SARAH VILLANOVA BORGES

svborges@uwm.edu

EDUCATION

Technological Institute of Aeronautics (ITA), Brazil *Mar 2012 – Dec 2017*
Bachelor's in Aeronautical Engineering, with a Minor in Physical Engineering

Technological Institute of Aeronautics (ITA), Brazil *Mar 2017 – Dec 2018*
Master of Science in Physics
Thesis: "Emission Models of Soft Gamma-Ray Repeaters/Anomalous X-Ray Pulsars Described as White Dwarfs"

University of Wisconsin-Milwaukee (UWM), USA *Jan 2021 – Present*
PhD Student in Physics — Expected Defense: Oct 2025 (date TBD)

OTHER RESEARCH EXPERIENCES

European Southern Observatory (ESO) - Chile *Mar 2019 - Jul 2019*
Visiting Graduate Student

National Institute for Space Research (INPE) - Brazil *Aug 2014 - Feb 2017*
Undergraduate research

PEER-REVIEWED PUBLICATIONS

Borges, S.V. et al. "An White-Dwarf accreting model for the anomalous X-ray Pulsar 4U 0142+61", ApJ, 2020.

– This paper was featured in a AAS author series interview on Feb 12th, 2021:

`https://www.youtube.com/watch?v=JPqG7-ifE_k&t=13s`

Valsan, V., **Borges, S.V.** et al. "Envelope ejection and the transition to homologous expansion in common-envelope events", MNRAS, 2023.

SUBMITTED PUBLICATION

Borges, S.V. "A correlation between the final separation and mass ratio from Common Envelope simulations". Submitted to ApJ in May 2025.

IN PREPARATION

Borges, S.V. & Chang, P. "How the geometry of the ejected envelope during Common Envelope impacts Planetary Nebulae morphology". To be submitted during Summer 2025.

INDEXED CONFERENCE PROCEEDINGS

Borges, S.V. et al. "Can the anomalous X-ray pulsar 4U 0142+61 be described as an accreting white dwarf?". The Fifteenth Marcel Grossmann Meeting on General Relativity, 2022

Borges, S.V. "A study of the infrared emission of SGR/AXPs in a disk scenario and its implications for their origin". The Sixteenth Marcel Grossmann Meeting on General Relativity, 2023

SELECTED CONFERENCES

– Rise Time 2024, Purdue, Indiana, USA, Aug 2024. "Planetary Nebulae shaping during Common Envelope".
–XVII Marcel Grossman Meeting, Online, Jul 2024. “Estimating the optical/infrared magnitudes of ultra-slow radio pulsars as white dwarfs”.
– 32nd Midwest Relativity Meeting, Rochester, Michigan, USA Oct 2022."Do magnetars have a disk? An X-rays/Infrared correlation for Soft-Gamma Ray Repeaters and Anomalous X-ray Pulsars".
–XVI Marcel Grossman Meeting, Online, Jul 2021. “A study of the infrared emission of SGR/AXPs in a disk scenario and its implications for their origin”.
–XV Marcel Grossman Meeting, Rome, Italy, Jul 2018. “Can the anomalous X-ray pulsar 4U 0142+61 be described as an accreting white dwarf?”.
– XLII Brazilian Astronomical Society (SAB) meeting, São Paulo, Brazil, Jul 2018. "Can the anomalous X-ray pulsar 4U 0142+61 be described as an accreting white dwarf?”. –XV Hadron Physics meeting, São José dos Campos, Brazil, Sep 2021. "Can the anomalous X-ray pulsar 4U 0142+61 be described as an accreting white dwarf?”.
–XLIII Brazilian Astronomical Society (SAB) meeting, São Paulo, Brazil, Sep 2019. "Can the infrared emission of all Soft Gamma-Ray Repeaters and Anomalous X-ray Pulsars be explained by an irradiated disk?".
– XLI Brazilian Astronomical Society (SAB), São Paulo, Brazil, Sep 2017. “Can Soft Gamma-Ray Repeaters and Anomalous X-Ray Pulsars be described as white dwarfs?”.

SEMINARS

–**ESO, Chile**, Jul 11th 2019: "Can the infrared emission of all Soft Gamma-Ray Repeaters and Anomalous X-ray Pulsars be explained by an irradiated disk? "
–**INPE, Brazil**, Aug 4th 2020: "A Magnetic White Dwarf Accretion Model for the Anomalous X-Ray Pulsar 4U 0142+61"
–**UWM, USA**, Nov 4th 2022: "Do magnetars have a disk? An X-ray/Infrared correlation for Soft-Gamma Ray Repeaters and Anomalous X-ray Pulsars"

SUMMER SCHOOLS AND WORKSHOPS

– GROWTH Astronomy School 2020 - August 17-21 2021 - Online
– N-Body Workshop - June 27 - July 1 2022 - Flatiron Institute, USA
– MESA Summer School - August 8-12 2022 - UC Santa Barbara, USA
– CyberInfrastructure Comprehensive, Applied and Tangible Summer School (CIberCATSS) - May 30 - July 14 2023 - UW Milwaukee, USA

SCHOLARSHIPS AND FELLOWSHIPS

– Spring 2023/2024 - Victor Vega Scholarship, USA (UWM)
– Summer 2022 - David Lichtman Memorial Fellowship, USA (UWM)
– Mar 2017 – Jul 2018 - Graduate scholarship from Coordination for the Improvement of Higher Education Personnel, Brazil (CAPES).
– Dec 2016 – Feb 2017 - Undergraduate Scholarship from Foundation for Research Support of the State of São Paulo, Brazil (FAPESP);
– Aug 2014 – Nov 2016 - Undergraduate Scholarship from National Institute of Spatial Research/ Institutional Scholarship Program, Brazil (PIBIC/INPE/CNPq);

TEACHING EXPERIENCE

Graduate Teaching Assistant - UWM
–Spring 2021 - ASTRON 104 (Astronomy Laboratory) - Grader

–Spring 2021 - PHYSICS 422 (Electricity and Magnetism II) - Grader
– Fall 2021/Fall 2022/Spring 2023 - PHYSICS 120 (non-calculus Mechanics) - Discussion Sections
– Spring 2022 - PHYSICS 122 (non-calculus Electricity and Magnetism) - Discussion Sections

OTHER PROFESSIONAL EXPERIENCE

Brazilian Air Force *Jan 2012 - Nov 2012*
Completed mandatory military service as part of ITA's first-year undergraduate program.

OUTREACH

Women in STEM – ITA, Brazil *Mar 2016 – Oct 2017*
A partnership between ITA and Johnson & Johnson to inspire young girls to pursue STEM careers. As a member, I helped at engineering workshops and gave science talks at local high schools.

Coffeeshop Astrophysics *2021 – Present*
Monthly public talks by UWM physics graduate students at a local coffee shop. As a regular speaker, I co-presented the following talks:

– "How Do Stars Float? Great Questions from Kids You Might Not Know the Answer To"Sept 24, 2022
–"The Science of Science Fiction"– May 6, 2023
–"Ancient Astronomy"– Sept 23, 2023
–"The Last 10 Years of Astrophysics"– May 11, 2024
–"Galaxies: From Cradle to Grave"– Sept 28, 2024
–"Auroras: Cosmic Light Show"– Mar 29, 2025

Recordings of all talks are available on the Coffeeshop Astrophysics YouTube channel:
`https://www.youtube.com/@coffeeshopastrophysics4696`