

Jesús M. Rueda-Becerril

PhD

525 Northwestern Avenue
West Lafayette
IN 47907, USA
✉ jruedabe@purdue.edu
🌐 altjerue.github.io
in [jeruebe](#)
🐦 [jerue103](#)
🔗 [altjerue](#)
Nationality: Mexican

Last Updated: September 13, 2020

Professional Experience

Postdoctoral Fellow

Department of Physics and Astronomy, Purdue University, USA

Oct. 2018 – Present

MENTOR: Prof. Dimitrios Giannios

Postdoctoral Fellow

Instituto de Física y Matemáticas, Universidad Michoacana de San Nicolás de Hidalgo, Mexico

Jan. – Sep. 2018

MENTOR: Prof. Francisco S. Guzmán

Graduate research assistant

Departament d'Astronomia i Astrofísica, Universitat de València, Spain

Oct. 2011 – Jul. 2017

SUPERVISORS: Prof. Miguel A. Aloy & Dr. Petar Mimica

Graduate research assistant

Instituto de Física y Matemáticas, Universidad Michoacana de San Nicolás de Hidalgo, Mexico

Aug. 2009 – Sep. 2011

SUPERVISOR: Prof. José A. Cervera

Undergraduate research assistant

Facultad de Ciencias, Universidad Autónoma del Estado de México, Mexico

Sep. 2008 – May 2009

SUPERVISOR: Prof. Francisco S. Guzmán

Education

Ph.D. in Physics

Universitat de València, Spain

SUPERVISORS: Prof. Miguel A. Aloy & Dr. Petar Mimica.

Oct. 2011 – Jul. 2017

THESIS: *Numerical treatment of radiation processes in the internal shocks of magnetized relativistic outflows.*

HONORS: Excellent cum laude.

M.Sc. in Physics

Universidad Michoacana de San Nicolás de Hidalgo, Mexico

SUPERVISOR: Prof. José A. Cervera

Aug. 2009 – Sep. 2011

THESIS: *Study of TOV stars with the SPH method*

B.Sc. in Physics

Universidad Autónoma del Estado de México, Mexico

SUPERVISOR: Prof. Francisco S. Guzmán

Aug. 2004 – Dec. 2008

THESIS: *Numerical solution of null geodesics for the generation of gravitational lenses produced by spherically-symmetric and static spacetimes*

Awards

Marcos Moshinsky Award: for *Best Poster* presented at the IWARA 2020 Video Conference, Mexico City, 6 – 12 September 2020.

Lic. Juan Josafat Pichardo Cruz Award: for finishing and defending a thesis within a year after completing the undergraduate credits, granted by the Universidad Autónoma del Estado de México, 2009.

Invited Talks

Morphology of the spectra from numerical simulations of the internal shocks model for blazars

Astrophysics Seminar, Purdue University, West Lafayette, IN, USA, February 4, 2019

Numerical simulations of the internal shocks model in magnetized relativistic jets of blazars

DATA group weekly Seminar, Instituto de Astronomía, UNAM, Mexico City, Mexico, June 19, 2018

Numerical treatment of non-thermal radiation in the internal shocks model for blazars

Weekly Seminar, Instituto de Física y Matemáticas, Morelia, Mexico, March 2, 2018

Numerical simulations of the internal shock model in magnetized relativistic jets of blazars

IVICFA's Fridays: Computation in Physics, IFIC, Paterna, Spain, October 17, 2014

Meetings and conferences

Contributed Talks.....

The blazar sequence revised

9th International Workshop on Astronomy and Relativistic Astrophysics, Video Conference, September 6–12, 2020

<https://www.youtube.com/watch?v=BAZNWLNT69M>

Influence of the magnetic field on the spectral properties of blazars in the internal shocks scenario

Extreme-Astrophysics in an Ever-Changing Universe, Ierápetra, Greece, June 16–20, 2014

Numerical study of broadband spectra caused by internal shocks in magnetized relativistic jets

XXXIV Biennial meeting of the Royal Spanish Society of Physics, Valencia, Spain, July 15–19, 2013

Poster Sessions.....

A numerical approach for radiative cooling in relativistic outflows

9th International Workshop on Astronomy and Relativistic Astrophysics, Video Conference, September 6–12, 2020

Marcos Moshinsky Award for Best Poster. <https://www.youtube.com/watch?v=OTJiKg7k0PI>

Numerical simulations of the internal shock model in magnetized relativistic jets of blazars

Swift: 10 years of Discovery, Rome, Italy, December 2–5, 2014

Numerical study of broadband spectra caused by internal shocks in magnetized relativistic jets

The Innermost Regions of Relativistic Jets and Their Magnetic Fields, Granada, Spain, June 10–14, 2013

Teaching & Mentoring Experience

Zachary Davis

Graduate student, Department of Physics and Astronomy, Purdue University

Mentoring
2018 – Present

Amanda O. Harrison [5]

Graduate student, Department of Physics and Astronomy, Purdue University

Mentoring
2018 – 2020

Hao Zhang [4]

Graduate student, Department of Physics and Astronomy, Purdue University

Mentoring
2018 – 2019

Graduate Thermodynamics course

Dr. James P. Edwards, IFM, Universidad Michoacana de San Nicolás de Hidalgo

Class Substitution
2018

Technical Skills

Programming Languages: Fortran, Python, Shell Scripting, C/C++

Scientific Code Experience: SPEV (Mimica et al. 2009), GRTRANS (Dexter 2016), HARM (McKinney et al. 2012)

Scientific Code Development: SPEV [2, 3], PARAMO [5]

High Performance Computing: OpenMP, MPI, OpenACC

Tools: HDF5, version-control systems, Jupyter, gnuplot, Paraview

Outreach

Los más rápidos y los más furiosos (*The Fastest and the Most Furious*)

Community of Undergraduate Physics Students, Juárez Autonomous University of Tabasco
Tabasco, Mexico

Online Talk
September 4, 2020

Una simulación de la física y la astrofísica (*A Simulation of Physics and Astrophysics*)

Community of Undergraduate Physics Students, Juárez Autonomous University of Tabasco
Tabasco, Mexico

Online Talk
August 14, 2020

ANITA y la teoría de los universos paralelos (*ANITA and the theory of parallel universes*)

Científicos Mexicanos en el Extranjero, mexiciencia.github.io/post/anita

Blog post

May 29, 2020

¿Qué es el modelo SIR? (*What is the SIR model?*)

Científicos Mexicanos en el Extranjero, mexiciencia.github.io/post/modelo-sir

Blog post

May 25, 2020

Evolución del brote epidémico de COVID-19 (*Evolution of the COVID-19 epidemic outbreak?*)

Científicos Mexicanos en el Extranjero, mexiciencia.github.io/post/covid19

Blog post

April 5, 2020

Collaborator with the data analysis/modeling

Annual Department of Physics and Astronomy Poster Event

Department of Physics and Astronomy, Purdue University

West Lafayette, IN, USA

Posters (3) presentation

November 13, 2019

Post-Doc Panel Q&A: What happens when we complete our PhDs?

Department of Physics and Astronomy, Purdue University

West Lafayette, IN, USA

Panelist

April 10, 2019

Annual Department of Physics and Astronomy Poster Event

Department of Physics and Astronomy, Purdue University

West Lafayette, IN, USA

Poster presentation

November 14, 2018

¿Decía Einstein la verdad? (*Was Einstein saying the truth?*)

Facultad de Ciencias, Universidad Autónoma del Estado de México

Toluca, Mexico

Talk

March 11, 2009

Publications

Articles.....

- [5] **Rueda-Becerril, J. M.**, Harrison, A. O. & Giannios, D. *Baryon loading of blazar jets independent of accretion rate, not so their luminosity*, (2020), submitted for review to MNRAS [arXiv:2009.02273](#).
- [4] Zhang, H., Christie, I., Petropoulou, M., **Rueda-Becerril, J. M.** & Giannios, D. *Inverse Compton Signatures of Gamma-Ray Burst Afterglows*, **MNRAS** **496**, 974–986, (2020), [arXiv:1910.14049](#).
- [3] **Rueda-Becerril, J. M.**, Mimica, P. & Aloy, M. A. *On the influence of a hybrid thermal–non-thermal distribution in the internal shocks model for blazars*, **MNRAS** **468**, 1169–1182, (2017), [arXiv:1612.06383](#).
- [2] **Rueda-Becerril, J. M.**, Mimica, P. & Aloy, M. A. *The influence of the magnetic field on the spectral properties of blazars*, **MNRAS** **438**, 1856–1869 (2014), [arXiv:1310.5441](#).
- [1] Guzmán, F. S. & **Rueda-Becerril, J. M.** *Spherical boson stars as black hole mimickers*, **Phys. Rev. D** **80**, 084023 (2009), [arXiv:1009.1250](#).

Proceedings.....

- 5. **Rueda-Becerril, J. M.** *A numerical approach for radiative cooling in relativistic outflows*, (2020)
- 4. **Rueda-Becerril, J. M.**, Harrison, A. O. & Giannios, D. *The blazar sequence revised*, (2020)
- 3. **Rueda-Becerril, J. M.**, Mimica, P. & Aloy, M. A. *Numerical simulations of the internal shock model in magnetized relativistic jets of blazars*, **PoS(SWIFT 10)** **233**, 159 (2014), [arXiv:1502.07882](#).
- 2. **Rueda-Becerril, J. M.**, Mimica, P., Aloy, M. A. & Aloy, C. *Numerical study of broadband spectra caused by internal shocks in magnetized relativistic jets of blazars*, **EPJ Web Conf.** **61**, 02007 (2013), [arXiv:1309.4612](#).
- 1. Mimica, P., Aloy, M. A., **Rueda-Becerril, J. M.**, Tabik, S. & Aloy, C. *Numerical simulations of dynamics and emission from relativistic astrophysical jets*, **J. Phys.: Conf. Ser** **42**, 012001 (2013), [arXiv:1211.1794](#).

References

Dr. Maxim Barkov

Department of Physics and Astronomy
Purdue University
525 Northwestern Avenue
West Lafayette, IN 47907, USA

✉ mbarkov@purdue.edu

☎ +1 (765) 494-5194

Dr. Petar Mimica

Qindel Group
Valencia, Spain

✉ petar.mimica@gmail.com

Prof. Dimitrios Giannios

Department of Physics and Astronomy
Purdue University
525 Northwestern Avenue
West Lafayette, IN 47907, USA

✉ dgiannio@purdue.edu

☎ +1 (765) 494-5194

Prof. Miguel Ángel Aloy

Departament d'Astronomia i Astrofísica
Universitat de València
Edificio de Investigación
C/ Dr. Moliner s/n
46100 Burjassot, Valencia, Spain

✉ Miguel.A.Aloy@uv.es

☎ +34 963 543 080