

Jorge Andrés Villa-Vélez

Postdoctoral researcher at ENS, Paris, France

PERSONAL DATA

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EDUCATION

- 2022-2024 Postdoctoral research position, **École normale supérieure**, Paris, France.
Title: “The energy budget of galaxies: molecular shocks”
Team: Dr. Benjamin GODARD, Dr. Pierre GUILLARD, Dr. Guillaume PINEAU DES FORETS, and Dr. Edith FALGARONE
- 01/10/18 - 18/11/21 Ph.D. in ASTROPHYSICS and COSMOLOGY, **Aix-Marseille Université**, Marseille, France.
Thesis: “Spectro-photometric Analysis Around Cosmic Noon: Emission-Lines, Dust Attenuation, and Star Formation.”
Supervisor: Dr. Véronique BUAT
- 2016-2018 Master of Science in ASTRONOMY, **Leiden University**, Leiden, The Netherlands.
Major Project - Thesis: “Searching for exoplanetary rings with SWASP and *Gaia*.”
Supervisor: Dr. A.G.A. BROWN, Dr. M.A. (Matthew) KENWORTHY
- Minor Project:** “An ALMA survey of sub-millimetre galaxies in the extended chandra deep field south: A blind search for emission lines at 145 GHz.”
Supervisor: Dr. Jacqueline A. HODGE
- 2009-2015 Bachelor of Science in ASTRONOMY, **University of Antioquia**, Medellín, Colombia.
Thesis: “Dark Matter Halo Characterization Through Properties Of Galaxies Classified In The Hubble Sequence.”
Supervisor: Dr. rer. nat. Juan Carlos MUÑOZ-CUARTAS

PROFESSIONAL EXPERIENCE

- INTERNSHIP - 2013 | UBVRI Photometry of Open Clusters (ESO 587-04, FSR 124 and SAI 135).
Photometric study performed in the *National Observatory of México, San Pedro Mártir*.
Supervisor: Raúl Michel Murillo
Place: UNAM, Ensenada, Baja California

OBSERVING EXPERIENCE

- JWST proposal - 2023 **Co-I:** JWST Cycle 3. **PI:** Bjorn Emonts (National Radio Astronomy Observatory)
Proposal file 4817 - Spiderweb
- ALMA proposal - 2017 **Co-I:** ALMA Cycle 5 (ACA). **PI:** Gabriela Calistro Rivera (Leiden)
2016.2.00209.S
- Observing period - 2013 National Observatory of México, Ensenada, Baja California (UNAM)
Open clusters and cataclysmic variable stars observation.
- Trainee - 2013 National Observatory of México, Tonantzintla (UNAM & INAOE)
Observing techniques and instrumentation.

TEACHING EXPERIENCE

- Teaching Assistant - 2016 **Waves and Oscillations;** University of Antioquia.
- Adjunct professor - (2015-2016) **Observational Astronomy;** University of Antioquia.
- Teacher - (2012-2014) **Astronomy for Youngsters;** University of Antioquia.

RESEARCH LINES & INTERESTS

Galactic & Extragalactic Astrophysics Molecular shocks and PDRs, Radio Galaxies, Star-forming galaxies, dust attenuation, spectroscopy, surveys (FMOS, MOONS, PFS, WST), SED-fitting (CIGALE), ISM physics.

LANGUAGES

Spanish	Mother tongue
English	Fluent
French	Fluent

PUBLICATIONS

- 2024 Radiative and mechanical energies in galaxies: II. Contributions of molecular shocks and PDRs in Molecular Hydrogen Emitting Selected Galaxies (MOHEGS), **J. A. Villa-Vélez et al.**, [in preparation](#)
- 2023 Radiative and mechanical energies in galaxies: I. Contributions of molecular shocks and PDRs in 3C 326 N, **J. A. Villa-Vélez**, B. Godard, P. Guillard and G. Pineau des Forêts, [submitted \(draft available under request\)](#)
- 2023 One network by Colombian students of astronomy for development and the improvement of the Colombian professional astronomical community, **Rojas-Ruiz et al.** - co-author, [to be submitted \(draft available under request\)](#)
- 2023 RECA: Mentoring, internship and educational programs as tools to overcome inequalities for Astronomy students in Colombia, N. Ospina, M. Agudelo-Vásquez, J. C. Buitrago-Casas, S. M. Díaz-Castillo, N. Garavito-Camargo, N. Oliveros-Gomez, S. Pinilla-Jurado, L. H. Quiroga-Nuñez, S. Rojas-Ruiz, L. E. Salazar-Manzano, J. P. Uchima-Tamayo, A. A. Plazas Malagón, V. Abril-Melgarejo, A. Bonilla-Rivera, A. Cardenas-Avendaño, L. Cardona-Torres, G. Chaparro, D. Fernandez-Arenas, J. Gonzalez-Sanchez, C. P. Gutierrez, K. Peña-Ramirez, H. Quitian-Lara, O.H. Ramírez-Agudelo, J. F. Suarez-Perez, A. Vargas-Bastidas, **J. A. Villa-Vélez** and M. Villamil Sastre, [Highlights on Spanish Astrophysics XI, Proceedings of the XV Scientific Meeting of the Spanish Astronomical Society](#)
- 2021 Fitting spectral energy distributions of FMOS-COSMOS emission-line galaxies at $z \sim 1.6$: Star formation rates, dust attenuation, and [OIII] $\lambda 5007$ emission-line luminosities, **J. A. Villa-Vélez**, Véronique Buat, Patrice Theulé, Médéric Boquien & Denis Burgarella, [A&A, 2021, Vol. 654, A153](#)
- 2020 A Virgo Environmental Survey Tracing Ionised Gas Emission. VESTIGE VIII. Bridging the cluster-ICM-galaxy evolution at small scales, A. Longobardi, A. Boselli, M. Fossati, **J. A. Villa-Vélez**, S. Bianchi, V. Casasola, E. Sarpa, F. Combes, G. Hensler, D. Burgarella, C. Schimd, A. Nanni, P. Côté, V. Buat, P. Amram, L. Ferrarese, J. Braine, G. Trinchieri, S. Boissier, M. Boquien, P. Andreani, S. Gwyn, J. C. Cuillandre, [A&A, 2020, Vol. 644, A161](#)
- 2019 COSMOS/GOODS-S fields spectro-photometric analysis and the MOONS future perspectives in SED fitting studies, **J. A. Villa-Vélez**, V. Buat, D. Burgarella, M. Rodrigues, M. Puech, H. Flores, [Proceedings of the Annual meeting of the French Society of Astronomy and Astrophysics, 2019, pp.115-119](#)
- 2018 The Pre-main Sequence Population of Sco-Cen Unveiled with Gaia DR2, **J.A. Villa Vélez**, Brown A. G. A., and M. A. Kenworthy, [RN ASS, 2018, Volume 2, Number 2](#)

MEMBER OF COMMITTEES AND WORKING GROUPS

- (2023-) **Member of the WST (WideField Spectroscopic Telescope) collaboration.** Involved in the extragalactic scientific working groups.
- (2021-) **Colombian Astronomy Student Network (RECA) - Student mentoring program.**
- (2019-) **Member of the MOONS (Multi-Object Optical and Near-infrared Spectrograph) collaboration.** TE-WG7 and TWG1. Physical parameters, redshifts and end-to-end simulation.
- (2020) LOC member at "The Rise of Metals and Dust through Cosmic Time" conference.
- (2020-2022) Member of the NECO (International Research Network Extragalactic astrophysics and Cosmology) collaboration France-Japan.
- (2019-2021) Member of the Seminar Organizing Committee. Aix-Marseille Université, LAM.
- (2017-2018) Member of the Education Committee Master Astronomy. Leiden University.
- (2012-2015) Computational Physics & Astrophysics (FACom). University of Antioquia.

COMPUTATIONAL SKILLS

Programming	Python: NumPy, SciPy, Matplotlib, Astropy, Pandas, Seaborn, Scikit-learn, Geopandas, Plotly, JSON; SQL; Bash; Mathematica.
Codes	CIGALE, Paris-Durham shock code, CLOUDY
Operating Systems	Linux (Fedora, Ubuntu), Windows.
Data processing	TOPCAT, DS9, (CASA, IRAF, Aladin, Vizier).
Text editing	LATEX (kate, overleaf), Microsoft Applications.

ACADEMIC RECOGNITION AND AWARDS

- Scholarships- (2015-2018) M.Sc. Oort Scholarship, Leiden University.
- Honors - (2009-2015) Best Astronomy term GPA. Best Astronomy advanced student.
Best physics department graduated GPA.

OUTREACH

- 2022-2024** Skype A Scientist; (online, Florida, Chicago, Los Angeles, North Carolina, Salinas, USA).
- 2023** Astronomy goes to your school; RECA, Colombia.
- 2022** I Don't know about That with Jim Jefferies; (Podcast online, Los Angeles, USA).
- 2022** Sociedad Julio Garavito; (online, Medellín, Colombia) - Outreach.
- 2021** Conexión sin fronteras; (online via Alcaldía de Medellín, Medellín, Colombia).
- 2021** LGBTQ+ STEM Seminar; Capítulo de Óptica UNAL (online via Universidad Nacional de Colombia, Medellín, Colombia).
- 2021** Astronomía-UdeA Orígenes (online via Universidad de Antioquia, Colombia).
- 2020** e-ESAOBELA (online via OAN - Tonantzintla, Mexico).

CONFERENCES & WORKSHOPS

- 2024** MOONS Science Team meeting; Lisbon, Portugal.
- 2023** Cosmic turbulence and magnetic fields: physics of baryonic matter across time and scales; Cargèse, France. (Invited speaker)
- 2023** EAS Annual Meeting; Krakow, Poland. (Contributed talk, SS32: Multiwavelength view on extragalactic jets)
- 2023** EAS Annual Meeting; Krakow, Poland. (Contributed talk, SS34: Early Career Astronomers Session)
- 2023** MOONS Science Team meeting; Edinburg, Scotland.
- 2023** Accessible Notebooks Hackathon; Space Telescope Science Institute, virtual
- 2023** MAYA: Meeting of ALMA Young Astronomers 2023; virtual
- 2022** Physique et Chimie du Milieu Interstellaire; Paris, France. (Contributed talk)
- 2022** MOONS Science Team meeting; Florence, Italy.
- 2021** Dusty Galaxy Workshop; Marseille, France. (Contributed talk)

- 2021 Multi-Object Spectroscopy for Statistical Measures of Galaxy Evolution; Workshop; STScl, United States. (Poster)
- 2020 The Rise of Dust and Metals in Galaxies through Cosmic Time; Marseille, France. (Participant/LOC)
- 2020 EAS Annual Meeting; Leiden, The Netherlands. (Poster/speed-talk)
- 2019 The Art of Measuring Galaxy Physical Properties; Milan, Italy. (Poster)
- 2019 Société Française d'Astronomie & d'Astrophysique (SF2A); Nice, France. (Contributed talk)
- 2014 IV Colombian Meeting of Astronomy & Astrophysics (COCOA); Pasto, Colombia. (Contributed talk)
- 2013 XII Meeting for Science & Mathematics Teaching; Medellín, Colombia.
- 2012 II International Astrobiology Meeting; Medellín, Colombia.
- 2011 Magnetic-Related Phenomena in the Outer Atmosphere of Cool Stars; Medellín, Colombia.
- 2011 Modern Topics in Fourier Optics; Medellín, Colombia.
- 2011 IV Colombian Meeting of Astronomy & Astrophysics (COCOA); Bogotá, Colombia.

SUMMER SCHOOLS

- 2023 Saas-Fee CGM winter school; Les Diablerets, Switzerland.
- 2022 Interstellar Shocks School; Les Houches, France.
- 2021 International summer school on the interstellar medium of galaxies, from the epoch of reionisation to the Milky Way; France.
- 2013 XXII Summer in the Observatory; Ensenada, México.
- 2013 Observational Astronomy School for Latin American Students (ESAOBELA); Puebla, México.

SEMINARS

- 2023 INAOE seminar; INAOE, Tonantzintla, Mexico.
- 2023 HyGAL meeting (David Neufeld); LPENS, Paris, France.
- 2023 Journal Club seminar; IAP, Paris, France.
- 2023 Café-Club seminar; LAM, Marseille, France.
- 2022 Astrolunch seminar; LPENS, Paris, France.
- 2021 Dusty Galaxies Workshop; Marseille, France.
- 2015 Research Seminar; Leiden University, Leiden, the Netherlands.
- 2015 Research Seminar; University of Antioquia, Medellín, Colombia.
- 2013 Summer School Seminar; Ensenada, México.