 to June 1997.
Kavli Institute for Theoretical Physics: General Member, Spring 2018.
ENS-Lyon: Visiting Professor of Physics, Fall 2014.
Caltech: Visiting Associate of Physics, Spring 2011.
MIT: Visiting Professor of Physics, Spring 2004.
Institute for Theoretical Physics (University of California): Visiting Assistant Research Scientist, Spring 1992.

Research Completed at Brown

- Many-body theory of charge transfer involving simple atoms.
- Multidimensional bosonization of fermion liquids.
- DMRG approach to quantum criticality and dynamics.
- Phases of strongly correlated electrons in layered materials.

See: "Peer Reviewed Publications," and "Selected Invited Talks," appended.

Research in Progress

- Topological waves in geo- and astro-physical fluid dynamics.
- Direct statistical simulation of fluids, including the climate system.
- Non-equilibrium transport in nanostructures and in topological insulators.
- Theory of quantum materials.

Academic Awards and Honors

- Fellow of the American Physical Society (elected 2013).
- NSF American Competitiveness and Innovation Fellow, 2008 – 2011.
- APS Outstanding Referee for 2010.
- "Creativity Extension" awarded by NSF, 2008 – 2011.
- "Creativity Extension" awarded by NSF, 2000 – 2002.
- Alfred P. Sloan Research Fellow, 1994 – 1998.
- National Science Foundation Young Investigator, 1993 – 1998.
- IBM Postdoctoral Fellowship at Cornell University, 1989 to 1991.
- National Science Foundation Graduate Fellow at Princeton University, 1985 - 1988.
- Joseph Henry Prize from Princeton University, 1984.

Grants

(PI unless stated otherwise)

35. Funding from the Institute at Brown for Environment and Society: "Topological Signatures of Atmospheric and Oceanic Waves," June 2021 – May 2023. $58,600.

34. Brown Seed funding: "Search for Topological Waves in Magnetized Gaseous Plasmas," October 2019 – June 2021. $20,000.

33. Simons Foundation: Revisiting the turbulence problem using statistical mechanics: Theory of turbulence-flow interaction, Sept. 1, 2019 – Aug. 21, 2023. PI $302,974 (subcontract from the Weizmann Institute).

32. NSF 1921199 RII Track-2 FEC: Harnessing the Data Revolution for the Quantum Leap: From Quantum Control to Quantum Materials, Aug. 1, 2019 – July 31, 2023 $1,997,009. Co-PI; Vesna Mitrovic is the PI.

31. NSF 1936221 QII-TAQS: Spatially and Temporally Resolved Ultrasensitive Magnetic Sensing of Quantum Materials, Jan. 1, 2020 – Dec. 31, 2023. $2,000,000. Co-PI; Gang Xiao is the PI.

30. NSF 1936854 QLCI-CG: Identification and Control of Fundamental Properties of Quantum Systems Jan. 1, 2020 – Dec. 31, 2021. $143,490. Co-PI; Vesna Mitrovic is the PI.

29. "Search for Bosonic Dark Matter Using Magnetic Tunnel Junction," DOE-HEP (Senior Investigator) $275,000, 10/1/2019 - 9/30/2021.

28. "Unraveling Actinide Structure in the Environment: An Integrated Theoretical, Computational, and Spectroscopic Approach," (with Brenda Rubenstein and Lai-Sheng Wang) $95,452, internal Brown University seed funding award, 1/26/2017 through 6/30/2018.

27. "Understanding high-level nuclear waste with strong electronic correlations," National Academy of Sciences Keck Futures Initiative (NAKFI ANT7), $75,000, 5/1/2014 – 4/30/2016.

26. "Strong Correlations in Environmental Condensed Matter," NSF DMR-1306806, $275,000, 9/1/2013 through 8/31/2016.

25. "Solar Power By Optical Frequency Rectification With Plasmonic Concentrators Coupled to Junctions of Doped Mott Insulators," (with Vladan Mlinar, Domenico Pacifici, and Gang Xiao) $80,000, internal Brown University seed funding award, 3/29/2013 through 6/30/2015.

24. "DMRG++ Simulations of Strongly Correlated Electrons Driven Out of Equilibrium," CNMS2012-212 at Oak Ridge National Laboratory (provides staff support, and computer resources), 8/1/2012 through 7/31/2014.

23. UTRA fellowship for John Ribbans ($3,000, Summer 2013).

22. "Collaborative Research: Type 1 – LOI02170139: Direct Statistical Approaches to Large-Scale Dynamics, Low Cloud Dynamics, and their Interaction," NSF CCF-1048701, 5/1/11 – 4/30/15, $436,471 (Collaborator Tapio Schneider at Caltech received a similarly sized award).

21. IMNI Seed Funds: (with Lai-Sheng Wang), "Experiments and Models of Actinide Nanoclusters," $30,000.00 from the Harold Nahigian gift fund.

20. UTRA fellowship for Tom Iadecola ($3,000, Summer 2010).

19. UTRA fellowship for Katie Dagon ($3,000, Summer 2009).

18. "Strong Correlations in Layered Materials, in Nanoscale Complexes, and in Far-From-Equilibrium Dynamics," NSF, 9/1/06 – 8/31/11, $750,000.

17. UTRA fellowships (for Mr. Eric Leonard and Mr. Samuel Ocko) ($6,000, Summer 2008).

16. Grant from BP (British Petroleum) Research to provide supplemental funding for the Aspen Summer 2005 workshop "Novel Approaches to Climate" ($5,000).

15. Australian Research Council grant "Quantum states of matter: from spin liquids to superconductors" (Partner Investigator. Funding for two postdocs for three years starting 2005).

14. UTRA fellowship (for Ms. Emily Conover) ($3,000, Summer 2004).

13. Australian Research Council Linkage-International Grant Proposal: "Organic superconductors and frustrated antiferromagnets: from quantum chemistry to many-body theory to experiment," (Overseas Investigator, Australian $80,000 over 4 years starting 2004).

12. NSF grant "Strong Electronic Correlations in Layered Materials, in Nanoscale Dynamics, and in Actinide Complexes" DMR-0213818 ($504,000 with July 2002 – June 2007).

11. Salomon Faculty Research Grant "Investigation of Strong Electronic Correlations in Aqueous Actinide Complexes With Application to the Problem of Environmental Dispersal" ($12,000, awarded February 2002.)

10. NSF "Creativity Extension" awarded to extend DMR-9712391 through July 2002 with a 20% increase in funding. Total funding = $420,000 over five years.

9. NSF grant DMR-9712391 "Coherence and Many-Body Phenomena in Nanostructures and in Low Dimensions" ($208,000 with August 1997 start date).

8. NSF MRI grant CDA-9724347 "Acquisition of a CAVE and Shared Memory Supercomputer" (Co-PI with 13 others, $1,361,225 with November 1997 start date.)

7. UTRA fellowship (for Ms. Cara Rakowski) ($1,200, Summer 1996).

6. Cray Research Partnership ($586,000, May 1995).

5. Alfred P. Sloan Research Fellowship ($30,000 with February 1994 start date).

4. NSF grant "Many-Body Theory of Charge Transfer in Hyperthermal Atomic Scattering" ($90,000 with January 1994 start date).

3. NECUSE grant for astronomy curriculum (Co-PI with Fall 1993 start date).

2. National Science Foundation Young Investigator Award ($25,000 per year plus $37,500 per year matching funds for five years, with Summer 1993 start date).

1. NSF Small Telescope Grant (Co-PI), Summer 1993.

Professional Organizations

- Lifetime member and Fellow of *American Physical Society* (APS).
  Member, APS Board of Directors, 2017 – 2019.
  Chair of the APS Topical Group on the Physics of Climate (GPC) (2017).
  Divisional Councilor of the APS Division of Condensed Matter Physics (DCMP) 2016 – 2019.
- Member of *American Geophysical Union*.

Additional Professional Experience

- Invited speaker at the "Hydrodynamics Across Scales" meeting at U. Chicago, April 2019.
- Invited speaker at Weizmann Institute of Science, December 2018.
- Invited speaker at the Les Houches Summer School of Physics, August 2017.
- Invited visitor at the Kavli Institute for Theoretical Physics at UCSB, January 2017.
- Invited speaker, UNH/IAM Workshop on Advancing Wall-Turbulence Model Development and Implementation, November 2015.
- Fellow, Institute at Brown for Environment and Society (IBES), September 2015 to present.
- Invited speaker, BIRS Meeting on *The Mathematics of Layers and Interfaces*, Oaxaca, Mexico, November 2015.
- Invited participant, Summer GFD Program at Woods Hole Oceanographic Institute, July 2015.
- Invited speaker, Les Houches winter school on "Theoretical Advances in Planetary Flows and Climate Dynamics, March 2015.
- Invited participant and speaker, "Mathematics for the Fluid Earth," Isaac Newton Institute, Cambridge University, December 2013.
- Invited participant, National Academies / Keck Foundation: "Futures of Advanced Nuclear Technologies," Irvine November 2013.
- Speaker at AMS Atmospheric and Oceanic Fluid Dynamics Meeting, Newport 2013.
- Invited participant and speaker, Los Alamos National Lab "Ocean Turbulence Conference," Santa Fe, NM June 2013.
- Invited participant and speaker, Princeton Center for Theoretical Science "Geostrophic Turbulence and Active Tracer Transport in Two Dimensions," March 2013.
- Invited participant, 2012 NSF Earth Systems Modeling meeting.
- Invited speaker, 2012 Annual Meeting of the Institute for Complex Adaptive Matter.
- Speaker at AGU Fall Meetings: 2010 and 2011.
- Invited participant, 2009 Ocean-Atmosphere Energy Transport Conference at Caltech.
- Invited speaker, 2008 March APS Meeting in New Orleans.
- Invited workshop participant, "Energy Forum," Aspen Center for Physics, July 2006.
- Invited workshop participant, "Quantum Phase Transitions," KITP-UCSB, January 2005.
- Invited visitor at the Kavli Institute for Theoretical Physics at UCSB, Spring 2004.
- Participant at the Aspen Center for Physics: Summers of 2014, 2012, 2009, 2007, 2005, 2003, 2001, 1999, 1997, 1996, 1994, 1993, 1991 and Winter of 2001.
- Invited participant at the "Quantum Phase Transitions" workshop, *Max Planck Institute for the Physics of Complex Systems*, Dresden, Germany, July 2003.
- Invited speaker at NSF *Workshop on Opportunities in Materials Theory*, October 2002.
- Gordon Research Conferences, Summers of 2002 and 1998.
- Invited participant at the "Physics of Plutonium Workshop" held at Los Alamos National Laboratory, July 2001.
- Invited visitor at the Institute for Theoretical Physics at UCSB, Summer 2000.
- Gordon Godfrey Fellow at School of Physics, UNSW, Australia, June 2000.

Additional Professional Experience (cont.)

- Invited speaker at *Third Rencontres du Vietnam: Superconductivity, Magneto-Resistive Materials, and Strongly Correlated Systems*, Hanoi, Vietnam, January 1999.
- Invited visitor at the Institute for Theoretical Physics at UCSB, Fall 1998.
- Invited participant at the "Workshop on Chemical Reaction Theory for Environmental Problems," UC Davis, May 1998.
- Invited participant at the Telluride Academy, July 1995.
- Invited participant at the National Academy of Science's sixth Annual Symposium on Frontiers in Science, November 1994.
- Invited participant at the 9th International Workshop on Inelastic Ion Surface Collisions Aussois, France, September 1992.
- Invited visitor at Department of Physics, Yale University, August 1990.
- Invited participant at the 1990 Summer Institute in Theoretical Physics, Kingston, Ontario.
- Research at the IBM Thomas J. Watson Research Center, Summer 1988.
- 1988 Les Houches Summer School of Theoretical Physics.
- Research at Oak Ridge National Laboratory, Summer 1984.
- Research intern at Hewlett-Packard Laboratories, Summers of 1980 – 1983.

Synergistic Activities

- Organizer of 2018 Program on Planetary Boundary Layers in Atmospheres, Oceans, and Ice on Earth and Moons at the KITP.

- Organizer of programs at Dresden MPIPKS (2017) and Aspen (2017).

- Organizer, "Houghton Conference on Non-Equilibrium Statistical Mechanics," May 2015.

- Line of chairs, Executive Committee of the APS Topical Group on the Physics of Climate, Spring 2015 to present.

- Co-editor (with Paul Williams) of New Journal of Physics Focus Issue on *Stochastic Flows and Climate Statistics.*

- Member Representative for Brown University: University Corporation for Atmospheric Research (UCAR) 2009 to August 2015.

- Organizer, Minisymposium on *Global Climate Models: Dynamical Cores, Strengths and Weaknesses* APS DFD Meeting, Pittsburgh, November 2013.

- Chair, Kavli Institute for Theoretical Physics (KITP) Advisory Board, July 2012 – July 2013.

- Member, KITP Advisory Board and Steering Committee, September 2010 – September 2014.

- Member, Institute for Complex Adaptive Matter (ICAM) Advisory Board, 2012 to present.

- Member, Executive Committee of the APS Topical Group on the Physics of Climate, Fall 2010 to Fall 2013.

- Co-organizer of 3 month 2014 KITP Program on "Wave-Flow Interaction in Geophysics, Climate, Astrophysics, and Plasmas."

- Co-organizer of 2012 Aspen Center for Physics Workshop "Stochastic flows and climate modeling."

- Lead organizer of 2008 KITP Program "Physics of Climate Change."

- Led Brown's efforts to join the University Corporation for Atmospheric Research (UCAR).

- Lead organizer of 2005 Aspen Center for Physics Workshop "Novel Approaches To Climate."

- Colloquium "The Quantum and Fluid Mechanics of Global Warming" presented over 60 times.

- Created new freshman seminar *Introduction to Environmental Physics.*

Undergraduate Courses Taught: (enrollment figures in parenthesis)

- Physics 4 "Basic Physics"
  Spring 1999 (216)
  Spring 2000 (200)
  Spring 2001 (160)

- Physics 8 "Introduction to Relativity and Quantum Physics"
  Spring 1996 (51)
  Spring 1997 (52)
  Spring 1998 (60)

- Physics 11/12 First-year seminar "Introduction to Environmental Physics"
  Fall 2004 (9)
  Spring 2007 (10)

- Physics 0160 "Introduction to Relativity and Quantum Physics"
  Spring 2014 (50)
  Spring 2015 (43)
  Spring 2016 (43)

- Physics 24 "Introduction to Astronomy" including night laboratory
  Spring 1993
  Spring 1994 (15)
  Spring 1995 (24)

- Physics 47 "Electricity and Magnetism" including laboratory
  Fall 1994 (32)
  Fall 1995 (30)
  Fall 1996 (24)

- Physics 1410 "Quantum Mechanics A"
  Fall 2007 (28)
  Fall 2008 (22)
  Fall 2009 (24)
  Fall 2010 (33)

- Physics 1600 / 2600 "Computational Physics"
  Spring 2008 (20)
  Spring 2009 (17)
  Spring 2010 (20)
  Spring 2017 (15)

Undergraduate Courses Taught (cont):

- Physics 199 "The Quantum Mechanics of Global Warming: An Introduction to Environmental Physics"
  Fall 2003 (4)

- GISP GS13 "Quantum Computation" (with F. Preparata)
  Spring 2000 (9)

Graduate Courses:

- Physics 2030 "Classical Theoretical Physics I"
  Fall 2011 (20)
  Fall 2012 (13)
  Fall 2013 (13)
  Fall 2018 (44)
  Fall 2019 (22)
  Fall 2020 (20)

- Physics 205 "Graduate Quantum Mechanics I"
  Fall 2000 (18)
  Fall 2001 (20)
  Fall 2002 (15)
  Fall 2006 (16)

- Physics 206 "Graduate Quantum Mechanics II"
  Spring 2002 (22)
  Spring 2003 (18)
  Spring 2005 (19)
  Spring 2019 (26)
  Spring 2020 (25)
  Spring 2021 (30)

- Physics 2420 "Solid State Physics II"
  Spring 2012 (5)
  Spring 2013 (5)

- Physics 2430 "Quantum Many Body Theory"
  Fall 1993 (then called "Physics 243A")
  Fall 1997 (9)
  Fall 1999 (5)
  Fall 2005 (24)
  Fall 2015 (16)

- Physics 247 "Advanced Statistical Physics"
  Fall 1992 (previously numbered "Physics 243B")
  Fall 2016 (13)

- Physics 271 or 272 "Special Topics" many semesters.

16 Senior Thesis Students Supervised:

- Mr. Deven Carmichael, Fall 2020 – Spring 2021.
  Title: "Effects of Ordinary Viscosity on the Topological Classification of the Shallow Water Equations"
  (will be PhD student at the University of Pennsylvania)

- Mr. Alex Lawson, Fall 2019 – Spring 2020.
  Title: "Stochastic Modeling of Topological Geophysical Waves"
  (currently a graduate student at the University of Illinois)

- Ms. Sara Runkel, Fall 2018 – Spring 2020.
  Title: "Atmospheric Boundary Layer Dynamics and Pollutant Transport in La Paz, Bolivia"
  (currently working at the Institute for Defense Analyses)

- Ms. Kara Hartig, Summer 2017 to May 2018.
  Title: "Langmuir Turbulence in the Ocean Surface Boundary Layer: Towards a Sub-grid Statistical Climate Process Model"
  (currently graduate student at Harvard)

- Ms. Abigail Plummer, Spring 2014 to Spring 2015.
  Title: "Numerical and Statistical Simulation of an Idealized Model Tachocline."
  (currently a graduate student at Harvard)

- Mr. Charles Powell, Fall 2012 to Spring 2013.
  Title: "Density Functional Modeling of Actinide Complexes."
  (now at NOAA)

- Ms. Natalie Bodington-Rosen, Fall 2011 to Spring 2012.
  Title: "Rectification Behavior of Junctions of Hubbard-Chains Using the Density-Matrix Renormalization Group."
  (currently a graduate student at Stanford)

- Mr. William Strecker-Kellogg, Fall 2009 to Spring 2010.
  Title: "Implicit Integration of Geophysical Statistics."
  (now at Brookhaven National Laboratory)

- Dr. Katie Dagon, Summer 2009 to Spring 2010 (UTRA Fellow).
  Title: "Statistics of a Solar Tachocline Model with Stochastic Forcing."
  (now a graduate student at Harvard)

15 Senior Thesis Students Supervised (cont):

- Mr. Samuel Ocko, Summer 2008 to Spring 2009 (UTRA Fellow).
  Title: "Search for Broken Translational Symmetry in the Heisenberg Anti-Ferromagnet on the Kagome Lattice."
  (now a graduate student at MIT)

- Dr. Emily Conover, Fall 2005 to Spring 2006 (UTRA Fellow).
  Title: "Nonequilibrium Statistical Mechanics of a Geophysical Jet."
  (now a writer at Science News)

- Mr. Matt Carriuolo, Fall 2004 to Spring 2005.
  Title: "The Lorenz Attractor, Chaos, and Fluid Flow."

- Ms. Miriam Friedel, Summer 1999 to Spring 2000.
  Title: "An Investigation of SU(2n) Quantum Antiferromagnetic Ground States in One and Two Dimensions."
  (now at Mouse Imaging Centre / Toronto Centre for Phenogenomics)

- Ms. Cara Rakowski, Spring 1996 to Spring 1997 (UTRA Fellow).
  Title: "Time Series Analysis of GISP2 Ion and δO^{18} Data."
  (now at the Naval Research Laboratory)

- Mr. Benjamin Goodrich, 1994 – 95.
  Title: "The Implementation of CCD Cameras in Undergraduate Astronomy Education."

- Mr. Garvin Heath, 1993 – 94.
  Title: "Spectral Analysis of CH_4 and Oxygen Isotope Records From Ice Cores."
  (now at NREL in Golden, Colorado)

Other Undergraduate Students Supervised:

- Mr. Noah Cowan, Spring 2018.

- Mr. Thomas Iadecola, Fall 2009 through Summer 2010 (UTRA fellow).
  (now a graduate student at Boston University)

High School Students Supervised:

- Mr. Jack Jenkins, Fall 2016 to present.
  (now a student at the University of Massachusetts)

17 Ph.D. Thesis Students Supervised:

- Ms. Chenyu Zhang, Fall 2019 to present.

- Mr. Zekun Zhuang, Fall 2016 to present.

- Dr. Manfred Streiner M.D., Fall 2007 to present.

- Mr. Joseph Skitka, Fall 2014 to December 2018.
  Ph.D. thesis: "Quasilinear Modeling of Planetary Boundary-Layer Turbulence."
  Now a Deans' Faculty Fellow at Brown.

- Dr. Altan Allawala, Summer 2012 to Fall 2017.
  Ph.D. thesis: "Direct Statistical Simulation of Chaos and Turbulence."
  Now at JPMorgan Chase & Co.

- Dr. Lei Wang, Summer 2011 to Summer 2015.
  Ph.D. thesis: "Flow Equation Approach to the Hybrid DFT – Anderson Model Description of Actinide Compounds."
  Now at Google, Inc.

- Dr. Wanming Qi, Fall 2009 to Summer 2014.
  Ph.D. thesis: "Statistical Approaches to Two-Dimensional Turbulence."
  Now an assistant professor at the China University of Mining and Technology in Xuzhou.

- Mr. Florian Sabou, Summer 2009 to Summer 2014.

- Dr. Steve Horowitz, Summer 2003 to January 2011.
  Ph.D. thesis: "Strong Correlations in Aqueous Actinide Complexes."

- Dr. Seungwook Ma, Fall 2003 to Fall 2008. Ph.D. thesis:
  "Non-perturbative Approaches to Problems in Strongly-correlated Many-body Physics."
  Now an energy policy advisor at the US Department of Energy.

- Mr. Sootaek Lee, Summer 2001 to 2007.

- Dr. Chung-Hou Chung, Fall 1997 to May 2002.
  Ph.D. thesis: "Systematic Approaches to Layered Materials with Strong Electron Correlations."
  Now an associate professor at National Chiao Tung University.

17 Ph.D. Thesis Students Supervised (cont.):

- Dr. Basudev Chaudhuri (Cornell University), Summer 1998 to 2001.
  Ph.D. thesis: "Monte Carlo Studies of Vacancies in Solid Helium Four and
  A Dynamical Many-Body Model for Resonant Charge Transfer in Atom-Metal Scattering."
  Now a software engineer at Blue Origin.

- Dr. Shan-Wen Tsai, Fall 1996 to Fall 2000.
  Ph.D. thesis: "Systematic Analytical and Numerical Studies of Highly Correlated Electron Systems."
  Now a professor at UC Riverside.

- Ms. Najma Ahmad, Summer 1996 to Spring 1997.

- Dr. Alexey Onufriev, Fall 1993 to Spring 1997.
  Ph.D. thesis: "Synergetic Approach to Many-Body Problems: From Scattering Charge Transfer to Arrays of Quantum Dots."
  Now an associate professor at Virginia Polytechnic Institute.

- Dr. Hyok-Jon Kwon, 1992 – 1995.
  Ph.D. thesis: "Theory of Fermion Liquids."
  Now an assistant professor at the University of Illinois at Urbana-Champaign.

4 Masters Thesis Students Supervised:

- Mr. Christopher Lee, Spring 2021.

- Ms. Ashwini Kanan, summer 2017 to May 2018.
  ScM thesis: "Properties of inviscid two-dimensional fluid flow."

- Mr. Zekun Zhuang, 2016.
  ScM thesis: "Simulation of Rectifier with Density-Matrix Renormalization-Group Algorithm"
  Now a Ph.D. student at Brown.

- Mr. Han Liang, 2015.
  ScM thesis: "Generalized Quasi-Linear Approximation of 3D Convective Boundary Layer"

9 Postdoctoral Research Associates Supervised:

- Dr. Stephen Carr, June 2020 to present.
- Dr. Farid Ait-Chaalal, December 2011 to December 2013 (jointly with Tapio Schneider).
- Dr. Seungwook Ma, January to August 2009 (now at DOE).
- Dr. Florian Schütz, September 2006 to August 2008 (now at d-fine).
- Dr. Bernd Braunecker, Sept. 2004 to Sept. 2006 (now at Universidad Autonoma de Madrid).
- Prof. John Fjærstad, Sept. 2000 to Dec. 2002 (now at NTNU in Norway).
- Prof. Miguel Cazalilla, Fall 1999 to Fall 2001 (now at Donostia Int. Phys. Ctr.).
- Prof. Jaime Merino, Fall 1997 to Fall 1998 (now at U. Autonoma de Madrid).
- Prof. Jané Kondev, Fall 1995 to Fall 1997 (now at Brandeis).

Service

To the University (Committees):

- Member, University Library Advisory Board, Fall 2016 to Fall 2017, and Fall 2019 to present.
- Member of Faculty Executive Committee, Spring 2015 to Spring 2017.
- Member of Brown University Community Council, Fall 2011 to Spring 2014.
- Member of Center for Environmental Studies Curriculum Committee, 2012 – 2013.
- Member of OSP faculty committee, Fall 2010 to Spring 2011.
- Brown representative to UCAR, Fall 2009 to August 2015.
- Brown – MBL (Woods Hole) Steering Committee, Summer 2008 to Fall 2009.
- CCV Director Search Committee (Affirmative Action Representative), Spring 2005.
- Academic Priorities Committee, Fall 2004 through Spring 2007 (elected).
- Center for Computation and Visualization Advisory Committee, Spring 2004 to Spring 2005.
- Taskforce on Teaching and Doctoral Education, Fall 2002 to Spring 2003.
- Nominations Committee, Fall 2000 to Spring 2002 (elected).
- Member, Campus Advisory Committee to the Presidential Search Committee, 2000.
- FCEL (Faculty Committee on Educational Legislation), Fall 1997 to Spring 2000 (elected).

To the University (Undergraduate Advising):

- First year advisor, September 2019 to present.
- Concentration Advisor, Contemplative Studies concentration, Fall 2014 to Spring 2017.
- Freshman CAP Advisor, 1996 to Spring 2000.
- Sophomore Advisor, Fall 1992 to Spring 2000.

To the Department of Physics: (Committee Assignments)

- Member, Qualifying Exam Committee.
- Condensed Matter Seminar Coordinator, Fall 2016 to Fall 2017.
- Member, Condensed Matter Experimentalist Search Committee, 2016 – 2017.
- Member, Colloquium Committee, Fall 2016 to Fall 2017.
- Member, Curriculum Committee, Fall 2016 to present.
- Library Coordinator, Fall 2015 to present.
- Member, Astrophysics Search Committee, Fall 2014 – Spring 2015.
- Chair, Promotion Committee for Dima Feldman.
- Honors Coordinator, Fall 2011 to Spring 2014.
- Member, Condensed Matter Experimentalist Search Committee, 2012 – 2014.
- Member, Departmental Curriculum Committee, Fall 2010 to present.
- Chair, Departmental Curriculum Committee, Fall 2006 to Summer 2010.
- Chair, Mentoring Committee for Dima Feldman, 2005 to 2009.
- Publications and Outreach Committee, Fall 2004 to Spring 2008.
- Departmental Computer Committee, Fall 2005 to present.
- Chair, Departmental Computer Committee, Fall 2004 to Spring 2005.
- Ladd Observatory Advisory Committee, Fall 2004 to present.
- Computing sub-committee to redesign departmental web pages, Summer and Fall 2003.
- Chair of Condensed Matter Theory Faculty Search Committee, 2002.
- Member, Chair's Advisory Team, 2002.
- Chair of Graduate Admissions Committee, Fall 2001 to Spring 2002.
- Honors Advisor for Senior Thesis Projects, Spring 1999 to Spring 2001.
- Member of Colloquium / Seminar Committee
  Fall 1992 to Spring 1997
  Fall 1999 to Fall 2001
- Member, Undergraduate Curriculum Committee, Fall 1999 to Spring 2001.
- Chair, Graduate Curriculum Committee, Fall 1997 to Spring 1998.
- Graduate Coordinator / Advisor, Fall 1995 to Spring 1998.
- Astronomy Coordinator, Fall 1993 to Spring 1998.
- Member, Qualifying-Prelim Committee, Fall 1991 to Spring 1995.
- Member, Computing Committee, Fall 1991 to Spring 1992.

Additional Service at Brown:

- Member, Selection Committee for Nominees for Astronaut Scholarships, 2013 to 2017.
- Spoke to OSP staff on "Genesis of a NSF Proposal," October 2010.
- Public talk about global warming at Ladd Observatory, November 2008.
- Led seminar on summer reading for incoming freshman, September 2008.
- Brown Alumni Association speaker (twice in 2007, once in 2008).
- Brown Community for Learning in Retirement talk
  "The Quantum Mechanics of Global Warming," Dec. 2006.
- Wayland Collegium Faculty Seminar "The Contemplative Mind:
  An Interdisciplinary Approach," $10,000 (with Hal Roth).
- Faculty Lectureships Proposal "Zen's Chinese Heritage," $1,700 (with Hal Roth)
  that brought author Andy Ferguson to Brown.
- 101 Forum talk "The Quantum Mechanics of Global Warming," October 2000.
- Assisted in the rebuilding of Barus & Holley observatory (with D. Targan).
- "Points on the Compass" advising incoming students, August 1996 and 2002.
- Acquired Cray EL-98 and J-90 supercomputers (with G. Guralnik).
- Physics DUG talk "Quantum Computers and Dots," January 1997.
- Physics DUG talk "Quantum Mechanics of Global Warming," February 1996.
- Physics DUG talk "The Physics of Climate Change," April 1995.
- Physics DUG talk "The Metallic State, Reconsidered," September 1993.
- Faculty Lectureships Grant "Poetry and Farming" ($2,000) that brought author
  author Bill McKibben to Brown in Spring 1993.
- Physics DUG talk "Fermi Liquids," December 1992.
- Assistant to yoga teacher Suzanne Newton, 1991 – 1992.

To the Physics Profession:

- Referee for *Science*, *Physical Review Letters*, *Journal of Physics*, and many other journals.
- Referee for the *National Science Foundation.*
- Panel Reviewer for the *National Science Foundation.*
- Abstract sorter for the March 2002 APS Meeting.

To the Community:

- Public talk on "The Quantum Physics of Global Warming," KITP Santa Barbara 2014.
- Public talk on "The Science of Global Warming," Montshire Museum of Science,
  Norwich VT, September 2013.
- Public talk on "Quantum Mechanics of Global Warming" to Skyscrapers, Inc., Nov. 2012.
- Chair of the Rhode Island Chapter of the Sierra Club, 2002, 2003, and Fall 2004.
- Vice-chair of RI Sierra Club, 2001.
- Activist for pedestrian safety, see reports in the *Providence Journal,* 1998 to present.
- *Options* talk: "Dangers of the Greenhouse Effect" at Cranston Senior Services, Feb. 1994.
- *Options* talk: "Science of Temperature" at Joslin Community Center, November 1992.
- *Options* talk: "Dangers of the Greenhouse Effect," Hamilton House, October 1992.

Prepared April 2021.

John Bradley Marston

Peer Reviewed Publications

April 2021

82. J. B. Parker, J. B. Marston, S. M. Tobias, and Z. Zhu, "Topological gaseous plasmon polariton in realistic plasma," *Physical Review Letters* **124**, 195001 (2020).

81. J. B. Parker, J. W. Burby, J. B. Marston, and S. M. Tobias, "Nontrivial topology in the continuous spectrum of a magnetized plasma," *Physical Review* **2**, 033425 (2020).

80. Z. Zhuang, J. Merino, and J. B. Marston, "Transport in conductors and rectifiers: Mean-field Redfield equations and nonequilibrium Green's functions," *Physical Review B* **102**, 113 (2020).

79. A. Allawala, S. M. Tobias, and J. B. Marston, "Dimensional reduction of direct statistical simulation," *Journal of Fluid Mechanics* **898**, 53318 (2020).

78. Joseph Skitka, J. B. Marston, and Baylor Fox-Kemper, "Reduced-Order Quasilinear Model of Ocean Boundary-Layer Turbulence," *Journal of Physical Oceanography* **50**, 537558 (2020). http://doi.org/10.1175/JPO-D-19-0149.1

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Build on Itself, Some Scientists Say" and *Science News*, March 9, 1991 p. 159 "CO_2 and Temperature: A *pas de deux*."

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1. J. B. Marston and S. E. Koonin, "Mean-Field Calculations of Fluctuations in Nuclear Collisions," *Physical Review Letters* **54**, 1139 – 1141 (1985).

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Other Publications

6. Steve Ghan, Anna Marston, and J. B. Marston, "Pacific Crest Trail 2080," (to appear in the 2nd edition of the PCT Trailside Reader to be published in 2022).

5. J. B. Marston, "Looking for new problems to solve? Consider the climate," *Physics* **4**, 20 (2011).

4. Brad Marston, "Skating on Thin Ice," book review of *Tritium on Ice* that appeared in the September / October 2003 issue of *Brown Alumni Magazine* on page 57.

3. Brad Marston, "Cause & Effect" in *Tricycle: The Buddhist Review*, Summer 2000, pages 74 to 75.

2. Brad Marston, "Quarks 1, Bootstraps 0," in *Tricycle: The Buddhist Review*, Spring 2000, page 96.

1. J. B. Marston, "Consilience of High-T_c Theories," *Proceedings of the Third Rencontres du Vietnam: Superconductivity, Magneto-Resistive Materials, and Strongly Correlated Systems* pp. 23 – 32 (Vietnam National University Press, 2000).

John Bradley Marston

Selected Invited Talks

• "El Niño as a Topological Insulator: A Surprising Connection Between Climate, and Quantum, Physics," Physics Colloquium at Dartmouth College, February 2020 (in person).

• "El Niño as a Topological Insulator: A Surprising Connection Between Climate, and Quantum, Physics," Physics Colloquium at the APS Editorial Office in October 2020 (remote).

• "El Niño as a Topological Insulator: A Surprising Connection Between Climate, and Quantum, Physics," Physics Colloquium at Georgetown University in October 2020 (remote).

• "Topological Origin of Equatorial Waves," invited talk at *Hydrodynamics Across the Scales* meeting at the University of Chicago, April 2019.

• Physics colloquium "Quantum and Fluid Mechanics of Climate Change," Northwestern University, April 2019.

• Physics colloquium 'El Niño as a Topological Insulator: A Surprising Connection Between Climate, and Quantum, Physics," University of Nebraska, April 2019.

• Physics colloquium 'El Niño as a Topological Insulator: A Surprising Connection Between Climate, and Quantum, Physics," Fermilab, April 2019.

• "Topological Origin of Equatorial Waves," talk in *Fluid Flows from Graphene to Planetary Atmospheres* workshop at the Weizmann Institute of Science, Israel, December 2018.

• "Topological Origin of Equatorial Waves," Computations in Science Seminar, University of Chicago, November 2018.

• "Topological Origin of Equatorial Waves," Condensed Matter Seminar, University of Pennsylvania, October 2018.

• "El Niño as a Topological Insulator: A Surprising Connection Between Climate, and Quantum, Physics," Physics Colloquium, Harvard University, September 2018.

• "Topological Origin of Equatorial Waves," Topology in Condensed Matter Workshop, Harvard University, August 2018.

• "El Niño as a Topological Insulator: A Surprising Connection Between Climate, and Quantum, Physics," Affleck @65 Symposium, University of British Columbia, April 2018.

• "Topological Origin of Equatorial Waves," KITP Colloquium, April 2018.

• "Dimensional Reduction of Direct Statistical Simulation," Brown University Applied Mathematics seminar, December 2017.

• "Topological Origin of Equatorial Waves," Brown University Mathematics Colloquium, October 2017.

• "The Quantum Physics of Climate Change," Heinz Pagels Public Lecture at the Aspen Center for Physics, September 2017.

• "Direct Statistical Simulation," Les Houches Summer School on Physics, August 2017.

• "El Niño as a Topological Insulator: A Surprising Connection Between Climate, and Quantum, Physics," MPIPKS Dresden Physics Colloquium, July 2017.

• "El Niño as a Topological Insulator: A Surprising Connection Between Climate, and Quantum, Physics," Simons Institute, Stonybrook University, March 2017.

• "The Quantum and Fluid Mechanics of Climate Change," Rutgers University Physics Colloquium, November 2016.

• "The Quantum and Fluid Mechanics of Climate Change," University of Oregon seminar, May 2016.

• "The Quantum and Fluid Mechanics of Climate Change," Oregon State University Math & Physics Colloquium, May 2016.

• "The Quantum and Fluid Mechanics of Climate Change," Northeastern University Physics Colloquium, March 2016.

• "The Quantum and Fluid Mechanics of Climate Change," UMass Dartmouth seminar, February 2016.

• Tutorial on "Quasi-linearization of Anisotropic and InhomogeneousTurbulent Flows," UNH/IAM Workshop on Advancing Wall-Turbulence Model Development and Implementation, Durham NH, November 2015.

• "Direct Statistical Simulation of Anisotropic and Inhomogeneous Flows," BIRS Meeting on *The Mathematics of Layers and Interfaces*, Oaxaca, Mexico, November 2015.

• "The Quantum and Fluid Mechanics of Global Warming," Emory University Physics Colloquium, October 2015.

• "Statistics of Stochastically Driven Jets," Summer Geophysical Fluid Dynamics program at Woods Hole Oceanographic Institution, July 2015.

• "The Quantum and Fluid Mechanics of Global Warming," University of Illinois Physics Colloquium, April 2015.

• "Direct Statistical Simulation of Geophysical and Astrophysical Flows: Taming the Curse of Dimensionality," University of Massachusetts Mathematics Colloquium, April 2015.

• "The Quantum and Fluid Mechanics of Global Warming," Cornell University Physics Colloquium, March 2015.

• "The Quantum and Fluid Mechanics of Global Warming," Brandeis University IGERT seminar, March 2015.

• "Direct Statistical Simulation of Geophysical and Astrophysical Flows: Taming the Curse of Dimensionality," Les Houches winter school on "Theoretical Advances in Planetary Flows and Climate Dynamics, March 2015.

• "Multiscale Approach to the Direct Statistical Simulation of Geophysical Flows," The Dynamics of Rotating Fluids Meeting, UCL London (January 2015).

• "Statistical Mechanics of Geophysical Flows," Non-equilibrium Dynamics of Climate: Linking Models to Data at Darlington Hall, UK (January 2015).

• "The Quantum and Fluid Mechanics of Global Warming," physics colloquium ENS-Lyon (December 2014).

• "Multiscale Approach to the Direct Statistical Simulation of Geophysical Flows," Frontiers in Geophysical Fluid Dynamics, Paris (November 2014).

• "Long-Time Evolution of 2D Inviscid Flows," Turbulence and Wave-Vortex Interactions in Fluids and Plasmas, Ecole Centrale de Lyon (October 2014).

• "Direct Statistical Simulation of Geophysical Flows," Atmosphere and Ocean Science Colloquium at the Courant Institute (April 2014).

• "The Quantum and Fluid Mechanics of Global Warming," colloquium at SUNY Stony Brook (April 2014).

• "Direct Statistical Simulation of Flows by Expansions in Cumulants," MIT Seminar (March 2014).

• "Direct Statistical Simulation of a Two-Layer Primitive Equation Model," Isaac Newton Institute, Cambridge UK (December 2013).

• "The Quantum and Fluid Mechanics of Global Warming," University of Oklahoma Physics Colloquium (October 2013).

• "Direct Statistical Simulation of a Two-Layer Primitive Equation Model," 33rd CNLS Annual Conference on Ocean Turbulence, Santa Fe (June 2013).

• "Environmental Condensed Matter Physics," Princeton Plasma Physics Laboratory (April 2013).

• "The Quantum and Fluid Mechanics of Global Warming," University of Maryland Physics Colloquium (April 2013).

• "Statistics of Quasi-Geostrophic Flows Obtained Directly From Cumulant Expansion," Princeton Center for Theoretical Physics Workshop on Geostrophic Turbulence and Active Tracer Transport in 2D (March 2013).

• "The Quantum and Fluid Mechanics of Global Warming," physics colloquium at the University of Kentucky, November 2012.

• "The Quantum and Fluid Mechanics of Global Warming," physics colloquium at the University of Cincinnati, November 2012.

• "The Climate System As Nonequilibrium Condensed Matter," condensed matter seminar at the University of Colorado in Boulder, October 2012.

• "The Climate System As Complex Adaptive Matter: Implications for Energy," invited talk at the Annual Meeting of the Institute for Complex Adaptive Matter, New York University, May 2012.

• "The Quantum and Fluid Mechanics of Global Warming," physics colloquium at the Ohio State University, May 2012.

• "The Quantum and Fluid Mechanics of Global Warming," physics colloquium at Harvard University, April 2012.

• "Geophysical and Astrophysical Flows as Nonequilibrium Condensed Matter," LASSP seminar at Cornell University, November 2011.

• "The Quantum and Fluid Mechanics of Global Warming," physics colloquium at the College of William and Mary, September 2011.

• "The Quantum and Fluid Mechanics of Global Warming," physics colloquium at the University of Wisconsin, September 2011.

• "The Quantum and Fluid Mechanics of Global Warming," physics colloquium at UC Irvine, April 2011.

• "Direct Statistical Simulation of Geophysical & Astrophysical Flows," Graduate School of Oceanography (University of Rhode Island), October 2010.

• "Direct Statistical Simulation of Geophysical & Astrophysical Flows," MIT EAPS Department Lecture, September 2010.

• "The Quantum and Fluid Mechanics of Global Warming," physics colloquium at the University of Florida, January 2010.

• "The Quantum and Fluid Mechanics of Global Warming," physics colloquium at Brandeis University, October 2009.

• "The Quantum Mechanics of Global Warming," public lecture at the Aspen Institute, August 2009.

• "The Quantum and Fluid Mechanics of Global Warming," physics colloquium at UC Riverside, June 2009.

• "The Quantum and Fluid Mechanics of Global Warming," physics colloquium at the University of Virginia, April 2009.

• "The Quantum Mechanics of Global Warming," physics colloquium at Kansas State University, November 2008.

• "Climate Feedbacks and Biosphere-Climate Interactions," talk at the Brown – Woods Hole MBL retreat, September 2008.

• "The Quantum Mechanics of Global Warming," physics colloquium at the Center for Nonlinear Studies, Los Alamos National Laboratory, September 2008.

• "The Quantum Mechanics of Global Warming," talk to the Brown Alumni Club of Southern California , June 2008.

• "The Quantum Mechanics of Global Warming," physics colloquium at UC Santa Cruz, June 2008.

• "The Quantum Mechanics of Global Warming," physics colloquium at UC Santa Barbara, April 2008.

• "Nonequilibrium Statistics of Geophysical Flows From Cumulant Expansions and Flow Equations," talk at the Workshop on Classical and Quantum Information Theory 2008 in Santa Fe, March 2008.

• "The Quantum Mechanics of Global Warming," physics colloquium at Case Western Reserve University, March 2008.

• "The Quantum and Fluid Mechanics of Global Warming," invited talk at the March Meeting of the American Physical Society in New Orleans, March 2008.

• "The Quantum Mechanics of Global Warming," physics colloquium at Boston College, February 2008.

• "The Quantum Mechanics of Global Warming," talk to the Brown Alumni Association in San Francisco, November 2007.

• "The Quantum Mechanics of Global Warming," talk to the Brown Alumni Association at Brown University, October 2007.

• "The Quantum Mechanics of Global Warming," physics colloquium at the University of Colorado Boulder campus, October 2007.

• "Gapless Spin Liquids: An Idea Whose Time Has Come," Symposium on 50 Years of BCS, Brown University, April 2007.

• "Actinides in Solution: Nuclear Waster, Strong Correlations, and Emergence," physics colloquium at the University of Toronto, April 2007.

• "The Quantum Mechanics of Global Warming," physics colloquium at the Johns Hopkins University, March 2007.

• "The Quantum Mechanics of Global Warming," physics colloquium at Yale University, February 2007.

• "The Quantum Mechanics of Global Warming," physics colloquium at the University of Missouri – Rolla, November 2006.

• "The Quantum Mechanics of Global Warming," physics colloquium at Caltech, October 2006.

• "The Physics of Climate," Aspen Center for Physics Energy Forum, July 2006. (See URL http://andy.bu.edu/energy/).

• "Actinides in Solution: Disproportionation, Strong Correlations, and Emergence," condensed matter seminar at Boston College, April 2006.

• "Hopf-Flow Approach To Nonlinear Dynamics, Including Atmospheres," Aspen Center for Physics, June 2005.

• "Scientific Computing and Visualization With Objective-C and Apple's Cocoa: Statistics of Nonlinear Systems Including Geophysical Fluid Dynamics," CCV Water Cooler talk at Brown University, May 2005.

• "The Quantum Mechanics of Global Warming," physics colloquium at Lehigh University, April 2005.

• "The Quantum Mechanics of Global Warming," physics colloquium at Brookhaven National Laboratory, April 2005.

• "High-T_c Superconductors: Known Knowns and Unknowns," talk at the *Quantum Phase Transitions* workshop at the Kavli Institute for Theoretical Physics, UCSB, January 2005.

• "The Quantum Mechanics of Global Warming," physics colloquium at Louisiana State University, December 2004.

• "The Quantum Mechanics of Global Warming," physics colloquium at Rice University, December 2004.

• "The Quantum Mechanics of Global Warming," nuclear physics colloquium at Lawrence Berkeley National Laboratory, September 2004.

• "Does Climate Science Need Mathematics?" talk at the Mathematical Association of America MathFest, August 2004.

• "The Quantum Mechanics of Global Warming," physics colloquium at UCLA, June 2004.

• "The Quantum Mechanics of Global Warming," physics colloquium at the Kavli Institute for Theoretical Physics, April 2004.

• "Complex Orderings of Strongly Correlated Electrons: Insights from Models," condensed matter seminar at the University of British Columbia, March 2004.

• "The Quantum Mechanics of Global Warming," physics colloquium at Simon Fraser University, March 2004.

• "The Quantum Mechanics of Global Warming," physics colloquium at the University of British Columbia, March 2004.

• "The Quantum Mechanics of Global Warming," physics colloquium at Boston University, November 2003.

• "The Quantum Mechanics of Global Warming," science colloquium at Lake Forest College, October 2003.

• "The Quantum Mechanics of Global Warming," physics colloquium at the University of Chicago, October 2003.

• "The Quantum Mechanics of Global Warming," physics colloquium at the University of Illinois at Chicago, October 2003.

• "The Quantum Mechanics of Global Warming," ecology and evolutionary biology seminar, Brown University, September 2003.

• "The Quantum Mechanics of Global Warming," physics colloquium at Brown University, September 2003.

• "Complex Orderings of Strongly Correlated Electrons: Insights from Models," seminar at the "Quantum Phase Transitions" workshop held at the *Max Planck Institute for the Physics of Complex Systems*, Dresden, Germany, July 2003.

• "Complex Orderings of Strongly Correlated Electrons: Insights from Models," condensed matter seminar at the University of Florida, March 2003.

• "The Quantum Mechanics of Global Warming," public lecture at the National Science Foundation Workshop on Opportunities in Materials Theory held at Georgetown University, October 2002.

• "Competing, Coexisting, Hidden and Quasi-Orderings of Strongly Correlated Electrons: Insights from Models," Workshop on Opportunities in Materials Theory held at the NSF, October 2002.

• "When are Fermi Liquids Not Really Fermi Liquids? Violations of the Wiedemann-Franz Law in the t-J Model," seminar at NEC Research, May 2002.

• "The Quantum Mechanics of Global Warming," Physics Colloquium at Queen's University, Kingston, Ontario, April 2002.

• "When are Fermi Liquids Not Really Fermi Liquids? Violations of the Wiedemann-Franz Law in the t-J Model," Condensed Matter Seminar at the University of Toronto, April 2002.

• "The Quantum Mechanics of Global Warming," Science Colloquium at Roger Williams University, November 2001.

• "The Quantum Mechanics of Global Warming," Physics Colloquium at Worcester Polytechnic Institute, November 2001.

• "The Quantum Mechanics of Global Warming," Chemistry Colloquium at Brown University, October 2001.

• "Do Orbital Currents Form Spontaneously in the High-Temperature Cuprate Superconductors," condensed matter seminar "Chez Pierre", MIT, March 2001.

• "Flux Phase Redux? A Search For Staggered Orbital Currents," Institute for Theoretical Physics, UC Santa Barbara, September 2000.

• "Flux Phase Redux? A Search For Staggered Orbital Currents," seminar at Stanford University, August 2000.

• "The Quantum Mechanics of Global Warming," physics colloquium at University of New South Wales, Sydney, Australia, June 2000.

• "Quantum Criticality in Spin Chains and Plateau Transitions," condensed matter seminar at University of New South Wales, Sydney, Australia, June 2000.

• "Photoemission Studies of Insulating Cuprates: Blast From the Past," invited talk at the Tenth Gordon Godfrey Workshop on Condensed Matter Physics, University of New South Wales, Sydney, Australia, June 2000.

• "The Quantum Mechanics of Global Warming," physics colloquium at Clark University, May 2000.

• "The Quantum Mechanics of Global Warming," physics colloquium at University of Rhode Island, April 2000.

• "Why Quantum Many-Body Descriptions of Charge Transfer Are Here To Stay," invited APS Symposium talk at the APS March Meeting, Minneapolis, March 2000.

• "The Quantum Mechanics of Global Warming," physics colloquium at Rutgers University, March 2000.

• "Quantum Criticality in Spin Chains and Plateau Transitions," condensed matter seminar at Rutgers University, February 2000.

• "The Quantum Mechanics of Global Warming," physics colloquium at Brandeis University, February 2000.

• "Quantum Criticality in Spin Chains and Plateau Transitions," condensed matter seminar at Yale University, February 2000.

• "The Quantum Mechanics of Global Warming," physics colloquium at University of Connecticut, December 1999.

• "The Quantum Mechanics of Global Warming," physics colloquium at University of Toronto, November 1999.

• "Using Supersymmetry and the Density Matrix RG to Understand Quantum Criticality and Disorder" seminar at University of Toronto, November 1999.

• "The Quantum Mechanics of Global Warming," college-wide lecture at St. John's College, Annapolis, Maryland, October 1999.

• "The Quantum Mechanics of Global Warming," colloquium at Indiana University, October 1999.

• "Using Supersymmetry and the Density Matrix RG to Understand Quantum Criticality and Disorder" seminar at Indiana University, October 1999.

• "Quantum Many Body Descriptions of Dynamical Charge Transfer," invited talk at the 3rd European Research Conference on Particle-Solid Interactions, San Sebastian, Spain, October 1999.

• "Using Supersymmetry to Understand Disorder and Quantum Criticality: Successes and Failures," invited talk at Recent Progress in Many Body Theories X, Seattle, Washington, September 1999.

• "The Quantum Mechanics of Global Warming," seminar at the Center for Nonlinear Studies at Los Alamos National Laboratory, June 1999.

• "The Quantum Mechanics of Global Warming," physics colloquium at the University of Massachusetts, Amherst, May 1999.

• "High Temperature Superconductivity," seminar at the University of Massachusetts, Dartmouth, May 1999.

• "Why Many Body Descriptions of Charge Transfer are Here to Stay," invited talk at the IISC-12 conference, South Padre Island, Texas, January 1999.

• "Consilience of High-T_c Theories," talk given at *The International Workshop on Superconductivity, Magneto-Resistive Materials, and Strongly Correlated Systems* held in Hanoi, Vietnam, January 1999.

• "The Quantum Mechanics of Global Warming," physics colloquium at UC Davis, December 1998.

• "The Quantum Mechanics of Global Warming" Institute for Theoretical Physics colloquium at UC Santa Barbara, November 1998.

• "Room Temperature Kondo Effect in Atom-Surface Scattering," *Workshop on Chemical Reaction Theory for Environmental Problems*, UC Davis, May 1998.

• "The Quantum Mechanics of Global Warming" physics colloquium at Brown University, April 1998.

• "Multidimensional Bosonization of Fermion Systems," at the *Conference on Coherence in Strongly Correlated Electron Systems*, Pisa, Italy, July 1996.

• "Identity Crisis in Metals," statistical mechanics seminar at the University of Maryland, April 1996.

• "Identity Crisis in Metals," physics colloquium at Columbia University, April 1996.

• "Quantum Mechanics of Global Warming," science colloquium at Roger Williams University, November 1995.

• "Identity Crisis in Compressible Fermion Liquids," condensed matter seminar at Boston University, November 1995.

• "Identity Crisis in Metals," physics colloquium at Dartmouth College, October 1995.

• "Multidimensional Bosonization," condensed matter seminar at The Ohio State University, October 1995.

• "Multidimensional Bosonization: Fundamentals and Open Questions," Telluride, July 1995.

• "Bosonization in Dimensions Greater Than One," Invited APS Symposium talk at the APS March Meeting in San Jose, March 1995.

• "Theory of Compressible Fermion Liquids," condensed matter seminar, University of Massachusetts at Amherst, February, 1995.

• "Fermi and Nearly-Fermi Liquids: Understanding Them With Bosonization in $D > 1$," condensed matter seminar, University of Indiana, November 1994.

• "Fermi and Nearly-Fermi Liquids: Understanding Them With Bosonization in $D > 1$," theory seminar, University of Illinois, November 1994.

• "Gauge Fields and Fermion Liquids in $D > 1$: Solution via Bosonization," condensed matter seminar, Institute for Advanced Study, Princeton, May 1994.

• "Fermi and Nearly-Fermi Liquids: Understanding Them With Bosonization in $D > 1$," condensed matter seminar, Harvard University, March 1994.

• "The Metallic State Reconsidered," physics colloquium at the University of Vermont, February 1994.

• "Bosonized Fermi Liquids," condensed matter seminar, Princeton University, December, 1993.

• "Bosonization and Fermi Liquids in Dimensions Bigger Than One," theory seminar at AT & T Bell Labs, October, 1993.

• "The Metallic State Reconsidered," physics colloquium at Rice University, April, 1993.

• "Global Temperatures and Carbon Dioxide," colloquium at the AECL Chalk River Laboratory in Ontario Canada, February 1993.

• "Many Body Theory of Charge Transfer in Hyperthermal Atomic Scattering," Condensed Matter Seminar, Boston University, November 1992.

• "Bosonization and Fermion Liquids in Dimensions Bigger Than One," Condensed Matter Seminar, Yale University, October 1992.

• "Bosonization and Fermi Liquids," seminar at the Institute for Theoretical Physics, Santa Barbara, CA, May 1992.

• "High-Temperature Superconductivity: A Progress Report," physics colloquium at the University of Rhode Island, November 1991.

• "A Many Body Theory of Charge Transfer in Hyperthermal Scattering of Alkali Atoms off Metal Surfaces," Xerox Webster Research Center, April 1991.

• "Exact C-Breaking Ground States of SU(2n) Quantum Antiferromagnets," California Institute of Technology, Condensed Matter Seminar, January 1991.

• "A Many Body Theory of Charge Transfer in Hyperthermal Scattering of Alkali Atoms off Metal Surfaces," Brown University, December 1990.

• "Two Observable Features of the Staggered Flux Phase" at the 1990 Summer Institute in Theoretical Physics in Kingston, Ontario, July 1990.

• "Do Quantum Spin-Liquids Exist?," University of California at Davis, Solid State Physics Seminar, March 1990.

• "Do Quantum Spin-Liquids Exist?," University of California at Berkeley, Statistical and Many Body Physics Seminar, March 1990.

• "Do Quantum Spin-Liquids Exist?," University of British Columbia, Condensed Matter Seminar, March 1990.

• "Do Quantum Spin-Liquids Exist?," Cornell University, LASSP Theory Seminar, March 1990.

• "Instantons and Massless Fermions," Rutgers University, Seminar, November 1989.

• "The Flux Phase," Yale University, Seminar, June 1989.

• "SU(n) Quantum Antiferromagnets," University of Illinois at Urbana-Champaign, Seminar, March 1989.

• "SU(n) Quantum Antiferromagnets," Harvard University, Condensed Matter Theory Seminar, January 1989.

• "SU(n) Quantum Antiferromagnets," The State University of New Jersey at Rutgers, Seminar, December 1988.

• "Field Theory Analysis of a Short-Range Pairing Model," Princeton University Theoretical Particle Physics Seminar, November 1987.

• "The Large-n Limit of the Hubbard-Heisenberg Model," Princeton University Condensed Matter Theory Seminar, November 1987.

• "The Large-n Limit of the Hubbard-Heisenberg Model" at the Conference on High-T_c Superconductors held at McMaster University, Hamilton, Ontario, October 1987.

• "Beyond Time Dependent Hartree Fock: The Calculation of Fluctuations," Oak Ridge National Laboratory, Theory Seminar, August 1984.

• "Beyond Time Dependent Hartree Fock: The Calculation of Fluctuations," California Institute of Technology, W. K. Kellogg Radiation Laboratory, June 1984.