Leon Balents

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Born: July 24, 1967—New Jersey, USA
Nationality: American

Current position

Professor and Permanent Member, Kavli Institute for Theoretical Physics, UCSB

Areas of specialization

Theoretical condensed matter physics

Appointments held

1994-1998	ITP Research Fellow, ITP, Santa Barbara
1998-1999	Member of Technical Staff, Bell Laboratories, Lucent Technologies
1999-2001	Assistant Professor of Physics, UC Santa Barbara
2001-2002	Associate Professor of Physics, UC Santa Barbara
2002-present	Professor of Physics, UC Santa Barbara
2008-present	Permanent Member, Kavli Institute for Theoretical Physics, UCSB

Education

1989	SB in Physics and Mathematics, Massachusetts Institute of Technology
1994	PhD in Physics, Harvard University

Grants, honors & awards

2000	Alfred P. Sloan Fellowship
2000	David and Lucile Packard Fellowship
2000	NSF Career Award
2013	APS Fellowship

Service to the profession

2007	Coauthor, BESAC report on Grand Challenges in Basic Energy Sciences
2007-2009	Member, ICAM science steering committee
2009-2010	Member, Program Committee for HFM2010 conference
2009-2011	Molecular and Materials Science Evaluation Committee, TRIUMF
2009-present	Contributing Member, Journal Club for Condensed Matter Physics
2010-2011	Member, International Advisory Board for LT26 conference
2010-2012	Member, advisory committee of Princeton Center for Complex Materials
2011-2012	Co-chair, Program Committee for HFM2012 conference
2011-2012	Member, IPhT Evaluation Committee, Saclay, France
2012	Member, International Review Panel for CIFAR Quantum Materials Program
2012-present	Program co-chair, International Conference in Magnetism, (San Francisco, 2018).
2013	Member, APS Buckley Prize Committee
2013-2014	Member, International Advisory Board for LT27 conference
2013-present	Foreign Associate, CIFAR Quantum Materials program.
2014-present	Distinguished Visiting Research Chair, Perimeter Institute for Theoretical Physics.
2015-2016	Member, International Advisory Board for LT28 conference
2015-present	Member, advisory board for IQM, Johns-Hopkins University
2015-present	Member, Fine Theoretical Physics Institute Oversight Board
2015-present	Member, Science Review Committee for Neutron Sciences at ORNL

Major workshops organized

2007	KITP Program on *Moments and Multiplets in Mott Materials*
2008	Chair, Gordon Research Conference on *Correlated Electron Systems*
2012	Aspen workshop on *Spin-Orbit Physics in Correlated Electron Systems*
2013	KITP Program on *Spintronics: Progress in Theory, Materials, and Devices*
2016	Laguna Beach conference on *Intertwined Orders in Strongly Correlated Systems*

Public lectures

2014	"Particles, Quasi-particles, and beyond", Maggie and Nick DeWolf public lecture, Wheeler Opera House, Aspen, CO
2016	"Strange stuff: a second quantum revolution", lecture associated with the Boulder summer school on condensed matter physics, Boulder, CO
2017	"Strange stuff: a second quantum revolution", H.L. Welsh lecture in physics, University of Toronto.

Courses at advanced physics schools

2008	"Frustrated Magnetism", Boulder summer school for condensed matter and materials physics, 2008.
2009	"Frustrated Magnetism", ICTS Winter School, Mahabaleshwar, India, December 2009.
2013	"Topological insulators and their implications", MANEP 2013 school, Les Diablerets ,

Switzerland, June 2013.

2013 "Frustration, structure, and symmetry of interactions", 12th annual PSI summer school, Zuoz, Switzerland, August 2013.

2016 "Quantum spin liquids", CIFAR quantum materials school, April 2016.

2016 "Quantum spin liquids", Boulder summer school for condensed matter and materials physics, July 2016.

other Invited talks

2016- Please see the list at https://spinsandelectrons.com/talks/

2004-2016 Earlier talks are shown at http://gabriel.physics.ucsb.edu/ balents/talks.html

Publications

[1] L. Balents and M. Kardar,"Directed paths on percolation clusters", *Journal of Statistical Physics*, **67**: 1–11 (1992).

[2] L. Balents and M. Kardar,"Roughening of anisotropically reconstructed surfaces and the hubbard-model", *Physical Review B*, **46**: 16031–16044 (1992).

[3] L. Balents, R. D. Kamien, P. Ledoussal, and E. Zaslow,"On the isotropic-nematic transition for polymers in liquid-crystals", *Journal de Physique I*, **2**: 263–272 (1992).

[4] L. Balents and M. Kardar,"A system of n-interacting fermions and its unusual n-]0 limit", *Nuclear Physics B*, **393**: 480–494 (1993).

[5] L. Balents,"Localization of elastic layers by correlated disorder", *Europhysics Letters*, **24**: 489–494 (1993).

[6] L. Balents and M. Kardar,"Delocalization of flux lines from extended defects by bulk randomness", *Europhysics Letters*, **23**: 503–509 (1993).

[7] L. Balents and D. S. Fisher,"Large-n expansion of (4-epsilon)-dimensional oriented manifolds in random-media", *Physical Review B*, **48**: 5949–5963 (1993).

[8] L. Balents and M. Kardar,"Disorder-induced unbinding of a flux-line from an extended defect", *Physical Review B*, **49**: 13030–13048 (1994).

[9] L. Balents and D. R. Nelson,"Fluctuations and intrinsic pinning in layered superconductors", *Physical Review Letters*, **73**: 2618–2621 (1994).

[10] L. Balents and M. P. A. Fisher,"Temporal-order in dirty driven periodic media", *Physical Review Letters*, **75**: 4270–4273 (1995).

[11] L. Balents and S. H. Simon,"Problems with the vortex-boson mapping in 1+1 dimensions", *Physical Review B*, **51**: 15610–15612 (1995).

[12] L. Balents and S. H. Simon,"Commensurability effects in large josephson-junctions", *Physical Review B*, **51**: 6515–6525 (1995).

[13] L. Balents and D. R. Nelson,"Quantum smectic and supersolid order in helium films and vortex arrays", *Physical Review B*, **52**: 12951–12968 (1995).

[14] L. Balents and L. Radzihovsky,"Continuous 3D freezing transition in layered superconductors", *Physical Review Letters*, **76**: 3416–3419 (1996).

[15] L. Balents and M. P. A. Fisher,"Chiral surface states in the bulk quantum Hall effect", *Physical Review Letters*, **76**: 2782–2785 (1996).

[16] L. Balents, J. P. Bouchaud, and M. Mezard,"The large scale energy landscape of ran-

domly pinned objects", *Journal de Physique I*, **6**: 1007–1020 (1996).

[17] L. Balents,"Spatially ordered fractional quantum Hall states", *Europhysics Letters*, **33**: 291–296 (1996).

[18] L. Balents and M. P. A. Fisher,"Weak-coupling phase diagram of the two-chain Hubbard model", *Physical Review B*, **53**: 12133–12141 (1996).

[19] L. W. Chen, L. Balents, M. P. A. Fisher, and M. C. Marchetti,"Dynamical transition in sliding charge-density waves with quenched disorder", *Physical Review B*, **54**: 12798–12806 (1996).

[20] C. Kane, L. Balents, and M. P. A. Fisher,"Coulomb interactions and mesoscopic effects in carbon nanotubes", *Physical Review Letters*, **79**: 5086–5089 (1997).

[21] S. Cho, L. Balents, and M. P. A. Fisher,"Transport of surface states in the bulk quantum Hall effect", *Physical Review B*, **56**: 15814–15821 (1997).

[22] E. Frey and L. Balents,"Critical behavior of the supersolid transition in Bose-Hubbard models", *Physical Review B*, **55**: 1050–1067 (1997).

[23] L. Balents, M. C. Marchetti, and L. Radzihovsky,"Moving glass phase of driven lattices:Comment", *Physical Review Letters*, **78**: 751–751 (1997).

[24] L. Balents, M. P. A. Fisher, and M. R. Zirnbauer,"Chiral metal as a ferromagnetic super spin chain", *Nuclear Physics B*, **483**: 601–636 (1997).

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[26] L. Balents and M. P. A. Fisher,"Delocalization transition via supersymmetry in one dimension", *Physical Review B*, **56**: 12970–12991 (1997).

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[29] L. Balents, M. P. A. Fisher, and C. Nayak,"Nodal liquid theory of the pseudo-gap phase of high-T-c superconductors", *International Journal of Modern Physics B*, **12**: 1033–1068 (1998).

[30] H. H. Lin, L. Balents, and M. P. A. Fisher,"Exact SO(8) symmetry in the weakly-interacting two-leg ladder", *Physical Review B*, **58**: 1794–1825 (1998).

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[40] L. Balents and L. Radzihovsky,"Interlayer tunneling in double-layer quantum Hall pseudoferromagnets", *Physical Review Letters*, **86**: 1825–1828 (2001).
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[53] A. A. Burkov and L. Balents,"Anomalous Hall effect in ferromagnetic semiconductors in the hopping transport regime", *Physical Review Letters*, **91**: 057202 (2003).
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phase transitions between valence bond solids", *Physical Review B*, **69**: 224416 (2004).

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Luttinger liquids", *Physical Review B*, **73**: 165104 (2006).

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antiferromagnet in a magnetic field", *Physical Review B*, **77**: 174414 (2008).

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