Robyn Ellyn Sanderson

Education

Massachusetts Institute of Technology, 2004 - present
PhD candidate, Department of Physics, Astrophysics Division

University of Maryland, College Park, 1999 - 2003
B.S., Physics, High Honors awarded November 19, 2003; degree conferred magna cum laude December 21, 2003
B.S., Astronomy, High Honors awarded November 19, 2003; degree conferred magna cum laude December 21, 2003

University of Burgundy, Dijon, France, January - May 2002
Diplome d'Études Langue Française, deuxième degré, mention Très Bien
(Diploma in French language studies, with academic commendation)

Montgomery Blair High School Mathematics, Science, and Computer Science Magnet Program, 1994-1999

Honors

Whiteman Fellow, 2004-2006

Honorable mention, NSF GRFP, 2003 - 2004

Student speaker, University of Maryland, College Park Commencement Ceremony, 12/2003

Student speaker, College of Computer, Mathematical, and Physical Sciences Commencement Ceremony, 12/2003

Member, Phi Beta Kappa Honor Society

Maryland Distinguished Scholar

Banneker-Key Scholar (4-year merit scholarship comprising tuition, room/board, books, stipend)

National Merit Scholar

Research and Teaching Experience

Current research, 2004-present
My thesis research uses a combination of analytic and numerical methods to investigate the formation and

behavior of unbound substructures, specifically caustics and tidal streams, in galaxies. The goal is to infer information about galactic shape and merger history by identifying and characterizing substructures in existing observational data sets. Other research interests include applying mathematical formalisms used in the theory of electromagnetism to general relativity, validating simulations of large-scale structure formation, and applying the results of such simulations to measure cosmological properties using observational data.

Teaching Assistant, MIT Department of Physics, September 2006-May 2008

8.282 (Spring 2008; 50% TA): Introduction to Astronomy. Undergraduate survey course in astronomy and astrophysics. Held office hours and exam review session; graded exam; ran astronomy demonstration session; lectured two classes.

8.284 (Spring 2008; 50% TA): Astrophysics. Advanced undergraduate course in quantitative astrophysics. Graded homework and exams; held office hours.

8.902 (Fall 2007; 10% TA): Astrophysics II. Graduate course in extragalactic astrophysics. Graded homework & exams and wrote problem set solutions.

8.224 (Spring 2007): Exploring Black Holes: General Relativity and Astrophysics. Graded homework; held office hours and exam review sessions; gave introductory lecture; reviewed new sections of the course textbook for a new edition.

8.287 (Fall 2006): Observational Techniques of Optical Astronomy. Graded homework; conducted weekly $\geq$3-hour laboratories at Wallace Astrophysical Observatory on data-taking and analysis.

Honors Thesis Research, January - November 2003

Computational studies of the dynamics of Jupiter's moon Amalthea as a rubble pile, based on new results from Galileo. Awarded High Honors in Physics and Astronomy.

Teaching Assistant, University of Maryland Department of Astronomy, 2001-2003 (4 semesters; 1 summer)

ASTR100 (all spring and fall semesters except Spring 2002): Introduction to Astronomy. Duties included grading homework and exams and leading a weekly 1-hour discussion section.

ASTR101 (Summer 2003): Introduction to Astronomy Laboratory. Conducted two 2-hour laboratories weekly for a 6-week course.

Research Experiences for Undergraduates, Goddard Spaceflight Center, Summer 2001

Studied the efficiency of the Gamma Ray Spectrometer aboard the NEAR-Shoemaker satellite.

Undergraduate Teaching Assistant, University of Maryland Dept. of Physics, Spring 2001 (1 semester)

PHYS170: Introduction to Mechanics for Physics Majors. Duties included grading homework and exams, developing exam problems, and leading weekly problem-solving sessions. Conducted for credit through the Center for Teaching Excellence, concurrent with a course for undergraduate teaching assistants.

Undergraduate Research Assistant, Space Physics Group, University of Maryland Dept. of Physics, 2000-2001

Studied solar maximum using data from the ACE and WIND spacecraft; presented a poster at the American Geophysical Union 2000 Spring Meeting.

Talks, Posters, and Publication

Sanderson, R.E.: Gamma rays from neutralino self-annihilation in a caustic in M31. Talk at Small-Scale Structure of Dark Matter Workshop, Perimeter Institute, Waterloo, Canada, June 5-8, 2008.

Sanderson, R.E.: Cosmology. Set of two lectures for 8.282, "Introduction to Astronomy", May 2008.

Sanderson, R.E. and E. Bertschinger: Stellar and dark matter caustics: are both visible? Poster, APS April Meeting, April 11–15, 2008.

Sanderson, R.E. and E. Bertschinger: Some analogies between electromagnetism and gravity. Poster, APS April Meeting, April 14–17, 2007.

Sanderson, R.E: Astrophysical Black Holes. Lecture for 8.224, "Exploring Black Holes", February 2007.

Sanderson, R.E.: The Birth, Life, and Death of Stars. Outreach presentations, Jonas Clarke Middle School, Lexington, MA, 2006–7.

Sanderson, R.E.: Electromagnetic analogies in weak-field GR. Presentation, 9th Eastern Gravity Meeting, March 24–25, 2006.

D.C. Richardson, P. Elankumaran & R.E. Sanderson: Numerical experiments with rubble piles: equilibrium shapes and spins. *Icarus* 173 (2005) 349-361.

Sanderson, R.E. et al: The onset of solar maximum as seen by ACE/ULEIS. Poster, AGU Spring Meeting, May 30–June 3, 2000.