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Education

- 2021 – **Ph.D., UNSW Canberra** Physics (Astrophysics).
Thesis topic: *Analysis of the formation channels and characteristics of sub-dwarf B stars through computational methods.*
Supervisors: *Dr. Ashley Ruiter (Primary), Dr. Ivo Seitenzahl.*
- 2016 – 2020 **B.Sc. Pontificia Universidad Catolica de Chile** Astronomy.
Undergrad. thesis title: *Period-change rates in the Large Magellanic Cloud's Classical Cepheids.*

Employment History

- 2024 **ZPEM1502 Physics 1B: Electromagnetism and Modern Physics, Tutor.** Guide, solve and explain physics problems for Undergraduate students UNSW Canberra. Duties include going through a step-by-step solving process, reviewing and highlighting the most relevant concepts and solving questions of 1st year physics ADFA officer trainees.
- 2023 – 2024 **ZPEM1501 Physics 1A: Mechanics, Waves and Thermodynamics, Laboratory Demonstrator.** Physics experiments for Undergraduate students at UNSW Canberra, duties include demonstrating experiments, supervising the execution/procedure and grading laboratory reports on a weekly basis for 1st year physics ADFA officer trainees.
- 2020 – **Research Assistant.** DECam data management and reduction for Prof. Márcio Catelan. The database consists of hundreds of images in the *griz* filters, from which light curves are regularly extracted.



Certificates

- 2022 **Java Programming I** University of Helsinki, Computer Science Department.
Validate: <https://certificates.mooc.fi/validate/op8od19ryh4r>
- 2018 **Data-driven Astronomy** Coursera - University of Sydney.
Validate: <https://coursera.org/verify/LN7T4DZ24W43>

Awards and Successful Proposals



- 2024 **ANU 2.3m telescope observing proposal (PI), WiFeS spectrograph.**
Sample of Hot Subdwarf Stars, 20 hours.
- AAT 3.9m telescope observing proposal (Co-I), Veloce spectrograph.**
High resolution spectroscopy for abundance studies of HdC stars located in diverse Galactic sub-structures with AAT/Veloce, 5 nights.
- Blanco 4m telescope observing proposal (Co-I), DECam wide-field CCD imager.**
Deep Drilling in the Time Domain with DECam, multiple nights (see NOIRLab proposals 2023A-716082, 2024A-941948 for details).
- J-P Macquart Award, runner up, ANITA 2024 workshop.**
Distinction awarded to the best student talk by the Australian National Institute for Theoretical Astrophysics (ANITA).
- 2022 **AAT 3.9m telescope observing proposal (Co-I), Veloce spectrograph.**
High resolution spectroscopy of the faintest HdC stars with AAT/Veloce, 4 nights.

Awards and Successful Proposals (continued)





- 2021  **UNSW Tuition Fee Scholarship**, University Of New South Wales, Australia.
Highly competitive award, tenable for 3,5 years (Research Doctorate).
- 2019  **ESO Summer Students Internship**, ESO Vitacura (Chile) - Paranal Observatory (Chile).
Competitive internship position to gain experience working as both a researcher and observer at ESO premises in Chile.

Research Publications

Journal Articles (First Author)

- 1 N. Rodríguez-Segovia, A. J. Ruitter, and I. R. Seitzzahl, *Population synthesis of hot-subdwarf B stars with COMPAS: parameter variations and a prescription for hydrogen-rich shells*, Dec. 2024.  DOI: 10.1017/pasa.2024.135.
- 2 N. Rodríguez-Segovia, G. Hajdu, M. Catelan, *et al.*, *Period-change rates in Large Magellanic Cloud Cepheids revisited*, Jan. 2022.  DOI: 10.1093/mnras/stab3246. arXiv: 2111.03503 [astro-ph.SR].

Journal Articles (Co-Author)

- 1 K. Baeza-Villagra, N. Rodriguez-Segovia, M. Catelan, *et al.*, *High-cadence stellar variability studies of RR Lyrae stars with DECAM: New multi-band templates*, Jan. 2025.  DOI: 10.48550/arXiv.2501.03813. arXiv: 2501.03813 [astro-ph.SR].
- 2 E. K. Owusu, S. Buder, A. J. Ruitter, I. R. Seitzzahl, and N. Rodriguez-Segovia, *At the same age, metallicity, and alpha-enhancement, sodium is a more effective tracer of the young and old sequences of the Milky Way disc*, Nov. 2024.  DOI: 10.1017/pasa.2024.85. arXiv: 2405.00315 [astro-ph.GA].
- 3 M. L. Graham, R. A. Knop, T. D. Kennedy, *et al.*, *Deep drilling in the time domain with DECAM: survey characterization*, Mar. 2023.  DOI: 10.1093/mnras/stac3363. arXiv: 2211.09202 [astro-ph.IM].
- 4 F. Espinoza-Arancibia, M. Catelan, G. Hajdu, *et al.*, *Period change rates of Large Magellanic Cloud Cepheids using MESA*, Nov. 2022.  DOI: 10.1093/mnras/stac2732. arXiv: 2209.10609 [astro-ph.SR].

Conferences & Workshops

- 2024  **Stars in Brisbane 2024**, University of Southern Queensland, QLD.
Talk: *Sub-dwarf B Stars with COMPAS and MESA*.
-  **MESA Down Under**, Sydney University, NSW.
Attendee. Modules for Experiments in Stellar Astrophysics (MESA) is a 1-D stellar structure and evolution code. This workshop covered topics such as AGB and massive stars, tides, binaries and white dwarf binaries.
-  **ANITA 2024: Workshop and School**, Monash University, VIC.
Talk: *Sub-dwarf B Stars with COMPAS and MESA*. School topic: Tidal Disruption Events.
-  **Transients Down Under 2024**, Swinburne University, VIC.
Poster: *Hot sub-dwarfs with the COMPAS population synthesis code*. Member of the organizing committee.
- 2023  **ANITA 2023: Workshop and School**, University of Adelaide, SA.
Talk: *Core mass at helium ignition and its importance for sdB stars*. School topic: Astroparticle Physics & Extreme Transients.

Conferences & Workshops (continued)

- **ADACS ECR Python Workshop**, University of Melbourne, VIC.
Attendee. Main contents: Profiling, optimisation, parallelisation, project planning, project design and structure, version control using Git, debugging and unit testing, collaborative software development.
- **Harley Wood School**, Wollongong, NSW.
Attendee. Topic: *State-of-the-art facilities: What science can you do with them and how?*
- **ASA ASM**, Macquarie University, NSW.
Attendee, Astronomical Society of Australia (ASA) Annual Science Meeting.
- **sdOB11 – 11th international conference on Hot Subdwarf Stars and Related Objects**, Armagh Observatory and Planetarium, Northern Ireland, UK.
Talk: *Sub-dwarf B Stars with COMPAS and MESA*.
- 2022 ■ **ANITA 2022: Workshop and School**, Online.
Talk: *Helium White Dwarfs: Formation and Evolution*. School topic: Galactic Archaeology.
- **The Next Big Thing**, UNSW Canberra, ACT.
Talk: *Gravitational Waves and the Laser Interferometer Space Antenna (LISA)*. Conference consisting of short (5-minute or less) talks.

Skills

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| Languages | ■ Spanish: Native. English: Strong proficiency (last TOEFL iBT scores: R:30, L:29, S:28, W:29). Korean: Upper intermediate (mostly self-taught, with a recent certificate provided by Korea University after attending a short online course on 2023). |
| Programming | ■ <i>Advanced</i> : Scientific Python. <i>Intermediate</i> : C++, Java. <i>Basic</i> : C, Julia, SQL, ADQL, fortran, bash, L ^A T _E X. |
| OS | ■ Linux (several distributions), Windows. |
| Software | ■ TOPCAT, MESA, COMPAS, ALADIN, VS CODE. |
| Misc. | ■ Time series analysis, collaborative programming on GitHub, usage of databases such as Gaia. |

Supervision and Mentorship

- 2023 ■ **Finn Loughman**, Honours Student from Trinity College Dublin (Ireland).
Supervised and provided advice during Finn's 9 weeks at UNSW Canberra in the context of his practicum project using the COMPAS binary population synthesis code to study R CrB star formation rates.
- 2020 – ■ **Undergraduate and Masters Students - Pontificia Universidad Catolica de Chile**, members of Prof. Márcio Catelan's Stellar Astrophysics group.
Provided general advice and technical support for students working on their undergraduate thesis or master thesis, focusing on Variable Stars and using time series.

Additional Research Experience

- 2019 – 2020 ■ **Bright Calibrators for MATISSE - ESO Chile**, design and implementation of a list of sources to be used as calibrator stars for the MATISSE instrument at the VLT-I in Paranal Observatory, under ESO's *Summer Students* program. Testing of data-reduction pipelines and user experience.

Additional Research Experience (continued)

- 2018 – 2019 **Machine Learning for AGN Detection - Pontificia Universidad Catolica de Chile**, implementation of Machine Learning methods for the detection of AGN based on multi-band photometry. Surface density of sources (per square degree) used as estimate for the expected number of AGN in future astronomical surveys, particularly in the context of the Multi Object Optical and Near-infrared Spectrograph (MOONS).

Other Experience

- 2023 – 2024 **Transients Down Under 2024**, created and maintained the website (<https://transientsdownunder.github.io/>) for the conference by using GitHub pages. The final product is a customized version of a freely available template. This involved design, structure, widgets, etc. Additional tasks included overseeing the conference's email inbox and providing support on-site.