

Jaime Villaseñor

Astronomer

Contact

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Languages


Spanish (native)
English (fluent)
German (basic)

Programming

Python ●●●●●
SM ●●○○○
Wolfram ●●○○○
IDL ●●●○○
L^AT_EX ●●●●●

Software

PHOEBE ●●●●○
MESA ●●●●○
TOPCAT ●●●●●
IRAF ●●●●○
Aladin ●●●○○

Developer of the Massive
bINaries Analysis TOols
(MINATO) available at 

Interests

Evolution of massive stars,
multiplicity, orbital properties
of massive binaries,
spectroscopy, spectral
classification, CCSNs,
compact binaries, HMXBs,
gravitational-wave sources,
stripped stars, OB+BH
binaries.

Work

- 09.2023–Present **Postdoctoral Research Associate** MPIA, Germany
Working for ERC Advanced Grant "Hunting Dormant Black Holes in the Galaxy with SDSS-V" (PI: HW. Rix).
Link: <https://www.mpia.de/rix/team>
- 09.2021–08.2023 **Postdoctoral Research Associate** KU Leuven, Belgium
Working for the MULTIPLES research programme under an ERC consolidator grant (PI: H. Sana).
Link: <https://fys.kuleuven.be/ster/research-projects/multiples>

Education

- 2016–2021 **Ph.D. Astronomy** University of Edinburgh, U.K.
Thesis *The multiplicity properties and spectral classification of B-type stars*
Supervisor Prof. Dr. Chris Evans
- 2014–2016 **M.Sc. Astronomy** University of La Serena, Chile
with maximum distinction
Thesis *Spectral Classification of B-Type Stars Observed in the Framework of the "Galactic O-Star Spectroscopic Survey"*
Supervisor Prof. Dr. Rodolfo Barbá
- 2007–2012 **B.Sc. Physics with a major in Astronomy** University of Valparaíso, Chile
with distinction
Thesis *Evolution of Compact Binaries: The Future of Post-Common-Envelope Binaries*
Supervisor Prof. Dr. Matthias Schreiber

Publications

Refereed

- The B-type Binaries Characterisation Programme - II. VFTS 291: a stripped star from a recent mass transfer phase
J. I. Villaseñor, D. J. Lennon, A. Picco, T. Shenar, P. Marchant, N. Langer, P. L. Dufton, F. Nardini, C. J. Evans, J. Bodensteiner, S. E. de Mink, Y. Götzberg, I. Soszyński, W. D. Taylor, and H. Sana
2023, *MNRAS*, 525, pp. 5121–5145
- Searching for compact objects in the single-lined spectroscopic binaries of the young Galactic cluster NGC 6231
G. Banyard, L. Mahy, H. Sana, J. Bodensteiner, **J. I. Villaseñor**, K. Sen, N. Langer, S. de Mink, A. Picco, and T. Shenar
2023, *A&A*, 674, A60
- Properties of the Be-type stars in 30 Doradus
P. L. Dufton, D. J. Lennon, **J. I. Villaseñor**, I. D. Howarth, C. J. Evans, S. E. de Mink, H. Sana, and W. D. Taylor
2022, *MNRAS*, 512, pp. 3331–3344

Refereed - continued

The observed multiplicity properties of B-type stars in the Galactic young open cluster NGC 6231

G. Banyard, H. Sana, L. Mahy, J. Bodensteiner, **J. I. Villaseñor**, and C. J. Evans

2022, *A&A*, 658, A69

The VLT-FLAMES survey of massive stars. NGC 2004#115: A triple system hosting a possible short period B+BH binary

D. J. Lennon, P. L. Dufton, **J. I. Villaseñor**, C. J. Evans, N. Langer, R. Saxton, I. M. Monageng, and S. Toonen

2022, *A&A*, 665, A180

The B-type binaries characterization programme I. Orbital solutions for the 30 Doradus population

J. I. Villaseñor, W. D. Taylor, C. J. Evans, O. H. Ramírez-Agudelo, H. Sana, L. A. Almeida, S. E. de Mink, P. L. Dufton, and N. Langer

2021, *MNRAS*, 507, pp. 5348–5375

Revisiting the post-common-envelope binaries HZ 9, KV Vel and Abell 65

C. Rios-Venegas, A. Contreras-Quijada, N. Vogt, F. -J. Hamsch, R. Hinojosa, J. Aranda, V. Gotta, R. Jerez, E. Puebla, J. Rey, and **J. I. Villaseñor**

2020, *MNRAS*, 493, pp. 1197–1203

Determination of Pulsation Periods and Other Parameters of 2875 Stars Classified as MIRA in the All Sky Automated Survey (ASAS)

N. Vogt, A. Contreras-Quijada, I. Fuentes-Morales, S. Vogt-Geisse, C. Arcos, C. Abarca, C. Agurto-Gangas, M. Caviedes, H. DaSilva, J. Flores, V. Gotta, F. Peñaloza, K. Rojas, and **J. I. Villaseñor**

2016, *ApJS*, 227, p. 6

Non-refereed

The VLT-FLAMES Tarantula Survey

C. Evans, D. Lennon, N. Langer, and 40 co-authors including **J. I. Villaseñor**

2020, *The Messenger*, 181, pp. 22–27

Observational Experience

Observations

09.2022 & 03.2023 **22 nights** of observations operating Hermes spectrograph at Mercator Telescope, La Palma, Spain.

Supervision

09.2022–	Co-supervisor of student Ruchya Karthik. Master thesis: “ <i>Multiplicity Properties of Young B-type star populations</i> ”.	KU Leuven, Belgium
10.2022–12.2022	Supervisor of students Eva Kuipers, Jasmine Vrancken & Sasha Fonteijn. Master research project: “ <i>Determination of physical parameters of B-type binaries from the BBC programme</i> ”.	KU Leuven, Belgium
10.2022–12.2022	Supervisor of students Evi Goethuys & Lukas Rosseels. Bachelor research project: “ <i>Determination of orbital properties of massive binary stars with PHOEBE</i> ”.	KU Leuven, Belgium
03.2022–05.2022	Co-supervisor of student Federica Nardini. Master theoretical research project: “ <i>Analysing the candidate B+BH VFTS 291 with MESA</i> ”.	KU Leuven, Belgium

Teaching

- 11.2022 **Lecturer** KU Leuven, Belgium
One lecture on astronomical spectroscopy for the bachelor course “Astronomy Methods, Tools and Techniques”.
- 10.2022–12.2022 **Teaching Assistant** KU Leuven, Belgium
Tutorials for the bachelor course “Astronomy Methods, Tools and Techniques”.
- 10.2021–12.2021 **Teaching Assistant** KU Leuven, Belgium
Tutorials on the PHYSICS OF ECLIPSING BINARIES (Phoebe) software for the master course “Binary Stars”.
- 01.2017–05.2019 **Teaching Assistant** University of Edinburgh, U.K.
Tutorials and graded coursework and exams of undergraduate physics and astronomy courses (Stellar Evolution, Astrophysics Laboratory, Introduction to Astrophysics, Discovering Astronomy, Physics of Fields and Matter).
- 03.2015–03.2016 **Teaching Assistant** University of La Serena, Chile
Tutorials and taught and graded laboratory section of an undergraduate physics course (Electromagnetism and Thermodynamics).
- 08.2009–01.2012 **Undergraduate Teaching Assistant** University of Valparaiso, Chile
Tutorials of undergraduate physics and mathematics courses (Mathematics I and IV, Analytic Geometry, Thermodynamics).

Awards

- 2017 **Postgraduate, Postdoctoral and Early Career Researcher Short-Term Visits funding**
from Scottish Universities Physics Alliance (SUPA).
to visit Dr Simón-Díaz at the IAC (Tenerife) to learn and work on quantitative analysis of massive stars.
web https://www.supa.ac.uk/opportunities/funding/pecre_apply
- 2016 **Becas Chile scholarship**
from National Commission for Scientific and Technological Research (CONICYT)
to enrol in the PhD in Astrophysics programme at the University of Edinburgh
web https://www.anid.cl/doctorado_en_el_extranjero/
- 2014 **DIDULS scholarship**
from Research Direction from University of La Serena
to enrol in the MSc in Astronomy programme
web http://vipuls.userena.cl/investigacion/financiamiento_interno/

Presentations

Talks

- 06.2023 **The Renaissance of Stellar Black-Hole Detections in The Local Group**
Leiden, The Netherlands
The Search for OB+BH/NS Systems from the B-type Binaries Characterisation (BBC) Programme
- 03.2023 **XV VLT-FLAMES Tarantula Survey Meeting**
Munich, Germany
Binary interaction products from the BBC programme
- 10.2022 **Talk during visit to Dr Tomer Shenar at Anton Pannekoek Institute**
Amsterdam, The Netherlands
The B-Type Binaries Characterisation programme: A closer look at the Tarantula’s massive binaries
- 06.2022 **XIV VLT-FLAMES Tarantula Survey Meeting**
Heidelberg, Germany
VFTS 291: A stripped star + OB companion from the BBC programme

- 07.2021 **European Astronomical Society Annual Meeting 2021**
Virtual
The B-type Binaries Characterisation programme: Searching for compact companions
- 05.2019 **XII VLT-FLAMES Tarantula Survey Meeting**
Edinburgh, Scotland
The B-type Binaries Characterisation (BBC) Project
- 05.2017 **X VLT-FLAMES Tarantula Survey Meeting**
Leuven, Belgium
B-type Stars from the "Galactic O-Star Spectroscopic Survey" (GOSSS): Standard Stars & Spectral Classification
- 03.2015 **XIII Annual Meeting of the Chilean Astronomical Society (SOCHIAS)**
Antofagasta, Chile
B-type Giant and Supergiant Stars in the "Galactic O-type Star Spectroscopic Survey": Spectral Classification
- 10.2012 **X Annual Meeting of the Chilean Astronomical Society (SOCHIAS)**
Viña del Mar, Chile
Evolution of Cataclysmic Variables: The Future of Post-Common-Envelope Binaries
- 10.2012 **First National Conference of Students of Physics and Astronomy**
Viña del Mar, Chile
Understanding Cataclysmic Variables through Post-Common-Envelope Binaries

Posters

- 05.2022 **IAU Symposium 361: Massive Stars Near and Far**
Ballyconnell, Ireland
VFTS 291: A stripped star above the Chandrasekhar limit with an elusive companion
- 11.2018 **Massive stars and Supernovae**
Bariloche, Argentina
Orbital Periods from the B-star Binary Characterisation Project
- 11.2017 **XXIX Canary Islands Winter School of Astrophysics**
Tenerife, Spain
Characterisation of B-type Binaries from the Tarantula Nebula
- 03.2015 **XIII Annual Meeting of the Chilean Astronomical Society (SOCHIAS)**
Puerto Varas, Chile
Spectral classification of B-type stars observed in the framework of the "Galactic O Star Spectroscopic Survey"

Schools

- 06.2022 **Summer School in Statistics for Astronomers XVII**
Penn State, Pennsylvania, USA (online)
- 11.2017 **XXIX Canary Islands Winter School of Astrophysics: Application of Radiative Transfer to Stellar and Planetary Atmospheres**
Instituto de Astrofísica de Canarias, Tenerife, Spain
- 08.2015 **La Serena School for Data Science: Applied Tools for Astronomy**
AURA Campus, La Serena, Chile
- 03.2013 **Summer School in Planetary Formation**
Departamento de Astronomía, Universidad de Chile, Santiago, Chile
- 01.2012 **ESO workshop: Variability at different evolutionary stages of binary stars**
ESO, Santiago, Chile.

03.2011 **ESO workshop: Evolution of Compact Binaries**
Viña del Mar, Chile

Outreach

- 03.2022 **Speaker** for KU Leuven's programme "Kinderuniversiteit" for children between 8 and 13 years old. We presented the talk "A Spanish journey through the cosmos".
- 2014–2016 **Tourist guide** of ESO's La Silla Observatory.
- 2015 **Speaker** of the programme *Research on Stellar Astrophysics, Teaching and Outreach Activities at Universidad de Valparaiso*, funded by ESO, Mixed Committee Government of Chile and scientific initiative Millennium Nucleus of the Milky Way to perform activities in schools of the IV, V and VI region of Chile.