

Rachel Mandelbaum

Carnegie Mellon University
Department of Physics
5000 Forbes Ave.
Pittsburgh, PA 15213

Phone: (412) 268-1714
Email: rmandelb@andrew.cmu.edu
Homepage: <http://www.andrew.cmu.edu/user/rmandelb/>

Personal data

Appointments

2016-present	Associate Professor with Indefinite Tenure, Department of Physics, Carnegie Mellon University
2014-2016	Associate Professor, Department of Physics, Carnegie Mellon University
2013-2016	The Falco-DeBenedetti Career Development Professor in Physics, Carnegie Mellon University
2011-2014	Assistant Professor, Department of Physics, Carnegie Mellon University
2011-2012	Visiting Associate Research Scholar, Department of Astrophysical Sciences, Princeton University
2009-2011	Associate Research Scholar, Department of Astrophysical Sciences, Princeton University
2006-2009	Hubble Fellow (NASA postdoctoral fellowship), Astrophysics, Institute for Advanced Study

Education

2001-2006	Ph.D. in Physics, Princeton University (advisor: Uroš Seljak) Thesis title: “Weak gravitational lensing analysis of Sloan Digital Sky Survey data”
1996-2000	A.B. in Physics with highest honors, Princeton University

Presentations

Invited talks at conferences and workshops

2018	Keynote speaker at “Statistical Challenges in 21st Century Cosmology” (Cosmo21), Valencia, Spain, May 2018 Invited speaker on the LSST survey at “Probing the Nature of Dark Matter with LSST”, University of Pittsburgh, March 2018
2017	Invited course speaker for “Essential Cosmology for the Next Generation” (“Cosmology on the Beach”, or COTB), Puerto Vallarta, Mexico, December 2017 Invited speaker at Super-PAC workshop in philosophy of astrophysics and cosmology, University of Pittsburgh, October 2017 Invited review talk in parallel session at the 2017 TeV Particle Astrophysics conference (TeVPA), Ohio State University, August 2017 Invited plenary speaker (one of two science-oriented plenary speakers) at Euclid Consortium meeting, London, June 2017

- Invited speaker at “Quantifying and Understanding the Galaxy-Halo Connection”, KITP, Santa Barbara, May 2017
- Invited talk on WFIRST cosmology at special session of American Astronomical Society (AAS) winter meeting, January 2017
- 2016 Invited speaker at “Enabling Cosmological Resonances Between WFIRST and LSST” workshop, Pasadena, September 2016
- Invited plenary speaker at COSMO-16 (International Conference on Particle Physics and Cosmology), Ann Arbor, August 2016
- Invited speaker at Statistical Challenges in Modern Astronomy VI, Pittsburgh, June 2016
- Invited speaker at invited talk at the workshop: “Cross-correlation spectacular with LSST: exploring synergies between LSST and external datasets”, Brookhaven National Lab, May 2016
- 2015 Invited speaker at LSST systematics workshop, UC Davis, December 2015
- Invited speaker at Lorentz Centre Workshop “Small-Scales=Big-Problem?”, Leiden, February 2015
- Invited speaker at “Mocking the Universe”, STScI, July 2015
- 2014 Invited pedagogical review about weak lensing measurements at “Precision Astronomy with Fully Depleted CCDs” (PACCD) conference, Brookhaven National Labs, December 2014.
- Invited review talk at IAU Symposium 311, “Galaxy masses as Constraints of Formation Models”, July, 2014.
- 2013 The Aspen Center for Physics weekly general physics colloquium, June, 2013.
- Plenary talk at the 2013 MPA/ESO/MPE/Excellence-Cluster Joint Astronomy Conference, “The Physical Link between Galaxies and their Halos”, June 2013.
- 2012 *Astrophysical tests of General Relativity*, invited talk at the 7th Sackler Conference in Theoretical Astrophysics, Harvard University, spring 2012.
- Weak lensing - Revealing the Dark Side of the Universe*, Annie Jump Cannon Prize lecture at the Jan. 2012 meeting of the American Astronomical Society.
- 2011 *Weak lensing: what’s next?*, Munich Joint Astronomical Colloquium series, fall 2011.
- SDSS stripe 82 science: a random grab bag*, invited plenary talk at the Sloan Digital Sky Survey-III (SDSS-III) collaboration meeting, Vanderbilt, summer 2011.
- Prospects for constraining the theory of gravity with SDSS/BOSS and HSC*, invited plenary talk at “Unraveling the Nature of the Universe with current and future Data Sets,” CCAPP (Ohio State Univ.), spring 2011.
- 2010 Invited panelist, “Observational Pursuit of Dark Energy after Astro2010”, Caltech, fall 2010.
- 2009 *Robust cluster masses and cosmological constraints from galaxy-galaxy lensing*, invited talk at “Science Opportunities with Wide-Field Surveys”, Princeton, Nov 2009.
- 2007 *Constraining galaxy formation scenarios and density profiles with galaxy-galaxy weak lensing*, Heidelberg Joint Astronomical Colloquium Series, fall 2007.
- SDSS galaxy-galaxy weak lensing*, invited plenary talk at the SDSS collaboration meeting, 2007.
- 2006 *Science results from weak lensing in the SDSS*, invited talk at “Large Scale Structure with SDSS” session at the AAS meeting, 2006.

Invited departmental seminars and colloquia

2018	Harvard-Smithsonian Center for Astrophysics colloquium Ohio State University CCAPP seminar Goddard Space Flight Center (GSFC) astrophysics colloquium
2017	LINEA webinar (Brazilian astronomical community)
2016	Columbia University department of astronomy colloquium Canadian Institute for Theoretical Astrophysics (CITA) astrophysics seminar, University of Toronto MIT astrophysics colloquium JPL cosmology seminar Institute colloquium at ASIAA (Academia Sinica Institute of Astronomy and Astrophysics, Taipei), National Taiwan University
2015	Lawrence Berkeley National Labs cosmology seminar Princeton University Department of Astrophysical Sciences colloquium Yale University physics colloquium Cosmology webinar for LIneA (Inter-institutional Laboratory for e-Astronomy), Brazil
2014	Princeton University and IAS Joint Astrophysics Seminar
2013	Ohio State University Space Telescope Science Institute University of Pittsburgh
2012	Canadian Institute for Theoretical Astrophysics, Toronto
2011	Institute for Theory and Computation (ITC) at the Harvard-Smithsonian Center for Astrophysics (CfA) U. of Arizona astronomy colloquium MIT astronomy colloquium LBNL cosmology seminar UC Berkeley astronomy seminar
2010	UC San Diego astrophysics seminar UC Santa Cruz astronomy seminar Rutgers University astrophysics seminar New York University physics department seminar
2009	Caltech astronomy colloquium University of Michigan astronomy department colloquium
2008	University of Michigan physics department Carnegie Mellon University, department of physics University of Pittsburgh, department of physics Yale University, department of physics University of Texas at Austin astronomy department colloquium
2005	Harvard-Smithsonian Center for Astrophysics University of Chicago (KICP) California Institute of Technology UC Davis UC Berkeley, department of physics Canadian Institute for Theoretical Astrophysics (CITA)

Information reflecting external reputation

Fellowships and Awards

2013	Alfred P. Sloan Fellowship
2012-2017	Department of Energy Early Career Award
2011	American Astronomical Society Annie Jump Cannon Prize, awarded “for outstanding research and promise for future research by a postdoctoral woman researcher”
2006	Hubble Fellowship, a NASA prize postdoctoral program
2001-2006	Centennial Fellowship, Princeton University
2002-2005	National Science Foundation Graduate Research Fellowship
2000	Kusaka Memorial Prize, Dept. of Physics, Princeton University

Leadership roles

7/15-present	Analysis coordinator for the LSST Dark Energy Science Collaboration (DESC), which consists of several hundred scientists who are preparing for dark energy analysis with the LSST survey. The analysis coordinator is part of the collaboration’s management team, overseeing and enabling the efforts of the collaboration’s seven science working groups individually and together.
8/15-8/17	Head of the collaboration meetings committee for the DESC, responsible for the organization of twice yearly collaboration meetings with typically 100-150 participants and additional smaller meetings.
7/12-7/15	Weak lensing working group co-convener for DESC.
2011-2018	Co-chair of the weak lensing working group for the Hyper-SuprimeCam (HSC) survey.
2012-present	One of several lead developers for the widely-used open-source image simulation software package, GalSim ¹ , used by many groups in weak lensing and other image-intensive applications world-wide.
2012-2014	Co-leader of the international weak lensing committee challenge, GREAT3 ² , meant to test data analysis methods. This challenge was highly successful, with 24 participating groups and substantial improvement in algorithm performance compared to the previous challenge held three years earlier.

Other professional activities

6/17-present	Member of Advisory Board for the Tri-Agency Cosmological Simulation (TACS) Task Force, which reports to the Tri-Agency (NASA, NSF, DOE), Tri-Project (LSST, WFIRST, Euclid) group (TAG) on cosmological simulation data products of common interest to these agencies and surveys.
6/17-present	Member of Cosmic Visions Dark Energy group, which provides DOE lab and general community input and discussion of DOE cosmology projects and science program

¹<https://github.com/GalSim-developers/GalSim>

²<http://www.great3challenge.info>

2017	Invited to submit review to Annual Reviews in Astronomy & Astrophysics (ARA&A) on “Weak lensing for precision cosmology” (submitted in September 2017, for 2018 issue)
5/15-6/16	Member of “Maximizing Science in the Era of LSST: A Community-based Study of Needed US OIR Capabilities” study group endorsed by NSF/AST to provide community input to the US optical/infrared capabilities in the coming decade
7/15-7/18	Member (since 7/15) and vice-chair (since 7/16) of the Astronomy & Astrophysics Advisory Committee (AAAC), a federal advisory committee (FACA) that advises the National Science Foundation (NSF), the National Aeronautics and Space Administration (NASA) and the U.S. Department of Energy (DOE) on selected issues within the fields of astronomy and astrophysics that are of mutual interest and concern to the agencies. It also provides a yearly report to Congress.
2014-present	Member of the Collaboration Council (CC) for the LSST DESC, an elected body meant to represent the membership in its governance.
2014-2016	Member of the LSST Science Advisory Committee (SAC), which advises the LSST project director on policy questions relevant to the project and the scientific community.
2013-present	Member of Euclid consortium (one of 40 NASA-funded US scientists selected through a competitive proposal process).
2007-present	Reviewer for MNRAS, ApJ, A&A
2015	Cosmology session convener for the American Physical Society Division of Particles and Fields (DPF) meeting, August 2015
2015	Reviewer for Department of Energy Cosmic Frontier grants program
2014	Reviewer for NASA Postdoctoral Program (NPP)
2011	Member of HST cosmology review panel, cycle 19
2006-present	Member of American Astronomical Society (AAS)
2015-present	Member of International Astronomical Union (IAU)

Meetings organized

2018	Member of program committee for MLSE (Machine Learning for Science and Engineering) conference at CMU, June 2018, and lead organizer of associated workshop on machine learning for time domain astrophysics Organizer of “Perfect pixels. Accurate astrophysics. Correct cosmology.” workshop at Aspen Center for Physics, June-July 2018
2017	Organization committee for “Cosmic Visions: Dark Energy” workshop, November 2017, LBNL Lead organizer for workshop of the HSC survey weak lensing working group, February 2017, Princeton University Head of SOC for LSST DESC collaboration meetings in February and July Lead organizer for special session about science with the HSC survey at the American Astronomical Society (AAS) winter meeting, January 2017
2016	Parallel session organizer for COSMO-16 (International Conference on Particle Physics and Cosmology), Ann Arbor, August 2016 Head of LOC and SOC for LSST DESC hack week, November 2016 at CMU

- Member of SOC for “From theory to applications: celebrating a century of gravitational lensing”, July 2016 in Leiden
- Member of SOC for COSMO21, “Statistical Challenges in 21st Century Cosmology”, May 2016 in Greece
- 2015 Head of SOC for LSST DESC collaboration meetings in February and July 2016
- Head of SOC for LSST DESC collaboration meeting, October 2015
- Member of SOC for “Theoretical and Observational Progress on Large-Scale Structure of the Universe”, MPA/ESO/MPE/Excellence Cluster University Joint Conference 2015
- SOC, LOC for “Innovative Cosmological Simulations with Machine Learning and Statistics in the Era of LSST”, Pittsburgh, PA, June 2015
- 2014 Weak lensing working group meeting for HSC, May 2015
- Lead organizer for final meeting of the GREAT3 challenge (May 2014) at CMU
- Member of SOC for meeting on Stripe 82, Princeton, March 2014
- Co-organizer for mid-challenge meeting (Jan. 2014) for the GREAT3 lensing challenge, Edinburgh, Scotland
- 2013 Member of LOC for collaboration meeting of the LSST Dark Energy Science Collaboration (DESC), Dec. 2013
- Co-organizer for kickoff meeting (Aug. 2013) for the GREAT3 lensing challenge, Pasadena, CA
- Member of SOC for “Probes of Dark Matter in Galaxies”, July 2013
- Member of SOC for the 2013 MPA/ESO/MPE/Excellence-Cluster Joint Astronomy Conference, “The Physical Link between Galaxies and their Halos”, Garching, Germany, June 2013
- Co-organizer of workshop (June-July 2013) on weak lensing at the Aspen Center for Physics.
- Co-organizer of workshop for GREAT3 challenge planning, Oct. 2013, Pittsburgh, PA.
- 2012 Member of local organizing committee for workshop on cosmic acceleration, Carnegie Mellon University, August 2012
- 2011 Local organizer for Hyper-SuprimeCam (HSC) survey collaboration meeting held at Princeton University, Aug. 2011
- 2008 Co-organizer of workshop “Intrinsic alignments and cosmic shear,” University College, London, March-April 2008

Service and committee work within the University

University Committees

2017 | Member of steering committee for Science@CMU

College Committees

2014 | Member of Mellon College of Science Ad-Hoc Non-Tenure Committee member

Departmental Committees

2017–2018	Member of Physics Department oral qualifying exam committee
2017–2018	Member of Physics Department strategic planning committee
2017	Member of McWilliams Center strategic planning committee
2016–2018	Co-chair (with M. Paulini) of graduate program working group
2016–2017	Member of Physics Department head search committee
2015–2016	Co-chair of faculty search committee in cosmology
2013–2015	Member (2013–2015) and chair (2015) of McWilliams Center astro lunch seminar committee member
2013, 2014, 2015	Member of Physics graduate admissions committee
2012–2013	Member of faculty search committee in cosmology
Ongoing	Member of thesis committees for Hsiu-Hsien Lin, Evan Tucker, Siddharth Satpathy, Rongpu Zhou (UPitt), Siyu He, Aklant Bhowmich, Kuan Wong (Pitt), Daniel Perrefort (Pitt)