

# Pooneh Nazari

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Karl-Schwarzschild-Strasse 2, 85748,  
Garching

## Positions

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| <b>ESO Fellow</b><br>Garching, Germany | 2023–present |
| <b>IAU Gruber Foundation Fellow</b>    | 2023–present |

## Education

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| <b>Leiden University</b><br>Ph.D. in Astrophysics<br>Promotor: Prof. Ewine van Dishoeck<br>– Thesis: “ <a href="#">Bridging the gap between physics and chemistry in early stages of star formation</a> ” | Leiden, Netherlands<br>2019–2023 |
| <b>University of Cambridge</b><br>MPhil in Astrophysics<br>Supervisor: Prof. Cathie Clarke<br>– Thesis: “Observational consequences of planet migration”  | Cambridge, UK<br>2018–2019       |
| MASt (Part III) in Astrophysics   | 2017–2018                        |
| <b>University of St Andrews</b><br>B.Sc. in Astrophysics  | St Andrews, UK<br>2013–2017      |

## Research Interests

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Interstellar molecules, Planet formation, Submillimetre and infrared astronomy, Astrochemistry

## Publications

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I have **24** publications with **10** as first author and **8** as second to fourth author. H-index = 9, total citations > 350, first-author citations > 100. See the full list at the end of the CV.

## Talks

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I have given **26** talks including **9** invited. See the full list at the end of the CV.

## Awards

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| ▪ Gruber Foundation Fellowship  | 2023–2025 |
| ▪ ESO Fellowship  | 2023–2026 |
| ▪ Funding from Leids Kerkhoven-Bosscha Fonds (LKBF)                                 | 2022      |
| ▪ Sheepshanks Scholarship and Studentship in Astronomy (Trinity College, Cambridge) | 2017–2018 |
| ▪ Harvard Origins of Life Initiative Undergraduate Research Award                   | 2017      |

- The Astrophysics Project Prize (University of St Andrews) 2017
- Royal Astronomical Society Undergraduate Research Bursary (University of St Andrews) 2015

## Observing programs

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I am a **PI of 16.9 hours** of JWST NIRSpec-IFU observations and **Co-I of 243 hours** of JWST NIRCAM, NIRSpec, and MIRI observations.

## Major collaborations

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- HEFE: High Angular Resolution observations of Stellar Emergence in Filamentary Environments 2024–present  
PI: T. Megeath  
JWST NIRCAM, NIRSpec, and MIRI-MRS large program of the OMC2/3 region
- COMPASS: Complex Organic Molecules in Protostars with ALMA Spectral Surveys 2023–present  
PI: J. K. Jørgensen  
ALMA large program and NIRSpec MOS medium program of 11 protostars
- JOYS+: Jwst Observations of Young protoStars 2023–present  
PIs: E. F. van Dishoeck; M.E. Ressler; T. P. Ray; T. P. Greene  
Combination of MIRI-MRS and NIRSpec-IFU observations of ~30 protostars
- IPA: Investigating Protostellar Accretion JWST program 2023–present  
PI: T. Megeath  
MIRI-MRS and NIRSpec-IFU observations of 5 protostellar systems

## Research visits

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- Frequent research visits to University of Copenhagen 2023–present
- Extended research visit, Harvard University Oct 2022–Nov 2022
- Research visits, Universities of St Andrews, Cambridge, and Harvard University Summers 2015-2018

## Supervision

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- One LEAPS student Summer 2021  
*Leiden Observatory*
- Three MSc students 2020-2022  
*Leiden Observatory*

## Teaching

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- Teaching Assistant of 'Astrochemistry' course taught by Prof. Ewine van Dishoeck 2022  
*Leiden Observatory*
- Teaching Assistant of 'Star and Planet Formation' course taught by Prof. Ewine van Dishoeck and Dr. Melissa McClure 2020, 2021, 2022  
*Leiden Observatory*

## Selected outreach and service activities

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- Reviewer for The Astrophysical Journal and Astronomy & Astrophysics
- Organiser of the NOVA Network II seminars in the Netherlands, 2019-2022
- Main author of a [CASSIS manual](#), 2022
- ALMA proposal reviewer, 2021-2023
- Invited talk at Astronomy on Tap, 2021
- Author at [She Speaks Science](#), 2018

## Presentations

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I have given 26 talks, including 9 *invited*.

- **Invited talk at Villa Vigoni workshop** Villa Vigoni, 2024  
*'Complex organic molecules in the gas and ices around protostars'*
- **Invited talk at Celebrating 30 Years of Protoplanetary Disk Chemistry** Ringberg, 2024  
*'Bridging the gap between physics and chemistry in early stages of star formation'*
- **PhD Colloquium** Leiden University, 2024  
*'Bridging the gap between physics and chemistry in early stages of star formation'*
- **Star and Planet Formation Seminar** ESO, 2024  
*'Bridging the gap between physics and chemistry in early stages of star formation'*
- **Invited talk at Workshop on Interstellar Catalysis** Aarhus, 2023  
*'Complex organic molecules around protostars'*
- **NOVA Network II seminar** Netherlands, 2023  
*'Complex organic molecules around protostars'*
- **Blaauw workshop** University of Groningen, 2023  
*'Evidence for ubiquitous carbon grain destruction around young protostars'*
- **Origins seminar series** University of Arizona, 2022  
*'Complex organic molecules around low- and high-mass protostars'*
- **Lunch talk** University of Virginia/NRAO, 2022  
*'Complex organic molecules around low- and high-mass protostars'*
- **Star and planet formation meeting** University of Michigan, 2022  
*'Complex organic molecules around low- and high-mass protostars'*
- **Star formation journal club** Harvard University, 2022  
*'Complex organic molecules around low- and high-mass protostars'*
- **Disk and Astrochemistry meeting** Harvard University, 2022  
*'Complex organic molecules around low- and high-mass protostars'*
- **Invited talk at Niels Bohr Legacy Symposium in Astrochemistry** Copenhagen University, 2022  
*'Complex organic molecules toward low- and high-mass protostars'*
- **Invited talk at Astrochemistry Seminar** Leiden University, 2022  
*'Can disks explain lack of COM emission from low-mass protostars?'*
- **Invited talk at Iranian National Observatory workshop** Online, 2022  
*'Astrochemistry in the embedded phase of star formation'*
- **Invited talk at InterCat Centre meeting** Online, 2021  
*'N-bearing complex organic molecules: From low- to high-mass protostars'*
- **Star formation meeting** Leiden University, 2021

*'Methanol emission from protostars: Can disks explain lack of emission from some sources?'*

- **Informal seminar at Centre for Star and Planet Formation** Copenhagen University, 2021  
*'Complex organic molecules: From low- to high-mass protostars'*
- **Contributed talk at Chemical processes in Solar-type star forming regions** Torino, 2021  
*'Complex organic molecules: From low- to high-mass protostars'*
- **Contributed talk at Astrochemical Frontiers** Online, 2021  
*'Methanol emission from protostars: Can disks explain lack of emission from some sources?'*
- **Invited talk at Astrochemistry Seminar** Leiden University, 2021  
*'Complex organic molecules in low-mass protostars'*
- **Contributed talk at ALMA day** Leiden University, 2021  
*'Complex organic molecules in low-mass protostars'*
- **Contributed talk at Five Years After HL Tau** Online, 2020  
*'Observational consequences of planet migration'*
- **Seminar at Institute of Astronomy** University of Cambridge, 2020  
*'N-bearing complex organic molecules in low-mass protostars'*
- **Contributed talk at Trinity forum, Trinity college** University of Cambridge, 2019  
*'Observational consequences of planet migration'*
- **Invited talk at Kavli Institute** University of Cambridge, 2019  
*'Observational consequences of planet migration'*

## Publications

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I have 24 publications with 10 as first author and 8 as second to fourth author. H-index = 9, total citations > 300, first-author citations > 100.

## First author

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10. **P. Nazari**, B. Tabone, A. Ahmadi, S. Cabrit, E. F. van Dishoeck, C. Codella, J. Ferreira, L. Podio, Ł. Tychoniec, and M. L. van Gelder, "[ALMA view of the L1448-mm protostellar system on disk scales: CH<sub>3</sub>OH and H<sup>13</sup>CN as new disk wind tracers](#)", *Accepted for publication in A&A*, 2023
9. **P. Nazari**, B. Tabone, G. P. Rosotti, and E. F. van Dishoeck, "Physical factors can change the observed correlation among complex organics around protostars", *Submitted to A&A*, 2023
8. **P. Nazari**, W. R. M. Rocha, A. E. Rubinstein, K. Slavicinska, M. G. Rachid, E. F. van Dishoeck, S. T. Megeath, R. Gutermuth, *et al.*, "[Hunt for complex cyanides in protostellar ices with JWST: Tentative detection of CH<sub>3</sub>CN and C<sub>2</sub>H<sub>5</sub>CN](#)", *Accepted for publication in A&A*, 2023, [See press release](#)
7. **P. Nazari**, J. S. Y. Cheung, J. Ferrer Asensio, N. M. Murillo, E. F. van Dishoeck, J. K. Jørgensen, T. L. Bourke, K.-J. Chuang, *et al.*, "[A deep search for large complex organic species toward IRAS16293-2422 B at 3 mm with ALMA](#)", *Accepted for publication in A&A*, 2023
6. **P. Nazari**, B. Tabone, M. L. R. van't Hoff, J. K. Jørgensen, and E. F. van Dishoeck, "[Evidence for Ubiquitous Carbon Grain Destruction in Hot Protostellar Envelopes](#)", *ApJ Letters*, vol. 951, L38, 2023
5. **P. Nazari**, B. Tabone, and G. P. Rosotti, "[Importance of source structure on complex organics emission. III. Effect of disks around massive protostars](#)", *A&A*, vol. 671, A107, 2023

4. **P. Nazari**, J. D. Meijerhof, M. L. van Gelder, A. Ahmadi, E. F. van Dishoeck, B. Tabone, D. Langeroodi, N. F. W. Ligterink, J. Jaspers, M. T. Beltrán, G. A. Fuller, Á. Sánchez-Monge, and P. Schilke, “[N-bearing complex organics toward high-mass protostars. Constant ratios pointing to formation in similar pre-stellar conditions across a large mass range](#)”, *A&A*, vol. 668, A109, 2022
3. **P. Nazari**, B. Tabone, G. P. Rosotti, M. L. van Gelder, R. Meshaka, and E. F. van Dishoeck, “[Importance of source structure on complex organics emission. II. Do disks explain lack of methanol emission from low-mass protostars?](#)”, *A&A*, vol. 663, A58, 2022
2. **P. Nazari**, M. L. van Gelder, E. F. van Dishoeck, B. Tabone, M. L. R. van't Hoff, N. F. W. Ligterink, H. Beuther, A. C. A. Boogert, A. Caratti o Garatti, P. D. Klaassen, H. Linnartz, V. Taquet, and Ł. Tychoniec, “[Complex organic molecules in low-mass protostars on Solar System scales. II. Nitrogen-bearing species](#)”, *A&A*, vol. 650, A150, 2021
1. **P. Nazari**, R. A. Booth, C. J. Clarke, G. P. Rosotti, M. Tazzari, A. Juhasz, and F. Meru, “[Revealing signatures of planets migrating in protoplanetary discs with ALMA multiwavelength observations](#)”, *MNRAS*, vol. 485, pp. 5914–5923, 2019

## Second-Fourth author

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8. A. E. Rubinstein, H. Tyagi, **P. Nazari**, R. Gutermuth, S. Federman, M. Narang, W. R. M. Rocha, N. Brunken, K. Slavicinska, *et al.*, “[IPA. Class 0 Protostars Viewed in CO Emission Using JWST/NIRSpec](#)”, *Submitted to ApJ*, 2023
7. M. L. van Gelder, M. E. Ressler, E. F. van Dishoeck, **P. Nazari**, B. Tabone, J. H. Black, Ł. Tychoniec, L. Francis, M. Barsony, *et al.*, “[JOYS+: mid-infrared detection of gas-phase SO<sub>2</sub> emission in a low-mass protostar: The case of NGC 1333 IRAS2A: hot core or accretion shock?](#)”, *Accepted to A&A*, 2023
6. Y. Chen, M. L. van Gelder, **P. Nazari**, *et al.*, “[CoCCoA: Complex Chemistry in hot Cores with ALMA. Selected oxygen-bearing species](#)”, *A&A*, vol. 678, A137, 2023
5. N. G. C. Brunken, A. S. Booth, M. Leemker, **P. Nazari**, N. van der Marel, and E. F. van Dishoeck, “[A major asymmetric ice trap in a planet-forming disk. III. First detection of dimethyl ether](#)”, *A&A*, vol. 659, A29, 2022, [See press release](#)
4. M. L. van Gelder, **P. Nazari**, B. Tabone, A. Ahmadi, E. F. van Dishoeck, M. T. Beltrán, G. A. Fuller, N. Sakai, Á. Sánchez-Monge, P. Schilke, Y.-L. Yang, and Y. Zhang, “[Importance of source structure on complex organics emission. I. Observations of CH<sub>3</sub>OH from low-mass to high-mass protostars](#)”, *A&A*, vol. 662, A67, 2022
3. M. L. van Gelder, J. Jaspers, **P. Nazari**, A. Ahmadi, E. F. van Dishoeck, M. T. Beltrán, G. A. Fuller, Á. Sánchez-Monge, and P. Schilke, “[Methanol deuteration in high-mass protostars](#)”, *A&A*, vol. 667, A136, 2022
2. F. Meru, G. P. Rosotti, R. A. Booth, **P. Nazari**, and C. J. Clarke, “[Is the ring inside or outside the planet?: the effect of planet migration on dust rings](#)”, *MNRAS*, vol. 482, pp. 3678–3695, 2019, [See press release](#)
1. J. D. Ilee, C. J. Cyganowski, **P. Nazari**, T. R. Hunter, C. L. Brogan, D. H. Forgan, and Q. Zhang, “[G11.92-0.61 MM1: a Keplerian disc around a massive young proto-O star](#)”, *MNRAS*, vol. 462, pp. 4386–4401, 2016, [See press release](#)

6. N. G. C. Brunken, W. R. M. Rocha, E. F. van Dishoeck, S. T. Megeath, R. Gutermuth, H. Tyagi, K. Slavicinska, **P. Nazari**, M. Narang, P. Manoj, A. E. Rubinstein, *et al.*, “JWST observations of  $^{13}\text{CO}_2$  ice: Tracing the chemical environment and thermal history of ices in protostellar envelopes”, *Submitted to A&A*, 2023
5. M. Narang, P. Manoj, H. Tyagi, *et al.*, “Investigating Protostellar Accretion across the mass spectrum with the JWST: discovery of a collimated jet from the low luminosity protostar IRAS 16253-2429 in a quiescent accretion phase”, *Submitted to ApJ Letters*, 2023
4. E. F. van Dishoeck, S. Grant, B. Tabone, *et al.*, “The diverse chemistry of protoplanetary disks as revealed by JWST”, *Faraday Discussions*, vol. 245, pp. 52–79, 2023
3. G. M. Williams, C. J. Cyganowski, C. L. Brogan, T. R. Hunter, **P. Nazari**, and R. J. Smith, “ALMA observations of the Extended Green Object G19.01-0.03 - II. A massive protostar with typical chemical abundances surrounded by four low-mass pre-stellar core candidates”, *MNRAS*, vol. 525, pp. 6146–6169, 2023
2. G. M. Williams, C. J. Cyganowski, C. L. Brogan, T. R. Hunter, J. D. Ilee, **P. Nazari**, J. M. D. Kruijssen, R. J. Smith, and I. A. Bonnell, “ALMA observations of the Extended Green Object G19.01-0.03 - I. A Keplerian disc in a massive protostellar system”, *MNRAS*, vol. 509, pp. 748–762, 2022
1. A. J. Cridland, G. P. Rosotti, B. Tabone, Ł. Tychoniec, M. McClure, **P. Nazari**, and E. F. van Dishoeck, “Early planet formation in embedded protostellar disks. Setting the stage for the first generation of planetesimals”, *A&A*, vol. 662, A90, 2022