Charles J. Law – Curriculum Vitae

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EDUCATION

Ph.D., Astronomy and Astrophysics 2018 – Present
Harvard University, Cambridge, MA
Thesis: *Chemical Complexity at High Spatial Resolution during Star and Planet Formation*
Advisor: Karin I. Öberg

M.A., Astronomy and Astrophysics May 2021
Harvard University, Cambridge, MA

B.A., Physics and Astrophysics 2013 – 2017
Secondary Concentration: Computer Science
Magna Cum Laude with Highest Honors
Harvard University, Cambridge, MA
Thesis: *Carbon Chain Molecules Toward Embedded Low-Mass Protostars*
Advisor: Karin I. Öberg

RESEARCH INTERESTS

I am broadly interested in exploring chemical complexity in space, with a particular focus on (sub)millimeter interferometry. I use high spatial resolution observations to understand the chemistry and physics of the star and planet formation process, including toward low-mass and embedded protostars, massive young stellar objects, and protoplanetary disks.

HONORS & AWARDS

- NSF Graduate Research Fellowship 2019 – Present
  Supports outstanding graduate students in NSF-supported science disciplines
- Honorable Mention, Chambliss Astronomy Achievement Award Student Prize 2020
- Smithsonian Astrophysical Observatory Research Fellowship 2017
- Leo Goldberg Prize in Astronomy, Harvard University 2017
  Departmental award for an exceptional undergraduate senior astronomy thesis
- Thomas Temple Hoopes Prize, Harvard University 2017
  College-wide award for an outstanding undergraduate senior thesis
- Phi Beta Kappa, Harvard University 2017
- Frederick Tarantino Memorial Scholarship Award, Universities Space Research Assoc. 2016
  National designation for astrophysics research potential
- Harvard College PRISE Research Fellowship 2016
- Detur Book Prize, Harvard University 2014
  Awarded to outstanding first-year students
- John Harvard Scholar, Harvard University 2014
  Awarded to top 5% of first-year students

PUBLICATIONS

Author of 31 publications (refereed or under review), including 8 as first author. A full listing of my publications can be found on ADS.

First Author

1. **Law, C.J.**, Loomis, R. A., et al. (+33 coauthors). Molecules with ALMA at Planet-forming Scales (MAPS) III. Characteristics of Radial Chemical Substructures, *ApJS*, accepted
2. **Law, C.J.**, Teague, R., et al. (+33 coauthors). Molecules with ALMA at Planet-forming Scales (MAPS) IV. Emission Surfaces and Vertical Distribution of Molecules, *ApJS*, accepted
3. **Law, C. J.**, Zhang, Q., Öberg, K. I., Galván-Madrid, R., Keto, E., Liu, H., Ho, P. T. P. 2021, Subarcsecond Imaging of the Complex Organic Chemistry in Massive Star-Forming Region G10.6-0.4, *ApJ*, 909, 214
4. **Law, C. J.**, Milisavljevic, D., et al. (+10 coauthors). 2020, Three-dimensional Kinematic Reconstruction of the Optically-Emitting, High-Velocity, Oxygen-Rich Ejecta of Supernova Remnant N132D, *ApJ*, 894, 73
5. **Law, C. J.**, Zhang, Q., Ricci, L., Petitpas, G., M. J. Jiménez-Donaire, Ueda, J., Lu, X., Dunham, M. M. 2018, Submillimeter Array Observations of Extended CO (J = 2 - 1) Emission in Interacting Galaxy NGC 3627, *ApJ*, 865, 17
6. **Law, C. J.**, Öberg, K. I., Bergner, J. B., Graninger, D. 2018, Carbon Chain Molecules Toward Embedded Low-Mass Protostars, *ApJ*, 863, 88
7. **Law, C. J.**, Ricci, L., Andrews, S. M., Wilner, D. J., Qi, C. 2017, An SMA Continuum Survey of Circumstellar Disks in the Serpens Star-Forming Region, *AJ*, 154, 255
8. **Law, C. J.**, Milisavljevic, D., et al. (+9 coauthors). 2017, TRES Survey of Variable Diffuse Interstellar Bands, *MNRAS*, 470, 2835

Co-Authored Publications

1. Sharda, P, et al. (incl. **Law, C. J.**). First extragalactic measurement of the turbulence driving parameter: ALMA observations of the star-forming region N159E in the Large Magellanic Cloud, submitted, arXiv:2109.03983
2. Anderson, A. R., et al. (incl. **Law, C. J.**). Protostellar and Protoplanetary Disk Masses in the Serpens-Aquila Region, submitted
3. Martín Doménech, R., et al. (incl. **Law, C. J.**). Hot corino chemistry in the Class I binary source Ser-emb 11, submitted
4. Öberg K. I., et al. (incl. **Law, C. J.**). Molecules with ALMA at Planet-forming Scales (MAPS) I. Program Overview and Highlights, *ApJS*, accepted
5. Czekala, I., et al. (incl. **Law, C. J.**). Molecules with ALMA at Planet-forming Scales (MAPS) II. CLEAN Strategies for Synthesizing Images of Molecular Line Emission in Protoplanetary Disks, *ApJS*, accepted
6. Zhang, K., Booth, A., **Law, C. J.**, et al. Molecules with ALMA at Planet-forming Scales (MAPS) V. CO Gas Distributions, *ApJS*, accepted
7. Guzmán, V. V., Bergner, J. B., **Law, C. J.**, et al. Molecules with ALMA at Planet-forming Scales (MAPS) VI. Distribution of the Small Organics HCN, C_2H, and H_2CO, *ApJS*, accepted

8. Bosman, A. D., et al. (incl. **Law, C. J.**). Molecules with ALMA at Planet-forming Scales (MAPS) VII. Substellar O/H and C/H and Superstellar C/O in Planet-feeding Gas, *ApJS*, accepted
9. Alarcón, F., et al. (incl. **Law, C. J.**). Molecules with ALMA at Planet-forming Scales (MAPS) VIII. CO Gap in AS 209 – Gas Depletion or Chemical Processing?, *ApJS*, accepted
10. Ilee, J. D., et al. (incl. **Law, C. J.**). Molecules with ALMA at Planet-forming Scales (MAPS) IX. Distribution and Properties of the Large Organic Molecules HC_3N, CH_3CN, and c-C_3H_2, *ApJS*, accepted
11. Cataldi, G., et al. (incl. **Law, C. J.**). Molecules with ALMA at Planet-forming Scales (MAPS) X. Studying Deuteration at High Angular Resolution toward Protoplanetary Disks, *ApJS*, accepted
12. Bergner, J. B., Öberg, K. I., Guzmán, V. V., **Law, C. J.**, et al. Molecules with ALMA at Planet-forming Scales (MAPS) XI. CN and HCN as Tracers of Photochemistry in Disks, *ApJS*, accepted
13. Le Gal, R., et al. (incl. **Law, C. J.**). Molecules with ALMA at Planet-forming Scales (MAPS) XII. Inferring the C/O and S/H Ratios in Protoplanetary Disks with Sulfur Molecules, *ApJS*, accepted
14. Aikawa, Y., et al. (incl. **Law, C. J.**). Molecules with ALMA at Planet-forming Scales (MAPS) XIII. HCO^+ and Disk Ionization Structure, *ApJS*, accepted
15. Sierra, A., et al. (incl. **Law, C. J.**). Molecules with ALMA at Planet-forming Scales (MAPS) XIV. Revealing Disk Substructures in Multiwavelength Continuum Emission, *ApJS*, accepted
16. Bosman, A. D., et al. (incl. **Law, C. J.**). Molecules with ALMA at Planet-forming Scales (MAPS) XV. Tracing Protoplanetary Disk Structure within 20 au, *ApJS*, accepted
17. Booth, A., et al. (incl. **Law, C. J.**). Molecules with ALMA at Planet-forming Scales (MAPS) XVI. Characterizing the Impact of the Molecular wind on the Evolution of the HD 163296 System, *ApJS*, accepted
18. Calahan, J., et al. (incl. **Law, C. J.**). Molecules with ALMA at Planet-forming Scales (MAPS) XVII. Determining the 2D Thermal Structure of the HD 163296 Disk, *ApJS*, accepted
19. Teague, R., et al. (incl. **Law, C. J.**). Molecules with ALMA at Planet-forming Scales (MAPS) XVIII. Kinematic Substructure in the Disks of HD 163296 and MWC 480, *ApJS*, accepted
20. Huang, J., et al. (incl. **Law, C. J.**). Molecules with ALMA at Planet-forming Scales (MAPS) XIX. Spiral Arms, a Tail, and Diffuse Structures Traced by CO around the GM Aur Disk, *ApJS*, accepted
21. Schwarz, K., et al. (incl. **Law, C. J.**). Molecules with ALMA at Planet-forming Scales (MAPS) XX. The Massive Disk Around GM Aurigae, *ApJS*, accepted
22. Sano, H., et al. (incl. **Law, C. J.**). 2020, ALMA CO Observations of Gamma-Ray Supernova Remnant N132D in the Large Magellanic Cloud: Possible Evidence for Shocked Molecular Clouds Illuminated by Cosmic-Ray Protons, *ApJ*, 902, 53
23. Le Gal, R., et al. (incl. **Law, C. J.**). 2020, A 3mm chemical exploration of small organics in Class I YSOs *ApJ*, 898, 131

PRESS

1.	INAF Bulletin on the 3D reconstruction of SNR N132D	April 2020
2.	SMA Newsletter on SMA observations of NGC 3627	January 2019

TALKS

I have given a total of 23 talks, including 5 invited talks and 5 public talks.

1. Seminar, Exoplanet Pizza Lunch, CfA [*expected*] September 2021
2. Contributed, Chemical processes in Solar-type star forming regions, Turin, Italy [*expected*] September 2021
3. **Invited**, SSP Coffee Talk July 2021
4. Contributed, Emerging Researchers in Exoplanet Science May 2021
5. **Invited**, Origins Seminar, University of Arizona May 2021
6. Contributed, Space Telescope, 2021 Spring Symposium April 2021
7. Contributed, Five years after HL Tau: a new era in planet formation December 2020
8. Contributed, Harvard-Heidelberg Star Formation Workshop December 2020
9. Contributed, Astrochemical Frontiers June 2020
10. *Public Talk*, North Shore Amateur Astronomy Club June 2020
11. *Public Talk*, Gloucester Area Astronomy Club May 2020
12. *Public Talk*, Beacon Hill Seminar March 2020
13. Seminar, SMA Talk, CfA February 2020
14. Contributed, New England Star Formation Meeting, UConn January 2020
15. Contributed, 235th AAS, Honolulu, HI January 2020
16. *Public Talk*, Union County College/AAI, NJ December 2019
17. Contributed, Science with the Submillimeter Array: Present and Future October 2019
18. Contributed, ISMS, 74th, Champaign-Urbana, IL June 2019
19. Contributed, SNRs II, Chania, Crete, Greece June 2019
20. Seminar, Exoplanet Pizza Lunch, CfA May 2019
21. **Invited**, ALMA Community Day, MIT April 2019
22. **Invited**, ALMA Community Day, CfA April 2019
23. Seminar, High Energy Phenomena Seminar, CfA February 2019
24. **Invited**, SMA Advisory Committee Meeting, CfA July 2018
25. *Public Talk*, Gloucester Area Astronomy Club September 2018

CONFERENCE CONTRIBUTIONS

Author of 11 conference contributions, including 7 as primary contributor.

1. Milisavljevic, D. (+5 coauthors; incl. **Law, C. J.**), "Visualization and Collaborative Exploration of Complex Multi-dimensional Data Among Distant Individuals using Virtual Reality," American Astronomical Society, Meeting #237 (Poster)
2. Plucinsky, P. P. on behalf of N132D Legacy Team (incl. **Law, C. J.**), "A Chandra Legacy Observation of N132D," American Astronomical Society, Meeting #235 (Poster)
3. Milisavljevic, D., **Law, C. J.,** (+8 coauthors) "Three-Dimensional Kinematic Reconstruction of the Optically-Emitting, High-Velocity, Oxygen-Rich Ejecta of Supernova Remnant N132D," American Astronomical Society, Meeting #235 (Poster)

4. **Law, C. J.**, Zhang, Q, Öberg, K., Galván-Madrid, R., Keto, E., Ho, P., Liu, H. 2020, "An ALMA Sub-arcsecond View of Outflows, Ionized Gas, and Spatially-Extended Complex Organic Chemistry in OB Cluster-forming Region G10.6-0.4," ALMA Special Session at American Astronomical Society, Meeting #235 (Poster)
5. Plucinsky, P. P. on behalf of the N132D Legacy Team (incl. **Law, C. J.**), "A Chandra Legacy Observation of the LMC SNR N132D," 20 Years of Chandra Science Symposium (Poster)
6. **Law, C. J.**, Zhang, Q, Öberg, K., Galván-Madrid, R., Keto, E., Ho, P., Liu, H. 2019, "Sub-arcsecond Imaging of the Complex Organic Chemistry in Massive Star-forming region G10.6-0.4," Harvard-Heidelberg Star Formation Workshop 2019: Linking Observations and Simulations (Intro Talk & Poster)
7. **Law, C. J.**, Zhang, Q, Öberg, K., Loomis, R., Galván-Madrid, R., Keto, E., Ho, P., Liu, H. 2019, "ALMA Observations of Nitrile Chemistry in the Massive Star-forming Region G10.6-0.4," American Astronomical Society, Meeting #233 (Poster)
8. **Law, C. J.**, Ricci, L., Andrews, S. M., Wilner, D. J., Qi, C. 2018, "SMA Continuum Survey of Circumstellar Disks in Serpens," SPF2 (Poster)
9. **Law, C. J.**, Öberg, K. I., Bergner, J. B., Graninger, D. 2017, "Carbon Chains Toward Embedded Low-Mass Protostars," Harvard-Heidelberg Star Formation Workshop 2017: Star Formation Across the Universe (Intro Talk & Poster)
10. **Law, C. J.**, Ricci, L., Andrews, S. M., Wilner, D. J., Qi, C. 2017, "SMA Continuum Survey of Circumstellar Disks in Serpens," American Astronomical Society, Meeting #230 (Poster)
11. **Law, C. J.**, Milisavljevic, D., Crabtree, K., Johansen, S., Patnaude, D. 2017, "TRES Survey of Variable Diffuse Interstellar Bands," American Astronomical Society, Meeting #229 (Poster)

OBSERVING EXPERIENCE & PROPOSALS

PI of 8 programs and Co-I on an additional 30 programs for access to observing facilities such as the SMA, 6.5m Magellan telescope, VLA, ALMA, HST, Chandra, and JWST.

PI

1. Connecting scaling laws between exoplanets and young disks
   Submillimeter Array 2021A-S003 *4 B-ranked Tracks*
2. Jet-like, IR-bright Ejecta in O-rich LMC Supernova Remnant N132D
   Magellan Baade 6.5m, FIRE, 2021B *3 Nights*
3. Connecting scaling laws between exoplanets and young disks
   Submillimeter Array 2020A-S028 *4 B-ranked Tracks**
4. Jet-like, IR-bright Ejecta in O-rich LMC Supernova Remnant N132D
   Magellan Baade 6.5m, FIRE, 2020B *4 Nights**
5. Searching for Ionized Accretion Flows around 0.1 pc Scale Clusters with O-Type Stars
   ALMA, Cycle 7 *14.8 hours, C-ranked**
6. Jet-like, Si-rich ejecta in O-rich LMC Supernova Remnant N132D
   Magellan Baade 6.5m, FIRE, 2019B *3 Nights*
7. Formation of O Stars by Accretion of Ionized Gas
   Very Large Array 2019A-228 *11 hours, A-ranked*

8. Searching for Ionized Accretion Flows around 0.1 pc Scale Clusters with O-Type Stars
   Submillimeter Array 2018B+2019A *8 B-ranked Tracks*

**not observed due to pandemic-related observatory closures*

Co-I

1. Benchmarking ^{13}C fractionation with HC_3N in protoplanetary disks
   ALMA, Cycle 8 (*PI: R. Loomis*) *C-ranked*
2. A snowline origin for the substructures in the Class I disk GY 91?
   ALMA, Cycle 8 (*PI: J. Huang*) *B-ranked*
3. Quantifying the neutral carbon content in HD163296, a planet-forming disk
   ALMA, Cycle 8 (*PI: F. Alarcón)* *C-ranked*
4. Spatially resolved observations of the $^{14}N/^{15}N$ isotopic ratio in Herbig disks
   ALMA, Cycle 8 *(PI: V. Guzmán)* *C-ranked*
5. A survey of H_2CO lines in protoplanetary disks
   ALMA, Cycle 8 (*PI: V. Guzmán)* *B-ranked*
6. A unique gas tracer of pebble drift in protoplanetary disks
   ALMA, Cycle 8 (*PI: K. Zhang)* *B-ranked*
7. Evaporating ices in planet-forming disks
   ALMA, Cycle 8 (*PI: A. Booth*) *B-ranked*
8. High resolution observations of deuterated hydrocarbons in protoplanetary disks
   ALMA, Cycle 8 (*PI: Y. Yamato*) *B-ranked*
9. A Chemistry Survey of Protoplanetary Disks in Binary Systems
   ALMA, Cycle 8 (*PI: F. Long)* *B-ranked*
10. Measuring The Expansion of the SNR N132D in X-rays *50 ks (GO) + 50 ks (GTO)*
    Chandra, HRC, Cycle 23 (*PI: X. Long*)
11. Precision Tomography of the LMC Supernova Remnant N132D using MUSE *12 hours*
    VLT, MUSE, P108, Priority A (*PI: D. Milisavljevic*)
12. Mapping the Delivery of Material to a Planet-forming Disk
    GBT, 21B-065, Priority B+ *(PI: J. Huang)* *11.75 hours*
13. Detecting a Young 2 Jupiter Mass Planet Embedded in the Disk of HD 163296
    JWST, MIRI/Coronagraphy, Cycle 1 GO, ID: 2153 *(PI: G. Cugno*) *7.8 hours*
14. The Chemistry of Planet Formation: A JWST-ALMA Survey of 4 Planet-Forming Disks
    JWST, MIRI/MRS, Cycle 1 GO, ID: 2025 *(PI: K. Öberg*) *12.8 hours*
15. Distinguishing between envelope and embedded disk chemistry of Class I YSOs
    NOEMA Winter 2020, W20AJ *(PI: R. Le Gal*) *B-ranked*
16. A Unique Opportunity to Measure the Continuum Optical Depth of a Protoplanetary Disk via Background Illumination
    IRAM 30m 2020A, No. 140-20 *(PI: I. Czekala*) *A-ranked*
17. Sulfur Chemistry in Planet-forming Disks
    Submillimeter Array 2020A-S018 *(PI: R. Le Gal*) *5 A-ranked Tracks*
18. Distinguishing between envelope and embedded disk chemistry of Class I YSOs

NOEMA Summer 2020, S20AH *(PI: R. Le Gal)* *B-ranked*

19. Resolving ionized accretion flow toward most massive O-type stars
    ALMA Cycle 7 *(PI: Q. Zhang)* *B-ranked*
20. A Serpens disk survey: exploring planet formation in an unexplored region
    ALMA Cycle 7 *(PI: N. van der Marel)* *B-ranked*
21. The Center of Expansion and Age of Supernova Remnant N132D
    HST Cycle 27, 15818 *(PI: D. Milisavljevic)* *3 Orbits*
22. Exploratory survey of Class I YSO chemistry
    IRAM 30m 2019A, No. 014-19 *(PI: R. Le Gal)* *B-ranked*
23. Variable Diffuse Interstellar Bands
    Shane 3m 2019A *(PI: K. Crabtree)* *5 Nights*
24. Variable Diffuse Interstellar Bands
    Gemini 2019A *(PI: D. Milisavljevic)* *5 hours*
25. Searching for Ionized Accretion Flows around the Cluster with O-Type Stars
    Very Large Array, 2019A *(PI: Q. Zhang)* *B-ranked*
26. A Pilot Wideband Chemical Survey of Class I Protostellar Disks
    Submillimeter Array 2018B+2019A *(PI: J. Huang)* *4 A- + 4 B-ranked Tracks*
27. The Chemistry of Planet Formation
    ALMA Cycle 6, Large Program *(PI: K. Öberg)* *A-ranked; 131 hours*
28. Variable Diffuse Interstellar Bands
    Shane 3m 2018B *(PI: K. Crabtree)* *5 Nights*
29. WIYN Survey of Variable Diffuse Interstellar Bands
    WIYN 3.5m 2018A *(PI: D. Milisavljevic)* *1.5 Nights*
30. Hectochelle Survey of Cygnus OB2
    MMT 6.5 m 2016B *(PI: D. Milisavljevic)* *0.5 Nights*

Observing Experience:

- SMA, 15 nights (July 14 – 18, 2016; Dec. 14 – 18, 2017; June 21 – 25, 2018)
- FIRE+Baade, 6.5m Magellan telescope, 2.5 nights (Dec. 13 – 15, 2019)
- MMT, 1 night [*remote*] (Dec. 2, 16, 2016)

Funding:

- Harvard Data Science Initiative Research Fund, Regularized Maximum Likelihood Imaging: A New Method for Detecting Planets ($9,700; Collaborator, PI: R. Teague)
- NRAO Student Observing Support, VLA 2019A, 2019 ($33,601; Advisor: Q. Zhang)
- ALMA Student Observing Support, ALMA Cycle 4, 2016 ($9,000; Advisor: Q. Zhang)

COLLABORATIONS

Molecules with ALMA at Planet-forming Scales (MAPS) 2018 – Present
PI: Karin I. Öberg; co-PIs: Yuri Aikawa, Edwin A. Bergin, Viviana V. Guzmán, Catherine Walsh
ALMA Cycle 6 Large Program to comprehensive survey the chemistry of five protoplanetary disks at high spatial resolution (~15 au)

N132D Chandra Legacy Team 2019 – Present

PI: Paul P. Plucinsky

Chandra Cycle 20 Large Program to obtain legacy observations of N132D at unprecedented depth/integration time (900 ks)

TEACHING

- Python Workshop instructor, SAO Latino Initiative Program — Aug. 16, 2021
  "Scientific Computing with SciPy"
- Co-Instructor, Introduction to Scientific Programming in Python (CSCI P-14320). — Summer 2021
- TF, Interstellar Medium and Star Formation (AY203). Harvard University. — Spring 2021
- TF, Introduction to Scientific Programming in Python (CSCI P-14320). — Summer 2019, 2020
  Harvard Summer School, Pre-College Program
- TF, Stellar and Planetary Astronomy (AY16). Harvard University. — Spring 2020
- TF, Physics I (Lab): Mechanics, Elasticity, Fluids, and Diffusion (PHYS E-1axl). — Fall 2017
  Harvard Extension School.

OUTREACH

- Course Coordinator, Beacon Hill Seminar — Spring 2021, Fall 2021 [*expected*]
  Organized the "Unveiling the Cosmos" weekly seminar; featured in community newspaper
  ["Harvard-Smithsonian Center makes impact with outreach to lifelong learners" in Wicked Local]
- Astronomy Advisor to Harvard Undergraduate Science Olympiad — 2018 – 2020
  Served multiple roles including Astronomy Rules-Writer (Spring 2020) and Event Supervisor (Fall 2018)
- Astrobites Contributing Author — Jan 2019 – Present
  Author and editor of the "reader's digest" version of recent astronomy papers with a wide audience.
  A full list of authored posts (12) can be found here; three of which were featured on AAS Nova:
  Salt and Hot Water around Massive Protostars
  Spectral Line Survey Reveals New Molecules in Two Protoplanetary Disks
  A New Window into Prebiotic Nitrogen Chemistry in Protoplanetary Disks
- AAS Astronomy Ambassador — Jan 2019 – Present
- Presenter, Flipped Science Fair, John F. Kennedy School — June 2018, May 2019
- Speaker, Science Research Mentoring Program, Cambridge Rindge and Latin School — Mar 2018
  Led a hands-on astronomy lecture and activity about molecules in space
- Observatory Night Volunteer, CfA — Fall 2017 – Present
- Seminar Leader, Harvard Summit for Young Leaders in China — Aug 2017
  Designed course curriculum and taught a weeklong astronomy seminar to
  Chinese high school students in Shanghai; handled aspects of residential life

PROFESSIONAL SERVICE & LEADERSHIP

Referee: A&A, A&A Letters, ApJ, ApJS — 2018 – Present

Junior Member, American Astronomical Society — Apr 2017 – Present

CfA Star Formation Journal Club Series Co-Organizer [*expected*]	Fall 2021 – Present
CfA APS-IDEA Committee Member	2021 – Present
Harvard Astronomy Department Peer Mentor	2021 – Present
Co-Organizer, Grad School Visitation Days	Spring 2020
Co-Organizer, Student-Faculty Lunch Series	Spring 2020
Member, Astronomical Society of the Pacific	Jan 2019 – Jan 2020
Treasurer & Founding Member, Harvard Astrophysical Society	Nov 2015 – May 2017

MENTORING

Sage Crystian, Harvard Undergraduate — Summer 2021

Co-advised with K. Öberg; summer research project mapping vertical gas structures in protoplanetary disks using ALMA data

Prabidhik KC, Harvard Undergraduate — Spring 2020 – Present

Co-advised with Q. Zhang; independent research project on the chemistry of MYSOs and UC HII regions using using SMA data

Devin Sullivan, Harvard Undergraduate — Fall 2019

Co-advised with K. Öberg; Junior Thesis (AY98) on the distribution of HCN gas in protoplanetary disks using using ALMA data