

Dan Josué Deras Badillo, Ph.D.

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Research Experience

- 2021 – 2023 **Postdoctoral Position.** Dipartimento di Fisica e Astronomia, University of Bologna, Italy.
Project Title: *Light on Dark: Determination of the internal kinematics of Galactic globular clusters (GGCs) by means of an innovative combination of multi-instrument spectroscopy of individual stars and proper motion measurements with HST and Gaia.*

Education

- 2020 **Ph.D. in Astrophysics, Instituto de Astronomía, UNAM. México. *Cum Laude.***
Thesis title: *Pulsating stars in globular clusters and the study of the stellar evolution on the Horizontal Branch.*
- 2015 **M.Sc. in Astrophysics, Universität Innsbruck, Austria. AstroMundus Programme in Astrophysics.**
Thesis title: *Modelling near-surface effects in evolved solar-like oscillators.*
- 2013 **B.Sc. in Physics, Facultad de Ciencias, UNAM. México.**
Thesis title: *Estudio de las oscilaciones de tipo solar en la estrella KIC 5701829.*

Skills

- Scientific **Solid observational expertise in time-domain astronomy in a broad range of stellar variability, e.g., stellar pulsations in RR Lyrae and asteroseismology of red giants. Also, competent expertise in the study of Galactic globular clusters (GGCs). Photometric analysis of GCs. Differential Imaging Analysis. CCD photometry with filter wheel. Experience using DAOPHOT to process images from the Hubble Space Telescope.**
- Observational Experience **50+ nights of observation at the Observatorio Astronómico Nacional - San Pedro Mártir, Baja California, México; observing stellar clusters (open and globular), variable stars (RR Lyrae, SR, SX Phe, EC and EW) and white dwarfs.**
- Communication **Excellent communication skills gained through scientific and public outreach talks and through teaching undergraduate courses.**
- Languages **Spanish (Native). English (Fluent). Working knowledge of Italian. Basic German.**

Research Publications

Journal Articles

- 1 Deras, D., Cadelano, M., Ferraro, F. R., Lanzoni, B., & Pallanca, C. (2023). Digging into the Galactic Bulge: Stellar Population and Structure of the Poorly Studied Cluster NGC 6316., *942*(2), 104. [doi:10.3847/1538-4357/aca9ce](https://doi.org/10.3847/1538-4357/aca9ce). arXiv: 2212.03649 [astro-ph. GA]
- 2 Deras, D., Arellano Ferro, A., Bustos Fierro, I., & Yepez, M. A. (2022). A New Visit to the Variable Stars in M56 and its Colour-Magnitude Diagram Structure. *58*, 121–132. [doi:10.22201/ia.01851101p.2022.58.01.10](https://doi.org/10.22201/ia.01851101p.2022.58.01.10). arXiv: 2202.09395 [astro-ph. SR]
- 3 Yepez, M. A., Arellano Ferro, A., Deras, D., Bustos Fierro, I., Muneer, S., & Schröder, K. -. (2022). A new photometric study of M14 (NGC 6402): an interpretation of the horizontal branch and beyond., *511*(1), 1285–1302. [doi:10.1093/mnras/stac054](https://doi.org/10.1093/mnras/stac054). arXiv: 2201.02160 [astro-ph. SR]
- 4 Yepez, M. A., Arellano Ferro, A., & Deras, D. (2020). CCD VI time-series of the extremely metal-poor globular cluster M92: revisiting its variable star population., *494*(3), 3212–3226. [doi:10.1093/mnras/staa637](https://doi.org/10.1093/mnras/staa637). arXiv: 2003.00087 [astro-ph. SR]
- 5 Deras, D., Arellano Ferro, A., Lázaro, C., Bustos Fierro, I. H., Calderón, J. H., Muneer, S., & Giridhar, S. (2020). NGC 6712: the variable star population of a tidally disrupted globular cluster., *493*(2), 1996–2014. [doi:10.1093/mnras/staa196](https://doi.org/10.1093/mnras/staa196). arXiv: 2001.08306 [astro-ph. SR]
- 6 Deras, D., Arellano Ferro, A., Lázaro, C., Bustos Fierro, I. H., Calderón, J. H., Muneer, S., & Giridhar, S. (2019). A new study of the variable star population in the Hercules globular cluster (M13; NGC 6205), *486*(2), 2791–2808. [doi:10.1093/mnras/stz642](https://doi.org/10.1093/mnras/stz642). arXiv: 1903.01572 [astro-ph. SR]
- 7 Deras, D., Arellano Ferro, A., Muneer, S., Giridhar, S., & Michel, R. (2018). Physical parameters of RR Lyrae stars in NGC 6171. *Astronomische Nachrichten*, *339*(603), 603–614. [doi:10.1002/asna.201813489](https://doi.org/10.1002/asna.201813489). arXiv: 1810.02388 [astro-ph. SR]
- 8 Kjurkchieva, D. P., Michel, R., Popov, V. A., & Deras, D. (2018). Observations and light curve solutions of three ultrashort-period W UMa binaries., *62*, 41–45. [doi:10.1016/j.newast.2018.01.007](https://doi.org/10.1016/j.newast.2018.01.007)
- 9 Arellano Ferro, A., Rosenzweig, P., Luna, A., Deras, D., Muneer, S., Giridhar, S., & Michel, R. (2018). Period changes in the RR Lyrae stars of NGC 6171 (M107). *Astronomische Nachrichten*, *339*(158), 158–167. [doi:10.1002/asna.201813409](https://doi.org/10.1002/asna.201813409). arXiv: 1801.04347 [astro-ph. SR]

Conference Proceedings

- 1 Deras, D., Arellano Ferro, A., Lázaro, C., Bustos Fierro, I. H., & Calderón, J. H. (2021). A New Study of the Variable Star Population in the Hercules Globular Cluster (M13, NGC 6205). In K. Kinemuchi, C. Lovekin, H. Neilson, & K. Vivas (Eds.), *Rr lyrae/cepheid 2019: Frontiers of classical pulsators* (Vol. 529, p. 179).
- 2 Fox-Machado, L., & Deras, D. (2016). An analysis of the solar-like oscillations in the red giant star KIC 5701829 observed with Kepler. (Vol. 29B, pp. 544–547). [doi:10.1017/S1743921316006098](https://doi.org/10.1017/S1743921316006098)
- 3 Fox-Machado, L., & Deras, D. (2015). An analysis of the solar-like oscillations in the red giant star KIC 5701829 observed with KEPLER. In *Iau general assembly* (Vol. 29, p. 2254049).

Scientific Talks







- 2019
- A new study of the variable star population in the Hercules globular cluster (M13; NGC 6205). Sternwarte Hamburg, Germany.
 - A new study of the variable star population in the Hercules globular cluster (M13; NGC 6205). Astromundus Alumni Retreat. Valjevo, Serbia.
 - A new study of the variable star population in the Hercules globular cluster (M13; NGC 6205). RRL/Cep 2019 Conference. Frontiers of Classical pulsators: Theory and observations. Cloudcroft, New Mexico. USA.
 - A new study of the variable star population in the Hercules globular cluster (M13; NGC 6205). 108th Annual Meeting of the American Association of Variable Stars Observers (AAVSO). Las Cruces, New Mexico. USA.
 - NGC 6712: The variable star population of a tidally disrupted globular cluster. At Instituto de Astronomía, UNAM. Ensenada, B.C. Mexico.
- 2018
- Physical parameters of RR Lyrae stars in NGC 6171. At Instituto de Astronomía, UNAM. Mexico City, Mexico.
- 2017
- Period changes in the RR Lyrae stars of NGC 6171 (M107). At Instituto de Astronomía, UNAM. Mexico City, Mexico.
- 2016
- Modelling near-surface effects in evolved solar-like oscillators. At Instituto de Astronomía, UNAM. Mexico City, Mexico.

Teaching





- 2021
- Lab of Electromagnetic Phenomena. Facultad de Ciencias, UNAM. Mexico.
 - Lab of Electromagnetic Phenomena. Facultad de Ciencias, UNAM. Mexico.
- 2020
- Advanced Mathematical Methods for Physicists. Facultad de Ciencias, UNAM. Mexico.
 - Lab of Collective Phenomena. Facultad de Ciencias, UNAM. Mexico.
- 2019
- Intro to Human Body Physics. Facultad de Ciencias, UNAM. Mexico.
- 2018
- General Astrophysics. Facultad de Ciencias, UNAM. Mexico.
 - General Astrophysics. Facultad de Ciencias, UNAM. Mexico.
- 2017
- Methodology of Experimental Physics. Facultad de Ciencias, UNAM. Mexico.
 - Measurements and Analyses in Experimental Physics. Facultad de Ciencias, UNAM. Mexico.

Outreach

Talks

- 2018  Gravitational lenses: Universe's natural telescopes.
- 2017  From Sienna to Alexandria: How do we know Earth is round?
 -  Eclipses: What are they and what can we learn from them?
 -  A brief history of the Universe.
- 2016  The Universe: Our conception of it and the paradigm shift.
 -  Listening to see: The sounds of the stars.

Workshops

- 2022  Acted as evaluator for the "XVII Concurso Leamos La Ciencia para Todos, FCE", sponsored by the Fondo de Cultura Económica.
- 2020  Ciencia Nocturna: Star party at the archaeological site of Xochicalco, Morelos. I collaborated as a staff member in charge of using amateur telescopes for the attendees while explaining the properties of the celestial objects.
- 2019  Project Estrelleros: Bringing astronomy to Children Hospitals in Mexico City, Mexico. I collaborated as a staff member in charge of the sessions carried out at the mobile planetarium.
- 2018  Astronomy Workshop for elementary and middle school students in Hidalgo state. I collaborated as a staff member interacting with children and adults.

Contacts

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