

YAO-LUN YANG

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CONTACT INFORMATION

Department of Astronomy, University of Virginia
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RESEARCH INTERESTS

Astrochemistry, Infall & Outflows, Early Stage Star Formation, Radiative Transfer Modeling, Atomic and Molecular Spectroscopy, and Infrared & Radio Astronomy.

PROFESSIONAL APPOINTMENTS

2020 Feb.–	Virginia Initiative on Cosmic Origins (VICO) Postdoctoral Fellow University of Virginia, USA
2019 Aug.–2020 Jan.	Japan Society for the Promotion of Science (JSPS) Postdoctoral Fellow RIKEN, Japan

EDUCATION

2019 Ph.D. Astronomy

The University of Texas at Austin, U.S.A. Advisors: [Prof. Neal J. Evans II](#) and [Dr. Joel D. Green](#)
Dissertation: *The Three-dimensional Structure and Kinematics of Protostellar Envelopes*

2015 M.A. Astronomy

The University of Texas at Austin, U.S.A. Advisor: [Prof. Neal J. Evans II](#)
Thesis: *The Class 0 Protostar BHR71: Herschel Observations and Dust Continuum Models*

2012 B.S. Physics

National Taiwan University, Taiwan Advisor: [Dr. Ciska Kemper](#)
Project: *Molecular Hydrogen in Diffuse Interstellar Medium of the Large Magellanic Cloud*

AWARDS AND RECOGNITIONS

Virginia Initiative on Cosmic Origins (VICO) Postdoctoral Fellowship	University of Virginia 2019
Japan Society for the Promotion of Science (JSPS) Postdoctoral Fellowship	Japan 2019
Concentration in Teaching and Mentoring	UT-Austin 2018
Professional Development Award (\$600)	UT-Austin 2018
University Graduate Continuing Fellowship (\$80,000)	UT-Austin 2017-2019
Fred T. Goetting, Jr. Memorial Endowed Presidential Fellowship (\$10,000)	UT-Austin 2016
Summer Internship (\$14,120)	STScI 2016
Outstanding Thesis Award (\$1,000)	School of Graduate Studies, UT-Austin 2016
Summer Student Fellowship (\$1,300)	ASIAA 2011
College Student Research Training Fellowship (\$1500)	National Science Council, Taiwan 2011

PUBLICATIONS

First-Author and Significant Contribution Refereed Journal Articles

- [6] **Yang, Y.-L.**, Sakai, N., Zhang, Y., et al. 2020, “The Perseus ALMA Chemistry Survey (PEACHES). I. The Complex Organic Molecules in Perseus Embedded Protostars”, *accepted to ApJ*, [arXiv: 2101.11009](#)

- [5] **Yang, Y.-L.**, Evans, N. J. II, Smith, A. et al. 2020, “Constraining the Infalling Envelope Models of Embedded Protostars: BHR71 and its Hot Corino”, [ApJ](#), **891**, 1
- [4] **Yang, Y.-L.**, Green, J. D., Evans, N. J. II, et al. 2018, “CO in Protostars (COPS): *Herschel*-SPIRE Spectroscopy of Embedded Protostars”, [ApJ](#), **860** 174
- [3] **Yang, Y.-L.**, Evans, N. J. II, Green, J. D. et al. 2017, “The Class 0 Protostar BHR71: *Herschel* Observations and Dust Continuum Models”, [ApJ](#), **835**, 259
- [2] Green, J. D., **Yang, Y.-L.**, et al. 2016, “The CDF Archive: Herschel PACS and SPIRE Spectroscopic Data Pipeline and Products for Protostars and Young Stellar Objects”, [AJ](#), **151**, 75
- [1] Larson, R. L., Evans, N. J., Green, J. D., **Yang, Y.-L.** 2015, “Evidence for Decay of Turbulence by MHD Shocks in the ISM via CO Emission”, [ApJ](#), **806**, 70

Other Refereed Journal Articles

- [8] Liu, M., Tan, J. C., De Buizer, J. M. **et al.** 2020, “The SOFIA Massive (SOMA) Star Formation Survey. III. From Intermediate- to High-Mass Protostars”, [ApJ](#), **904**, 75
- [7] Hsu, S.-Y., Liu, S.-Y., Liu, T., **et al.** 2020, “ALMA Survey of Orion Planck Galactic Cold Clumps (ALMASOP) I. Detection of New Hot Corinos with ACA”, [ApJ](#), **898**, 107
- [6] Liu, H. B., Mérand, A, Green, J. D., Pérez, S., Hales, A. S., **Yang, Y.-L.**, et al. 2019, “Diagnosing 0.1-10 au Scale Morphology of the FU Ori Disk using ALMA and VLTI/GRAVITY”, [ApJ](#), **884**, 97
- [5] Yi, H.-W., Lee, J.-L., Liu, T, **et al.** 2018, “Planck Cold Clumps in the λ Orionis complex. II. Environmental effects on core formation”, [ApJS](#), **236**, 2
- [4] Karska, A, Kaufman, M. J., Kristensen, L. E., **et al.** 2018, “The Herschel-PACS Legacy of Low-mass Protostars: Far-IR Gas Properties and Their Origin in FUV-illuminated C-shocks”, [ApJS](#), **235**, 30
- [3] Liu, T, Kim, K.-T., Juvela, M, **et al.** 2018, “The TOP-SCOPE Survey of Planck Galactic Cold Clumps: Survey Overview and Results of an Exemplar Source, PGCC G26.53+0.17”, [ApJS](#), **234**, 28
- [2] Green, J. D., Jones, O. C., Keller, L. D., **et al.** 2016, “The Mid-infrared Evolution of the FU Orionis Disk”, [ApJ](#), **832**, 4
- [1] Naslim, N., Kemper, F., Madden, S. C., **et al.** 2015, “Molecular Hydrogen Emission in the Interstellar Medium of the Large Magellanic Cloud”, [MNRAS](#), **446**, 2490—2504

Non-refereed Research Articles

- [6] **Yang, Y.-L.**, Evans, N. J., Smith, A., et al. 2020, “Direct Infall Signatures and Complex Organic Molecules toward an Isolated Embedded Protostar BHR 71”, *Origins: From the Proto-sun to the First Steps of Life*, Proceedings of the International Astronomical Union, 345, 312. [doi:10.1017/S1743921319001571](https://doi.org/10.1017/S1743921319001571)
- [5] Gutermuth, R., Offner, S., Arce, H., **et al.** 2019, “Dense Cores, Stellar Feedback and the Origins of Clustered Star Formation”, *Astro2020: Decadal Survey on Astronomy and Astrophysics*, science white papers, no. 467, [BAAS](#), **51**, 467
- [4] Green, J., **Yang, Y.-L.**, Megeath, T., et al. 2019, “Variability in the Assembly of Protostellar Systems”, *Astro2020: Decadal Survey on Astronomy and Astrophysics*, science white papers, no. 372, [BAAS](#), **51**, 372

- [3] Tobin, J., Offner, S., Sheehan, P., **et al.** 2019, “Measuring Protostar Masses: The Key to Protostellar Evolution”, Astro2020: Decadal Survey on Astronomy and Astrophysics, science white papers, no. 189, [BAAS](#), **51**, 189
- [2] Tobin, J., Kounkel, M., Offner, S., **et al.** 2019, “The Formation and Evolution of Multiple Star Systems”, Astro2020: Decadal Survey on Astronomy and Astrophysics, science white papers, no. 187, [BAAS](#), **51**, 187
- [1] **Yang, Y.-L.**, Evans, N. J., & Green, J. 2015, “The Structure of Class 0 Protostars: BHR71 in Herschel View”, [Frank N. Bash Symposium 2015 \(BASH2015\)](#), 30

OBSERVING PROGRAMS

SOFIA/FIFI-LS, cycle 9, 23.1 hrs survey program (as PI, \$7,000 awarded)
Very Large Array, 2021A, 15 hrs, Priority A (as PI)
Submillimeter Telescope, 2020, 10 nights (as PI)
Gemini-South/IGRINS, 2020A, 6 hrs (as co-PI)
ALMA, cycle 7, 19 hrs (as PI)
APEX/FLASH⁺, 7.5 hrs (as PI)
ALMA, cycle 4, 1 hr (as PI)
SOFIA/GREAT, cycle 6, 4.1 hrs (as PI, \$41,000 awarded)
SOFIA/FORCAST, cycle 6, 3.9 hrs (as Co-I, \$39,000 awarded)
SOFIA/GREAT, cycle 4, 5.3 hrs (as Co-PI, \$56,000 awarded)
SOFIA/FORCAST, cycle 4, 3 hrs (as Co-I, \$33,000 awarded)
Harlan J. Smith Telescope/DIAFI, 4 nights (as on-site observer)
IRTF/TEXES, 2014–2016, 4 nights (as Co-I & on-site observer)

INVITED TALKS

Astrochemistry Seminar,	NAOJ (<i>virtual</i>) 2020
Colloquium,	NTHU, Hsinchu, Taiwan 2020
Seminar at Center of Astronomy and Gravitation,	NTNU, Taipei, Taiwan 2020
Colloquium,	ASIAA, Taipei, Taiwan 2020
ZUNA talk,	NRAO, VA, USA 2020
APEC Seminar,	IPMU, Chiba, Japan 2019
Star Formation Mini Symposium,	Kyung Hee University, Suwan, South Korea 2019
Colloquium,	NTHU, Taiwan 2019
Review talk, From Star to Planet Formation II,	Göteborg, Sweden 2019
CAS seminar,	Center for Astrochemical Studies, MPE, Germany 2019

CONTRIBUTED TALKS

2021 COSPAR (scheduled),	virtual space, Earth 2021
237th AAS Meeting,	virtual space, Earth 2021
Astrochemical Frontier,	virtual space, Earth 2020
2019 ALMA EA Development Workshop,	NAOJ, Tokyo, Japan 2019
Early Planet Formation in Embedded Disks,	University of Tokyo, Tokyo, Japan 2019
2018 ALMA EA Science/Development Workshop,	Osaka Prefecture University, Osaka, Japan 2018

TUNA Talk,	NRAO/UVa, VA 2018
6 th GMT Science Meeting: Stars Birth & Death,	Honolulu, HI 2018
231 st AAS Meeting,	National Harbor, DC 2018
2017 Asia-Pacific Regional IAU Meeting,	Taipei, Taiwan 2017
72 nd International Symposium on Molecular Spectroscopy,	UIUC, IL 2017
230 th AAS Meeting,	Austin, TX 2017
Star Formation 2016, Splinter session,	Exeter, UK 2016
Workshop on Dense Cores,	Monterey, CA 2014
Seminars at UT-Austin, NRAO/UVa, ASIAA, Subaru Telescope, IfA/U of Hawaii, Leiden Observa-	
tory, ESO-Garching, MPIA, STScI, East Asia Observatory, CfA/Harvard, U of Arizona, Kyung Hee	
University, Osaka University, and Osaka Prefecture University	

UNDERGRADUATE STUDENTS MENTORING

- Eva Greco (2020, *undergraduate student at UVa*): Study ALMA observations of CO outflows associated with a clustered massive star-forming regions, involving ALMA imaging and spectral analyses.
- Alyssa Ramos (2018, *currently as a chemist in pharmaceutical industry*): Exploratory study on the complex organic molecules at the early phase of star formation, involving an archival study using the ALMA archive and simulating synthetic spectra of COMs.
- Rebecca Larson (2014–2016, *currently PhD student at UT Austin*): Constrain the decay of turbulence shocks with *Herschel* observations of starless molecular clouds.

SERVICE, OUTREACH, AND PROFESSIONAL SOCIETY MEMBERSHIP

- Referee for ApJ and AJ
- Organizer & Presenter, Astronomy on Tap ATX, Austin, TX, 2016–2019
Monthly astronomy talk held in a local bar joined by more than 250 audience
- Guest Host & Presenter, Astronomy on Tap Taipei, Taipei, Taiwan, 2019, 2020
- Talk, “*How to Make A Star*”, Westcave Preserve, Jan. 2015
- American Astronomical Society Member, 2017–