

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/>

Appointments

| | |
|--------------|---|
| 2014-present | 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, Astrophysics, Institute for Advanced Study |

Education

| | |
|-----------|---|
| 2001-2006 | Ph.D. in Physics, Princeton University (advisor: Uroš Seljak) |
| 1996-2000 | A.B. in Physics with highest honors, Princeton University |

Fellowships and Awards

| | |
|-----------|--|
| 2013-2016 | The Falco-DeBenedetti Career Development Professor in Physics at CMU |
| 2013 | Alfred P. Sloan Fellowship |
| 2012 | Department of Energy Early Career Award |
| 2011 | AAS Annie Jump Cannon Prize |
| 2006 | Hubble Fellowship |
| 2001-2006 | Centennial Fellowship, Princeton University |
| 2002-2005 | National Science Foundation Graduate Research Fellowship |
| 2000 | Kusaka Memorial Prize, Dept. of Physics, Princeton University |
| 2000 | Member of Phi Beta Kappa |

Other professional activities

| | |
|--------------|--|
| 2016 | Invited to submit review on weak lensing to Annual Reviews in Astronomy & Astrophysics (ARA&A), in progress |
| 2016 | Participant in study group and workshop on Maximizing Science in the Era of LSST, funded by Kavli Foundation and endorsed by NSF |
| 7/15-present | Member of the Astronomy & Astrophysics Advisory Committee (AAAC); vice-chair since 7/16 |

| | |
|--------------|---|
| 7/15-present | Analysis coordinator for the LSST Dark Energy Science Collaboration (DESC), overseeing seven dark energy science working groups |
| 2015-present | Head of the collaboration meetings committee for the DESC |
| 2015-present | Co-leader of the weak lensing working group for the Hyper-SuprimeCam (HSC) survey |
| 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 program |
| 2015-present | Member of International Astronomical Union (IAU) |
| 2014-present | Member of the Collaboration Council (CC) for the DESC |
| 2014-2016 | Member of the LSST Science Advisory Committee (SAC) |
| 2014 | Reviewer for NASA Postdoctoral Program (NPP) |
| 2013-present | Member of Euclid consortium |
| 2012-2015 | Weak lensing working group co-convener for DESC |
| 2012-2014 | Co-leader of the international weak lensing community challenge, GREAT3 ¹ |
| 2012-present | One of several lead developers for the widely-used open-source image simulation software package, GalSim ² |
| 2011 | Member of HST cosmology review panel, cycle 19 |
| 2007-present | Reviewer for MNRAS, ApJ, A&A |
| 2006-present | Member of American Astronomical Society (AAS) |

Invited talks from past five years

This list includes only conferences and workshops, not departmental seminars (of which I give typically 4-5/year).

| | |
|------|--|
| 2016 | Plenary talk at COSMO-16 in Ann Arbor, MI, August 2016 Invited speaker at Statistical Challenges in Modern Astronomy VI, Pittsburgh, June 2016 Invited speaker at “Cross-correlation Spectacular with LSST”, BNL, May 2016 |
| 2015 | Invited speaker at “Foreground Physical Effects on Weak Lensing Science”, UC Davis, December 2015 Invited speaker at “Mocking the Universe”, STScI, July 2015 Invited speaker at Lorentz Centre Workshop “Small-Scales=Big-Problem?”, Leiden, February 2015 |
| 2014 | Invited pedagogical review about weak lensing measurements at “Precision Astronomy with Fully Depleted CCDs” (PACCD) conference, Brookhaven National Labs, December 2014. 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 | <i>Astrophysical tests of General Relativity</i> , invited talk at the 7th Sackler Conference in Theoretical Astrophysics, Harvard University, spring 2012. |

¹<http://www.great3challenge.info>

²<https://github.com/GalSim-developers/GalSim>

- 2011 | *Weak lensing - Revealing the Dark Side of the Universe*, Annie Jump Cannon Prize lecture at the Jan. 2012 meeting of the American Astronomical Society.
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.

Meetings organized in past 5 years

- 2016 | Head of SOC and LOC for the LSST DESC’s first “hack week”, CMU, Nov. 2016
 Head of SOC for LSST DESC collaboration meetings, Feb. and July 2016
 Member of SOC for “Statistical Challenges in 21st Century Cosmology (SCCC21)”, May 2016
 Member of SOC for “From theory to applications: celebrating a century of gravitational lensing”, July 2016
 Organized, ran cosmology parallel session at COSMO-16, August 2016
- 2015 | 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
 Weak lensing working group meeting for HSC, May 2015
 Member of SOC for “From theory to applications: celebrating a century of gravitational lensing”, planned for July 2016 in Leiden
- 2014 | 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

Grants

| | |
|-----------|---|
| 2016-2019 | “RI: III: Medium: Scalable Machine Learning for Automating Scientific Discovery in Astrophysics”, NSF IIS Medium, PI: Barnabas Poczcos, \$1.2M |
| 2016-2021 | “Cosmology with the WFIRST High Latitude Survey”, NASA WFIRST Science Investigation Team program, PI: Olivier Dore (JPL), \$8.4M split across multiple institutions with \$615k to CMU |
| 2012-2028 | “Science with the Euclid Mission”, NASA, PI: Jason Rhodes, amount of funding per person varies per year (~\$90k to CMU in 2014-2015, 140k in 2015-2016) |
| 2015-2018 | “Cosmic Web Reconstruction: A Unique Opportunity On the Cosmic Structures of the Universe”, NSF AAG program, PI: Shirley Ho, \$436k |
| 2014-2017 | “Machine Learning Algorithms for Matching Theories, Simulations, and Observations in Cosmology”, Department of Energy, Advanced Scientific Computing, PI: B. Poczcos, \$1.65M |
| 2012-2017 | “Optimal cosmological measurements with weak gravitational lensing”, Department of Energy Early Career Award Program (office of High Energy Physics), \$750,000 |
| 2016 | “Alignment models for weak lensing science”, JPL SURP program, PI: Alina Kiessling (JPL), \$100k (\$65k to CMU) |
| 2015-2016 | “Interpixel capacitance requirements and GalSim development for WFIRST PI”, WFIRST project office, \$40k |
| 2012-2016 | “A homogeneous ACS dataset for realistic galaxy simulations”, HST Archive Research Program, \$106k |
| 2013-2016 | “Galaxy shape measurements and intrinsic alignments: reducing the impact of weak lensing systematic errors”, National Science Foundation (NSF) Astronomy and Astrophysics Grant (AAG) Program, \$363k |
| 2013-2015 | Alfred P. Sloan Fellowship, \$50k |
| 2014 | “GalSim for WFIRST-AFTA: State-of-the-Art Image Simulations”, WFIRST project office, \$36k |
| 2012-2013 | “A GREAT Opportunity: weak lensing method development for the era of precision cosmology”, JPL SURP program, PI: Jason Rhodes, \$100k (\$45k to CMU) |