David R. Rodriguez

Contact Information

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Archive Scientist at MAST with experience coding in Python and SQL to manage and analyze data, create visualizations, and produce web applications. Previous experience (8+ years) as a research astronomer carrying out independent research on a variety of topics in astrophysics.

Data Analysis, Coding, & Critical Thinking Skills

- More than 8 years of independent scientific research
- Proficient in: Python, R, SQL, HTML
- Management and development of an SQL database for our research team
- Created web application to interface with our database (http://database.bdnyc.org) and derive physical parameters (http://kinematics.bdnyc.org); these are also hosted on Heroku
- Combined data from 5 different catalogs (60 to 900 million entries) and applied numerical algorithms to estimate various quantities and select 2000 objects for further study
- Processing and analysis of data from 15 astronomical instruments
- Participant in Essentials of Data Science bootcamp

Oral, Written, & Visual Communication Skills

- Author or co-author in 26 peer-review publications and conference proceedings
- Presented 20+ talks and posters at international conferences, research institutes, and for outreach to the general public
- Created 3 press release videos:
  - "Backyard Worlds: The Search For Planet 9" (https://youtu.be/P8pRUP3jNIY)
  - "Brown Dwarfs Reveal Exoplanets' Secrets" (https://youtu.be/E8sntVB_NE4)
  - "Young, Unattached Jupiter Analog Found In Solar Neighborhood" (https://youtu.be/1QbPaQAQ-N8)
- Over 100 posts on my personal blog (strakul.blogspot.com), in which I discuss my data science projects, review books, and write about various topics
- Fluent in both English and Spanish

Leadership & Collaborative Skills

- Designed and led the GALNYSS project, which combined the efforts of 4-6 researchers to identify and characterize young stars near the Earth by combining large catalogs of data
- Helped manage the BDNYC project, which combines efforts of over a dozen researchers in the study of brown dwarf objects near the Earth
- Mentored and supervised 8 students in various research projects
- Collaborated with 19 school groups across 10 countries to time the transit of Venus and measure the distance to the Sun

Work Experience

- **Space Telescope Science Institute**, Baltimore, MD
  Archive Scientist Apr. 2017 – Present
  Working for the Barbara A. Mikulski Archive for Space Telescopes (MAST) in a variety of project including upgrading software for the ingest of new data from HST, JWST, TESS, and future missions; and upgrades to the Guide Star Catalog for use in HST and JWST.
- **American Museum of Natural History**, New York, NY
  BDNYC Project Manager Oct. 2015 – Mar. 2017
  Lead and assisted in a variety of projects ongoing within the department of Astrophysics primarily linked to studies of brown dwarfs and exoplanets (the BDNYC, or Brown Dwarfs in New York City, research group). I helped manage their SQL database of brown dwarfs and created a web interface for it. I'm also actively updating their code and database for ease of use and reliability. I've created a second web application to calculate kinematics for objects

of interest. I also created outreach visualizations with the Uniview planetarium software and incorporated additional catalogs in that software.

- **Universidad de Chile**, Santiago, Chile
  Postdoctoral Researcher & Fondecyt Fellow Oct. 2011 – Sep. 2015
  Designed GALNYSS, the GALEX Nearby Young Star Survey, which incorporated ultraviolet data from the GALEX satellite with infrared and kinematic catalogs to identify nearby young stars. Performed spectroscopic observations to confirm youth and used sub-millimeter facilities to characterize nearby protoplanetary disks. Also participated in outreach activities including helping lead events for observations of the transit of Venus.
- **University of California, Los Angeles**
  Teaching Assistant April 2007 – Sept. 2011
  Graduate Student Researcher, with Dr. B. Zuckerman May 2008 – Sept. 2011
  Graduate Student Researcher, with Dr. M. Malkan April 2007 – April 2008
- **Florida Institute of Technology**, Geospace Physics Laboratory
  Undergraduate Researcher, with Dr. M. Zhang August 2005 – June 2006
- **University of California, Los Angeles**
  Undergraduate Researcher, with Drs. M. Morris & M. Rich July – Sept. 2005
- **Florida Institute of Technology**
  Assistant C++ Programer, with Dr. J. Mantovani January – June 2004

Education

- **University of California, Los Angeles**, Los Angeles, CA
  Ph.D., Astronomy June 2011
  Thesis: *A Search for Low Mass Stars and Substellar Companions and A Study of Circumbinary Gas and Dust Disks*
  M.S., Astronomy April 2008
  Thesis: *Emission Line Properties of Seyfert Galaxies In The 12 Micron Sample*
- **Florida Institute of Technology**, Melbourne, FL
  B.S., Space Sciences, Astronomy & Astrophysics Option May 2006

Selected Publications

- Rodriguez, D. R., et al. 2015 A&A, 582, L5. *An ALMA Survey for Disks Orbiting Low-Mass Stars in the TW Hya Association*
- Rodriguez, D. R., et al. 2015, MRNAS, 449, 3160. *Stellar Multiplicity and Debris Disks: An Unbiased Sample*
- Rodriguez, D. R., et al. 2014, A&A, 567, 20. *A Dusty M5 Binary in the beta Pictoris Moving Group*
- Rodriguez, D. R., et al. 2013, ApJ, 774, 101. *The GALEX Nearby Young-Star Survey*
- Rodriguez, D. R., et al. 2012, ApJ, 748, 30. *A Substellar Companion to the Dusty Pleiades Star HD 23514*
- Rodriguez, D. R., et al. 2011, ApJ, 727, 62. *A New Method to Identify Nearby, Young, Low-mass Stars*
- Rodriguez, D. R., et al. 2010, ApJ, 720, 1684. *Imaging the Molecular Disk Orbiting the Twin Young Suns of V4046 Sgr*

Honors and Awards

- PI of Chile Fondecyt Fellowship grant #3130520 2012–2015
- Co-I in NASA Astrophysics Data Analaysis Program grant NNX12AH37G 2012–2014
- Co-I in NASA Astrophysics Data Analaysis Program grant NNX09AC96G 2009–2011
- UCLA Eugene Cota-Robles Fellowship 2006, 2008
- UCLA Department of Astronomy Summer Fellowship 2007
- FIT Faculty Honors Award 2006
- FIT Distinguished Student Scholar 2005, 2006

References

Available upon request.