

Korash Assani

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📄 <https://korashassani.github.io>

RESEARCH INTEREST

Observational & Theoretical Astronomy, Computational Astrophysics, and Spectroscopy with a focus on Atomic & Molecular Line Emission in Star-Forming Regions; Star & Planet Formation including Protostellar Outflows, Protoplanetary Disks, Planet Formation, and Astrochemistry.

EDUCATION

University of Cincinnati

B.S. in Astrophysics

B.S. in Physics

B.A. in Mathematics

Cincinnati, OH

August 2016 – May 2020

GPA: 3.769/4.000

University of Virginia

MS in Astronomy

Charlottesville, VA

August 2020 – May 2022

GPA: 3.981/4.000

University of Virginia

PhD Candidate in Astronomy

Charlottesville, VA

May 2022 – Present

RESEARCH EXPERIENCE

University of Cincinnati

Research Assistant

Cincinnati, OH

August, 2016-May, 2020

University of Virginia

Research Assistant

Charlottesville, VA

June, 2020-Current

Publications

Lead Author Publications.....

1. **2025: Mid-infrared extinction curve for protostellar envelopes from JWST-detected embedded jet emission: the case of TMC1A.** Assani, K. D., Li, Z.-Y., Ramsey, J. P., Tychoniec, Ł., Francis, L., Le Gouellec, V. J. M., Caratti o Garatti, A., Giannini, T., McClure, M., Bjerkeli, P., Calcutt, H., Beuther, H., Devaraj, R., Liu, X., Plunkett, A., Navarro, M. G., van Dishoeck, E. F., Harsono, D. *arXiv e-prints*, arXiv:2504.02136. DOI: 10.48550/arXiv.2504.02136
2. **2024: The asymmetric bipolar [Fe II] jet and H₂ outflow of TMC1A resolved with the JWST NIRSpec IFU.** Assani, K. D., Harsono, D., Ramsey, J. P., Li, Z.-Y., Bjerkeli, P., Pontoppidan, K. M., Tychoniec, Ł., Calcutt, H., Kristensen, L. E., Jørgensen, J. K., Plunkett, A., van Gelder, M. L., Francis, L. *Astronomy & Astrophysics*, 688, A26. DOI: 10.1051/0004-6361/202449745

Co-Author Publications.....

1. **2024: Gas Dynamics in 3 “Dippers”: EPIC 203850058, EPIC 204638512, and EPIC 205151387 in 2017–2018.** Sitko, M. L., Russell, R. W., Assani, K., Bayyari, A., Tyler, D., Lisse, C. M., Grady, C. A. *Research Notes of the AAS*, 8(12), 310. DOI: 10.3847/2515-5172/ad9f33
2. **2024: Dracula’s Chivito: Discovery of a Large Edge-on Protoplanetary Disk with Pan-STARRS.** Bergha, C. T., Bayyari, A., Sitko, M. L., Drake, J. J., Mosquera, A., Garraffo, C., Petit, T., Russell, R.

- W., **Assani, K.** The Astrophysical Journal Letters, 967(1), L3. DOI: 10.3847/2041-8213/ad43e3
3. **2023: Direct Images and Spectroscopy of a Giant Protoplanet Driving Spiral Arms in MWC 758.** Wagner, K., Stone, J., Skemer, A., Ertel, S., Dong, R., Apai, D., Spalding, E., Leisenring, J., Sitko, M., Kratter, K., Barman, T., Marley, M., Miles, B., Boccaletti, A., **Assani, K.**, Bayyari, A., Uyama, T., Woodward, C. E., Hinz, P., Briesemeister, Z., Lawson, K., Ménard, F., Pantin, E., Russell, R. W., Skrutskie, M., Wisniewski, J. Nature Astronomy, 7(10), 1208–1217. DOI: 10.1038/s41550-023-02028-3
 4. **2023: Wavelength-dependent Extinction and Grain Sizes in “Dippers”.** Sitko, M. L., Russell, R. W., Long, Z. C., **Assani, K.**, Pikhartova, M., Bayyari, A., Grady, C. A., Lisse, C. M., Marengo, M., Wisniewski, J. P., Danchi, W. C. The Astronomical Journal, 166(1), 24. DOI: 10.3847/1538-3881/acd7e8
 5. **2021: Variability of Disk Emission in Pre-main Sequence and Related Stars. V. Occultation Events from the Innermost Disk Region of the Herbig Ae Star HD 163296.** Pikhartova, M., Long, Z. C., **Assani, K.**, Fernandes, R. B., Bayyari, A., Sitko, M. L., Grady, C. A., Wisniewski, J. P., Rich, E. A., Henden, A. A., Danchi, W. C. The Astrophysical Journal, 919(1), 64. DOI: 10.3847/1538-4357/ac03af
 6. **2018: Differences in the Gas and Dust Distribution in the Transitional Disk of a Sun-like Young Star, PDS 70.** Long, Z. C., Akiyama, E., Sitko, M., Fernandes, R. B., **Assani, K.**, Grady, C. A., Cure, M., Danchi, W. C., Dong, R., Fukagawa, M., Hasegawa, Y., Hashimoto, J., Henning, T., Inutsuka, S.-I., Kraus, S., Kwon, J., Lisse, C. M., Liu, H. B., Mayama, S., Muto, T., Nakagawa, T., Takami, M., Tamura, M., Currie, T., Wisniewski, J. P., Yang, Y. The Astrophysical Journal, 858(2), 112. DOI: 10.3847/1538-4357/aaba7c

Presentations

- **[Fe II] & H₂ Excitation Conditions of the TMC1A Protostellar Outflow** Sep, 2024
Specola Vaticana Castel Gandolfo, Italy
- **Global Simulations of Planetary Growth via Pebble Accretion**
- Gordon Research Conference, June 2023 Mount Holyoke, MA
- Bob Rood Symposium, April 2023 Charlottesville, VA
- VICO-CICO Workshop, Nov 2021 Charlottesville, VA
- Sagan Exoplanet Summer Virtual Workshop, Poster #54, June 2021
- **Variability in the Gas and Dust Emission of the UX Orionis Star CQ Tau** Jan, 2020
235th American Astronomical Society Meeting, Poster #451.01 Honolulu, HI
- **Modeling the Circumstellar Disk of HD 166191**
- 233rd American Astronomical Society Meeting, Poster #163.19, Jan 2019 Seattle, WA
- UC Department of Physics, MUSE Fellowship Presentation, Nov 2018 Cincinnati, OH

Invited Talks

- **The Birth of Stars: JWST Insights into Protostellar Outflows and Dust in Star-Forming Regions** Mar, 2025
Virginia Tech Astronomy Series Blacksburg, VA

Workshops

- **NASA GPU Hackathon** Sep 12, 20-28, 2022
Remote Workshop

- **Dynamic and Chemical Connection Workshop**
Lorentz Center

July 4-8, 2022
Leiden, Netherlands

Observing Proposals

- **Assani, Korash D.**, Daniel Lin, Jonathan Ramsey, et al., "*The Dark Side of the Force: Unraveling Protostellar Jet Asymmetry by Probing TMC1A's Fainter Red-shifted Outflow with JWST.*" **Proposal ID:** 8872 | **Accepted, JWST Cycle 4 (2025), 7.5 hrs (11% acceptance rate)**
- **Harsono, Daniel, Korash Assani**, et al., "*ALMA Meets JWST: Is There Warm Molecular Gas Near the [Fe] Jet?*" **Project Code:** 2024.1.00046.S | **Accepted, Rank C**
- **Assani, Korash D.**, Daniel Lin, et al., "*Is the Abnormally Low Spectral Index of the Elias 2-27 Disk Caused by Dust Scattering?*" **Project Code:** 2023.1.00377.S | **ALMA Cycle 10 (2023), Accepted Rank-C, Not Observed**
- **Wagner, Kevin, Korash Assani**, et al., "*Imaging Planet Formation at Its Earliest Stages: Measuring the Extinction Level of an Enshrouded Protoplanet.*" **Proposal ID:** 4010 | **Accepted, JWST Cycle 2 (2022)**

TEACHING EXPERIENCE

News Highlight: UC Triple Major Seeks to Inspire and Educate

- **UVA Center for Teaching Excellence**
 - Tomorrows Professor Today (TPT), Jan 2025 – Present
 - Teaching as a Graduate Student (TAGS), Aug 2021
- **Teaching Assistant** Fall 2020, Spring 2022
University of Virginia, Astronomy Department
- **Learning Commons Instructor** Jan 2017 – May 2019
University of Cincinnati, Learning Commons Roles:
 - **Peer Leader** (Aug 2018 – May 2019)
 - **Peer Tutor** (Aug 2018 – May 2019)
 - **Supplemental Instructor** (Aug 2017 – Apr 2018)
 - **Learning Assistant** (Jan 2017 – Apr 2017)
- **Teaching Assistant** Aug 2017 – Dec 2017
University of Cincinnati, Physics Department

EXTRACURRICULAR ACTIVITIES

- **UVA Astro Grad Lunch** Jan 2023 – Jan 2024
Role: Coordinator
- **UVA Astronomy Graduate Journal Club** Jan 2021 – Jan 2023
Role: Coordinator
- **Society of Physics Students** Aug 2018 – May 2020
Role: Vice President
- **UC College of Arts and Sciences Student Ambassadors** Dec 2016 – May 2020
Roles: Treasurer, Vice President, President
- **Circle K International** Aug 2016 – Apr 2018
Role: Head of Recruitment

Volunteer and Outreach

- **Virginia Piedmont Regional Science Fair** Mar 30, 2023, Mar 20, 2025
Judge
- **Public Nights at McCormick Observatory** 2021 – Present
Telescope Operator
- **Dark Sky Bright Kids** 2021, 2022
Star Party Volunteer, Semester Club
- **University of Virginia, Astronomy Mentoring Program** Aug 2021 – Aug 2022
Undergraduate Mentor
- **Astronomy on Tap** Sep 12, 2022
Speaker: "*JWST: Exploring the Universe Like Never Before*"
- **Cincinnati Observatory** Nov 2016 – Aug 2017
Volunteer Docent

Academic Honors

- **Sigma Pi Sigma**, Physics Honor Society 2019
- **Phi Beta Kappa**, National Honor Society 2020
- **Magna Cum Laude**, University of Cincinnati 2020
- **Distinguished University Honors Scholar**, University of Cincinnati 2020

Computational Experience

- Extensive experience in **Python**, **Fortran**, and **Mathematica**, with proficiency in **IDL**, **C++**, **MATLAB**, **HTML**, and **Java**. Comfortable adapting to new programming languages as needed.
- Experienced in computationally intensive **3D physics simulations**, including: - *Hydrodynamic + dust simulations* of planet formation (**DISPATCH**, **Athena++**). - *Atomic spectral synthesis modeling* of [Fe II] emission (**CLOUDY**). - *Monte Carlo radiative transfer modeling* of full spectral energy distributions (**HOCHUNK3D**).
- Proficient in **Python**-based data analysis and visualization of large datasets, including **N-dimensional datacubes** from **JWST** and **ALMA** observations.
- Experienced in **Git** version control using GitHub and Bitbucket: <https://github.com/KorashAssani>