JUAN RAFAEL MARTÍNEZ GALARZA

OFFICE ADDRESS
Harvard-Smithsonian Center for Astrophysics
60 Garden Street
Cambridge, MA 02138
U. S. A.

CONTACT INFO
Phone: +1 617 495 7027
Fax: +1 617 495 7490
jmartine@cfa.harvard.edu
www.cfa.harvard.edu/ jmartine/

CURRENT POSITION

Astrophysicist at the Harvard-Smithsonian Center for Astrophysics. Deputy end-to-end scientist for the Chandra X-ray Center Data System.
Since September 2017

RESEARCH EXPERIENCE

Program on Statistical, Mathematical and Computational Methods for Astronomy

August 2016 - May 2017
Participant. The year-long SAMSI-ASTRO program trained a group of early-career scientist in astrostatistics and started cross-disciplinary collaborations involving astronomers, computer scientists, and statisticians, with the goal of preparing for future synoptic surveys. I led the efforts to design an LSST Data Challenge, that has now merged with the Photometric LSST Astronomical Time-Series Classification Challenge (PLAsTiCC).

Postdoctoral fellow at the Harvard-Smithsonian CfA

August 2012 - June 2017
Star formation in interacting galaxies. Combining hydrodynamical models with multi-wavelength observations and Bayesian fitting applied to the SED of galactic mergers. Physical characterization of Main Sequence of star formation in galaxies using novel physical diagnostics. Parameter estimation with stochastic optimization in a Bayesian framework. Classification of infrared sources using supervised learning.

PhD Thesis: Mid-infrared spectroscopy of starburst

Leiden Observatory, 2008 - 2012
State-of-the-art physical modelling and interpretation of the Spectral Energy Distributions (SEDs) of starburts. Comparison with Spitzer-IRS data.

Mid-Infrared Instrument (MIRI) for the James Webb Space Telescope

Rutherford Appleton Laboratory, United Kingdom, 2008-2012
Testing and data analysis of the spectrometer performance. Responsible for the wavelength calibration of the instrument.

Master Research: Filamentary Star formation in ρ-Ophiuchus

Leiden Observatory, 2006-2007
Radio interferometric observations of a star-forming filament in the ρ-Ophiuchus region. Analysis of high density gas tracers.
Supervisor: Dr. Michiel Hogerheijde

Undergrad Research: Modelling of infrared emission from λ Bootis stars

Steward Observatory, University of Arizona, 2005
Modelling of the geometry and radiative properties of diffuse dust in the vicinity of chemically peculiar stars.
Supervisor: Dr. Kate Su, Prof. George Rieke

Undergrad Research: The Nature of λ Bootis stars
Space Telescope Science Institute (STScI), Baltimore, 2004-2005
Chemical abundances in the atmospheres of λ Bootis stars, via optical spectroscopy.
Supervisor: Dr. Inga Kamp

EDUCATION

Leiden University
PhD in Astronomy, June 2012
Title: Infrared Spectroscopy of Starbursts: From Spitzer-IRS to JWST-MIRI
Advisor: Dr. Bernhard Brandl
Promotor: Prof. Ewine van Dishoeck

Leiden University
Msc in Astronomy, December 2007

Universidad Nacional de Colombia
Bsc in Physics, July 2005

TEACHING

Lead TF for AM207: Monte Carlo Methods, Stochastic Optimization
School of Engineering and Applied Science (SEAS). Harvard University. 2015-2017.

IAU's International School for Young Astronomers. Invited lectureship
Topic: Astrostatistics and X-ray Astronomy. Socorro, Colombia, 2018.

TF of several undergraduate and graduate courses
Leiden Observatory. 2008-2011.

SUPERVISING

Undergraduate thesis: David Pérez Millán. Physical Properties of IRDCs Using a Thermal Emission Model.
Universidad de Antioquia, Colombia, 2016.

Undergraduate thesis: Andrés Ramos-Padilla. Understanding the Physics of Polycyclic Aromatic Hydrocarbos in Active Galaxies Through Infrared Observations.
Universidad Nacional de Colombia, 2015.

Master Thesis: James Kirk. Characterising the Protostars in the Herschel Survey of Cygnus-X.
University of Southhampton, 2014.

Supervised several summer students as part of the CfA REU program.

SUCCESSFUL NASA GRANTS

As co-investigator:

14-ADAP14-0145 PI González Alfonso

The Physical and Chemical Conditions in Luminous Galaxies: A Systematic IR Analysis.

13-ADAP13-65 PI Smith

The Evolving Physical Processes in Interacting Galaxies Traced by Their Spectral Energy Distributions.

SERVICE

Reviewer for proposals submitted to the National Fellowships Committee for Graduate Women in Science.
Spring 2017.

Member of the LSST science collaboration - Transients and Variable stars.
Since 2016.

Peer review panelist for proposals submitted to the Astrophysics Data Analysis Program (ADAP)
NASA, summer 2015.

Member of the core team of Science Clubs Colombia
A program that brings international researchers to teach about science and technology to high school students in Colombia.

HONORS & AWARDS

Smithsonian Astrophysical Observatory Postdoctoral Fellowship
Harvard-Smithsonian Center for Astrophysics, 2012-2015.

James Webb Space Telescope Significant Achievement Award
European Space Agency, 2012.

Office of Astronomy for Development Grant
International Astronomical Union, 2014.

PUBLICATIONS

Unraveling the Spectral Energu Distributions of Clustered YSOs
Martínez-Galarza, J.R.; Protopapas, P; Smith, H. A.; Morales, E. F. E., 2018, arXiv, 1803.10779.

Young Stellar Objects in the Massive Star-forming Regions W51 and W43
Saral, G.; Hora, J.L.; Audard, M.; Koenig, X.P.; **Martínez-Galarza, J.R.**; Motte, F.; Nguyen-Luong, Q.; Saygac, A.T.; Smith, 2017, Astrophysical Journal, 839, 108M.

Variations of the ISM Conditions Across the Main Sequence of Star Forming Galaxies: Observations and Simulations
Martínez-Galarza, J.R.; Smith, H.; Lanz., L.; Hayward, C.; Zezas, A.; Weiner, A.; Hung, C.; Rosenthal, L.; Groves, B., 2016, Astrophysical Journal, 817, 76M.

Merger Signatures in the Dynamics of Star-forming Gas
Hung, C.; Hayward, C.; Smith, H.; Ashby, Lanz., L.; M.; **Martínez-Galarza, J.R.**; Sanders, D. Zezas, A. Astrophysical Journal, 2016, 816, 99H.

A WISE Census of Young Stellar Objects in the Perseus OB2 Association
Azimlu, M.; **Martínez-Galarza, J.R.**; Muench, A., 2015, Astronomical Journal, 150, 95A.

The Schmidt Law in Six Galactic Massive Star-forming Regions
Willis, S.; Guzman, A.; Marengo, M.; Smith, H. A.,**Martínez-Galarza, J.R.**; Allen, L. Astrophysical Journal, 809, 87W.

The Mid-Infrared Instrument for the James Webb Space Telescope, VI: The Medium Resolution Spectrometer

Wells, M. et al., 2015, Publications of the Astronomical Society of the Pacific, Volume 127, issue 953, pp. 646-664.

The total infrared luminosity may significantly overestimate the star formation rate of recently quenched galaxies
Hayward, C.; Lanz, L.; Ashby, M.; Fazio, G.; Hernquist, L.; **Martínez-Galarza, J.R.**; Noeske, K.; Smith, H.; Wuyts, S.; Zezas, A.

Ongoing Massive Star Formation in NGC 604
Martínez-Galarza, J.R.; Hunter, D.; Groves, B.; Brandl, B., 2012, Astrophysical Journal, 761, 3M.

The Physical Conditions in Starbursts Derived from Bayesian Fitting of Mid-IR SED Models: 30 Doradus as a Template
Martínez-Galarza, J.R.; Groves, B.; Brandl, B.; de Messieres, G. E.; Indebetouw, R.; Dopita, M. A., 2011, Astrophysical Journal, 738, 176M.

Infrared Emission by Dust Around λ Bootis Stars: Debris Disks or Thermally Emitting Nebulae?
Martínez-Galarza, J.R.; Kamp, I.; Su, K. Y. L.; G asp ar, A.; Rieke, G.; Mamajek, E. E., 2009, Astrophysical Journal, Volume 694, Issue 1, pp. 165-173.

Modeling the Infrared Bow Shock at δ Velorum: Implications for Studies of Debris Disks and λ Bootis Stars
Gáspár, A.; Su, K. Y. L.; Rieke, G. H.; Balog, Z.; Kamp, I.; **Martínez-Galarza, J.R.**; Stapelfeldt, K., 2008, Astrophysical Journal, Volume 672, Issue 2, pp. 97 4-983

NON-REFEREED PUBLICATIONS

Wavelength calibration of the JWST-MIRI medium resolution spectrometer
Martínez-Galarza, J.R.; Glauser, A. M.; Hernán-Caballero, A.; Azzollini, R.; Glasse, A.; Kendrew, S.; Brandl, B.; Lahuis, F., 2010, Proceedings of the SPIE Meeting, Volume 7731, pp. 77313Q-77313Q-12

First results from MIRI verification model testing
With 30 co-authors, 2008, Proceedings of the SPIE Meeting, Volume 7010, pp. 70103A-70103A-12

λ Bootis stars: Current status and new insights from Spitzer
Kamp, I.; **Martínez-Galarza, J.R.** ; Paunzen, E.; Su, K. Y. L.; G asp ar, A.; Rieke, G. H., 2008, Contributions of the Astronomical Observatory Skalnat Pleso, vol. 38, no. 2, p. 147-156

REFERENCES

Howard A. Smith
Harvard-Smithsonian Center for Astrophysics
hsmith@cfa.harvard.edu
617-496-2198

Pavlos Protopapas
Harvard School of Engineering and Applied Sciences
pavlos@seas.harvard.edu
617-496-2623

Bernhard Brandl
Leiden Observatory
brandl@strw.leidenuniv.nl
31 71 527 5830