

Dr. Anna Mercedes Nierenberg

CONTACT INFORMATION Physics & Astronomy Department
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APPOINTMENTS **University of California Chancellor's Fellow** Sept. 2017-
Department of Physics and Astronomy,
University of California Irvine

CCAPP Postdoctoral Fellow Sept. 2014 to Sept. 2017
Center for Cosmology and AstroParticle Physics,
The Ohio State University

EDUCATION **Ph. D. Physics**, University of California Santa Barbara Sept. 2014
Dissertation: *Testing galaxy formation and the nature of dark matter with satellite galaxies*, Advisor: Tommaso Treu

B. S. Physics, University of California Los Angeles *summa cum laude* June 2008

OBSERVING PROPOSALS AND GRANTS **Principal-Investigator**
Hubble Space Telescope GO-15177, 'Testing CDM with the WFC3 Grism', Cycle 25, 18 orbits, WFC3 IR imaging and grism, TBD, (PI)

Hubble Space Telescope GO-13732, 'Detecting dark matter substructure with narrow-line lensing', Cycle 21, 10 orbits, WFC3 IR imaging and grism, \$70,759 (PI)

Hubble Space Telescope AR-13271, 'The cosmic evolution of faint satellites as a test of galaxy formation and the nature of dark matter', archival proposal, \$59,784 (Co-PI)

Co-Investigator

Hubble Space Telescope GO-15320, 'Probing the dark universe with quadruply imaged quasars', Cycle 25, 26 orbits, WFC3 IR, UVIS, TBD

Keck Observatory, Keck I and II telescopes, 10 nights (OSIRIS, NIRC2)

Lick Observatory, 3 m telescope, 17 nights (Kast, IRCAL)

OTHER UCSB Dean's Fellowship Sept. 2012 to June 2013
FELLOWSHIPS Worster Undergraduate Research Mentor Fellowship June 2012 to Sept. 2012
AND Physics Chair's Fellowship April 2012 - June 2012
AWARDS

TEACHING **Physics 3L**
Mechanics lab, teaching assistant, UCSB Fall 2008

Physics 4L
Electromagnetism lab teaching assistant, UCSB Winter 2009

PUBLICATIONS **Nierenberg, A. M.** ; Treu, T.; Brammer, G.; Peter, A. H. G.; Fassnacht, C. D.; Keeton, C. R.; Kochanek, C. S.; Schmidt, K. B.; Sluse, D. ; Wright, S. A., 'Probing dark matter substructure in the gravitational lens HE0435-1223 with the WFC3 grism', arXiv:1701.05188.

Nierenberg, A. M. ; Treu, T.; Menci, N.; Lu, Y.; Torrey, Paul; Vogelsberger, M., 'The Missing Satellite Problem in 3D', MNRAS 462, 4473 (2016).

Nierenberg, A. M.; Treu, T.; Wright, S. A.; Fassnacht, C. D.; Auger, M. W., 'Detection of substructure with integral field spectroscopy of the gravitational lens B1422+231', MNRAS 422, 2434 (2014).

Nierenberg, A. M.; Oldenburg, Dylan; Treu, T., 'Do lens galaxies have an excess of luminous substructure?', MNRAS 436, 2120 (2013)

Nierenberg, A. M.; Treu, T.; Menci, N.; Wang, W., 'The Cosmic Evolution of Faint Satellite Galaxies as a Test of Galaxy Formation and the Nature of Dark Matter', ApJ 772, 146 (2013)

Nierenberg, A. M.; Auger M. W.; Treu, T.; Marshall, P.J.; Fassnacht, C. D.; Busha, Michael T., 'Luminous Satellites of Early-Type Galaxies II: Spatial Distribution, Luminosity Function and Cosmic Evolution', ApJ 752, 99 (2012)

Nierenberg, A. M.; Auger, M.W.; Treu, T.; Marshall, P.J.; Fassnacht, C. D. 'Luminous Satellites of Early-Type Galaxies I: Spatial Distribution', ApJ 731, 44 (2011)

Barth, Aaron J. et al., **including AMN**, 'The Lick AGN Monitoring Project 2011: Spectroscopic Campaign and Emission-line Light Curves' ApJS 217, 26 (2015)

Barth, Aaron et al. **including AMN**, 'The The Lick AGN Monitoring Project 2011: Fe II Reverberation from the Outer Broad-line Region', ApJ 769, 128 (2013)

Pancoast, Anna et al. **including AMN**, 'The Lick AGN Monitoring Project: Dynamical Modeling of the Broad Line Region in Mrk 50', ApJ 754, 49 (2012)

Keel, William C. et al. **including AMN**, 'The Galaxy Zoo survey for giant AGN-ionized clouds: past and present black hole accretion events', MNRAS 420, 878 (2012)

Barth, Aaron J. et al., **including AMN**, ‘The Lick AGN Monitoring Project 2011: Reverberation Mapping of Markarian 50’, ApJ 743L, 4 (2011)

ACADEMIC
SERVICE

NASA Keck TAC

CCAPP seminar co-organizer, OSU, Spring 2016.

CCAPP summer seminar co-organizer, OSU, Summer 2015.

Physics graduate student life committee, UCSB, 2008-2009

Referee MNRAS, Nature Astronomy

OUTREACH

Space in Your Face YouTube Channel

Co-host, Youtube outreach channel with astronomy news, Spring 2015 to present

Columbus Fair Physics Volunteer

Ran a booth demonstrating light components, August 2016

Columbus Science Pub Speaker

Public lecture on dark matter, June 2016

Science day at Innis Elementary

Created and presented an educational slideshow about astronauts for K-2 students, Winter 2015

Adopt-A-Physicist

Communicate with several high school classes about being a physicist over the course of several weeks, Fall 2015, Fall 2009- 2013, Spring 2011

Astronomy on Tap

Speaker and co-organizer, Spring 2015.

JW Science Extravaganza

Elementary School crater exhibit presenter, April 2015.

La Colina Middle School Career Day

Discuss science career with middle school students October 2011, 2012

STUDENT
ADVISING

Daniella Roberts

Bridge graduate student in Physics, The Ohio State University. Measuring the luminosity function of satellites around sub-Milky Way mass host galaxies. Supervised with Professor Annika Peter. May 2016 to present.

Kaitlin McTague

Undergraduate in Astronomy and Astrophysics, The Ohio State University. Searching for new ultra-faint satellite galaxies in the local volume. Supervised with Professor Annika Peter. May 2016 to present.

Dylan Oldenburg

Undergraduate in Physics, UCSB. Measured the luminosity function of satellites around gravitational lenses. June 2012-November 2013.

- INVITED TALKS Kavli IPMU, ‘The Astrophysics of Dark Matter’ conference, October 2016
- University of Texas at Dallas, ‘Symposium on relativistic astrophysics’, December 2013
- The Ohio State University, CCAPP Seminar, October 2013
- INPAC, panel member ‘ Λ CDM and astronomical probes of dark matter physics’, April 2013.
- Pepperdine University, Science Seminar, October 2012
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- CONTRIBUTED TALKS Leiden University, ‘Astrophysics of Dark Matter’ workshop, April 2016.
- Kavli IPMU, ‘Galaxies and cosmology in light of strong lensing’ conference, October 2014.
- 223 AAS meeting, January 2015
- Courmayeur Italy, ‘Galaxy formation under the magnifying glass of gravitational lensing’ workshop, June 2013.
- University of California, San Diego, ‘Keck Science Meeting’, September 2012.
- University of Bologna, ‘Dark Matter from Globular Clusters to Clusters of Galaxies’, September 2012.
- Courmayeur, Italy, ‘Strong lensing from stars to dark matter halos’, workshop, June 2012.
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- SEMINARS Carnegie Observatories, May 2016, lunch talk
- Leiden University, April 2016, Galaxy lunch talk
- UC Santa Barbara, April 2015, Astronomy lunch talk
- Yale, January 2014, Galaxy lunch talk
- UC Irvine, Astrophysics Seminar, November 2013
- California Institute of Technology, Tea Talk, November 2013
- UCSD, Journal Club, November 2013
- UCLA, Journal Club, November 2013
- UC Berkeley, Galform talk, October 2013
- Stanford, KIPAC tea talk, September 2013
- UC Santa Cruz, cosmo-club seminar, September 2013

Jet Propulsion Laboratories, astrophysics lunch seminar, May 2013.

UC Davis, cosmology seminar, January 2013.

Carnegie Observatories, lunch talk, May 2012.

SOFTWARE

Python, Mathematica, Matlab:

linear algebra, linear optimization, Markov Chain Monte Carlo methods, Bayesian statistical inferences, image pattern recognition, numerical integration and differentiation

Astronomical Data Analysis:

OSIRIS data reduction, NIRC2 data reduction, HST grism reduction, astrodrizzle, Lensmodel and Gravlens, SourceExtractor, Bayesian Photo Z, astroconda