Jonathan Albert Aguilar

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Citizenship: USA

Current position

May 2021- **Staff Scientist II**, Space Telescope Science Institute *Baltimore, MD, USA*
Instruments Division: James Webb Space Telescope / Mid-Infrared Instrument
Deputy lead for MIRI coronagraphy

Education

Jan 2020 **Ph.D., Astronomy** The Johns Hopkins University *Baltimore, MD, USA*
Atmospheres and orbits of low-mass companions to stars with Project 1640 and the Hubble Space Telescope. Advisors: Dr. Laurent Pueyo (STScI) and Prof. Kevin Schlaufman (JHU).

May 2015 **M.A., Physics and Astronomy** The Johns Hopkins University *Baltimore, MD, USA*

May 2008 **B.A., Physics, with honors** Harvard University *Cambridge, MA, USA*
Secondary field: Organismic and evolutionary biology. Advisor: Prof. Robert M. Westervelt.

Work experience

Apr 2020-May 2021 **Postdoctoral fellow**, Space Telescope Science Institute *Baltimore, MD*
Supervisor: Dr. Elena Sabbi

Jun 2014-Aug 2014 **NPSC sumer intern**, Laboratory for Physical Sciences *College Park, MD*
Supervisor: Dr. Kevin Osborn

Sep 2012-Jan 2020 **Graduate research fellow**, The Johns Hopkins University *Baltimore, MD*
Supervisors: Dr. Laurent Pueyo (STScI), Prof. Kevin Schlaufman (JHU)

Jan 2009-Jan 2012 **Marie Curie fellow**, AGH University of Science and Technology *Krakow, Poland*
Supervisors: Prof dr. hab. inż. Marek Idzik (AGH), Dr. Bogdan Pawlik (Inst. Nucl. Phys. PAN)

Feb 2007-May 2007 **Radio telescope operator**, Smithsonian Center for Astrophysics *Cambridge, MA*
Supervisor: Dr. Thomas Dame

Jun 2007-Aug 2007 **Undergraduate research assistant**, UC Santa Barbara *Santa Barbara, CA*
National Nanotechnology Infrastructure Network Research Experience for Undergraduates. Supervisor: Prof. Stephen DenBaars

Sep 2006-Jun 2008 **Undergraduate research assistant**, Harvard University *Cambridge, MA*
Supervisor: Prof. Robert M. Westervelt

Jun 2006-Aug 2006 **Undergraduate research assistant**, Harvard University *Cambridge, MA*
National Nanotechnology Infrastructure Network Research Experience for Undergraduates. Supervisor: Prof. Robert M. Westervelt

Fellowships and awards

2012-2018 **National Physical Science Consortium Graduate Fellowship**
www.npsc.org
Sponsors: Laboratory for Physical Sciences, College Park, MD, USA and the National Security Agency, Fort Meade, MD, USA. Supervisor: Dr. Kevin Osborn.

2012-2015 **Owen Scholars Fellowship**
krieger.jhu.edu/research/other-awards
Sponsor: Department of Physics and Astronomy, The Johns Hopkins University.

2009-2012 **Marie Curie Fellowship**
mc-pad.web.cern.ch/mc-pad
Sponsors: AGH University of Science and Technology and Institute for Nuclear Physics – Polish Academy of Sciences, Krakow, Poland. Supervisors: Prof dr. hab. inż. Marek Idzik (AGH), Dr. Bogdan Pawlik (Inst. Nucl. Phys. PAN).

Past research topics

2020-2021 **Binarity survey in young massive clusters with high-contrast imaging.** Supervisor: Dr. Elena Sabbi. Space Telescope Science Institute, Baltimore, MD, USA.

2013-2020 **High-contrast searches for faint companions to stars**. Supervisor: Dr. Laurent Pueyo (STScI). JHU Dept. of Physics and Astronomy, Baltimore, MD, USA.

2013 **Novel materials for superconducting qubits**. Supervisor: Dr. Kevin Osborn. Laboratory for Physical Sciences, College Park, MD, USA.

2009-2012 **Luminosity Calorimeter design for the future International Linear Collider**. Supervisors: Prof dr. hab. inż. Marek Idzik (AGH), Dr. Bogdan Pawlik (IFJ). AGH-UST and IFJ-PAN, Krakow, Poland.

2006-2008 **Microparticle manipulation with atomic force microscopy**. Supervisor: Prof. Robert M. Westervelt. Harvard University, Cambridge, MA.

Skills

Certifications	Comprehensive Data Science with Python (link to certification)
Astronomy	Astronomical observations, astronomical image processing, mathematical and physical modeling, FITS images handling
Programming	Python – numpy, pandas, astropy, matplotlib, seaborn; bash scripting; C++
Development	git, test-driven development, GUI programming
Office	Linux, MacOS, Windows; Microsoft Office, LaTeX
Languages	Conversational Spanish, limited proficiency in French and Polish

Other activities

Observing **Commissioning for James Webb Space Telescope, Mid-Infrared Instrument** Monitored telemetry in the Mission Operations Center. Designed, executed, and analyzed data from observing programs to commission the MIRI coronagraphic imaging mode.
Palomar Observatory, Hale Telescope Approx. 70 nights with Project 1640, a near-infrared integral field spectrograph with an integrated Lyot coronagraph and advanced adaptive optics.

Teaching **General Physics for Physical Science Majors** (AS.171.108) teaching assistant. Introductory electricity and magnetism in an inverted classroom. Led problem-solving sessions during class time and during section. Held office hours, graded homeworks and exams.
General Physics Laboratory I (AS.173.111), teaching assistant. Basics of experimental design, data analysis, and scientific writing.

Mentoring Briley Lewis, Columbia University undergraduate, 2016-2018
Tarini Konchady, Johns Hopkins University undergraduate, 2014-2016

Outreach Active member and ex-treasurer of JHU Physics and Astronomy Outreach group. Performed physics demonstrations at local schools and produced portable planetarium shows.

References

References available upon request.

Grants

HST-GO-17092 *CoI*, Cycle 30 (2022-2025), amount pending

HST-GO-17167 *CoI*, Cycle 30 (2022-2025), amount pending

Publications

Strampelli G. M., Pueyo L., **Aguilar J.**, Aparicio A., Duchêne G., Robberto M. "StraKLIP: A Novel Pipeline for Detection and Characterization of Close-in Faint Companions through the Karhunen-Loéve Image Processing Algorithm." The Astronomical Journal vol. 164, 2022

Publications (continued)

Girard J. H., Leisenring J., Kammerer J., Gennaro M., ... **Aguilar J.**, et al. "JWST/NIRCam coronagraphy: commissioning and first on-sky results." Proc. SPIE vol. 12180, 2022

Boccaletti A., Cossou C., Baudoz P., Lagage P. O., ... **Aguilar J.**, et al. "JWST/MIRI coronagraphic performances as measured on-sky." arXiv e-prints 2022

Rigby J., Perrin M., McElwain M., Kimble R., ... **Aguilar J.**, et al. "Characterization of JWST science performance from commissioning." arXiv e-prints 2022

Strampelli G. M., **Aguilar J.**, Pueyo L., Aparicio A., Gennaro M., Ubeda L., Robberto M. "HST Survey of the Orion Nebula Cluster in the H_2O 1.4 micron Absorption Band. III. The Population of Substellar Binary Companions." The Astrophysical Journal vol. 896, 2020

Meshkat T., Nilsson R., **Aguilar J.**, et al. "A Deep Search for Planets in the Inner 15 au around Vega." The Astronomical Journal vol. 156, 2018

Greenbaum A. Z., Pueyo L., Ruffio J.-B., Wang J. J., De Rosa R. J., **Aguilar J.**, et al. "GPI Spectra of HR 8799 c, d, and e from 1.5 to 2.4 micron with KLIP Forward Modeling." The Astronomical Journal vol. 155, 2018

Bacchus E., Parry I. R., Oppenheimer R., **Aguilar J.**, et al. "Project 1640 observations of the white dwarf HD 114174 B." Monthly Notices of the Royal Astronomical Society vol. 469, 2017

Nilsson R., Veicht A., Giorla Godfrey P. A., Rice E. L., **Aguilar J.**, et al. "Project 1640 Observations of Brown Dwarf GJ 758 B: Near-infrared Spectrum and Atmospheric Modeling." The Astrophysical Journal vol. 838, 2017

Roberts L. C., Mason B. D., **Aguilar J.**, et al. "Characterization of the Companion μ Her." The Astronomical Journal vol. 151, 2016

Choquet É., Pueyo L., Soummer R., Perrin M. D., ... **Aguilar J.** et al. "Archival Legacy Investigations of Circumstellar Environments (ALICE): Statistical assessment of point source detections." Techniques and Instrumentation for Detection of Exoplanets VII vol. 9605, 2015

Abramowicz H., Abusleme A., Afanaciev K., **Aguilar J.**, et al. "Performance of fully instrumented detector planes of the forward calorimeter of a Linear Collider detector." Journal of Instrumentation vol. 10, 2015

Crepp J. R., Rice E. L., Veicht A., **Aguilar J.**, et al. "Direct Spectrum of the Benchmark T Dwarf HD 19467 B." The Astrophysical Journal vol. 798, 2015

Aguilar J., Crepp J. R., Rice E. L., Pueyo L., et al. "Brown dwarf science at Project 1640: the case of HD 19467 B." American Astronomical Society Meeting Abstracts #225 vol. 225, 2015

Novgorodova O., **Aguilar J. A.**, Kulis S., Zawiejski L., Chrzaszcz M., Henschel H., Lohmann W., Schuwalow S., Afanaciev K., Ignatenko A., Kollowa S., Levy I., Idzik M. "Performance Results of Assembled Sensor Plane Prototypes for Special Forward Calorimeters at Future E^+E Colliders." Astroparticle vol. 2012

Aguilar J. A., Pawlik B., Kulis S., Idzik M., et al. "Luminometer for the future International Linear Collider -Simulation and Beam Test Results." Physics Procedia vol. 37, 2012

Abramowicz H., Abusleme A., Afanaciev K., **Aguilar J.**, et al. "Forward instrumentation for ILC detectors." Journal of Instrumentation vol. 5, 2010

Brown K. A., **Aguilar J. A.**, Westervelt R. M. "Coaxial atomic force microscope tweezers." Applied Physics Letters vol. 96, 2010