Curriculum Vitae
Juana Moreno
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Education:

1997 Ph.D. in Physics, Rutgers University. Thesis written under the supervision of Professor Piers Coleman.

1988 B.S. in Physics, Universidad Autónoma de Madrid, Spain.

Employment:

Aug. 2004-present Assistant Professor, Department of Physics, University of North Dakota, Grand Forks, North Dakota.

Summer 2002, 2003, 2005, 2006 & 2007 Invited researcher in Oak Ridge National Laboratory, Oak Ridge, Tennessee.

Dec. 2003-Aug. 2004 Research associate in the Department of Physics, University of Cincinnati, Cincinnati, Ohio.

2001-2003 Research associate in the Department of Physics & Astronomy, Clemson University.

1998-2001 Postdoctoral position in the Department of Physics & Astronomy, Northwestern University.

1996-1998 Postdoctoral position in the Abdus Salam International Centre for Theoretical Physics, Trieste, Italy.

1990-96 Teaching and Graduate Assistantship, Dept. of Physics & Astronomy, Rutgers University.

1988-90 Graduate Fellowship, Dept. of Condensed Matter Physics, Universidad Autónoma de Madrid. Research work under the supervision of Professor José M. Soler.

Grants and support

Grants and awards through competitive proposals:

- *PIRE: Graduate Education and Research in Petascale Many Body Methods for Complex Correlated Systems: A Collaboration with Partners in Germany and Switzerland*, OISE-0730290, PI: Juana Moreno, Co-PIs: Mark Jarrell and Karen Tomko (University of Cincinnati), Richard Van Eck (University of North Dakota), National Science Foundation-Partnerships for International Research and Education, $2,499,999, September 2007-August 2012.

- *Magnetic Ordering in Porphyrin and others*, Department of Energy through Oak Ridge National Laboratory, UT-Battelle LLC, Subcontract Number 4000060687, $8,000, July 2007.
- *Simulations Employing The Dynamical Cluster Approximation*, PI: Mark Jarrell, Co-PIs: Karen Tomko, Alexandru Macridin, Richard T. Scalettar and Juana Moreno, 495,000 SUs (service units) to access TACC Lonestar, TACC Ranger and NCSA Xeon clusters, CyberInfrastructure Partnership funded by the National Science Foundation, April 2007-March 2008.
- *Improving Math and Science Literacy of Middle and High School Students of North Dakota Through Teacher-Faculty Partnerships*, PI: Daniel Rice and Martha Potvin, Key personnel: Lars Helgeson, Kanishka Marasinghe, Julie Abrahamson, George Bibel, Jeff Carmichael, Brett Goodwin, Cheryl Halcrow, Michele Iiams, Gail Ingwalson, Ju Kim, Juana Moreno, David Pierce, and William Schwalm, under the 'Mathematics and Science Partnerships' program funded by the North Dakota Department of Public Instruction, $1,500,000, September 2006-August 2009.
- *Quantum Wells of Dilute Magnetic Semiconductors*, Department of Energy through Oak Ridge National Laboratory, UT-Battelle LLC, Subcontract Number 4000051574, $10,000, July 2006-November 2006.
- *CAREER: A Search for the Optimal Material for Spintronic Device Applications: from University to Primary School Classrooms*, DMR-0548011, NSF-Division of Materials Research, $400,000, July 2006-June 2011.
- *UND-NDSU Spintronics Collaboration: Modeling and Characterization of Magnetic Organic Semiconductors*, North Dakota EPSCoR Spintronics Statewide Initiative, $91,500, May 2006-April 2008.
- EPSCoR travel stipend to attend the NSF sponsored Cyberinfrastructure Workshop, Nashville, Tennessee, $1,500, May 2006.
- *Simulations Employing The Dynamical Cluster Approximation*, PI: M. Jarrell, Co-PIs: A. Macridin, R. T. Scalettar, Juana Moreno, P. R. C. Kent, Douglas Scalapino, Thomas Devereaux, B. Moritz, Eduardo D'Azevedo and Thomas Maier, 418,500 SUs (service units) to access TeraGrid and Xeon clusters, CyberInfrastructure Partnership funded by the National Science Foundation, April 2006-March 2007.
- *Simulations Employing The Dynamical Cluster Approximation*, PI: A. Macridin, Co-PIs: P. R. C. Kent, M. Jarrell and B. Moritz, Thomas Devereaux, R. T. Scalettar, Douglas Scalapino, Juana Moreno, Thomas Maier and Eduardo D'Azevedo, 50,000SUs (service units) to access the TeraGrid, under the CyberInfrastructure Partnership funded by the National Science Foundation, December 2005-March 2006.
- *Computational Study of Dilute Magnetic Semiconductors*, computer facilities at the Center for Functional Nanomaterials (CFN), Brookhaven National Laboratory, 120 days/year, September 2005-August 2007.
- *Dynamical Cluster Approximation Simulations of Dilute Magnetic Semiconductors*, Department of Energy through Oak Ridge National Laboratory, UT-Battelle LLC, Subcontract Number 4000042030, $19,280, July 2005-November 2005.
- *Magnetic and Transport Properties of Ferromagnetic Semiconductors: A Search for the Optimal Material for Spintronic Device Applications*, Oak Ridge Associated Universities (ORAU) Junior Faculty Award, $10,000, April 2005-May 2006.

- *Computational Studies of Dilute Magnetic Semiconductors*, North Dakota EPSCoR new faculty startup program, $75,000, August 2004-April 2006.
- *Magnetic and transport properties of diluted magnetic semiconductors*, computer facilities at the Center for Functional Nanomaterials (CFN), Brookhaven National Laboratory, 90 days/year, September 2003-August 2005.
- *Dynamical Mean Field Theory Studies of Dilute Ferromagnetic Semiconductors*, Department of Energy through Oak Ridge National Laboratory, UT-Battelle LLC, Subcontract Number 4000022756, $8,000, Summer 2003.

Internal Grants and awards:

- *Training Opportunities for UND Students in Nanoscience and Materials Science*, Student Technology Fee, PIs: Kanishka Marasinghe, Juana Moreno, $33,500, February 2007.
- *Our Nanoworld: Introduction to nanoscience and nanotechnology for K-12 teachers*, UND Summer Program and Events Council Start-up Mini-grant, $3,681, February 2006.
- Research Development and Compliance (RD&C) travel grant to attend the Northcentral States Nanosystems Consortium workshop in Denver, Colorado, $655.39, October 2005.
- *Properties of Ferromagnetic Semiconductor Quantum Dots*, Senate Scholarly Activities Committee New Faculty Scholar Award, $4,000, March 2005.
- Senate Scholarly Activities Committee travel grant to present a paper at the American Physical Society March Meeting, $501.80, February 2005.
- Research Proposal Writing Fellowship by the Office of Research & Program Development, $1,000, January 2005.
- EPSCoR travel grant to attend the Oklahoma NSF EPSCoR Women in Science Conference at Langston University, Langston, Oklahoma, $1,034, November 2004.
- Faculty Instructional Development Grant to attend the Ninth Workshop for New Physics and Astronomy Faculty, $477, October 2004.

Proposals pending:

- *Building a unified computational model for the resonant X-ray scattering of strongly correlated materials*, PIs: Ken Ahn, Arun Bansil, Bernardo Barbiellini, Tom Devereaux, Jim Freericks, Bob Markiewicz, Juana Moreno, John Rehr and Michel van Veenendaal, DOE-CMSN (Computational Materials Science Network), September 2007.
- *Next Generation Multi-Scale Quantum Simulation Software for Strongly Correlated Materials*, PIs: Zhaojun Bai, Eduardo D'Azevedo, Mark Jarrell, Thomas Maier, Juana Moreno, Sergej Savrasov, Richard Scalettar and Karen Tomko, Innovative and Novel Computational Impact on Theory and Experiment (INCITE) program, DOE's Office of Science, August 2007.
- *Organic-based Magnetoelectronic Materials and Devices*, PI: Douglas Schulz, Co-PIs: Konstantin Pokhodnya, Anthony Caruso, Seth Rasmussen, Iskander Akhatov, Kalpana Katti, Dean Webster, Juana Moreno, Orven Swenson, Kenton Rogers, RII State Research Initiatives Preliminary White Paper, $3,750,000, May 2007.

- *Magnetism of Layered Metal-Organic Materials*, PI: Randy Fishman, Co-Pis: Radu Custelcean, Mark Lumsden, Fernando Reboredo, and Brian Sales, External Investigators: Markus Eisenbach and Juana Moreno, Office of Basic Energy Sciences, Department of Energy, $2,132,094, January 2007.

Publications:

- *Optimal meshes for integrals in real- and reciprocal-space unit cells*, Juana Moreno and José M. Soler, Phys. Rev. B **45**, 13891 (1992).
- *Ultrasound attenuation in gap-anisotropic systems*, J. Moreno and P. Coleman, Phys. Rev. B **53**, R2995 (1996).
- *Thermal currents in highly correlated systems*, J. Moreno and P. Coleman, xxx.lanl.gov/abs/cond-mat/9603079.
- *Gap-anisotropic model for the narrow-gap Kondo insulators*, Juana Moreno and P. Coleman, Physica B **259-261**, 190 (1999).
- *Gap-anisotropic model for the narrow-gap Kondo insulators*, Juana Moreno and P. Coleman, Phys. Rev. Lett. **84**, 342 (2000).
- *Magnetic field effects on neutron diffraction in the antiferromagnetic phase of* UPt_3, Juana Moreno and J. A. Sauls, Phys. Rev. B **63**, 24419 (2001).
- *Two-channel Kondo Lattice Model on a ladder studied by the Density Matrix Renormalization Group Method*, Juana Moreno, Shaojin Qin, P. Coleman and Lu Yu, Phys. Rev. B **64**, 085116 (2001).
- *Reply to "Comment on 'Magnetic field effects on neutron diffraction in the antiferromagnetic phase of* UPt_3*'"*, Juana Moreno and J. A. Sauls, Phys. Rev. B **66**, 216402 (2002).
- *Effective electron-electron interaction in a two dimensional paramagnetic system*, Juana Moreno and D. C. Marinescu, cond-mat/0206465.
- *Local Field Corrections Of A Paramagnetic Two Dimensional Gas*, D. C. Marinescu and Juana Moreno, Proceedings of the 8th International Workshop on Similarity in Diversity, Nova Science, New York (2002).
- *Pair distribution function at the origin in a two-dimensional electron gas*, Juana Moreno and D. C. Marinescu, Journal of Physics: Condensed Matter **15**, 6321 (2003).
- *Local field factors in a polarized two-dimensional electron gas*, Juana Moreno and D. C. Marinescu, Phys. Rev. B **68**, 195210 (2003), selected to appear on the Virtual Journal of Nanoscale Science & Technology.
- *Hartree-Fock energy of a density wave in a spin-polarized two-dimensional electron gas*, Juana Moreno and D. C. Marinescu, Journal of Physics: Condensed Matter **16**, 2311 (2004).
- *Magnetism in semiconductors: A dynamical mean field study of ferromagnetism in* $Ga_{1-x}Mn_xAs$, K. Aryanpour, J. Moreno, M. Jarrell and R. S. Fishman, Phys. Rev. B **72**, 045343 (2005).

- *Thermodynamic Consistency of the Dynamical Mean-Field Theory of the Double-Exchange Model*, Randy S. Fishman, Juana Moreno, Thomas Maier, and Mark Jarrell, Phys. Rev. B **71**, 180405R (2005).
- *Generalized Double-Exchange Model for Magnetic Semiconductors with Angular Momentum j*, Randy Fishman, Juana Moreno, and Mark Jarrell, Journal of Magnetism and Magnetic Materials **300**, 53 (2006).
- *Short-range ordered phase of the double-exchange model in infinite dimensions*, R. S. Fishman, F. Popescu, G. Alvarez, T.Maier and J. Moreno, Phys. Rev. B **73**, 140405R (2006).
- *Transition Temperature of a Magnetic Semiconductor with Angular Momentum j*, J. Moreno, R. S. Fishman and M. Jarrell, Phys. Rev. Lett. **96**, 237204 (2006), selected to appear on the Virtual Journal of Nanoscale Science & Technology.
- *Magnetic Instabilities and Phase Diagram of the Double-Exchange Model in Infinite Dimensions*, R. S. Fishman, F. Popescu, G. Alvarez, J. Moreno, Th. Maier, and M Jarrell, New Journal of Physics **8**, 116 (2006).
- *Dynamics of Impurity and Valence Bands in $Ga_{1-x}Mn_xAs$ within the Dynamical Mean Field Approximation*, M.A. Majidi, J. Moreno, M. Jarrell, and R.S. Fishman, Phys. Rev. B **74**, 115205 (2006).
- *Nature of Perpendicular-to-Parallel Spin Reorientation in a Mn-doped GaAs Quantum Well: Canting or Phase Separation?*, Randy S. Fishman, Fernando A. Reboredo, Alex Brandt, and Juana Moreno, Phys. Rev. Lett. **98**, 267203 (2007).
- *Charge Density Wave Driven Ferromagnetism in the Periodic Anderson Model*, M. A. Majidi, D. G. S. P. Doluweera, B. Moritz, and P. R. C. Kent, J. Moreno, M. Jarrell, cond-mat.str-el/0710.5937.
- *Cluster extension of CPA using the Dynamical Cluster Approximation*, Brian Moritz, Karlis Mikelsons, Juana Moreno, Randy Fishman, and Mark Jarrell, submitted Phys. Rev. B.

Presentations :

- *Gap-anisotropic model for the narrow-gap Kondo insulators*, poster presentation, SCES98 Conference, July 1998, Paris, France.
- *Magnetism in UPt_3 and related compounds*, invited talk at the workshop on 'Unconventional Superconductivity and Magnetism in UPt_3 and related systems', Northwestern University, April 1999.
- *The narrow-gap Kondo insulators CeNiSn and CeRhSb*, talk at the workshop on 'Unconventional order in metals', Aspen Center for Physics, July 1999.
- *Two-channel Kondo Lattice Model on a ladder studied by the Density Matrix Renormalization Group Method*, poster presentation at 'XII Workshop on strongly correlated electron systems' at the Abdus Salam ICTP, Trieste, Italy, July 2000.
- *Kondo insulators*, invited colloquium, Chicago State University, February 2001.
- *The Flux-line lattice in UPt_3*, invited talk at Argonne National Laboratory, April 2001.

- *Beyond the conventional Kondo lattice model*, invited talk, Los Alamos National Laboratory, April 2001.
- *The challenge of new superconducting materials*, invited colloquium, Hanover College, May 2001.
- *From insulating to metallic ground states in the lattice Kondo model*, invited talk, School of Physics, Georgia Institute of Technology, April 2002.
- *Effective Interaction in Spin Polarized Systems*, invited talk, '8th International Workshop on Similarity in Diversity', University at Buffalo, SUNY, Amherst, May 2002.
- *Effective electron-electron interaction in a spin polarized system* and *Pairing symmetry and non-local electrodynamic effects on the flux lattice in* UPt_3, poster presentations, Gordon Conference in 'Correlated Electron Systems', Colby College, Maine, June 2002.
- *Flux Lattice of the heavy fermion superconductor* UPt_3, invited talk, Oak Ridge National Laboratory, July 2002.
- *Spin-charge density wave instability in a polarized two-dimensional electron gas*:
  - Invited talk, Department of Physics, University of Georgia, January 2003
  - Invited talk, Department of Physics, University of Cincinnati, April 2003.
- *The physics of the Kondo model*, invited colloquium, Manhattan College, April 2003.
- *Inhomogeneous ground state of the polarized two-dimensional electron gas*, poster presentation, DOE EPSCoR 2003 Conference, Albuquerque, June 2003.
- *Magnetic semiconductors: candidates for spintronic applications?*:
  - Invited talk, Department of Physics, Ohio University, Athens, April 2004.
  - Invited talk, Department of Physics, Indiana University-Purdue University, Indianapolis, April 2004.
  - Invited talk, Department of Physics, University of North Dakota, Grand Forks, April 2004.
- *Optimizing Spintronic Materials: Theory of GaMnAs*
  - Invited talk, Department of Physics, University of Cincinnati, May 2004.
  - Invited talk, Center for Nanoscale Science and Engineering, North Dakota State University, Fargo, January 2005.
- *Magnetic Properties of Ferromagnetic Semiconductors: Finding the Optimal Material Parameters for Spintronic Device Applications*, Brian Moritz, Juana Moreno, Mark Jarrell, Randy Fishman, Karlis Mikelsons, Graduate School's Scholarly Forum, U.N.D., February 2005.
- *Computational Nanoscience at the University of North Dakota* Juana Moreno, Brian Moritz, Randy Fishman and Mark Jarrell, poster presentation at the South Dakota/North Dakota EPSCoR 5th Biennial Joint Conference, Brookings, South Dakota, September 2005.
- *Magnetic and Transport Properties of Ferromagnetic Semiconductors: A Search for the Optimal Material for Spintronic Device Applications*, invited talk, Department of Physics, University of North Dakota, Grand Forks, September 2005.

- *Modeling of Magnetic Semiconductor Heterostructures*, Juana Moreno, Brian Moritz, Karlis Mikelsons, Sarma Kancharla, Randy Fishman, Mark Jarrell, Graduate School's Scholarly Forum, U.N.D., February 2006.

- *Modeling of Ferromagnetic Semiconductors: Finding the Optimal Material Parameters for Spintronic Devices*
  - Invited talk, Department of Civil Engineering North Dakota State University, Fargo, April 2006.
  - Northcentral States Nanosystems Consortium (NSNC) Webinar, July 6th, 2006.
  - Invited seminar, Materials Science & Technology Division, Oak Ridge National Laboratory, Oak Ridge, August 3rd, 2006.
  - Invited talk, School of Engineering and Mines Seminar series, University of North Dakota, October 2006.
  - Invited talk, Department of Physics, University of Cincinnati, November 2006.
  - Invited colloquium, Department of Physics, North Dakota State University, October 24, 2007.

- *Modeling of Ferromagnetic Organic Semiconductors*, NDSU Spintronics Program Review, Center for Nanoscale Science and Engineering, Fargo, May 16th, 2006.

- *Progress Report on Spintronics Statewide Research Initiative*, panel presentation, "North Dakota's Evolving Research Infrastructure", ND EPSCoR 2006 State Conference, Grand Forks, North Dakota, September 29th, 2006.

- *Our Nanoworld: Introduction to Nanoscience and Nanotechnology for teachers in North Dakota*, poster presentation at the K-12 & Informal Education Nanoscale Science & Engineering Workshop, National Science Foundation, January 11-12, 2007, Arlington, Virginia.

- *NSF Career Seminar*, panel presentation, University of North Dakota, April 27, 2007.

- *Magnetism in a Porphyrin-based Organic Semiconductor?*,
  - Oak Ridge National Lab Symposium on Organic Magnetism, July 16 and 17, 2007, Oak Ridge, Tennessee.
  - North Dakota State University Organic Spintronics Workshop, August 8 and 9, 2007, Fargo, North Dakota.

- *Searching Optimal Materials for Semiconductor-based Spintronics*, M.A. Majidi and J. Moreno, poster presentation at the Nano Education and Outreach (NEO) Workshop (program part of the NSF Nanoscale Informal Science Education (NISE) Network), August 26 to 30, 2007, Exploratorium, San Francisco, California.

- *Graduate Education in Petascale Many Body Methods for Complex Correlated Systems at the University of North Dakota*, poster presentation at the ND/SD ESPCoR 6th Biennial Joint Conference, September 7th, 2007, Fargo, North Dakota.

- *Modeling of Ferromagnetic Semiconductors: Finding the Optimal Material Parameters for Spintronic Devices*, invited talk at the Symposium on Computational Studies of Novel Materials, Society for Advancement of Chicanos and Native Americans in Science (SACNAS) National Conference, October 2007, Kansas City, Missouri.

- *PIRE: Graduate Education and Research in Petascale Many Body Methods for Complex Correlated Systems: A Collaboration with Partners in Germany and Switzerland*, poster presentation at the PIRE (Partnerships for International Research and Education) Principal Investigators meeting, National Science Foundation, Arlington, Virginia, October 15th and 16th, 2007.
- *Making Faster Computers Using Electron Spins*, M.A. Majidi and J. Moreno, poster presentation at the Nanoscale Informal Science Education Network (NISE Net) Annual Meeting, November 7 to 8, 2007, San Francisco, California.