

# Korash Assani

✉ ka8km@virginia.edu

📄 <https://korashassani.github.io>

## RESEARCH INTEREST

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Observational Astronomy, Computational Astrophysics, Star and Planet formation, Protostellar Outflows, Protoplanetary Disks, Planet Formation, Astrochemistry

## EDUCATION

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### 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

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### University of Cincinnati

*Research Assistant*

**Cincinnati, OH**

*August, 2016-May, 2020*

### University of Virginia

*Research Assistant*

**Charlottesville, VA**

*June, 2020-Current*

## Publications

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### Lead Author Publications.....

1. **2024: The asymmetric bipolar [Fe II] jet and H<sub>2</sub> 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, L., 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.** Berghea, 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-

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

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- **[Fe II] & H<sub>2</sub> 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

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

## Workshops

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- **NASA GPU Hackathon** Sep 12, 20-28, 2022  
Remote Workshop
- **Dynamic and Chemical Connection Workshop** July 4-8, 2022  
Lorentz Center Leiden, Netherlands

## Observing Proposals

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- **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 Resubmitted for ALMA Cycle 11 (2024)
- 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)

## Computational Experience

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- 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>

## TEACHING EXPERIENCE

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**News Highlight:** UC Triple Major Seeks to Inspire and Educate

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

## EXTRACURRICULAR ACTIVITIES

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- **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
- **Society of Physics Students** Aug 2018 – May 2020  
Role: Vice President

- **UVA Astronomy Graduate Journal Club** Jan 2021 – Jan 2023  
Role: Coordinator
- **UVA Astro Grad Lunch** Jan 2023 – Jan 2024  
Role: Coordinator

## Volunteer and Outreach

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

## Academic Honors

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- **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