KARA M. BEAUCHAMP
Department of Physics
Cornell College
Mount Vernon, IA 52314

EDUCATION

University of Minnesota, Minneapolis, MN
Ph.D. in condensed matter physics (January 1994)
Physics graduate program (September 1988-September 1993).
Materials science graduate program (September 1987-September 1988)

Carleton College, Northfield, MN
Bachelor of Arts in physics, magna cum laude (June 1987).
Distinction in Senior Integrative Exercise

EMPLOYMENT

Cornell College, Mount Vernon, IA (Sept 2001 – present)
Department of Physics
Professor (Sept 2010 - present)
Associate Professor (Sept 2003 – Sept 2010)
Assistant Professor (Sept 2001 – Sept 2003)
Research: Fabrication and testing of dye-sensitized solar cells. Viability of wind energy generation through wind speed measurements.

Wesleyan University, Middletown, CT (Aug 1996 – June 2001)
Assistant Professor, Department of Physics.
Research: Magnetic properties of low dimensional magnetic systems which have competing ferromagnetic and antiferromagnetic interactions; transport properties at the metal-insulator transition in transition metal oxides.

University of Chicago, James Franck Institute, Chicago, IL (Oct 1993-May 1996)
Research Associate. Research Advisor, Dr. Thomas Rosenbaum.
Research: Effect of columnar defects on vortex motion in the quantum regime, quantum spin glasses.
Teaching: Teaching assistant, undergraduate section (Fall quarter 1994).

University of Minnesota, Minneapolis, MN (Sept 1987 – Sept 1993)
Research: Magnetic Interactions at the Superconductor-Insulator Transition in Ultrathin $DyBa_2Cu_3O_x$ Films
Teaching: Teaching Assistant, undergraduate physics labs and problem sessions (1988-1989).

PROFESSIONAL ACTIVITIES

AP Physics Exam Question Writer (July 2013)
Higher Learning Commission Annual Conference (April 2013)
Reunion of the AAPT/APS New Physics Teacher Workshop (Nov 2012)
STSI 2010 May Symposium: Stellar Populations in the Cosmological Context (May 2010)
ACM Workshop on the Integration of Athletics and Academics (Fall 2009)
28^{th} Annual Conference on the First-Year Experience, Orlando, Florida (Feb 2009)

ACT Science Test Reviewer (December 2008, January 2013)
Wind Resource & Project Energy Assessment Workshop, AWEA, Portland, OR (Sept. 2008)
AP Physics Exam Grading (June 2007, June 2008, June 2013)
Executive Editor, Renewable Energy Case Studies, Iowa Energy Center (2007)
Cornell College Writing Course Workshop (June 2003)
Learner-centered Astronomy Teaching Workshop (May 2003)
Cornell College Information Literacy Workshop (June 2002)
Project Kaleidoscope Conference, Undergraduate Physics Curricula (Fall 1997)
Workshop for New Physics Faculty, American Association of Physics Teachers (Fall 1997)

SERVICE

To Cornell College:
Chair, Administration Committee (July 2011 – June 2013)
Member, Institutional Research Advisory Committee (Sept 2011 – May 2013)
Member, Student Life Committee (July 2010 – June 2011)
Member, Berry Center Advisory Committee (July 2010 – June 2011)
Chair, Student Life Committee (July 2008 – June 2010)
Member, Big Four Committee (July 2008 – June 2010)
Member, President's Planning Council (July 2008 – present)
Member, Committee on Committees (Sept 2005 – May 2007)
Member, Academic Regulations Committee (Sept 2003 – May 2004)
Member, Cornell Strategic Planning Committee (March 2003 – May 2005)
Member, Off Campus Study Subcommittee of Strategic Planning Committee (Spring 2005)
Member, Student Life Committee (Sept. 2002 – May 2003)
Member, Sustainability Advisory Committee (2007-2008)
Member, Environmental Studies Committee (Fall 2001 – present)
Faculty Representative to the Recycling Oversight Committee (Fall 2001)
Faculty Supervisor, Cornell Recycling work study program (Spring 2002 – Spring 2007)
Search Committees for Chemistry (Craig Teague - 2003), English (Glenn Freeman - 2004), Geology (Emily Walsh - 2005), Dean of Students (Heidi Levine - 2007)
Faculty Mentor for Emily Walsh (Fall 2005 – Spring 2007)

To the Department of Physics
Chair, Physics Department (July 2006 - July 2009)
Member, West Science Building Renovation Committee (2006-2007)
Liaison Officer, Engineering Dual Degree (Sept. 2002 – July 2006, July 2009 - present)
Departmental Liaison and Recorder, NCA self evaluation (Fall 2002)

To the Wider Community:
Board of Directors, Iowa Renewable Energy Association (Sept 2001 – Sept 2009)
President of the Board, Iowa Renewable Energy Association (Sept 2005 - Sept 2008)

To the Physics Community:
Reviewed articles for *American Journal of Physics*

HONORS AND AWARDS

NSF CAREER Award (1998)
University of Minnesota Aneesur Rahman Prize (May 1993)
American Association of University Women Dissertation Fellowship (1992-1993)
Department of Education Fellowship (1990-1992)

Graduate School Fellowship (1987-1988)

GRANTS

NSF CAREER Award: $74,900 transferred to Cornell College to train students in renewable energy technology and to provide a public demonstration of renewable energy production.
NSF CAREER Award (1998): $75,000/year for four years ($300,000 total)
"Interplay of Disorder and Quantum Effects in Low Dimensional Magnets"
NSF Research Planning Grant (1997): $15,000 for one year.

PRESENTATIONS

"Dark Matter in Space," Mount Vernon – Lisbon Rotary (June 2013), Cornell College SIG Lecture (April 2013), Cedar Amateur Astronomers Public Event Lecture (Aug 2012)
"Lives of Stars," Cedar Amateur Astronomers Public Event Lecture (July 2011)
"Hubble Images," Cedar Amateur Astronomers Public Event Lecture (June 2010)
"Light in Astronomy," Open Minds, Open Doors (Oct 2009)
"Going Organic: New Research in Dye-Sensitized Solar Cells," with Charley Liberko, Cornell College SIG lecture (Dec 2008)
"Photovoltaics," Cornell College Homecoming Panel Presentation (Oct 2008)
"Renewable Energy Basics," I-Renew Energy Expo (Sept 2008)
"Renewable Energy," Open Minds, Open Doors (Oct 2007)
"Determining Your Renewable Energy Resource," I-Renew Energy Expo (Sept 2006, Sept 2007)
"20 Years of High Temperature Superconductivity," Cornell College SIG lecture (Jan 2006)
"Measuring the Wind," I-Renew Energy Expo (Sept 2005), Cornell College SIG lecture (Jan 2004), Grandview College Science Colloquium (Jan 2004)
"Inspirational Tales from the Lives of Four Women in Science," with Cindy Strong, Cornell College (March 2002)
"Renewable Energy at Cornell?" for the Environmental Club, Cornell College (March 2002)
"Searching for the Random Quantum Spin Chain: A Cautionary Tale," Illinois Wesleyan University (March 2000)
"AC susceptibility of $Sr_3CuPt_xIr_{1-x}O_6$: a magnetic system with competing interactions and dimensionality," University of Rhode Island (Feb 2000)
"Mixing antiferromagnetic and ferromagnetic interactions on a chain - does it make a random spin paramagnet?" Clark University (Nov1999)
"Vortex Lock-in Deep in the Bose Glass," Yale University (March 1997), Brown University (February 1997)
"Locking Out Resistance from High Temperature Superconductors," Carleton College (April 1994)
"Characterization of Heteroepitaxial $DyBa_2Cu_3O_{7-x}$ Thin Films by Parallel Beam X-ray Diffraction," Tutorial Workshop on Use of Parallel Beam Optics for X-ray Diffraction, 41st Annual Denver Conference on Applications of X-ray Analysis, Colorado Springs, CO (Aug 1992)

PUBLICATIONS

22. "AC susceptibility of $Sr_3CuPt_xIr_{1-x}O_6$, a magnetic system with competing interactions and dimensionality," S. Irons, T.D. Sangrey, K.M. Beauchamp, M.D. Smith, H.-C. zur Loye, *Phys. Rev. B* **61**, 11594 (2000).

21. Book Review of Superconductivity, by C.P. Poole, H.A. Farach, and R.J. Crewsick, *Am. J. Phys*. **65**, 95 (1997).

20. "Vortex Lock-In Deep in the Bose Glass," K.M. Beauchamp, T.F. Rosenbaum, U. Welp, G.W. Crabtree, and V.M. Vinokur, *Phys. Rev. Lett*. **75**, 3942 (1995).

19. "Local Probe of Vortex Pinning Energies in the Bose Glass," K.M. Beauchamp, L. Radzihovsky, E. Shung, T.F. Rosenbaum, U. Welp, G.W. Crabtree, *Phys. Rev. B* **52**, 13025 (1995).

18. "Low Temperature Action in $YBa_2Cu_3O_{7-x}$," G.T. Seidler, T.F. Rosenbaum, K.M. Beauchamp, H.M. Jaeger, G.W. Crabtree, U. Welp, and V.M. Vinokur, *Phys. Rev. Lett*. **74**, 1442 (1995).

17. "Pair-Breaking by Spin-Disorder Scattering at the Antiferromagnetic Transition of the Dy^{3+} Sublattice of $DyBa_2Cu_3O_{7-x}$ Films," K.M. Beauchamp, G.C. Spalding, W.H. Huber, and A.M. Goldman, *Phys. Rev. Lett*. **73**, 2752 (1994).

16. "Classes of Superconductor-Insulator Transitions in High-T_c Films," K.M. Beauchamp, G.C. Spalding, T. Wang, and A.M. Goldman, *Physica B* **194-6**, 2321 (1994).

15. "The Interplay between Antiferromagnetism and Superconductivity in Disordered Ultrathin High-T_c Films," K.M. Beauchamp, T. Wang, G.C. Spalding, and A.M. Goldman, *Physica A* **200**, 287 (1993).

14. "Anomalous Magnetoresistance of Ultrathin Films of $DyBa_2Cu_3O_{7-x}$ near the Superconductor-Insulator Transition" T. Wang, K.M. Beauchamp, A.M. Mack, N.E. Israeloff, G.C. Spalding, and A.M. Goldman, *Phys.Rev. B* **47**, 11619 (1993).

13. "Fabrication of High-T_c Superconductors using Ozone-assisted Molecular Beam Epitaxy," V.S. Achutharaman, K.M Beauchamp, N. Chandrasekhar, G.C. Spalding, B.R. Johnson, and A.M. Goldman, *Thin Solid Films* **216**, 14 (1992).

12. "Heteroepitaxial Growth of $DyBa_2Cu_3O_{7-x}/Dy_2O_3$ Multilayers Analyzed by TEM," Y.J. Zhang, K.M. Beauchamp, B.R. Johnson, T. Wang, A.M. Goldman, and M.L. Mecartney, *J. Mater. Res.* **7**, 29 (1992).

11. "Natural Buffer Layer in $DyBa_2Cu_3O_{7-x}$ Films Grown on Si by Molecular Beam Epitaxy," C.A. Nordman, T. Wang, N. Chandrasekhar, K.M. Beauchamp, V.S. Achutharaman, R.K. Schulze, G.C. Spalding, Z-H. Lin, J.F. Evans, and A.M. Goldman, *J. Appl. Phys.* **70**, 10 (1991).

10. "Barrier Technology for $DyBa_2Cu_3O_{7-x}$ Junctions and Related Structures," K.M. Beauchamp, Y-J. Zhang, B.R. Johnson, R.K. Schulze, G.C. Spalding, M. Tsen, T. Wang, J.F. Evans, M.L. Mecartney, A.M. Goldman, *IEEE Trans. MAG* **27**, 3090 (1991).

9. "Onset of High Temperature Superconductivity in the Two-Dimensional Limit," T. Wang, K.M. Beauchamp, D.D. Berkley, B.R. Johnson, J-X. Liu, J. Zhang and A.M. Goldman, *Phys. Rev. B* **43**, 8623 (1991).

8. "Onset Superconductivity in Ultra-Thin $DyBa_2Cu_3O_7$ Films," T. Wang, K.M. Beauchamp, D.D. Berkley, J-X. Liu, B.R. Johnson, and A.M. Goldman, *Physica B* **165&166**, 1463 (1990).

7. "*In-situ* Growth of $DyBa_2Cu_3O_{7-x}$ Thin Films by Molecular Beam Epitaxy," B.R. Johnson, K.M. Beauchamp, T. Wang, J-X. Liu, K.A. McGreer, J-C. Wan, M. Tuominen, Y-J. Zhang, M.L. Mecartney, and A.M. Goldman, *Appl. Phys. Lett.* **56**, 1911 (1990).

6. "Growth of Co-evaporated Superconducting $YBa_2Cu_3O_{7-X}$ Thin Films Oxidized by Pure Ozone," B.R. Johnson, K.M. Beauchamp, J-X. Liu, T. Wang, and A.M. Goldman, in *Processing of Films for High-T_c Superconducting Electronics*, T. Venkatesan, editor, Proc. SPIE **1187**, 27 (1990).

5. "High-temperature Superconducting Microbolometer," T.G. Stratton, B.E. Cole, P.W. Kruse, R.A. Wood, K. Beauchamp, T.F. Wang, B. Johnson, and A.M. Goldman, *Appl. Phys. Lett.* **57**, 99 (1990).

4. "Low Temperature Scanning Tunneling Spectroscopy of a $DyBa_2Cu_3O_{7-x}$ Film," J-C. Wan, K.A. McGreer, K.M. Beauchamp, B. R. Johnson, J-X. Liu, T. Wang, and A.M. Goldman, *Physica B* **165&166**, 1505 (1990).

3. "Preparation of Y $Ba_2Cu_4O_{20-x}$ Thin Films by Thermal Co-evaporation," D.D. Berkley, D.H. Kim, B.R. Johnson, A.M. Goldman, M.L. Mecartney, K.M. Beauchamp, and J. Maps, *Appl. Phys. Lett*. **53**, 708 (1988).

2. "*In-situ* Formation of Superconducting $YBa_2Cu_3O_{7-x}$ Thin Films Using Pure Ozone Vapor Oxidation," D.D. Berkley, B.R. Johnson, N. Anand, J. Maps, J. Morton, M. Tuominen, K. Mauersberger, A.M. Goldman, K.M Beauchamp, Y.J. Zhang, M.L. Mecartney, and L.E. Conroy, *Appl. Phys. Lett*. **53**, 1973 (1988).

1. "Ozone Processing of MBE Grown $YBa_2Cu_3O_{7-x}$ Films," D.D. Berkley, B.R. Johnson, N. Anand, K.M. Beauchamp, L.E. Conroy, A.M. Goldman, J. Maps, K. Mauersberger, M.L. Mecartney, J. Morton, M. Touminen, and Y.J. Zhang, in the Proceedings of the 1988 Applied Superconductivity Conference.