Nadia M. Murillo Mejías

Investigadora Asociada C, IA-Ensenada, UNAM

Research Interest

Multiple stellar systems: formation, evolution, coevality, and physico-chemical structure.

Astrochemistry as a tool: combining observations with analytic and numerical models

Laboratory Astrochemistry and Astrophysics

Education

2013–2017 **Ph.D**, *Leiden Sterrenwacht, Universiteit Leiden & Max-Planck-Institut für extraterrestrische Physik*, Leiden, Netherlands & Garching bei München, Germany.
Supervisor: Ewine van Dishoeck

2011–2012 **M.Sc**, *National Tsing Hua University, Insitute of Astronomy*, Hsinchu, Taiwan.
Supervisor: Prof. Shih-Ping Lai

2007–2011 **B.Sc**, *National Tsing Hua University, Physics Department*, Hsinchu, Taiwan.
Physics Division

Research Experience

2023–present **Investigadora Asociada C (Associated Professor)**, *IA-UNAM*, Ensenada, Baja California, México.

2020–2023 **Special Postdoctoral Researcher**, *RIKEN*, Wako, Saitama, Japan.

2019– 2020 **Postdoc Star and Planet Formation Lab**, *RIKEN*, Wako, Saitama, Japan.

2017– 2019 **Postdoc JWST/MIRI**, *Leiden Sterrenwacht*, Leiden, Netherlands.

2012 – 2013 **Research Asistant**, *National Tsing Hua University Institute of Astronomy (NTHU IoA)*, Hsinchu, Taiwan.

2009 – 2011 **Undergraduate Research Project**, *Supervisor: Prof. Shih-Ping Lai*.
Outflows from Multiple Protostellar systems: the case of VLA1623

2009 – 2009 **Summer Student at NTHU**, *Supervisor: Prof. Shih-Ping Lai*.
CO Outflow of NGC1333 IRAS4A with polarization

Teaching Experience

9-11/2023 **Lecturer: Propedéutico de Mecánica clásica**, Instituto de Astronomía, UNAM, Ensenada, Baja California, México, Introductory course for admision to graduate school. Virtual.

9-10/2021 **Guest lecturer for course: Formación de estrellas**, Escuela de física y astrofísica, Universidad de Costa Rica, San José, Costa Rica, Graduate theoretical and practical course. Taught in Spanish. Virtual.

6/2019 **Toruń Astrophysics, Spectroscopy, and Quantum Chemistry School**, Nicolaus Copernicus University, Toruń, Poland. Astrochemistry Hands-on session.

10/2018 – 8/2019 **Supervision of MSc student: Judit Ferrer Asensio**, Leiden Sterrenwacht, Universiteit Leiden.
Molecular line identification in ALMA Band 3 observations of IRAS 16293, and distribution analysis.

2018 **Leiden ESA Astrophysics Program for Summer Students (LEAPS)**, Leiden Sterrenwacht, Universiteit Leiden. Summer program co-organization.

10/2017 – 8/2018 **Supervision of MSc student: Rosalie van Wetten**, Leiden Sterrenwacht, Universiteit Leiden. Exploiting ALMA data archive to measure the temperature sturcture of embedded protostars.

3/2016 **Workshop: Making Better Figures**, Leiden Observatory, Leiden University, Workshop co-organization and contributed talks.

7/2011 **Teaching Assistant**, *National Tsing Hua University, Institute of Astronomy*, REST: High school teacher training in Astronomy Summer course. Language: Mandarin.

Spring 2012 **Teaching Asistant**, National Tsing Hua University, Physics Department, Fundamental Observational Astronomy; Undergraduate course. Language: Mandarin.

Fall 2011 **Teaching Asistant**, Natinal Tsing Hua University, Institute of Astronomy, Observational Astronomy; Graduate course. Language: Mandarin & English.

PhD thesis

Title *Multiple star formation: chemistry, physics and coevality.*

Supervisor Prof. dr. Ewine van Dishoeck

Defended 2017 November 1

Master thesis

Title *Disentangling the Entangled: Observations and Analysis of the triple non-coeval protostellar system VLA1623*

Supervisor Prof. Shih-Ping Lai

Defended 2012 July 16

Observational Experience

2022-2023 **Nobeyama 45m Radio Observatory**, Project G22019, Remote observations.

2020 **Nobeyama 45m Radio Observatory**, Project CG201020, On-site and remote observations.

2019 **APEX**, Project O-0104.F-9307A.

2018 **ALMA**, Project 2018.1.00934.S.

2017 **APEX**, Project M-099.F-9516C-2017.

2016 **APEX**, Projects O-098.F-9320A.2016, O-098.F-9320B.2016, E-097.F-9810A.2016.

2016 **APEX**, Visiting Observer.

2015 **APEX**, Project M-095.F-0023.2015.

2014 **Atacama Pathfinder EXperiment (APEX)**, Project M-094.F-0006.2014.

2013 **ALMA**, Project 2013.1.01004.S.

2012 **SMA**, Visiting Observer.

2012 **Atacama Large Millimeter/submillimeter Array (ALMA)**, Project 2011.0.00902.S.

2012 **Lulin Observatory**, Nantou, Taiwan, Optical observations.

2012 **Submillimeter Array (SMA)**, Project 2011A-A021.

2010 **Kenting Observatory**, Kenting, Taiwan, Remote Optical Observation.

Refereeing Experience

- Astronomy & Astrophysics (1)
- Astrophysics Journal (3)
- Nature Astronomy (1); Nature Communications (1)
- Evaluation of Postdoctoral applications for Leiden Sterrewacht
- Research grant proposals in the field of Physics for RIKEN (5)

Selected Talks, Conferences & Workshops

9/2022 **Physics and Chemistry of Star Formation: The Dynamical ISM Across Time and Spatial Scales**, Puerto Varas, Chile, Talk: Formation and environment of multiple protostellar systems in Perseus. Poster: Modeling Snowlines in Protostars.

9/2022 **Seminar at Departamento de Astronomía**, Universidad de Chile, Santiago, Chile, Talk: Modeling Snowlines in Protostars.

9/2022 **Colloquium at Instituto de Astronomía**, Pontificia Universidad Católica, Santiago, Chile, Talk: Modeling Snowlines in Protostars.

9/2022 **Science with LLAMA**, Salta, Argentina, Talk: Studying the formation and environment of multiple protostellar systems in Perseus..

9/2021 **Astronomical Society of Japan Annual Autumn Meeting**, Virtual Conference, Talk: The relation of accretion to protostellar multiplicity and chemistry with Nobeyama.

7/2021 **Astrochemical Frontiers 2021**, Virtual Conference.

6/2021 **European Astronomical Society Annual Meeting**, Virtual Conference, Talk: How do you feed multiple protostars? Tracing cold gas streamers in embedded multiple protostellar systems..

12/2020 **ESO Star and Planet Formation Webinar**, Virtual Seminar, Talk: Feeding a multiple system: cold gas accretion flow onto IRAS16293 A.

6/2019 **Primer Congreso Internacional de Ciencias Exactas y Naturales (First International Congress on Exact and Natural Sciences)**, San José, Costa Rica, Talks: 1) Formación de estrellas múltiples de masa baja. 2) Modelos químicos de protoestrellas de masa baja.

11/2018 **Intersellar filament paradigm: on their formation, evolution and role in star formation**, Nagoya, Japan, Poster: The extended structure in the envelope of IRAS 16293.

7/2018 **Astrochemistry: Past, Present and Future**, Pasadena, California, Poster: Warm and cold gas in embedded protostars.

7/2017 **Disk Formation Workshop 2017: Leiden**, Leiden, The Netherlands, Talk: The impact of disk formation on the envelope chemistry.

3/2017 **IAUS 332: Astrochemistry VII – Through the Cosmos from Galaxies to Planets**, Puerto Varas, Chile, Poster: The cold and warm physico-chemical structure of embedded protostars..

8/2016 **Star Formation 2016**, Exeter, UK, Talk: Do siblings always form and evolve simultaneously?.

7/2016 **Star Formation in Different Environments**, Quy nhon, Vietnam, Talk: Do siblings always form and evolve simultaneously? Poster: Tracing the disk, envelope and outflow cavity of VLA1623 with ALMA..

9/2015 **6th Zermatt ISM Symposium: Conditions and impact of star formation: from lab to space**, Zermatt, Switzerland, Poster: Tracing the disk, envelope and outflow cavity of VLA1623 with ALMA.

3/2015 **Star and Planet Formation in the Southwest**, Oracle, AZ, USA, Talk: VLA1623A's Envelope and Disk: From the large to the small scale of a Class 0 source.

12/2014 **Radio Seminar at KASI**, Daejeon, South Korea, Talk: The physical and temperature structure of the disk-envelope interface: ALMA DCO^+ observations of VLA1623.

12/2014 **Revolution in Astronomy with ALMA - The 3rd year** -, Tokyo, Japan.
Poster: Revealing the anatomy of a triple low-mass protostellar system: ALMA Cycle 2 observations of VLA1623

5/2014 **Olympian Symposium on Star Formation**, Paralia, Greece, Poster: ALMA observations of the Class 0 source VLA1623A: a disk and a ring.

1/2014 **Star and Planet Formation Seminar at ESO**, Garching bei München, Germany, A Keplerian disk around a Class 0 source: ALMA observations of VLA1623.

7/2013 **Protostars & Planets VI**, Heidelberg, Germany, Poster: Testing Protostellar Formation models: VLA1623A's disk and envelope unravelled with ALMA.

12/2012 **The First Year of ALMA Science**, Puerto Varas, Chile, Talk: Deciphering VLA1623: a triple non-coeval system with a First Core candidate?.

6/2011 **Star Formation through Spectroimaging at High Angular Resolution**, Taipei, Taiwan, Talk: VLA1623: a non-coeval triple system with a First Core candidate?.

2/2009 **TIARA Winter School on Star Formation**, Hsinchu, Taiwan.

Press release & Outreach

9/2022 **Outreach talk and activity**, Colegio Superior de Señoritas, San José, Costa Rica.
Formación de estrellas: química y física

8/2022 **Outreach talk and activity**, Colegio Yurusti, Heredia, Costa Rica.
Formación de estrellas: química y física

8/2022 **Public talk**, Universidad de Costa Rica y Academia Nacional de Ciencias, San José, Costa Rica.
La formación y el ambiente de sistemas protoestelares múltiples en Perseo

8/2022 **Outreach talk and activity**, Liceo de Poás, Alajuela, Costa Rica.
Formación de estrellas: química y física

6/2019 **Outreach Talk**, Conservatorio de Castella, Heredia, Costa Rica.
La formación de estrellas: charla interactiva a estuidantes de primaria

6/2019 **Outreach Talk**, Escuela Juan Rafael Meoño, Alajuela, Costa Rica.
El sistema solar: charla interactiva a estuidantes de primaria

12/2015 **Public Talk**, Academia Nacional de Ciencias, San José, Costa Rica.
Viendo las estrellas y los planetas nacer.

12/2015 **Public Talk**, Dept. de Física, Universidad de Costa Rica, San José, Costa Rica.
VLA1623: una vista detallada desde lo físico hasta lo químico de un sistema protoestelar múltiple

11/2015 **Public Talk**, Conservatorio de Castella, Heredia, Costa Rica.
La tierra, luna y sol: charla interactiva a estuidantes de primaria

12/2013 **Press release: Youngest protoplanetary disk discovered with ALMA**.
Press release from ALMA and in Taiwanese news media.

4/2010 **Institute of Astronomy Stand, School Anniversary Open House**, NTHU.
Co-Organization and Participation

Awards

2020 – 2021 **Incentive Research Grant, RIKEN**.
Improving physico-chemical models with re-configurable AI-accelerator technology.

2012 **National Tsing Hua University Elite Master Student Award**.

2011 – 2012 **Institute of Astronomy Master Student Scholarship**.

2005 – 2011 **Taiwan Ministry of Foreign Affairs Scholarship**.
One year of Chinese language studies and four years of undergraduate studies

Languages

- Español (native level), English (native level), Chinese Mandarin (intermediate-advanced).
- Intermediate reading but basic conversation: French, German, Japanese