Korash Assani

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RESEARCH INTEREST

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

EDUCATION

University of Cincinnati — **Cincinnati, OH**
B.S. in Astrophysics — *August 2016 – May 2020*
B.S. in Physics — GPA: 3.769/4.000
B.A. in Mathematics

University of Virginia — **Charlottesville, VA**
MS in Astronomy — *August 2020 – May 2022*
GPA: 3.981/4.000

University of Virginia — **Charlottesville, VA**
PhD Candidate in Astronomy — *May 2022 – Present*

RESEARCH EXPERIENCE

University of Cincinnati — **Cincinnati, OH**
Research Assistant — *August, 2016-May, 2020*

University of Virginia — **Charlottesville, VA**
Research Assistant — *June, 2020-Current*

Publications

Lead Author Publications

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

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

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

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

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

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

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] & H_2 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** — July 4-8, 2022
  Lorentz Center — Leiden, Netherlands
- **UVA Center for Teaching Excellence**
  - Teaching as a Graduate Student (TAGS), Aug 2021
  - Tomorrows Professor Today (TPT), Jan 2025 - Present

Observing Proposals

- **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)**
- **Harsono, Daniel**, **Korash Assani**, et al., *"ALMA Meets JWST: Is There Warm Molecular Gas Near the [Fe] Jet?"* **Project Code:** 2024.1.00046.S | **Submitted**
- **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)**
- **Assani, Korash D.**, Jonathan Ramsey, Daniel Harsono, Zhi-Yun Li, et al., *"Searching for and Characterizing Atomic [Fe II] Jets in Class 0 Protostars with JWST."* **Proposal ID:** 5350 | **Submitted, JWST Cycle 3 (2023), Not Accepted**
- **Harsono, Daniel**, **Korash Assani**, et al., *"Unveiling the Diversity of Protostellar Jets in Low-Mass Protostars."* **Proposal ID:** 4765 | **Submitted, JWST Cycle 3 (2023), Not Accepted**

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`

TEACHING EXPERIENCE

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

EXTRACURRICULAR ACTIVITIES

- **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

- **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

- **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