CURRICULUM VITÆ

October, 2008

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Birthdate: 15 December 1963
Citizenship: United States
Languages: French (conversant), German (reading)

EDUCATION

Ph.D. Cornell University, physics, January 1991

M.S. Cornell University, physics, June 1988

A.B. Harvard University, physics, June 1985

EMPLOYMENT HISTORY

from 8/04	**Associate Professor of Physics** with tenure, University of South Florida. Research interests: computational and theoretical condensed-matter physics; mathematical crystallography; methods for data analysis in physics and biology.
8/98 – 8/04	**Assistant Professor of Physics**, University of South Florida.
5/02 – 7/02	**Visiting Scientist**, Cornell University.
8/95 – 7/98	**Director of Computing Facility and Lecturer**, Department of Physics, University of California at San Diego.
2/93 – 8/95	**Department of Energy Distinguished Postdoctoral Fellow**, Theory Division, Los Alamos National Laboratory.
8/91 – 1/93	**NATO Postdoctoral Fellow** and **Postdoctoral Associate**, Theoretical Physics, University of Oxford.
1/91 – 7/91	**Visiting Researcher**, Physics Department, University of British Columbia and Postdoctoral Associate, McMaster University.

GRANTS AND AWARDS

Department of Energy, Ames Laboratory subcontract, *Molecular-Dynamics Simulations of Tribological Properties of Quasicrystal Surfaces*, PI on subcontract, $14,468 (2007–2008)

National Science Foundation CHE-0722887, *MRI: Acquisition of a Computational Cluster for Research and Training at the University of South Florida in Partnership with Eckerd College and the University of Tampa*, co-PI (with Bhethanabotla, Cardenas, Guida, Space), $499,999 (2007–2011)

National Science Foundation DUE-0631023, *Scholarships Reinforcing Computational Physical Science*, PI (co-PIs: Ossowki, Space, Tsokos, Kersaint), $500,000 (2006–2011)

National Science Foundation DMS-0204845, *Collaborative Research: Homological Invariants in Crystallography*, PI with collaborator Benji Fisher (Boston College), $150,990 (2002–2006)

Research Corporation Cottrell Scholar's Award, *Geometric Effects and Tunneling in Layered Magnetic Structures*, single-PI, $75,000 (2001–2006)

USF internal grants: "Simulations in Thermodynamics and Statistical Mechanics: Improving Student Understanding and Retention in Physics and Chemistry (2007–8, $4,000, with co-PI B. Space); "Graduate-Level Computational Physics: team building for professional success" (2000, $7,500); and "Quantum Bytes: Computing with Collective Modes" (2000, $7,491).

PUBLICATIONS

D.C. Lovelady, J. Friedman, S. Patel, D.A. Rabson, C.-M. Lo, "Detecting effects of low levels of cytochalasin B in 3T3 fibroblast cultures by analysis of electrical noise obtained from cellular micromotion," to appear in *Biosensors and Bioelectronics*, 2008.

D.C. Lovelady, T.C. Richmond, A.N. Maggi, C.-M. Lo, D.A. Rabson, "Distinguishing cancerous from noncancerous cells through analysis of electrical noise," *Phys. Rev. E* **76**, 041908 (2007).

D.C. Lovelady, H.M. Harper, I.E. Brodsky, D.A. Rabson, "Multiphase region of helimagnetic superlattices at low temperature in an extended six-state clock model," *J. Phys. A* **39**, 5681–94 (2006).

J.F. Huesman, D.A. Rabson, "Band structure, density waves, and symmetries of aperiodic crystals," *Phil. Mag.* **86**, 909–914 (2006).

B. Fisher, D.A. Rabson, "Group Cohomology and Quasicrystals II: The Three Crystallographic Invariants in Two and Three Dimensions," *Ferroelectrics* **305**, 25–28 (2004).

B. Fisher, D.A. Rabson, "Group Cohomology and Quasicrystals I: Classification of the Two-Dimensional Space Groups," *Ferroelectrics* **305**, 37–40 (2004).

D.A. Rabson, B.N. Narozhny, A.J. Millis, "Crossover from Poisson to Wigner-Dyson level statistics in spin chains with integrability breaking," *Phys. Rev. B* **69**, 054403 (2004).

Z. Zhang, D.A. Rabson, "Electrical and thermal modeling of the non-Ohmic differential conductance in a tunnel junction containing a pinhole," *J. Appl. Phys.* **95**, 557 (2004).

Z. Zhang, D.A. Rabson, "Diagnosis and location of pinhole defects in tunnel junctions using only electrical measurements," *J. Appl. Phys.* **95**, 199 (2004).

D.A. Rabson, J. Huesman, B. Fisher, "Cohomology for Anyone," *Foundations of Physics* **33**, 1769–1796 (2003).

B. Fisher, D.A. Rabson, "Applications of Group Cohomology to the Classification of Crystals and Quasicrystals," *Journal of Physics A* **36**, 10195–10214 (2003).

D.A. Rabson, B. Fisher, "Fourier-Space Crystallography as Group Cohomology," *Phys. Rev.* B**65**, 024201 (2002).

J.J. Åkerman, R. Escudero, C. Leighton, S. Kim, D.A. Rabson, R.W. Dave, J.M. Slaughter, I.K. Schuller, "Criteria for ferromagnetic-insulator-ferromagnetic tunneling," *J. Magn. Magn. Mat.* **240**, 86 (2002).

D.A. Rabson, B.J. Jönsson-Åkerman, A.H. Romero, R. Escudero, C. Leighton, S. Kim, I.K. Schuller, "Pinholes may mimic tunneling," *J. Appl. Phys.* **89**, 2786 (2001).

B.J. Jönsson-Åkerman, R. Escudero, C. Leighton, S. Kim, I.K. Schuller, D.A. Rabson, "Reliability of normal-state current-voltage characteristics as an indicator of tunnel-junction barrier quality," *Appl. Phys. Letts.* **77**, 1870 (2000).

I.K. Schuller, D.A. Rabson, "Review of *Simulations for Solid-State Physics* by R.H. Silsbee and J. Dräger" (book review), *Physics Today*, June 1998.

E.G. Haanappel, D.A. Rabson, F.M. Mueller, "$Al_{70}Pd_{21.5}Mn_{8.5}$: a quasicrystal showing the de Haas-van Alphen effect," *Proceedings of Physical Phenomena at High Magnetic Fields II, Tallahassee, 6–9 May 1995, World Scientific*, 362 (1996).

E.G. Haanappel, F.M. Mueller, D.A. Rabson, "De Haas-van Alphen Effect and Fermi Surface of a Quasicrystal," *National High-Magnetic-Field Laboratory 1995 Annual Report*, 76 (1995).

D.A. Rabson, S.A. Trugman, "A Spin Model for Investigating Chirality," *J. Phys. Cond. Mat.* **7**, 9005 (1995).

F. Seno, D.A. Rabson, J.M. Yeomans, "Low-temperature behaviour of the six-state clock model with competing interactions," *J. Phys.* A**26**, 4887 (1993).

I. Affleck, D.P. Arovas, J.B. Marston, D.A. Rabson, "SU(2n) Quantum Antiferromagnets with Exact C-Breaking Ground States," *Nucl. Phys.* B**366**, 467 (1991).

D.A. Rabson, N.D. Mermin, D.S. Rokhsar, D.C. Wright, "The Space Groups of Axial Crystals and Quasicrystals," *Rev. Mod. Phys.* **63**, 699–733 (1991).

N.D. Mermin, D.A. Rabson, D.S. Rokhsar, D.C. Wright, "Stacking Quasicrystallographic Lattices," *Phys. Rev.* B**41**, 10 498 (1990).

A.P. Smith, D.A. Rabson, "Comment on 'Icosahedral Quasiperiodic Ground States?'," *Phys. Rev. Lett.* **63**, 2768 (1989).

D.A. Rabson, T-L. Ho, N.D. Mermin, "Space Groups of Quasicrystallographic Tilings," *Acta Cryst.* A**45**, 538–547 (1989).

D.A. Rabson, T-L. Ho, N.D. Mermin, "Aperiodic Tilings with Non-Symmorphic Space Groups $p2^jgm$," *Acta Cryst.* A**44**, 678–688 (1988).

INVITED TALKS AND SEMINARS (excluding talks at home institution)

Electrical Noise Gives Away Presence of Cancer or Toxins in Cell Cultures, or Applying Freshman Statistics to ECIS, Condensed-matter seminar, Virginia Tech, 1 September 2008.

The Consequences of (aperiodic) Symmetries, Condensed-matter seminar, University of Florida, 20 November 2006.

When is a Tunnel Junction not a Tunnel Junction?, Condensed-matter seminar, Syracuse University, 27 July 2004.

Oh, Thank Goodness!, Cottrell Scholars' Conference, Tucson, 9–10 July 2004.

Symmetries of Perfect Crystals that Violate Dalton's Law of Rational Proportions, Physics Colloquium, University of Maine, 1 August 2003.

J'accuse, Cottrell Scholars' Conference, Tucson, 12 July 2003.

Pinholes may Mimic Tunneling, seminar, Cornell University, 16 July 2002.

Project-Based Computational Physics, Cottrell Scholars' Conference, Tucson, 13 July 2002.

Topics in Condensed-Matter Theory, seminar, New College, 18 April 2001.

Mercifully Little: The Crystallography of Axial Crystals and Quasicrystals, colloquium, Florida Atlantic University, 5 February 1999.

Periodicity, Aperiodicity, and a Plea from the Physics Department, closing Plenary Address, Mathematical Association of America, Suncoast XXIII meeting, Brandon, Florida, 4 December 1998.

From Spin Models to Colossal-Magnetoresistive Disk-Read Heads: some approaches to magnetism, physics-department colloquium, University of South Florida, March 1998.

From Spin Models to Colossal-Magnetoresistive Disk-Read Heads: some approaches to magnetism, physics-department colloquium, Rochester Institute of Technology, 22 October 1996.

Mercifully Little: The Crystallography of Axial Crystals and Quasicrystals, physical-sciences colloquium, Atomic Energy of Canada laboratories at Chalk River, 30 June 1993.

Mercifully Little: The Crystallography of Axial Crystals and Quasicrystals, solid state seminar, Manchester University, 19 February 1992.

Mercifully Little: The Crystallography of Axial Crystals and Quasicrystals, solid state seminar, Simon Fraser University, 7 June 1991.

Crystallography is Better in Reciprocal Space, Workshop on the Geometry of Quasicrystals, Centre for Interdisciplinary Research, Bielefeld, Germany, 18–26 March 1991.

Mercifully Little: The Crystallography of Axial Crystals and Quasicrystals, solid-state seminar, McMaster University, 19 November 1990.

Mercifully Little: The Crystallography of Axial Crystals and Quasicrystals, Chemistry Department seminar, MIT, 17 October 1990.

CONTRIBUTED CONFERENCE TALKS (excluding talks given by students)

Electrical Noise Gives Away Presnce of Cancer or Toxins in Culture, 2008 March meeting of the American Physical Society, New Orleans, 10–14 March 2008.

Band Structure, Density Waves, and the Third Invariant, 2006 March meeting of the American Physical Society, Baltimore, 13–17 March 2006.

Group Cohomology and Quasicrystals, Workshop on geometry and physics, Aspen Institute for Physics, June 2004.

Group Cohomology and Quasicrystals II: The Three Crystallographic Invariants in Two and Three Dimensions, Aperiodic 2003, Belo Horizonte, 8–13 September 2003 (**abstract referreed and accepted for oral session**).

J'accuse, 2003 spring meeting of the Florida section of the American Association of Physics Teachers, 5 April 2003.

New Crystallographic Invariant, 2002 March meeting of the American Physical Society, Indianapolis, 18–22 March 2002.

Crossover from Poisson to Wigner-Dyson Level Statistics in One-Dimensional Systems with Integrability Breaking, 2001 March meeting of the American Physical Society, Seattle, 12–16 March 2001.

Fourier Space as Group Cohomology, 2001 March meeting of the American Physical Society, Seattle, 12–16 March 2001.

Pinholes May Mimic Tunneling, 2001 March meeting of the American Physical Society, Seattle, 12–16 March 2001.

Crossover in Spin Chains from Poisson to Wigner-Dyson Level Statistics with Integrability Breaking (poster), Gordon Conference on Correlated Electron Systems, Plymouth, New Hampshire, 29 June 2000.

Rough Interfaces Mimic Tunneling, 1999 Centennial meeting of the American Physical Society, Atlanta, 20–26 March 1999.

Chiral Order, Linear Spin-Wave Theory, and Quantum Canonical Transformations (poster), 1995 March meeting of the American Physical Society, San Jose, 20–24 March 1995.

A different kind of Chiral Order in a Two-Dimensional Quantum Spin Model, 1994 March meeting of the American Physical Society, Pittsburgh, 21-25 March 1994.

A six-state Clock Model relevant to Rare-Earth Metals and Multilayers, 1993 March meeting of the American Physical Society, Seattle, 22–26 March 1993.

Hofstadter on a Quasilattice, or What Happens with Two Incommensurabilities?, 1992 March meeting of the American Physical Society, Indianapolis, 16-20 March 1992.

SU(2n) Quantum Antiferromagnets with exact Charge-Conjugation-Symmetry-Breaking Ground States (poster), London meeting on high-temperature superconductivity, 2 December 1991.

The Three-Dimensional Quasicrystallographic Space Groups, 1990 March meeting of the American Physical Society, Anaheim, 12-16 March 1990.

Tilings of the Plane with Unusual Quasicrystallographic Space Groups, 1989 March meeting of the American Physical Society, St. Louis, 20-24 March 1989.

Aperiodic Tilings with Non-Symmorphic Space Groups $p2^j gm$, Rutgers Statistical Mechanics Meeting, 17-18 December 1987.

ORGANIZER

Co-organizer of "Symmetries and Mysteries: a Symposium on the Occasion of David Mermin's Retirement," Ithaca, 10–12 May 2002.

CONSULTANT

Subject-matter expert, K–12 PROMiSE grant (Partnership to Rejeuvenate and Optimize Mathematics and Science Education in Florida), July 2008

REVIEWER

National Science Foundation, Research Corporation, U.S. Department of Energy, Israel Science Foundation; American Journal of Physics, Communications in Mathematical Physics, Crystal Engineering, Ferroelectrics, Journal of Physics: Condensed Matter, MMM Conference Proceedings, and Philosophical Magazine.

ACADEMIC HONORS

Cottrell Scholar's Award, Research Corporation (2001–2006)
Department of Energy Distinguished Postdoctoral Fellowship (1993–1995)
North Atlantic Treaty Organization Postdoctoral Fellowship (1991–1992)
Cornell Mathematical Sciences Institute Graduate Fellowship (1989–1990)
Office of Naval Research Graduate Fellowship (1985–1988)
Harvard College Scholarship (honorary) (1982–1983, 1984–1985)
National Merit Scholarship (1981–1985)
Telluride-Association summer program, Deep Springs College (1980)

STUDENTS SUPERVISED

Zhongsheng Zhang, M.S., 2003; Jason Looper, M.S., 2003; Douglas Lovelady, M.S., 2003; Charles Hemphill, M.S., 2006; John Huesman. *current candidates:* Douglas Lovelady (Ph.D., joint), Nataliya Kovalchuk (Ph.D., joint), Heather Harper (M.S.), Tyson Richmond (M.S.), Keith McLaughlin (M.S.).

COURSES TAUGHT

University of South Florida

General Physics I (pre-med.) (2002, 2005)
General Physics I (engr.&sci.) (1998, 2000)
General Physics II (engr.&sci.) (1999, 2001)
General-Physics II Honors Supplement (1999)
Problem Solving for General Physics (1998, 2002)
Statistical Mechanics and Thermodynamics (undergraduate) (2003–8)
Solid-State Physics II (graduate) (2005–06)
Computational Physics I (graduate) (1999,2001,2002,2004,2006)
Undergraduate Computational Physics (2003–4, 7–8)
Solid-State Physics I (graduate) (2000, 2001, 2004, 2006, 2007)
Graduate Statistical Mechanics (2007)
Graduate reading course, Statistical Mechanics (2000)
Graduate reading course, Group theory (2003)
Graduate reading course, General Relativity (2008)
Independent Study (undergrad.) (2000)
Undergraduate Seminar/Colloquium (2008)
Undergraduate Research (1999–2008)
Directed Research, Thesis/Dissertation supervision (graduate)
Thesis/Dissertation supervision

University of California, San Diego

General Physics III (pre-med.) (1996)
Modern Physics (engineers) (1998)
Error Analysis (engineers) (1996)
Computational Physics (undergrad.) (1996, 1997)
Classical Electrodynamics II (grad) (1997)

EXPERIENCE IN COMPUTER ADMINISTRATION

- **1995–1998: Director of Computing Facility, Department of Physics, University of California, San Diego**
  - Responsible for 350 computers, 450 users, including 72 faculty. Supervised staff comprising a deputy (programmer/analyst III), help-desk people, administrative-database managers, and part-time students.
  - Supported administrative, instructional, and research computing for large department and allied centers; also responsible for networking (multiple protocols and media) and security.
  - Supported Macintosh OS, Windows 3.1/95/98/Workgroups, MS-DOS, OS/2, Solaris, SunOS, Open VMS, VAX VMS, Digital Unix, Ultrix, HP/UX, AIX, SGI-Irix, Linux (Slackware, Redhat, SüSE, Debian, Caldera), Free-BSD, BeOS, NCD.
  - Required to recover a portion of expenses and capital through recharge facility. Responsible for budget; worked to achieve goals with minimal expenditures.
  - Changed culture from one of "putting out fires" to that of anticipating and correcting problems before any user notices them.
- **1998–present: Associate/Assistant professor of physics, University of South Florida**
  - Originated proposal and secured funding for Center for parallel and numerical computing.
  - Developed and taught unique interdisciplinary course in scientific computing.

COMMITTEE SERVICE (UNIVERSITY OF SOUTH FLORIDA)

University: Search committee for chief technology officer (2007); Advanced-Computing Steering Committee and Oversight Committee (**chair** 2007–); Research-Computing Oversight Group (2002–7); Ad-hoc Committee of the Faculty Senate on Shared Governance (2004–5); Faculty representative to Deans' Advisory Committee on Academic Computing (2000–2) and to the Leadership Council's Workgroup on Technology and budget subcommittee (2000–2); Subgroup on Research Computing of the Technological Planning Committee (1998–9). **College:** College Computing Steering Committee (**chair** 2007–); College Computing Committee (2006–, **chair** 2007–); Graduate Committee **(chair 2003–4)** (2003–5); *ad-hoc* hiring committee in Chemistry (1999–2000), various dissertation committees in Chemistry and Math. **Department:** Faculty Advisory Committee (2005–); Graduate-admissions Committee (2004–); Undergraduate Committee (1998–) **(chair, 1999–2001)**, various *ad-hoc* hiring committees; Colloquium coordinator (1999–2001); Web coordinator (1998–2004); various thesis committees.