

Curriculum Vitae

Joel E. Moore

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Research area

I am a theoretical physicist studying condensed matter. My main interest in the past has been in understanding various quantum phases of correlated electrons in zero-, one-, and two-dimensional geometries. Examples include magnetism, superconductivity, and the quantum Hall effect. Recently my interests have focused on new topological phases in three dimensions (i.e., topological insulators and semimetals), quantum many-body dynamics, and connections between quantum information and statistical physics.

Degrees and positions held

2011-present: Professor, Department of Physics, UC Berkeley
2007–2011: Associate Professor with tenure, Department of Physics, UC Berkeley
2002–2007: Assistant Professor, Department of Physics, UC Berkeley

2017–present: Senior Faculty Scientist, Lawrence Berkeley National Laboratory
2002–2017: Faculty Scientist, Lawrence Berkeley National Laboratory

2001: Postdoctoral Member, Theoretical Physics Section 11111, Bell Labs, Murray Hill, NJ

1996–2000: Graduate student, Department of Physics, MIT, Ph.D. granted 2/2001
Thesis “Phase transitions and symmetry breaking in quantum Hall edge states”
Supervised by Prof. Xiao-Gang Wen

1995–1996: US Fulbright Grantee, Tata Institute of Fundamental Research, Bombay, India

1991–1995: A. B. *summa cum laude*, Department of Physics, Princeton University
Certificate (minor) in applied and computational mathematics

Honors, awards, and fellowships

Chern-Simons Professorship, UC Berkeley, 2016-present; Director, Center for Novel Pathways to Quantum Coherence in Materials, a DOE EFRC (2018-present); Perimeter Institute Distinguished Visiting Research Chair, 2014-2017; Simons Investigator, 2013-present; APS Fellow, 2014; Japan Society for the Promotion of Science Fellowship (Institute for Solid State Physics, Tokyo), 2007–2008; Hellman Fellowship, 2003–2004; NSF CAREER, 2003.

Fannie and John Hertz Fellowship, 1996-2000; NSF Fellowship (declined); MIT K. T. Compton Fellowship; ITP Graduate Fellowship (UCSB), fall 2000. Kusaka Memorial Prize (Princeton undergraduate physics award), 1993–1994, 1994–1995; elected to Phi Beta Kappa, Sigma Xi, 1995.

Selected advisory and editorial service

Member-at-Large, APS DCMP, elected 2013. General member, Aspen Center for Physics, 2010-present. Member and current chair, KITP Advisory Board.

Corresponding editor for Journal Club of Condensed Matter Physics. Reviewer and panelist for various US and international grant agencies and journals. Past advisory editor (six years), Physical Review B. Advisory editor, Advances in Physics.

Departmental, university, and LBNL service

Departmental service as Chair of Policy and New Appointments committee, 2008-2015, and Vice Chair for Faculty, 2013-2017. Interim Chair Spring 2017.

University service: Co-chair, Chancellor's Advisory Committee on Physical Sciences (2019-present). Member, campus academic planning and budget committee (2018-2019). Faculty Link core advisor.

Current or past member of LBNL scientific staff evaluation committee, division director search committee, and Materials Sciences Division divisional council.

National and public service

Public lectures at APS March Meeting, AAAS annual meeting, and IEEE Aerospace Meeting among others.

Committee member and chapter co-author, DOE Grand Challenges report "Directing Matter and Energy: Five Challenges for Science and the Imagination", Graham Fleming and Mark Ratner, chairs. Co-chair, 2017 DOE "Basic Research Needs in Quantum Materials" Report. Chair, 2017 DOE Quantum Information Science roundtable on applications of quantum computing. Co-chair, NSF meeting on future initiatives in materials research.

Lead faculty scientist for former Lawrence Hall of Science (LHS) online project to improve public awareness of policy issues in nanotechnology (Dr. D. Porcello, leader). Other outreach activities include participation in "Cal Day" (Berkeley) and public lectures to high school and undergraduate student groups. Former faculty advisor for Cal NERDS underrepresented student program.

Teaching

Lead instructor of undergraduate and graduate courses at UC Berkeley including statistical physics, quantum mechanics, solid-state physics, and special topics courses. Graduate and undergraduate mentor and research supervisor (see list of students below).

Recent past teaching evaluation scores, out of maximum 7.0: 6.3, Physics 250 (graduate many-body topics); 6.3, Physics 212 (graduate statistical physics); 6.4, Physics 137A (undergraduate quantum mechanics).

Lecture courses at schools including MIT, IISc Bangalore, Capri, Rio, NHMFL, Les Houches, Munich.

Selected conference organization

KITP program on topological phases (fall 2010), Ettore Majorana Center conference (summer 2013), Nobel symposium on topological insulators (summer 2014). Co-chair, Gordon Conference on Correlated Electrons, summer 2016. Organizer of two Aspen Center for Physics winter conferences and one summer program. Moore Foundation/TMS Japan joint meeting on topological materials.

Research support

Current (summer 2020) grants from DOE (lead PI of NPQC EFRC; co-PI of other programs), NSF (single-PI), DARPA. Simons Investigatorship (2013-present). Former PI of Berkeley's Moore Foundation EPiQS Theory Center.

Student supervision

Ph.D. theses supervised: 14 (Noah Bray-Ali, Cenke Xu, Pdraig Murphy, Andrew Essin, Vasudha Shivamoggi, Roger Mong, Jonas Kjäll, Gil Young Cho, Michael Zaletel, Yichen Huang, Daniel Varjas, Byungmin Kang, Aaron Szasz, Shudan Zhong)

Undergraduate honors theses supervised: 3 (Mr. Chayut Thanapirom, Ms. Yasaman Bahri, Mr. Joshua Lin)
Approximately 15 postdoctoral fellows supervised (≥ 1 year) solely or jointly, many now in faculty positions in the US or abroad.