Daniel A. Gilman

CONTACT INFORMATION

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RESEARCH INTERESTS

Investigating the nature of dark matter with strong gravitational lenses

EDUCATION

University of California, Los Angeles, Los Angeles, California USA

Ph.D. Candidate, Physics (expected graduation date: May 2020)

- Dissertation Topic: "Investigating the nature and origins of dark matter with flux ratio statistics in gravitational lenses"
- Advisor: Tommaso Treu

M.S., Physics, September 2016

James Madison University, Harrisonburg, Virginia USA

B.S., Physics *cum laude*, May, 2014

HONORS AND AWARDS

Phi Beta Kappa, James Madison University, 2014

Outstanding undergraduate research award, James Madison University, 2014

PUBLICATION STATISTICS

total publications: 12
(8 in press, 4 submitted)

total first-author publications: 5
(3 in press, 2 submitted)

PUBLICATIONS

Daniel Gilman, Xiaolong Du, Andrew Benson, Simon Birrer, Anna Nierenberg, Tommaso Treu
Constraints on the mass-concentration relation of cold dark matter halos with 11 strong gravitational lenses, submitted to MNRAS (September 2019), arXiv:1909.02573

Daniel Gilman, Simon Birrer, Anna Nierenberg, Tommaso Treu, Xiaolong Du, Andrew Benson
Warm dark matter chills out: constraints on the halo mass function and the free-streaming length of dark matter with 8 quadruple-image strong gravitational lenses, submitted to MNRAS (September 2019), arXiv:1908.06983

Anna Nierenberg, **Daniel Gilman**, et al.
Double dark matter vision: twice the number of compact-source lenses with narrow-line lensing and the WFC3 Grism, submitted to MNRAS (August 2019), arXiv:1908.06344

Vivian Bonvin, ... (+ 18 authors), **Daniel Gilman**, et al.
COSMOGRAIL. XVIII. time delays of the quadruply lensed quasar WFI2033-4723, Astronomy and Astrophysics 629, A97 (2019)

Josh Simon, ... (+8 authors), **Daniel Gilman**, et al.
Testing the Nature of Dark Matter with Extremely Large Telescopes, Bulletin of the American Astronomical Society 51, 152 (2019)

Daniel Gilman, Simon Birrer, Tommaso Treu, Anna Nierenberg, and Andrew Benson
Probing dark matter structure down to 10^7 *solar masses: flux ratio statistics in gravitational lenses with line of sight halos*, MNRAS 487, 5721-5738 (2019)

Daniel Gilman, Simon Birrer, Tommaso Treu, Charles R. Keeton, Anna Nierenberg
Probing the nature of dark matter by forward modelling flux ratios in strong gravitational lenses, MNRAS 481, 819-834 (2018)

Vivian Bonvin, ... (+ 10 authors), **Daniel Gilman**, et al.
COSMOGRAIL. XVII. Time delays for the quadruply imaged quasar PG 1115+080, Astronomy and Astrophysics 616, A183 (2018)

Xuheng, Ding, ... (+9 authors), **Daniel Gilman**, et al.
Time Delay Lens Modeling Challenge: I. Experimental Design, arXiv:1801.01506 (2018)

Frederic Courbin, ... (+ 16 authors), **Daniel Gilman**, et al.
COSMOGRAIL: the COSmological MOnitoring of GRAvItational Lenses. XVI. Time delays for the quadruply imaged quasar DES J0408-5354 with high-cadence photometric monitoring, Astronomy and Astrophysics 609, A71 (2018)

Daniel Gilman, Adriano Agnello, Tommaso Treu, Charles R. Keeton, Anna Nierenberg
Strong lensing signatures of luminous structure and substructure in early-type galaxies, MNRAS 467, 3970-3992 (2017)

Francis-Yan Cyr-Racine, Leonidas Moustakas, Charles R. Keeton, Kris Sigurdson, **Daniel Gilman**
Dark census: Statistically detecting the satellite populations of distant galaxies, Phys. Rev. D. 94, 043505 (2016)

Conference Presentations [***invited**]

Matera Oscura: Cosmology and Dark Matter Within Galaxies and Clusters; Matera, Italy; September 2019

TMT Science Forum, Pasadena USA; December 2018

The Universe as a Telescope: probing the cosmos at all scales with strong lensing, Milan, Italy; September 2018

***Identification of Dark Matter**, Providence, USA; July 2018

The Small Scale Structure of Cold Dark Matter, Santa Barbara, USA; April 2018 (*poster*)

Shedding Light on the Dark Universe with Extremely Large Telescopes, Los Angeles, USA; April 2018

UCLA Dark Matter Symposium, Los Angeles, USA; February 2018 (*poster*)

Aosta Strong Lensing Meeting, Cogne, Italy; August 2017

Workshops and Seminars [***invited**]

Institute of Astronomy Lunch Seminar at the University of Cambridge, Cambridge, UK; September 2019

LSST Dark Matter Workshop, Chicago, USA; August 2019

Carnegie Observatories Astrophysics Seminar, Pasadena, USA; May 2019

***Substructure Lensing with Galacticus**, Columbus, USA; August 2018

***Bhaumik Luncheon Young Scientists Seminar**, Los Angeles, USA; May 2018

STRIDES/H0LICOW Workshop, Los Angeles, USA; May 2018

STRIDES/H0LICOW Workshop, Los Angeles, USA; May 2017

Observing Experience

ESO/MPG 2.2m telescope, La Silla Observatory, Chile (30 nights total)
Experience with the three instruments on the 2.2m (WFI, FEROS, GROND)

Research and Professional Experience

PhD Research, Los Angeles, USA (September 2015-present)
Supervisors: Prof. Tommaso Treu (advisor), Dr. Simon Birrer
Using flux ratio statistics from quadruply imaged quasars to investigate the nature and origins of dark matter.

NASA Undergraduate Internship Program, Pasadena, USA
(September-December 2013, and May-August 2014)
Supervisors: Dr. Francis-Yan Cyr-Racine, Dr. Leonidas Moustakas
Using gravitational lensing to probe the nature of dark matter.

Ad Astra Rocket Company, Houston, USA (May-August 2013)
Supervisor: Dr. Franklin Chang-Diaz
Optimization of mission parameters for trips to Mars using the Variable Specific Impulse Magneto-Plasma Rocket (VASIMR) system in development by Ad Astra.

James Madison University, Harrisonburg, USA (May 2012 - May 2013)
Supervisor: Dr. Sean Scully
Using gamma spectra from blazars to constrain the opacity of the universe to gamma rays.

Technical Skills

Programming languages:

- Python (advanced)
- MATLAB (basic)
- C++ (basic)

Probability and Statistics:

- Bayesian inference methods, including likelihood-free inference techniques
- Cluster computing

Languages

Fluent in Spanish