

# A. Miguel Holgado | C.V.

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ORCID iD

## Education

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- **University of Illinois at Urbana-Champaign** **Urbana, IL**  
*Ph.D. Astronomy* 2015-20  
**Advisor:** Paul M. Ricker **Dissertation:** Gravitational Waves as Direct Probes of Binary Evolution and Astrophysical Environments
- **Texas A&M University** **College Station, TX**  
*B.S. Nuclear Engineering, summa cum laude* 2011-14  
**Advisor:** Ryan G. McClarren **Honors Thesis:** Semi-Analytic Radiative Shock Solutions with Multigroup  $S_n$  Transport

## Employment

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- **Carnegie Mellon University, McWilliams Center for Cosmology** **Pittsburgh, PA**  
*McWilliams Postdoctoral Fellow* 2020-
- **Institute of GW Astronomy, University of Birmingham** **Birmingham, UK**  
*NANOGrav PIRE Summer Fellow* Summer 2017
- **National Center for Supercomputing Applications** **Urbana, IL**  
*Sponsored Student* 2015-20
- **Lawrence Livermore National Laboratory** **Livermore, CA**  
*HED Physics Summer Intern, SSGF Practicum Fellow* Summer 2015, Fall 2017
- **Los Alamos National Laboratory** **Los Alamos, NM**  
*Student Guest Research Assistant - Computational Science Division* 2014-15  
*Computational Physics Summer Fellow* Summer 2014  
*National Undergraduate Plasma Physics Summer Fellow* Summer 2013
- **Texas A&M University** **College Station, TX**  
*Undergraduate Research Assistant* 2012-14

## Full Publication List

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### First-Author Publications

21. **A. M. Holgado**. “Equation-of-State Constraints on the Neutron-Star Binding Energy and Tests of Binary Formation Scenarios”. submitted. [arXiv:2103.13605](https://arxiv.org/abs/2103.13605).
20. **A. M. Holgado**, H. O. Silva, P. M. Ricker, and N. Yunes. “The Role of Strong Gravity and the Nuclear Equation of State on Neutron-Star Common-Envelope Accretion”. *ApJL*, **910**, L2.

19. **A. M. Holgado**, A. Ortega, and C. L. Rodriguez. “*Dynamical Formation Scenarios for GW195021 and Prospects for Decihertz GW Astronomy with GW190521-Like Binaries*”. *ApJL*, **909**, L24.
18. **A. M. Holgado** and P. M. Ricker. “*Gravitational Waves from Supernova Mass Loss and Natal Kicks in Close Binaries*”. *MNRAS*, **490**, 5560 (2019).
17. **A. M. Holgado** and P. M. Ricker. “*Gravitational Radiation from Close Binaries with Time-Varying Masses*”. *ApJ*, **882**, 39 (2019).
16. **A. M. Holgado**, A. Sesana, et al. “*Pulsar-Timing Constraints on the Fermi Massive Black-Hole Binary Blazar Population*”. *MNRAS*, **481**, L74 (2018).
15. **A. M. Holgado**, P. M. Ricker, and E. A. Huerta “*Gravitational Waves from Accreting Neutron Stars undergoing Common-Envelope Inspiral*”. *ApJ*, **857**, 38 (2018).
14. **A. M. Holgado**, J. M. Ferguson, and R. G. McClarren. “*Anti-diffusive-like behaviour in semi-analytic radiative shocks via multigroup  $S_n$  transport with constant cross sections*”. *HEDP*, **17**, 114 (2015).

### Refereed Conference Proceedings.....

13. **A. M. Holgado**, R. T. Holladay, A. B. Wollaber, et al. “*Kernel density estimation for grey Implicit Monte Carlo radiation transport*”. *International M&C Proceedings* (2015).

### Contributed Publications.....

12. H. Silva, **A. M. Holgado**, A. Cárdenas-Avedaño, and N. Yunes. “*Astrophysical and theoretical physics implications of multimessenger neutron-star observations*.” *PRL*, **126**, 181101.
11. The NANOGrav Collaboration, (analysis contributions from **A. M. Holgado**). “*The NANOGrav 12.5-year Data Set: Search for An Isotropic Stochastic Gravitational-Wave Background*”. *ApJL*, **905**, L34.
10. Y. Chen, X. Liu, W. Liao, **A. M. Holgado**, H. Guo, et al. (and the DES Collaboration). “*Supermassive Black-Hole Binary Candidates from optical variability from the Sloan Digital Sky Survey and the Dark Energy Survey*.” *MNRAS*, **499**, 2245.
9. W. Liao, X. Liu, Y. Chen, **A. M. Holgado**, (and 77 others, with the DES Collaboration). “*A candidate binary black hole in a periodic quasar from circumbinary accretion variability*.” *MNRAS*, **500**, 4025.
8. The NANOGrav Collaboration, (analysis contributions from **A. M. Holgado**). “*The NANOGrav 11-Year Data Set: Limits on Gravitational Waves from Individual Supermassive Black Hole Binaries*”. *ApJ*, **880**, 116 (2019).
7. S. Burke-Spolaor, S. Taylor, (and 13 others, including **A. M. Holgado**). “*The Astrophysics of Nanohertz Gravitational Waves*”. *Astron. Astrophys. Rev.* **27:5** (2019).

6. J. Goldstein, A. Sesana, **A. M. Holgado**, and J. Veitch. “Associating Host-Galaxy Candidates to Massive Black-Hole Binaries resolved by Pulsar Timing Arrays”. *MNRAS*, **485**, 248 (2018).
5. A. Sandrinelli, (and 5 others, including **A. M. Holgado**). “Quasiperiodicities of BL Lac Objects and Their Origin”. *A&A*, **600**, A132 (2018).
4. E. A. Huerta, (and 12 others, including **A. M. Holgado**). “Eccentric, nonspinning, inspiral, Gaussian-process merger approximant for the detection and characterization of eccentric binary black hole mergers”. *PRD*, **97**, 024031 (2018).
3. The LIGO-Virgo Collaboration, (analysis contributions from **A. M. Holgado**). “On the Progenitor of Binary Neutron Star Merger GW170817”. *ApJL*, **850**, L40 (2017).
2. P. Anninos, (and 5 others, including **A. M. Holgado**). “CosmosDG: an hp-adaptive discontinuous Galerkin code for hyper-resolved relativistic MHD”. *ApJS* **231:2** (2017). *Press*.
1. E.C. Merritt, (and 6 others, including **A. M. Holgado**). “Experimental evidence for collisional shock formation via two obliquely merging supersonic plasma jets”. *PoP*, **21**, 055703 (2014).

## Awards and Distinctions

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<b>McWilliams Postdoctoral Fellowship</b>	<b>2020</b>
Chu Graduate Award for Department of Astronomy Excellence in Research	2019
<b>Lindau Alumnus – 69th Lindau Nobel Laureate Meeting</b>	<b>2019</b>
APS DAP and DGRAV Travel Awards for the 2019 APS April Meeting	2019
APS Travel Award for Excellence in Graduate Research	2019
APS DAP and DGRAV Travel Awards for the 2018 APS April Meeting	2018
<b>DOE NNSA Stewardship Science Graduate Fellowship</b>	<b>2016-20</b>
DOE Computational Science Graduate Fellowship (declined)	2016
LANL Computational Physics Summer Student Workshop Fellowship	2014
Texas A&M Undergraduate Research Scholar	2013-14
Texas A&M Research Opportunities in Engineering Scholarship	2013-14
Harold Joe Giroir Jr. Memorial Scholarship	2013
PPPL National Undergraduate Fellowship Summer Program	2013
American Nuclear Society Undergraduate Scholarship	2013
Gail De Planque Scholarship	2012

## Grants and Observing Proposals

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### Principal Investigator.....

- **Astrophysics and Cyberinfrastructure Initiatives for Decihertz GW Missions**  
McWilliams Seed Grant Program
AMH (PI), C. Rodriguez, & J. Urbanic

- \$10,000 awarded for 2020-21.

## Co-Investigator.....

- **Identifying Binary SMBHs from Continued DECam Monitoring of DES-SN Quasars**  
National Optical Astronomy Observatory X. Liu (PI), Y. Chen, W. Liao, AMH, et al.  
- DECam: awarded for 2020B and 2021B.
- **LCOGT monitoring of a binary SMBH candidate in a periodic quasar from circumbinary accretion variability**  
National Optical Astronomy Observatory X. Liu (PI), Y. Chen, W. Liao, AMH, & Y. Shen  
- Las Cumbres Observatory: awarded 4 hours during 2018B and 6 hours during 2019A.

## Student Mentoring and Teaching

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### Programs.....

- Undergraduate Research Apprenticeship Program (URAP) UIUC  
Certificate of Mentorship 2019-20

### Graduate Students.....

- Nianyi Chen (Physics), co-advised with Tiziana Di Matteo Spring 2021-Present  
Massive BH mergers in cosmological simulations. CMU

### Undergraduate Students.....

- Chloe Hess, physics major – SURF program Spring 2021-Present  
Neutron star interiors and gravitational-wave astronomy. CMU
- Ryan Raikman, physics major – SURF program Fall 2020-Present  
Gravitational-wave parameter estimation and machine learning. CMU
- Karina Herrera, mechanical engineering major – URAP Jan-Aug 2020  
Supernova natal kicks in wide binaries: BH-He star binaries. UIUC
- David Cruz, engineering physics major – URAP Jan-Aug 2020  
Supernova natal kicks in close binaries: NS-He star binaries. UIUC
- Vivian Pérez, astronomy and physics double major 2018  
Stellar evolution with MESA. Scientific-computing methods. UIUC

### Courses.....

- Teaching Assistant UIUC 2015-16

## Presentations

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### Invited Talks.....

- *Bridging the Gap between LISA and LIGO with Decihertz GW Astronomy*  
CRA Seminar, Georgia Tech, Nov 2020.
- *NS-CE Evolution: The Interplay of Strong Gravity, Nuclear Microphysics, and Macroscopic Astrophysics*  
Astrophysics Lunch Seminar, Carnegie Mellon University, Sep 2020.
- Astrophysics Seminar, Los Alamos National Lab (March 2020, cancelled due to COVID-19).

- *Field Formation of Compact Binaries: Common-Envelope, Natal Kicks, and GWs*  
TAPIR Seminar, Caltech, Oct 2019.
- *The Gravitational-Wave Universe: Black Holes, Neutron Stars, and Beyond*  
Seminar, Lawrence Livermore National Laboratory, Nov 2017.

## Contributed Presentations

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- *The Role of Strong Gravity and the Nuclear Equation of State on NS-CE Accretion*
  - Session Talk, APS April Meeting, Virtual, Apr 2021.
  - Session Talk, Midwest Relativity Meeting, Virtual, Oct 2020.
- *Neutron-Star Universal Relations and their Implications for J0737-3039A*
  - Session Talk, NANOGrav Collaboration Fall Meeting, Virtual, Oct 2020.
- *Common-Envelope Evolution for Neutron-Star-Helium-Star Binaries*
  - iPoster Plus Talk, 236th AAS Summer Meeting, Virtual, Jun 2020.
- *SMBH Binary Candidates from DES & SDSS*
  - Session Talk, 13th International LISA Symposium, Virtual, Sep 2020.
  - Session Talk, NANOGrav Collaboration Fall Meeting, Cornell, Oct 2019.
  - Session Talk, APS April Meeting, Virtual, Apr 2020.
- *Gravitational Waves from Common-Envelope Evolution leading to Helium Mergers*
  - Poster, KITP, Santa Barbara, CA, Jun 2019.
- *On the Formation of Double Neutron Stars from Supernova Natal Kicks*
  - Session Talk, APS April Meeting, Denver, CO, Apr 2019.
  - Session Talk, Midwest Workshop on SNe and Transients, U. Chicago, Feb 2019.
- *Gravitational Waves from Close Binaries with Time-Varying Masses*
  - Rapid Talk and Poster, [Testing Gravity](#), SFU, Vancouver, Canada, Jan 2019.
- *NANOGrav Constraints on the Growing Census of Sub-Parsec SMBH Binary Candidates*
  - Session Talk, [Gravitational-Wave Physics and Astronomy Workshop](#), Dec 2018.
- *Astrometry for Detecting Nanohertz Gravitational Waves*
  - Astrophysics Seminar, [Department of Physics](#), University of Illinois, Nov 2018.
- *Associating Host-Galaxy Candidates to Extreme Mass-Ratio Inspirals*
  - Session Talk, [12th International LISA Symposium](#), Chicago, IL, July 2018.
- *Pulsar Timing Constraints on the Fermi Massive Black-Hole Binary Blazar Population*
  - Session Talk, [APS April Meeting](#), Columbus, OH, April 2018.
  - Session Talk, [NANOGrav Collaboration Spring Meeting](#), NRAO, March 2018.
- *Gravitational Waves from Neutron Stars in the Common-Envelope Phase*
  - Session Talk, [Midwest Relativity Meeting](#), Oct 2018.
  - Poster, Sackler Conference: GW Astrophysics, CfA, Cambridge, MA, May 2018.
  - Poster, [Deciphering the Violent Universe](#), Playa del Carmen, Mexico, Dec 2017.
  - Seminar, Department of Physics and Astronomy, [Columbia University](#), May 2017.
  - Poster, [Physics, Puzzles, and Phenomenology of Massive Stars](#), KITP, UCSB, Mar 2017.

## Professional Service and Broader Impacts

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### Review Panels

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NASA

## Journal Refereeing

The Astrophysical Journal: Letters

## Scientific Community

Lindau Online Sciathon (June 19-21) and Science Days (June 28-July 1) 2020

o Group Leader: *Graduate Admissions during and after COVID-19*

## Conference/Workshop Service

Co-Organizer, 2021 Multiband Gravitational-Wave Science Workshop May 2021

Session Chair, 236th Meeting of the Astronomical Society June 2020

Abstract Organizer, 235th Meeting of the American Astronomical Society Oct 2019

Scientific Organizing Committee Member, NANOGrav Fall Meeting Cornell 2019

## Department Administration

Co-Organizer, Annual Department Research Symposium 2019-20

Graduate Student-Body Representative, Astronomy Department, UIUC 2018-19

Colloquium Co-Organizer, Astronomy Department, UIUC 2018-19

Graduate Admissions Committee Member, Astronomy Department, UIUC Spring 2018

Co-Chair, Astronomy Journal Club, UIUC 2016-17

Representative, Nuclear Engineering Student Advisory Council, TAMU 2011-13

## University Service

Co-Organizer, Astro Lunch Seminar, Department of Physics & Astronomy CMU 2020-21

Presentations to prospective students, Astronomy Department UIUC 2016-20

Volunteer Judge, Undergraduate Student Research Symposium UIUC 2017

## Outreach

Astronomy on Tap – Champaign-Urbana 2020

Girls' Astronomy Summer Camp UIUC 2019

[Live Interview](#) – 69th Lindau Nobel Laureate Meeting 2019

Stewardship Science Academic Programs Annual 2019

[Research Outreach](#) – [April Issue Publication](#) – [Web Article](#) 2019

National Science Honor Society – The Woodlands High School, TX 2015-17

## Workshops

Exploring Extreme Matter in the Era of Multimessenger Astronomy Aspen 2021

NextProf Faculty Workshop [UM 2019](#)

Testing Gravity School [SFU 2019](#)

MESA Summer School [UCSB 2018](#)

Common-Envelope Evolution Workshop CCA 2017

NANOGrav PTA Hackathon	<a href="#">NCSA 2016</a>
Computational Plasma Astrophysics Summer School	<a href="#">IAS 2016</a>
High Energy Density Physics Summer School	<a href="#">UM 2016</a>
“Explosions I have known.” Stirling Colgate’s Legacy in Science	<a href="#">LANL 2014</a>
Plasma Physics Introductory Summer School	<a href="#">PPPL 2013</a>

## **Professional Affiliations and Collaborations**

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American Astronomical Society	2020-Present
Dark Energy Survey Collaboration	2018-20
LISA Consortium	2018-Present
American Physical Society	2018-Present
NANOGrav Collaboration	2017-Present
LIGO-Virgo Collaboration	2016-19