Charles J. Law – Curriculum Vitae

University of Virginia, Department of Astronomy
530 McCormick Road, Charlottesville, VA 22904, USA
charles.law@cfa.harvard.edu | claw-astro.github.io
ORCID iD: 0000-0003-1413-1776 | 724-493-0763

PROFESSIONAL APPOINTMENTS

NASA Hubble Fellowship Program (NHFP) Sagan Fellow — Sept 2023 – Present
University of Virginia, Department of Astronomy (Charlottesville, VA)

Postdoctoral Researcher — June 2023 – July 2023
Center for Astrophysics | Harvard & Smithsonian (Cambridge, MA)

EDUCATION

Ph.D., Astronomy and Astrophysics (Harvard University, Cambridge, MA) — 2018 – 2023
Thesis: Zooming in on the Chemistry of Star and Planet Formation — Advisors: Prof. Karin Öberg & Dr. Qizhou Zhang

M.A., Astronomy and Astrophysics (Harvard University, Cambridge, MA) — 2021

B.A., Physics and Astrophysics (Harvard University, Cambridge, MA) — 2013 – 2017
Thesis: Carbon Chain Molecules Toward Embedded Low-Mass Protostars — Advisor: Prof. Karin Öberg

AWARDS

AAS Rodger Doxsey Travel Prize (241st AAS meeting)	2023
ALMA Ambassador	2022
AAS Chambliss Prize Honorable Mention (235th AAS meeting)	2020
NSF Graduate Research Fellowship	2019
Smithsonian Astrophysical Observatory Research Fellowship	2017
Leo Goldberg Prize in Astronomy (Harvard University)	2017
Thomas Temple Hoopes Prize (Harvard University)	2017
Phi Beta Kappa (Harvard University)	2017
USRA Frederick Tarantino Memorial Scholarship Award	2016
PRISE Undergraduate Research Fellowship (Harvard University)	2016
Detur Book Prize (Harvard University)	2014
John Harvard Scholar (Harvard University)	2014

PUBLICATIONS

Author of **52 publications** (refereed or under review), including 12 as first author and 6 as second/third author with major contributions. See a full listing at the end of CV and ADS library for more details. [1013 citations; h-index = 20 (Sep 17, 2023)]

TALKS

I have given **52 talks**, including 8 invited and 11 public talks. See a full listing at the end of CV.

TELESCOPE OBSERVING & PROPOSALS

PI of **13 programs** and Co-I on an additional 50 programs for access to observing facilities.

PI:

1.	Chemical Signatures of a Recently-Confirmed Giant Protoplanet in the HD 169142 Disk	**ALMA**, B, 21.8 hrs, Cycle 10
2.	Witnessing Giant Planet Formation in the Act	**ALMA**, B, 5.2 hrs, Cycle 10
3.	HNC as a Novel Tracer of Protoplanetary Disk Properties	**SMA**, 4 A- + 4 B-tracks, 2023A
4.	Linking Ice and Complex Molecule Inventories in MYSOs	**ALMA**, A, 5.4 hrs, Cycle 9
5.	Witnessing Giant Planet Formation in the Act	**ALMA**, B, 6.0 hrs, Cycle 9
6.	Search for a Surviving Stellar Companion of Nearby SNRs E0102 and N132D	**Magellan**, 2.5 nights, 2022B
7.	Connecting Scaling Laws between Exoplanets and Young Disks	**SMA**, 8 B-tracks, 2020B/21A
8.	Jet-like, IR-bright Ejecta in O-rich LMC Supernova Remnant N132D	**Magellan**, 3 nights, 2021B
9.	Jet-like, IR-bright Ejecta in O-rich LMC Supernova Remnant N132D	**Magellan**, 4 nights, 2020B
10.	Ionized Accretion Flows around 0.1 pc Scale Clusters with O-Type Stars	**ALMA**, C, 14.8 hrs, Cycle 7

11. Jet-like, IR-bright Ejecta in O-rich LMC Supernova Remnant N132D — **Magellan**, 3 nights, 2019B
12. Formation of O Stars by Accretion of Ionized Gas — **VLA**, A, 11 hrs, 2019A
13. Ionized Accretion Flows around 0.1 pc Scale Clusters with O-Type Stars — **SMA**, 8 B-tracks, 2018B/19A

Co-I: **ALMA** (462 hrs), **ACA** (64 hrs), **SMA** (512 hrs), **VLA** (17 hrs), **NOEMA** (56 hrs), **VLBA** (72 hrs), **GBT** (14 hrs), **IRAM 30m** (50 hrs), **JWST** (21 hrs), **Chandra** (190 ks), **HST** (3 orbits), **VLT** (12 hrs), **Shane** (10 nights), **Gemini** (5 hrs), **WIYN** (1.5 nights), **MMT** (0.5 nights)

Observing: **SMA** (15 nights; 2016 – 2018); **Magellan** (7.5 nights; 2019, 2021, 2022); **MMT** (1 night; 2016)

Funding: ALMA Ambassador (**$10,000**), NRAO/SOS, VLA 2019A (**$33,601**; Q. Zhang), ALMA/SOS, ALMA Cycle 4 (**$9,000**; Q. Zhang), ALMA/SOS, ALMA Cycle 9 (**$23,423**; K. Öberg)

MAJOR COLLABORATIONS

SMA-SPEC: the SMA Survey of Protoplanetary disks to Explore their Chemistry — 2023 – Present
PI: Karin I. Öberg
SMA Large Scale Program to conduct unbiased spectral line survey of 40 planet-forming disks

The ALMA Disk-Exoplanet C/Onnection (DECO) — 2023 – Present
PI: Ilse Cleeves; co-PIs: Yuri Aikawa, Viviana V. Guzmán, Anna Miotello, Dana Anderson
ALMA Cycle 8 Large Program to survey the chemistry of 80 disks across 4 star-forming regions

X-ray Mega-Flares in the Orion Nebula Cluster — 2022 – Present
PI: Konstantin V. Getman
Multi-telescope (Chandra, VLBA, ALMA, HET) campaign to study flares in ~1000 PMS stars in the ONC

N132D Chandra Legacy Team — 2019 – Present
PI: Paul P. Plucinsky
Chandra Cycle 20 Large Program legacy observations of SNR N132D at unprecedented depth

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 study the chemistry of five protoplanetary disks at 10-20 au scales
[MAPS team webpage and selected press coverage]

TEACHING

Teaching Fellow

Interstellar Medium and Star Formation (Graduate, Harvard University) — Spring 2021
Stellar and Planetary Astronomy (Undergraduate, Harvard University) — Spring 2020
Introduction to Scientific Programming in Python (Harvard Pre-College Program) — Summer 2019, 2020
Physics I (Lab): Mechanics, Elasticity, Fluids, and Diffusion (Undergraduate, Harvard University) — Fall 2017

Instructor

Introduction to Scientific Programming in Python (Harvard Pre-College Program) — Summer 2021, 2022, 2023
Scientific Computing with SciPy, Python Workshop (SAO Latino Initiative Program) — Summer 2021, 2022, 2023
Unveiling the Cosmos (Beacon Hill Seminars) — Spring, Fall 2021

Pedagogy Training and Teaching Awards

Science Education Undergraduate Mentoring Workshop Series (Harvard University) — Spring 2022
Derek Bok Teaching Certificate (Harvard University) — 2021
Derek Bok Certificate of Excellence and Distinction in Teaching (Harvard University) — Spring 2021

OUTREACH

Subject Matter Expert, NASA Community College Network	2022 – Present
Subject Matter Expert, NASA JWST Community Events	2021 – Present
Poster Judge, NCRC	Jan 2023
Guest, Down to Earth with Terry Virts, Podcast	Feb 2022
Contributing Author, Astrobites	2018 – 2020
Astronomy Advisor, Harvard Undergraduate Science Olympiad	2018 – 2020
Volunteer, CfA Public Observatory Night	2017 – 2020
Presenter, Flipped Science Fair, John F. Kennedy School	June 2018, May 2019
Speaker, Science Research Mentoring Program, Cambridge Rindge and Latin School	Mar 2018

PROFESSIONAL ACTIVITIES

Referee, A&A, A&A Letters, ApJ, ApJS	2018 – Present
AAS Astronomy Ambassador	2019 – Present
SOC, NHFP Symposium (Cambridge, MA)	2023 – Present
Mentor, Astronomy Mentoring Program for Upcoming Postdocs (AMP-UP)	2023 – Present
Member, New Great Observatories Science Analysis Group	2023 – Present
Workshop Leader, ALMA data reduction workshop (IAU meeting, Traverse City, MI)	July 2023
Co-Organizer, CfA Star Formation Journal Club	2022 – 2023
Member, CfA APS-IDEA, Accessibility Subcommittee	2021 – 2023
Peer Mentor, Harvard Astronomy Department	2021 – 2022
Organizer, ALMA Data Reduction Workshop, CfA	Fall 2022
AAS Chambliss Competition Poster Judge	Summer 2022, Winter 2023
Reviewer, ALMA Archival Student Observing Support awards	Spring 2022
Co-Organizer, Graduate School Visitation Days	Spring 2020
Co-Organizer, Student-Faculty Lunch Series	Spring 2020

MENTORING

I have served as primary science advisor for four students and co-advisor for one student.

Arielle Frommer (Harvard, Undergraduate) — Summer 2022 – Present
Spatially-resolved nitrile chemistry in a sample of massive young stellar objects

Sarai Rankin (Morgan State, REU Undergraduate) — Summer 2022
SMA survey of protoplanetary disks in the Cepheus OBb3 star-forming region

Sage Crystian (Harvard, Undergraduate) — Summer 2021
Mapping the vertical structure of protoplanetary disks with CO line emission

Prabidhik KC (Harvard, Undergraduate) — Spring 2020 – Spring 2022
SMA survey of complex chemistry in ultra-compact HII regions

Devin Sullivan (Harvard, Undergraduate / co-advised with K. Öberg) — Fall 2019
Junior Thesis on the distribution of HCN gas in protoplanetary disks

PUBLICATIONS

A full listing of my publications can be found on ADS.
[1013 citations, h-index = 20 (as of Sept 17, 2023); mentees marked with †]

First Author

1. **Law, C. J.**, Benisty M., Facchini S., et al., 2023. ApJ, subm.
   Mapping the Vertical Gas Structure of the Planet-hosting PDS 70 Disk
2. **Law, C. J.**, Booth, A. S., & Öberg, K. I. 2023. ApJL, 952, L19
   SO and SiS Emission Tracing an Embedded Planet and Compact ^{12}CO and ^{13}CO Counterparts in the HD 169142 Disk
3. **Law, C. J.**, Teague, R., Öberg, K. I., et al., 2023. ApJ, 948, 60
   Mapping Protoplanetary Disk Vertical Structure with CO Isotopologue Line Emission
4. **Law, C. J.**, Crystian, S.†, Teague, R., et al., 2022. ApJ, 932, 114
   CO Line Emission Surfaces and Vertical Structure in Mid-Inclination Protoplanetary Disks
5. **Law, C. J.**, Loomis, R. A., Teague, R., et al., 2021. ApJS, 257, 3
   MAPS III. Characteristics of Radial Chemical Substructures
6. **Law, C. J.**, Teague, R., Loomis, R. A., et al., 2021. ApJS, 257, 4
   MAPS IV. Emission Surfaces and Vertical Distribution of Molecules
7. **Law, C. J.**, Zhang, Q., Öberg, K. I., et al., 2021. ApJ, 909, 214
   Subarcsecond Imaging of the Complex Organic Chemistry in Massive Star-Forming Region G10.6-0.4
8. **Law, C. J.**, Milisavljevic, D., Patnaude, D. J., et al., 2020. ApJ, 894, 73
   3D Kinematic Reconstruction of the Optically-Emitting, High-Velocity, Oxygen-Rich Ejecta of Supernova Remnant N132D
9. **Law, C. J.**, Zhang, Q., Ricci, L., et al., 2018. ApJ, 865, 17
   Submillimeter Array Observations of Extended CO (J = 2 – 1) Emission in Interacting Galaxy NGC 3627
10. **Law, C. J.**, Öberg, K. I., Bergner, J. B., et al., 2018. ApJ, 863, 88
    Carbon Chain Molecules Toward Embedded Low-Mass Protostars
11. **Law, C. J.**, Ricci, L., Andrews, S. M., et al., 2017. AJ, 154, 255
    An SMA Continuum Survey of Circumstellar Disks in the Serpens Star-Forming Region
12. **Law, C. J.**, Milisavljevic, D., Crabtree, K. N., et al., 2017. MNRAS, 470, 3
    TRES Survey of Variable Diffuse Interstellar Bands

Second or Third Author

1. Booth, A. S., **Law, C. J.**, Temmink, M., et al., 2023. A&A, in press [arXiv:2308.07910]
   Tracing snowlines and C/O ratio in a planet-hosting disk: ALMA molecular line observations towards the HD 169142 disk
2. Sturm, J. A., McClure M. K., **Law, C. J.**, et al., 2023. A&A, 677, 17
   The edge-on protoplanetary disk HH 48 NE I. Modeling the geometry and stellar parameters
3. Muñoz-Romero, C. E., Öberg, K. I., **Law, C. J.**, et al., 2023. ApJ, 943, 35
   Cold Deuterium Fractionation in the Nearest Planet-Forming Disk
4. Teague, R., **Law, C. J.**, Huang, J., et al., 2021. JOSS, 6, 67
   disksurf: Extracting the 3D Structure of Protoplanetary Disks
5. Zhang, K., Booth, A. S., **Law, C. J.**, et al., 2021. ApJS, 257, 5
   MAPS V. CO Gas Distributions
6. Guzmán, V. V., Bergner, J. B., **Law, C. J.**, et al., 2021. ApJS, 257, 6
   MAPS VI. Distribution of the Small Organics HCN, C_2H, and H_2CO

Other Co-Authored Publications

1. Lewis, B. L., et al. (incl. **Law, C. J.**), 2023. J. Sci. Educ. Technol., subm
   Exploring the Effects of Astrobites Lesson Plans on Undergraduate Astronomy Students

2. Muñoz-Romero, C. E., et al. (incl. **Law, C. J.**), 2023. ApJ, subm
   JWST-MIRI Unveils Reduced and Atypically Variable Water Vapor in the AS 209 Disk
3. Sano, H., et al. (incl. **Law, C. J.**), 2023. ApJ, subm
   ALMA Observations of Supernova Remnant N49 in the Large Magellanic Cloud. II. Non-LTE Analysis of Shock-Heated Molecular Clouds
4. Sturm, J. A., et al. (incl. **Law, C. J.**), 2023. A&A, in press [arXiv: 2309.07817]
   A JWST inventory of protoplanetary disk ices: The edge-on protoplanetary disk HH 48 NE, seen with the Ice Age ERS program
5. Waggoner, A. R., et al. (incl. **Law, C. J.**), 2023. ApJ, in press [arXiv:2308.11699]
   MAPS. Constraining Serendipitous Time Variability in Protoplanetary Disk Molecular Ion Emission
6. Portilla-Revelo, B. et al. (incl. **Law, C. J.**), 2023. A&A, 677, 76
   Constraining the gas distribution in the PDS 70 disc as a method to assess the effect of planet-disc interactions
7. Sturm, J. A., et al. (incl. **Law, C. J.**), 2023. A&A, 677, 18
   The edge-on protoplanetary disk HH 48 NE II. Modeling ices and silicates
8. Galloway-Sprietsma, M., et al. (incl. **Law, C. J.**), 2023. ApJ, 950, 147
   MAPS: Complex Kinematics in the AS 209 Disk Induced by a Forming Planet and Disk Winds
9. Pegues, J., et al. (incl. **Law, C. J.**), 2023. ApJ, 948, 57
   An SMA Survey of Chemistry in Disks around Herbig AeBe Stars
10. Banovetz, J., et al. (incl. **Law, C. J.**), 2023. ApJ, 948, 33
    HST Proper Motion Measurements of Supernova Remnant N132D: Center of Expansion and Age
11. Calahan, J. K., et al. (incl. **Law, C. J.**), 2023. Nature Astronomy, 7, 49
    UV-driven Chemistry as a Signpost of Late-stage Planet Formation
12. Galván-Madrid, R., et al. (incl. **Law, C. J.**), 2023. ApJL, 942, L7
    Clustered Formation of Massive Stars within an Ionized Rotating Disk
13. Anderson, A. R., et al. (incl. **Law, C. J.**), 2022. ApJ, 938, 55
    Protostellar and Protoplanetary Disk Masses in the Serpens-Aquila Region
14. Bae, J., et al. (incl. **Law, C. J.**), 2022. ApJL, 934, L20
    MAPS. A Circumplanetary Disk Candidate in Molecular Line Emission in the AS 209 Disk
15. Sharda, P., et al. (incl. **Law, C. J.**), 2022. MNRAS, 509, 2
    First extragalactic measurement of the turbulence driving parameter: ALMA observations of the star-forming region N159E in the Large Magellanic Cloud
16. Martín-Doménech, R., et al. (incl. **Law, C. J.**), 2021. ApJ, 923, 155
    Hot corino chemistry in the Class I binary source Ser-emb 11
17. Öberg, K. I., et al. (incl. **Law, C. J.**), 2021. ApJS, 257, 1
    MAPS I. Program Overview and Highlights
18. Czekala, I., et al. (incl. **Law, C. J.**), 2021. ApJS, 257, 2
    MAPS II. CLEAN Strategies for Synthesizing Images of Molecular Line Emission in Protoplanetary Disks
19. Bosman, A. D., et al. (incl. **Law, C. J.**), 2021. ApJS, 257, 7
    MAPS VII. Substellar O/H and C/H and Superstellar C/O in Planet-feeding Gas
20. Alarcón, F., et al. (incl. **Law, C. J.**), 2021. ApJS, 257, 8
    MAPS VIII. CO Gap in AS 209 – Gas Depletion or Chemical Processing?
21. Ilee, J. D., et al. (incl. **Law, C. J.**), 2021. ApJS, 257, 9
    MAPS IX. Distribution and Properties of the Large Organic Molecules HC_3N, CH_3CN, and c-C_3H_2
22. Cataldi, G., et al. (incl. **Law, C. J.**), 2021. ApJS, 257, 10
    MAPS X. Studying Deuteration at High Angular Resolution toward Protoplanetary Disks
23. Bergner, J. B., et al. (incl. **Law, C. J.**), 2021. ApJS, 257, 11
    MAPS XI. CN and HCN as Tracers of Photochemistry in Disks
24. Le Gal, R., et al. (incl. **Law, C. J.**), 2021. ApJS, 257, 12
    MAPS XII. Inferring the C/O and S/H Ratios in Protoplanetary Disks with Sulfur Molecules

25. Aikawa, Y., et al. (incl. **Law, C. J.**), 2021. ApJS, 257, 13
    MAPS XIII. HCO^+ and Disk Ionization Structure
26. Sierra, A., et al. (incl. **Law, C. J.**), 2021. ApJS, 257, 14
    MAPS XIV. Revealing Disk Substructures in Multiwavelength Continuum Emission
27. Bosman, A. D., et al. (incl. **Law, C. J.**), 2021. ApJS, 257, 15
    MAPS XV. Tracing Protoplanetary Disk Structure within 20 au
28. Booth, A. S., et al. (incl. **Law, C. J.**), 2021. ApJS, 257, 16
    MAPS XVI. Characterizing the Impact of the Molecular Wind on the Evolution of the HD 163296 System
29. Calahan, J. K., et al. (incl. **Law, C. J.**), 2021. ApJS, 257, 17
    MAPS XVII. Determining the 2D Thermal Structure of the HD 163296 Disk
30. Teague, R., et al. (incl. **Law, C. J.**), 2021. ApJS, 257, 18
    MAPS XVIII. Kinematic Substructure in the Disks of HD 163296 and MWC 480
31. Huang, J., et al. (incl. **Law, C. J.**), 2021. ApJS, 257, 19
    MAPS XIX. Spiral Arms, a Tail, and Diffuse Structures Traced by CO around the GM Aur Disk
32. Schwarz, K. R., et al. (incl. **Law, C. J.**), 2021. ApJS, 257, 20
    MAPS XX. The Massive Disk Around GM Aurigae
33. Sano, H., et al. (incl. **Law, C. J.**), 2020. ApJ, 902, 53
    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
34. Le Gal, R., et al. (incl. **Law, C. J.**), 2020. ApJ, 898, 131
    A 3mm chemical exploration of small organics in Class I YSOs

TALKS

1.	*Public Talk*, West Valley Astronomy Club (virtual)	Feb 2024 [*expected*]
2.	*Public Talk*, UVA Public Night (Charlottesville, VA)	Jan 2024 [*expected*]
3.	Contributed, 2023 NASA Hubble Fellowship Program Symposium (Cambridge, MA)	Sept 2023 [*expected*]
4.	Contributed, Kavli-IAU Astrochemistry Symposium (Traverse City, MI)	July 2023
5.	Contributed, 2023 Northeast Star and Planet Formation Meeting, CfA (Cambridge, MA)	June 2023
6.	Seminar, SMA Science Seminar, CfA (Cambridge, MA)	May 2023
7.	Dissertation Talk, 241st American Astronomical Society (Seattle, WA)	Jan 2023
8.	Seminar, Carnegie Earth & Planets Laboratory (virtual)	Dec 2022
9.	ITC Luncheon Talk, CfA (Cambridge, MA)	Oct 2022
10.	Seminar, University of Milan (Milan, Italy)	Oct 2022
11.	Contributed, From Clouds to Planets II (Berlin, Germany)	Oct 2022
12.	Leiden Astrochemistry Seminar (Leiden, The Netherlands)	Sept 2022
13.	Planet and Star Formation Coffee, MPIA (Heidelberg, Germany)	Sept 2022
14.	SPF Group Meeting, ESO (Garching, Germany)	Sept 2022
15.	Contributed, Planet and Binary Formation in GI Discs (Leicester, UK)	Sept 2022
16.	*Public Talk*, Tellus Science Museum (virtual)	Aug 2022
17.	Contributed, Northeast Star and Planet Formation Meeting, Wesleyan University (Middletown, CT)	July 2022
18.	*Public Talk*, Cape Cod Museum of Natural History (Brewster, MA)	July 2022
19.	*Public Talk*, Atwood Museum, Cape Cod (Chatham, MA)	July 2022
20.	Contributed, 240th American Astronomical Society (virtual)	June 2022
21.	Contributed, VICO-CICO-CASSUM Spring Workshop, University of Virginia (Charlottesville, VA)	May 2022
22.	Contributed, Exoplanets IV, AAS Topical Conference Series (Las Vegas, NV)	May 2022
23.	Contributed, MAYA: Meeting of ALMA Young Astronomers (virtual)	Mar 2022
24.	Contributed, AstroCheminar, American Chemical Society (virtual)	Jan 2022
25.	*Public Talk*, Cape Cod Astronomical Society (virtual)	Jan 2022

26. **Invited**, Lunch Talk, University of Virginia/NRAO (virtual) Nov 2021
27. *Public Talk*, Cape Cod Museum of Natural History (virtual) Nov 2021
28. **Invited**, Astrochemistry Discussions (virtual) Nov 2021
29. **Invited**, Leiden Astrochemistry Seminar (virtual) Oct 2021
30. *Public Talk*, Beacon Hill Seminar (virtual) Oct 2021
31. Seminar, Exoplanet Pizza Lunch, CfA (virtual) Sept 2021
32. Contributed, Chemical Processes in Solar-type Star-forming Regions (Turin, Italy) Sept 2021
33. **Invited**, SSP Coffee Talk, CfA (virtual) July 2021
34. Contributed, Emerging Researchers in Exoplanet Science (virtual) May 2021
35. **Invited**, Origins Seminar, University of Arizona (virtual) May 2021
36. Contributed, Space Telescope, 2021 Spring Symposium (virtual) Apr 2021
37. Contributed, Five Years after HL Tau: A New Era in Planet Formation (virtual) Dec 2020
38. Contributed, Harvard-Heidelberg Star Formation Workshop (virtual) Dec 2020
39. Contributed, Astrochemical Frontiers (virtual) June 2020
40. *Public Talk*, North Shore Amateur Astronomy Club (virtual) June 2020
41. *Public Talk*, Gloucester Area Astronomy Club (virtual) May 2020
42. *Public Talk*, Beacon Hill Seminar (Boston, MA) Mar 2020
43. Seminar, SMA Science Seminar, CfA (Cambridge, MA) Feb 2020
44. Contributed, New England Star Formation Meeting, University of Connecticut (Storrs, CT) Jan 2020
45. Contributed, 235th American Astronomical Society (Honolulu, HI) Jan 2020
46. *Public Talk*, Union County College/AAI (Cranford, NJ) Dec 2019
47. Contributed, Science with the SMA: Present and Future (Taipei, Taiwan) Oct 2019
48. Contributed, 74th International Symposium on Molecular Spectroscopy (Champaign-Urbana, IL) June 2019
49. Contributed, Supernova Remnants II: An Odyssey in Space after Stellar Death (Chania, Greece) June 2019
50. Seminar, Exoplanet Pizza Lunch, CfA (Cambridge, MA) May 2019
51. **Invited**, ALMA Community Day, MIT (Cambridge, MA) Apr 2019
52. **Invited**, ALMA Community Day, CfA (Cambridge, MA) Apr 2019
53. Seminar, High Energy Phenomena Seminar, CfA (Cambridge, MA) Feb 2019
54. **Invited**, SMA Advisory Committee Meeting, CfA (Cambridge, MA) July 2018
55. *Public Talk*, Gloucester Area Astronomy Club (Gloucester, MA) Sept 2018