

Alejandro Santamaría-Miranda

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Education & Employment History

- August 2015 – present **Ph.D. Astrophysics**, *Universidad de Valparaíso*, Valparaíso, Chile, Thesis title: *The origin of brown dwarfs*. Supervised by I. de Gregorio-Monsalvo (ESO) and M.R. Schreiber.
- 2014 – 2015 **Master degree in Astrophysics**, *Universidad Complutense de Madrid*, Madrid, Spain, Thesis title: *Star formation histories of bulges*. Supervised by P. Sánchez-Blázquez.
- 2009 – 2014 **B.S. Physics (4-year degree)**, *Complutense Univ.*, Madrid, Spain.

Research Interests

- Formation of substellar objects, planetary mass companions, star formation, protoplanetary disk, accretion, masers
- Millimeter, submillimeter, infrared and optical Astronomy
- Instrumentation and techniques in Radio Astronomy (Single-dish and Interferometry)

Grants & Fellowships

- 2017 – present European Southern Observatory **Studentship** (2 years)
- 2014 **Trainee project**. European Space Agency (ESA). *A study of possible tracer for X-Ray weakness in the optical spectra of SDSS quasar*. Supervised by Santos-Lleó M. and Schartel, N. (6 months)
- 2011, 2013 **Summer Student** at Centro de Estudios de Física del Cosmos de Aragón (CEFCA)

Research at Foreign Centers

- 2018 **European Southern Observatory**. Garching (Germany). 1 week. Research on dust and gas disk on protoplanetary disks of very low mass stars. *Supervisor: Leonardo Testi*
- 2017-2018 **Centro de Astrobiología**. Madrid (Spain). 6 weeks. Research on pre- and proto-brown dwarfs in Lupus. *Supervisor: Nuria Huélamo*

Research Collaborations

Current projects

2018 – **NPF: Núcleo Milenio de Formación Planetaria.** (PI: A. Bayo. Funding: Chilean present Ministry of Economy, Development and Tourism). Planet formation based on theory and observation. High quality mirror design and build in the mid-infrared.

2017 – **SOLA: (Soul of Lupus with ALMA)** (PI: I. de Gregorio-Monsalvo). Joint ALMA present Observatory collaboration with the objective of establishing a low-mass star and substellar formation scenario in Lupus using ALMA

Past projects

2015- 2017 **MAD: Millenium Nucleus for Protoplanetary Disk Research with ALMA** (PI: S. Cassasus. Funding: Chilean Ministry of Economy, Development and Tourism). The Millennium Nucleus Center of Protoplanetary Disks is a place dedicated to research on planet formation, mainly using the ALMA Observatory.

Observing Experience

- X-Shooter at the Very Large Telescope
- NACO at the Very Large Telescope
- VISIR at the Very Large Telescope
- MagE at Baade (Magellan Telescope)
- APEX (10 nights)

Data reduction experience

- Gasgano/ESOREX for X-Shooter
- CASA for ALMA
- GILDAS/CLASS for APEX
- IRAF for MagE

Accepted proposals

as PI

2018 **ALMA:** From cores to protobrown dwarfs: Unraveling the substellar formation mechanism in Lupus 4

2018 **ALMA:** Unveiling the true nature of the subluminoous young stellar object Par-Lup3-4

2018 **HAWK-I/VLT:** Confirming the nature of Lupus pre-and proto-brown dwarf candidates

2018 **APEX:** A search of submillimeter water masers at 321 GHz in young stellar objects

2016 **Baade/Magellan telescope:** Debris or not Debris? Determining the Nature of Low-mass Disks around Young Stars

as Co-PI in ALMA

2017, 2018 Confirmation of a sample of pre- and proto-substellar objects in Lupus molecular clouds. (PI Itziar de Gregorio-Monsalvo)

2017, 2018 Probing non-uniform dust production rate in a young debris disk. (PI Johan Olofsson)

2017 Outflow structure of the young protostar Lupus 3 MMS. (PI Adele Plunkett)

2017 Brown dwarf disks demographics. (PI Leonardo Testi)

- 2017 Planet formation in sparse stellar groups. (PI Claudio Caceres)
- 2017 Towards an evolutionary sequence in young planetary mass companions. (PI Claudio Caceres)
- 2016 Rising from the Dead: Planet Formation and Disk Evolution around Evolved Stars. (PI Matthias R. Schreiber)

Attendance to Training Schools and Workshops

- Nov 2017 *Astrobiology training School*, ESO, Santiago, Chile
- Oct 2017 *European Radio Interferometry School(ERIS)*, ASTRON, Dwingeloo, The Netherlands
- Oct 2017 *JWST Workshop – Planning your JWST observations*, ESAC, Madrid, Spain
- Nov 2014 *Spanish Virtual Observatory*, Centro de Astrobiologia, Madrid, Spain
- June 2014 *Science Analysis System(SAS) software*, ESA, Villanueva de la Cañada, Madrid, Spain
- July 2013 *Summer school: Astrophysics in the XXI century*, U. Complutense, Madrid, Spain

Education and Public Outreach

- 2018 Interview on the Mexican TV show 'Por el planeta' talking about ALMA observatory.
- 2018 – Astrobites en Español, contributor and editor (astrobites.org)
- Present
- March 2018 Open house day ESO-ALMA
- 2013 Support in laboratory classes on Physics for the 1st year of Physics BSC degree at the Universidad Complutense de Madrid.
- 2009-2015 Private tutor at school level in physics, chemistry and mathematics

Scientific activities

- Regular presentations at ESO Chile coffees (2017-2019)

Computer skills

- Op. Systems Linux, Windows
- Astronomy Iraf, CASA, GILDAS, Gasgano, ESOREX
- Programming Python, IDL, R, Matlab

Languages

- Spanish Native speaker
- English Written and spoken fluently
- German Basic level (A.2)

Meetings and Conference Proceedings

- Sept 2018 “The wonders of star formation”, Edinburgh, United Kingdom
Poster: *The early stages at substellar formation in Lupus 1 and 3 clouds with ALMA.*
- May 2018 “Formation of substellar objects: Theory and observations”, Madrid, Spain
Talk: *The early stages at substellar formation in Lupus 1 and 3 clouds with ALMA.*
- March 2018 “Diversis mundi: The Solar System in an Exoplanetary context”, Santiago, Chile
Talk: *Clues for planet formation using brown dwarfs in Lupus with ALMA.*

- Jan 2018 “Meeting Núcleo Formación Planetaria”, Valparaíso, Chile
Talk: *The early phases in the substellar formation.*
- March 2017 “Star Formation from Cores to Clusters”, Santiago, Chile
Talk: *Accretion Signatures in the X-Shooter Spectrum of the Substellar Companion to Sr 12.*
- November 2016 “Thirty Minutes Talk”, Santiago, Chile
Talk: *Accretion signatures in the X-Shooter spectrum of the substellar companion to SR 12*

Publications

First-author papers

- 1 **The early stages at substellar formation in Lupus 1 and 3 clouds with ALMA**
Santamaría-Miranda, Alejandro et al., in prep
- 2 **Accretion signatures in the X-shooter spectrum of the substellar companion to SR12**
Santamaría-Miranda, Alejandro et al., 2018, MNRAS, 475,2994S