

## Rachel Mandelbaum

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Hubble Fellow  
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### Research Interests

- Measurement of weak gravitational lensing in combination with other probes of large scale structure
- Cosmological parameter estimation
- Galaxy and cluster formation
- Data processing and analysis algorithms for large surveys

### Education

Physics Ph.D. program, 2001-2006  
Princeton University, Princeton, NJ, USA  
Advisor: Uroš Seljak

A.B. in Physics with highest honors, June 2000  
Princeton University, Princeton, NJ USA

### Fellowships and Awards

Hubble Fellowship (2006-2009)  
Centennial Fellowship, Princeton University (2001-2006)  
National Science Foundation Graduate Research Fellowship (2002-2005), awarded in 2000  
Kusaka Memorial Prize, Dept. of Physics, Princeton University, June 2000  
Admitted to Phi Beta Kappa and Sigma Xi, June 2000

### Research and Teaching Positions

Princeton University Dept. of Physics  
Assistant in Instruction  
Physics 102 (introductory electricity and magnetism) lab  
Princeton, NJ, USA  
Spring 2006

Princeton University Dept. of Physics  
Assistant in Research  
Thesis research  
Princeton, NJ, USA  
Fall 2001-Fall 2005

Princeton University Dept. of Physics  
Senior Thesis  
Title: *CP violation in B meson decays*, advisor: Prof. Daniel Marlow  
Princeton, NJ, USA  
Fall 1999-Spring 2000

Princeton Plasma Physics Laboratory  
Research Assistant  
Advisor: Prof. Samuel Cohen  
Princeton, NJ, USA  
Summer, 1999

Princeton University Dept. of Physics  
Junior independent work  
Advisor: Prof. Samuel Cohen  
Princeton, NJ, USA  
Spring, 1999

Princeton University Dept. of Physics  
Junior independent work  
Advisor: Prof. David Huse  
Princeton, NJ, USA  
Fall, 1998

Stanford University Dept. of Physics  
Research Assistant  
NSF REU (Research Experience for Undergraduates) Program, Advisor: Prof. Douglas Osheroff  
Palo Alto, CA, USA  
Summer, 1998

University of Chicago Dept. of Physics  
Research Assistant  
NSF REU Program, Advisor: Prof. P. Guyot-Sionnest  
Chicago, IL, USA  
Summer, 1997

## Publications

- R. Mandelbaum**, U. Seljak, C. M. Hirata et al., *Precision photometric redshift calibration for galaxy-galaxy weak lensing*, 2008, MNRAS, 386, 781
- J. K. Adelman-McCarthy et al., *The Sixth Data Release of the Sloan Digital Sky Survey*, 2008, ApJS, 175, 297
- R. Reyes, R. Mandelbaum et al., *Improved optical mass tracer for galaxy clusters calibrated using weak lensing measurements*, 2008, preprint (arXiv:0802.2365), submitted to MNRAS
- S. Bridle et al., *Handbook for the GREAT08 Challenge: An image analysis competition for cosmological lensing*, 2008, preprint (arXiv:0802.1214)
- C. M. Hirata, **R. Mandelbaum**, et al., *Intrinsic galaxy alignments from the 2SLAQ and SDSS surveys: luminosity and redshift scalings and implications for weak lensing surveys*, 2007, MNRAS, 381, 1197
- J. K. Adelman-McCarthy et al., *The Fifth Data Release of the Sloan Digital Sky Survey*, 2007, ApJS, 172, 634
- R. Mandelbaum**, U. Seljak, *A robust lower limit on the amplitude of matter fluctuations in the universe from cluster abundance and weak lensing*, 2007, JCAP, 376, 13
- R. Massey et al., *The Shear TEsting Programme 2: Factors affecting high precision weak lensing analyses*, 2007, MNRAS, 376, 13
- R. Mandelbaum**, U. Seljak, R. J. Cool, M. Blanton, C. M. Hirata, J. Brinkmann, *Density profiles of galaxy groups and clusters from SDSS galaxy-galaxy weak lensing*, 2006, MNRAS, 372, 758.

**R. Mandelbaum**, C. Hirata, T. Broderick, U. Seljak, J. Brinkmann, *Ellipticity of dark matter halos with galaxy-galaxy weak lensing*, 2006, MNRAS, 370, 1008.

**R. Mandelbaum**, U. Seljak, G. Kauffmann, C. Hirata, J. Brinkmann, *Galaxy halo masses and satellite fractions from galaxy-galaxy lensing in the SDSS: stellar mass, luminosity, morphology and environment dependencies*, 2006, MNRAS, 368, 715.

**R. Mandelbaum**, C. Hirata, M. Ishak, U. Seljak, J. Brinkmann, *Detection of large-scale intrinsic ellipticity-density correlation from the Sloan Digital Sky Survey and implications for weak lensing surveys*, 2006, MNRAS, 367, 611.

J. Adelman-McCarthy et al. (the SDSS collaboration), *The fourth data release of the Sloan Digital Sky Survey*, 2006, ApJS, 162, 38.

**R. Mandelbaum**, A. Tasitsiomi, U. Seljak, A. Kravtsov, R. Wechsler, *Galaxy-galaxy lensing: dissipationless simulations versus the halo model*, 2005, MNRAS, 362, 1451.

**R. Mandelbaum**, et al., *Systematic errors in weak lensing: application to SDSS galaxy-galaxy weak lensing*, 2005, MNRAS 361, 1287.

U. Seljak, A. Makarov, **R. Mandelbaum**, et al., *SDSS galaxy bias from halo mass-bias relation and its cosmological implications*, 2005, Phys. Rev. D 71, 043511.

C. Hirata, **R. Mandelbaum**, et al., *Galaxy-galaxy weak lensing in the Sloan Digital Sky Survey: intrinsic alignments and shear calibration errors*, 2004, MNRAS 353, 529.

**R. Mandelbaum**, P. McDonald, U. Seljak, R. Cen, *Precision cosmology from the Lyman- $\alpha$  forest*, 2003, MNRAS 344, 776.

### Invited talks

- CITA, May 2005
- University of California at Davis and at Berkeley, September 2005
- California Institute of Technology, September 2005
- University of Chicago (KICP), November 2005
- Harvard-Smithsonian Center for Astrophysics, November 2005
- Large Scale Structure with SDSS session at the 2006 AAS meeting (Calgary)
- Plenary talk on galaxy-galaxy weak lensing science, SDSS collaboration meeting, 2007
- Heidelberg Joint Astronomical Colloquium Series, fall 2007
- University of Michigan, spring 2008
- Carnegie Mellon University, department of physics, spring 2008
- University of Pittsburgh, department of physics, spring 2008
- Yale University, department of physics, spring 2008

**Education / Outreach**

- Physics and mathematics tutoring for high school students, 2005-2007
- Assisting in the design of an elementary-level Montessori curriculum describing the early universe, from the Big Bang until the formation of earth