

Department of Physics & Astronomy  
600 Rose Street  
University of Kentucky  
Lexington, KY-40506-0055



<http://www.pa.uky.edu/~rkk>  
rkk@pa.uky.edu  
Ph: (859) 257-1697  
Fax: (859) 323-2846

Ribhu Krishna Kaul

---

March 5, 2017

## CURRICULUM VITAE

### employment

*May 2014 - present:* Associate Professor (with tenure)

**Department of Physics & Astronomy**, University of Kentucky

*Aug 2015 - May 2016* Visiting Associate Professor (on sabbatical leave)

**Department of Physics**, University of California, Berkeley.

*Aug 2010 - May 2014:* Assistant Professor

**Department of Physics & Astronomy**, University of Kentucky

*Aug 2008 - Aug 2010:* Postdoctoral Researcher

**Microsoft Station Q**, University of California Santa Barbara

*Aug 2006 - Aug 2008:* Postdoctoral Fellow

**Condensed Matter Theory Group**, Department of Physics, Harvard University

### education

*May 2002 - May 2006:* Doctor of Philosophy (with Nano Certificate)

Department of Physics, Duke University

*Aug 2000 - May 2002:* Master of Arts

Department of Physics, Cornell University

*Aug 1997 - May 2000:* Bachelor of Science (Honors)

Department of Physics, St. Xaviers College, Mumbai University

### research specialization

*Condensed Matter Theory, Computational Physics and Many-Body Quantum Mechanics*

Numerical quantum many-body physics (quantum Monte-Carlo, exact diagonalization, algorithmic development)

Strongly-correlated quantum materials (frustrated magnets, cuprates, heavy-fermions)

Quantum field theory in condensed matter (quantum criticality)

Nano-physics (Kondo problem in quantum dots)

### teaching experience

*Primary Instructor:*

University of Kentucky, Fall 2016. Computational Physics (PHY 508)  
University of Kentucky, Fall 2014. Electricity & Magnetism I. (PHY 611)  
University of Kentucky, Fall 2014. Computational Physics. (PHY 508)  
University of Kentucky, Fall 2013. Electricity & Magnetism I. (PHY 611)  
University of Kentucky, Fall 2013. Computational Physics. (PHY 600)  
University of Kentucky, Fall 2012. Computational Physics. (PHY 422)  
University of Kentucky, Spring 2012. Computational Physics. (PHY 600a)  
University of Kentucky, Fall 2011. Advanced Mechanics. (PHY 504)  
University of Kentucky, Spring 2011. Computational Physics. (PHY 600a)  
University of Kentucky, Fall 2010. Condensed Matter Theory. (PHY 624)  
Duke University, Spring 2006. Computational physics (PHY 246).

*Teaching Assistant:*

Cornell University, Fall 2000. Physics I: Mechanics (PHYS 112).  
Cornell University, Spring 2001. Physics II: Heat/Electromagnetism (PHYS 213).  
Cornell University, Fall 2001. Physics III: Waves and Thermal Physics (PHYS 218).  
Cornell University, Spring 2002. Thermodynamics and Statistical Physics (PHYS 341).

**honors, grants & certificates**

*Major Research Awards:*

PI on NSF award DMR-1611161 (AY 2016-2019). “*Novel phases of quantum matter in numerical simulations, field theory and materials*”. (\$300,000)  
PI on NSF CAREER award DMR-1056536 (AY 2011-2016) “*Novel states of correlated quantum matter in numerical simulations, field theories and natural systems*”. (\$475,000)  
ORNL’s Ralph Powe Junior Faculty award “*Novel phenomena in quantum magnets with strong spin-orbit coupling*” (\$10,000)  
Co-PI on NSF award “*Holography, Supersymmetry, and Numerics in Quantum Critical and Quantum Lifshitz Theories*” with G. Murthy (PI), S. Das(co-PI) and A. Shapere(co-PI). (\$150,000)

*Other:*

University of Kentucky, Arts and Sciences International Travel Award 2010.  
Nano Certificate, Graduate Program, Duke University 2006  
Fritz London Fellow, Physics Department, Duke University, 2005  
Graduate Teaching Fellowship, Duke University, 2005  
International Travel Grant, Duke University 2005  
DAAD (Deutscher Akademischer Austauschdienst) Graduate Student Fellowship, 2004

**invited presentations (at international workshops & conferences)**

*Dec 2007:* International Center for Theoretical Sciences. “*Correlated Electrons and Frustrated Magnetism*”. Goa, India.  
*Jun 2008:* Yukawa Institute and Institute for Solid State Physics. “*Topological Aspects of Solid State Physics*”. Kyoto, Japan.  
*Apr 2009:* Kavli Institute for Theoretical Physics, workshop. “*Low Dimensional Electron Sys-*

*tems*". Santa Barbara, CA.

*Jul 2009*: Max Planck Institute workshop, "*Topological Order*". Dresden, Germany.

*Jul 2009*: University of Kentucky. "*Quantum Theory and Symmetry 6*". Lexington, KY.

*Dec 2009*: International Center for Theoretical Sciences. "*ICTS Condensed Matter Programme 2009*". Mahableswar, India.

*Jun 2010*: Richard B. Gump South Pacific Research Station, "*Topological Order and Quantum Computation*." Moorea, French Polynesia

*Jul 2010*: Max Planck Institute workshop. "*Correlated Phenomena in Low-Dimensional Systems*". Dresden, Germany.

*Dec 2010*: . International Center for Theoretical Sciences. "*ICTS Condensed Matter Programme 2010*". Mysore, India.

*Dec 2010*: National Physical Laboratory conference. "*International Conference on Quantum Effects in Solids of Today (I-ConQuEST)*". New Delhi, India.

*Jun 2011*: Huazhong University of Science and Technology. "*The 3rd Workshop on Novel Electronic Materials*". Wuhan, China.

*Oct 2011*: 78<sup>th</sup> Annual Meeting. "*South East Section of the American Physical Society*". Roanoke, VA.

*Feb 2012*: American Physical Society. "*2012 APS March Meeting*". Boston, MA.

*Aug 2012*: Kavli Institute for Theoretical Physics, workshop. "*Frustrated Magnetism and Quantum Spin Liquids: From Theory and Models to Experiments*." Santa Barbara, CA.

*Oct 2012*: Kavli Institute for Theoretical Physics, conference. "*Exotic Phases of Frustrated Magnets*." Santa Barbara, CA.

*July 2013*: Satellite meeting of STATPHYS 25 "*Statistical Physics of Quantum Matter*." Taipei, Taiwan.

*Jan 2014*: Aspen Center for Physics, Winter Conference. "*Beyond quasiparticles: New paradigms for quantum fluids*." Aspen, CO.

*Mar 2014*: American Physical Society. "*2014 APS March Meeting*." Denver, CO.

*Jul 2014*: Nordic Institute for Theoretical Physics (NORDITA). "*Novel Directions in Frustrated and Critical Magnetism*." Stockholm, Sweden.

*Aug 2014*: XXVI IUPAP Conference on Computational Physics. "*CCP2014*" Boston, MA.

*Oct 2014*: Universidade de Évora "*Correlations, coherence and criticality in quantum systems*" Évora, Portugal.

*Jan 2015*: International Conference on Computational Physics "*ICCP-9*" National University of Singapore. Singapore.

*Jan 2015*: Chandrasekhar Discussion Meeting "*Quantum entanglement in macroscopic matter*" Indian Institute of Science. Bangalore, India.

*Nov 2016*: Kavli Institute for Theoretical Physics, workshop. "*Symmetry, Topology, and Quantum Phases of Matter: From Tensor Networks to Physical Realizations*" Santa Barbara, CA.

### organization of conferences/workshops

*Oct 2015*: Organizer (with S. Chandrasekharan, C. Gatttringer and D. Lee). “*Advances in Diagrammatic Monte Carlo Methods for Quantum Field Theory Calculations in Nuclear-, Particle-, and Condensed Matter Physics*” at ECT\*. Trento, Italy.

*May 2014*: Organizer (with R. Brower, S. Catterall, E. Fradkin, J. Kuti, R. Scalettar and S. White). “*Field theoretic computer simulations for particle physics and condensed matter*” at Boston University. Boston, MA.

*May 2013*: Organizer (with A. Shapere, S. Das and G. Murthy). “*Great Lakes Strings 2013*” at the University of Kentucky. Lexington, KY.

*Apr 2012*: Organizer (with G. Cao). “*2012 Kentucky condensed matter physics symposium: The Iridates*” at the University of Kentucky. Lexington, KY.

*Jul 2011*: Organizer (with A. W. Sandvik, M. Vojta and M. Müller). “*Workshop on Synergies between Field Theory and Exact Computational Methods in Strongly Correlated Quantum Matter*” at International Center for Theoretical Physics. Trieste, Italy.

### seminars and colloquia by invitation (at universities & national labs)

*Jun 2004*: Duke University. Durham, NC.

*Oct 2004*: Technical University of Berlin. Berlin, Germany.

*Oct 2004*: Universität Hamburg. Hamburg, Germany.

*Dec 2004*: Universität Karlsruhe. Karlsruhe, Germany.

*Jan 2005*: Universität Regensburg. Regensburg, Germany.

*Feb 2005*: Universität zu Köln. Cologne, Germany.

*Jan 2006*: Boston University. Boston, MA.

*Feb 2006*: University of Tennessee. Knoxville, TN.

*Feb 2006*: Caltech. Pasadena, CA.

*Feb 2006*: Harvard University. Cambridge, MA.

*Mar 2006*: Argonne National Lab. Argonne, IL.

*Jul 2006*: Indian Institute of Science. Bangalore, India.

*Jul 2006*: Tata Institute for Fundamental Research. Mumbai, India.

*Jul 2007*: Oak Ridge National Lab. Oak Ridge, TN.

*Jul 2007*: Aspen Center for Physics. Aspen, CO.

*Nov 2007*: Microsoft Station Q. Santa Barbara, CA.

*Feb 2008*: Boston University. Boston, MA.

*Feb 2008*: [Department Colloquium] Univ. of Illinois at Urbana-Champaign. Urbana, IL.

*Mar 2008*: MIT. Cambridge, MA.

*May 2008*: University of California Santa Cruz. Santa Cruz, CA.

*May 2008*: SUNY Stony Brook. Stony Brook, NY.

*Nov 2008*: University of California. Los Angeles, CA.

*Feb 2010*: University of California. Riverside, CA.

*Jan 2011*: University of Cincinnati. Cincinnati, OH.

*Mar 2011*: Boston College. Boston, MA.

*May 2011:* Ohio State University. Columbus, OH.  
*Aug 2011:* [Department Colloquium] Tata Institute for Fundamental Research, Mumbai, India.  
*Sep 2011:* National High Magnetic Field Laboratory. Tallahassee, FL.  
*Oct 2011:* [Department Colloquium] University of Tennessee. Knoxville, TN.  
*Jan 2012:* University of Maryland. College Park, MD.  
*Mar 2012:* Indiana University. Bloomington, IN.  
*Apr 2012:* Vanderbilt University. Nashville, TN.  
*Apr 2012:* Yale University. New Haven, CT.  
*Jul 2012:* Georgetown University. Washington, DC.  
*Feb 2013:* City College of the City University of New York. New York, NY.  
*Feb 2013:* Temple University. Philadelphia, PA.  
*Feb 2013:* California Institute of Technology. Pasadena, CA.  
*Feb 2013:* University of California. Irvine, CA.  
*Mar 2013:* University of Illinois. Urbana-Champaign, IL.  
*Jul 2013:* Boston University. Boston, MA.  
*Jul 2013:* University of California. Berkeley, CA.  
*Oct 2013:* University of Wisconsin. Madison, WI.  
*Nov 2013:* Duke University. Durham, NC.  
*Mar 2014:* Boston College. Boston, MA.  
*Apr 2014:* Perimeter Institute. Waterloo, ON. Canada.  
*Apr 2015:* University of Colorado. Boulder, CO.  
*May 2015:* Case Western Reserve University. Cleveland, OH.  
*Oct 2015:* University of Innsbruck. Innsbruck, Austria.  
*Apr 2016:* McMaster University. Hamilton, ON.  
*Apr 2017:* University of Chicago. Chicago, IL.  
*Apr 2017:* Ohio State University. Columbus, OH.

**contributed talks, short research visits, conferences & workshops attended**

*Mar 2003:* APS March Meeting. Contributed talk. Austin.  
*Jul 2003:* Boulder Summer School on Frontiers in Magnetism. Boulder.  
*Mar 2004:* APS March Meeting. Contributed talk. Montreal, Canada.  
*Oct 2004:* 335. WE-Heraeus conference. “Quantum Phase Transitions” Bad Honnef, Germany.  
*Oct 2005:* Visiting researcher. Laboratoire de Physique Théorique et Modèles Statistiques, Université Paris-Sud, France.  
*Mar 2005:* APS March Meeting. Contributed talk. Los Angeles.  
*Mar 2006:* APS March Meeting. Contributed talk. Baltimore.  
*Jul 2006:* IISc Conference. Physics close to the Mott transition. Bangalore, India  
*Apr 2007:* KITP Conference. Correlated States in Degenerate Atomic Gases. Santa Barbara.  
*Jul 2007:* Aspen Center for Physics workshop. “Novel Aspects of Superconductivity.”  
*Nov 2007:* KITP Workshop. Moments and Multiplets in Mott Materials. Santa Barbara.  
*Mar 2008:* APS March Meeting. New Orleans.  
*Jun 2008:* Topological Aspects of Solid State Physics, ISSP Workshop, University of Tokyo.  
*Jul 2008:* Aspen Center for Physics workshop. “Frontiers in Strongly Correlated Systems.”  
*Jan-Jun 2009:* KITP workshop, “Low Dimensional Electronic Systems”. Santa Barbara.  
*Jan 2009:* UCLA-IPAM workshop. “Numerical Approaches to Quantum Many-Body Systems”.

*Feb 2009:* KITP conference, “New Directions in Low-Dimensional Electron Systems”. Santa Barbara.

*Mar 2009:* APS March Meeting. Pittsburgh. Contributed talk.

*Jun-Sep 2009:* KITP workshop, “Higher  $T_c$  superconductors”. Santa Barbara.

*Apr 2011:* Symposium for Michael Freedman’s 60<sup>th</sup> birthday.

*Mar 2013:* Symposium for Sankar Das Sarma’s 60<sup>th</sup> birthday.

*Mar 2013:* APS March Meeting. Contributed talk. Baltimore, MD.

*Mar 2015:* APS March Meeting. Contributed talk. San Antonio, TX.

*May 2016:* Hot Topics in Cold Matter. Contributed talk. Berkeley, CA.

### **outreach**

*Talk title:* “*Quantum mechanics of our material world*”.

*Sep 2009:* Public lecture at KITP, Santa Barbara, CA.

*Apr 2011:* Colloquium for undergraduates at Center College, Danville, KY.

*Mar 2014:* Colloquium for undergraduates at Berea College, Berea, KY.

*Apr 2015:* Colloquium for undergraduates at Center College, Danville, KY.

*Feb 2016:* Colloquium for undergraduates at California State University. Sacramento, CA.

*Feb 2016:* Popular science-level lecture at Chabot Space & Science Center. Oakland, CA.

### **miscellaneous**

Born in Bombay, 1979. Naturalized citizen of the United States. English (native speaker), Hindi (native speaker) and German (fluent conversational knowledge). Member of the American Physical Society since 2002.