

Christopher D. Matzner  
**CURRICULUM VITAE**  
November 2024

**A. Biographical Information**

1. Personal

Office Department of Astronomy and Astrophysics, University of Toronto  
50 St. George Street, Toronto ON M5S 3H4, Canada  
416 978-2172

2. Education

Ph.D. 1999 University of California, Berkeley (Physics)  
Thesis: *The Birth and Death of Stars*  
Supervisor: Christopher F. McKee  
M.A. 1995 University of California, Berkeley (Physics)  
A.B. 1993 Harvard University (Physics)

3. Employment

Assoc. Chair, Undergraduate	U. Toronto, Dept. of Astronomy & Astrophys.	2023 - present
Assoc. Chair, Graduate	U. Toronto, Dept. of Astronomy & Astrophys.	2016 - 2020
Professor	University of Toronto	2017 - present
Associate Professor	University of Toronto	2008 - 2017
Assistant Professor	University of Toronto	2002 - 2008
Graduate Faculty	University of Toronto	2002 - present
Senior Postdoc	Canad. Inst. for Theor. Astroph.	2000 - 2001
Postdoc	Canad. Inst. for Theor. Astroph.	1999 - 2000
Visiting Postdoc	Cal. Inst. of Tech.	2000
Graduate Researcher	U. California, Berkeley, Physics	1994 - 1999
Student Researcher	U. of Texas Appl. Rsch. Labs	1990 - 1993
Student Researcher	Harvard-Smithsonian CfA	1991 - 1992

4. Honours

U. of Toronto Commendation for Accessibility in Teaching	2011
Ontario Early Researcher Award	2007
Nominee, Board of Directors, Canadian Astronomical Society	2005
Canada Research Chair (Tier 2)	2002 - 2007
ARCS Fellowship	1997
U.S. National Science Foundation Fellowship	1993 - 1996
Ford Foundation Fellowship	1992
U.S. Dept. of Defense Science and Engineering Apprenticeship	1990
Tandy Technology Scholarship	1990
Texas Excellence Award	1990
Texas Chemical Council Award	1990
Tracor Scholarship	1989
U.S. National Merit Scholarship	1989

5. Professional Affiliations and Activities

SOC, <i>The Fullness of Space</i> (Berkeley, CA, USA)	2024
Member, CASCA <i>vAGM Tiger Team</i>	2024
Chair, CASCA <i>Annual General Meeting</i> Online Organizing Committee	2020
Inaugural Chair, CASCA Sustainability Committee	2020 -
SOC, <i>Star Formation in Different Environments</i> (Quy Nhon, Vietnam)	2015 - 2016
Member, <i>International Astronomical Union</i>	2015 -
Member, <i>Green Bank Ammonia Survey Science Team</i>	2015 -
Chair, <i>Compute Canada Astron. &amp; Subatomic Physics Eval. Committee</i>	2018
Member, <i>Compute Canada Astron. &amp; Subatomic Physics Eval. Committee</i>	2012 -
Member, <i>SciNet Local Resource Allocation Committee</i>	2009 - 2011
Co-Organizer, <i>Ontario Star Formation Jamboree</i>	2007
Member, <i>Multiplicity in Star Formation</i> local organizing committee	2007
Member, <i>JCMT Gould Belt Legacy Survey</i> science team	2006 - 2008
Member, Inst. for Applied and Interdisc. Mathematics	2004 -
Member, CITA Inc.	2004 -
Member, Canadian Astronomical Society	2000 -
Member, American Physical Society	1993 -
Member, American Astronomical Society	1995 -

**B. Academic History**

## 6a. Research Endeavours

My research group and I work on hydrodynamics relevant to gravitational collapse, black hole accretion, energy production, and explosion in fields such as star formation, supernova explosions, gamma-ray bursts, and stellar tidal disruptions. We also study the dynamics and observational diagnostics of interstellar nebulae and their effect on giant molecular clouds.

6b. Research Awards

2023-2027 Toronto-HUJI Research & Training Grant (Co-I)	\$ 517,000 <sup>†</sup>
2022-2023 Dunlap Inst. Seed Grant (Co-I)	\$ 344,920 <sup>†</sup>
2021-2022 Dunlap Inst. Seed Grant (Co-I)	\$ 67,000 <sup>†</sup>
2017-2024 NSERC Discovery Grant	\$ 180,000
2020-2021 Dunlap Inst. Seed Grant (Co-I)	\$ 20,000 <sup>†</sup>
2012-2017 NSERC Discovery Grant	\$ 165,000
2006-2010 Ontario Early Researcher Award	\$ 20,000
2002-2005 NSERC Discovery Grant	\$182,400
2007-2010 Ontario Early Researcher Award	\$ 20,000/yr
2002-2007 Canada Res. Chair Tier-2 Stipend	\$ 10,000/yr
Connaught New-Staff Matching Grant	\$ 16,500
Connaught Start-up Fund	\$ 10,000
Departmental Start-up Fund	\$ 30,000
2001-2002 CITA Senior Research Grant	\$ 15,000
2000-2001 NSERC CITA Research Grant	\$ 10,000

<sup>†</sup> I receive no material funding from these grants.

C. **Scholarly and Professional Work**7. Papers in Refereed Journals

76. Wu, Y., Hadden, S., Dewberry, J., El-Badry, K., & Matzner, C. D., “Eccentricities of Close Stellar Binaries”, 2024, *ApJL*, submitted (14 pg.)
75. Pineda, J. et al. incl. Matzner, C. D. “The Green Bank Ammonia Survey: Data Release 2”, 2024, *MNRAS*, submitted (24 pg.)
74. Faran, T., Matzner, C. D., & Quataert, E., “Nonlinear acoustics and shock dynamics in isentropic atmospheres”, 2024, *ApJ*, 976, 97 (7 pg.)
73. Matzner, C. D., “Intense star cluster formation: stellar masses, the mass function, and the fundamental mass scale”, 2024, *ApJL*, 1, L17 (11 pg.)
72. **Khullar, S.**,\* Matzner, C.D., Murray, N., et al. “Playing with FIRE: A Galactic Feedback-Halting Experiment Challenges Star Formation Rate Theories” 2023, *ApJ.*, 973, 40 (14 pg.)
71. Lu, W., Matsumoto, T., & Matzner, C.D., “Misaligned precessing jets are choked by the accretion disk wind”, 2023, *MNRAS*, 533, 979 (11 pg.)
70. **Armstrong, I., Gurbuz, B.**, Curtin, D. & Matzner, C. D., “Electromagnetic Signatures of Mirror Stars”, 2023, *ApJ*, 965, 42 (11 pg.)
69. **Scully, B.**, Matzner, C. D., & Yalinewich, A. “Observability of flashes from ejecta crashes in aspherical supernovae, with application to SN 2008D”, 2023, *MNRAS*, 525, 1562 (7 pg.)

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\*Boldface authors are students or postdoctoral fellows under my supervision or co-supervision when the work was written.

68. Ni, Y. Q., Moon, D.-S., Drout, M. R., Matzner, C. D. et al., “Origin of high-velocity ejecta and early red excess emission in the infant Type Ia supernova 2021aefx”, 2023, *ApJ*, 959, 132 (35 pg.)
67. Ni, Y. Q., Moon, D.-S., Drout, M. R., et al., “The Origin and Evolution of the Normal Type Ia SN 2018aoz with Infant-phase Reddening and Excess Emission”, 2023, *ApJ*, 946, 7
66. Smith, S. et al., “Velocity-Coherent Substructure in TMC-1: Inflow and Fragmentation”, 2023, *MNRAS*, 519, 285. (15 pg.)
65. Gill, A. S., Shaaban, M. M., **Tohuvavohu, A.**, et al., “A low-cost ultraviolet-to-infrared absolute quantum efficiency characterization system of detectors”, 2022, *Proceedings of SPIE*, 12191, 1219114 (15 pg.)
64. Ni, Y. Q. et al., “Infant-phase reddening by surface Fe-peak elements in a normal type Ia supernova”. 2022, *Nature Astronomy*, 6, 568 (9 pg.)
63. Howe, A., Setford, J., Curtin, D., et al. “How to Search for Mirror Stars With Gaia”, 2022, *JHEP*, 7, 59 (31 pg.)
62. Ni, Y. Q. et al. “Infant-phase reddening by surface Fe-peak elements in a normal type Ia supernova” 2022, *Nature Astronomy*. doi:10.1038/s41550-022-01603-4 (46 pg.)
61. **A. Singh**, C. D. Matzner, and the GAS collaboration (22 co-authors), “Are massive dense clumps truly sub-virial? A new analysis using Gould Belt ammonia data”, 2021, *ApJ*, 922, 87 (16 pg.)
60. **Khullar, S.**, Fedderath, C., Krumholz, M., & Matzner, C. D., “The density structure of supersonic self-gravitating turbulence”, 2021, *MNRAS*, 507, 4335 (17 pg.)
59. Matzner, C. D. & Ro, S. “On Linear and Nonlinear Acoustics in Stratified, Variable-Area Ducts and Atmospheres, and Lighthill’s Proposition”, 2021, *J. Fl. Mech.*, 915, A32(14 pg.)
58. **Afsariardchi, N.**, Drout, M. R., Khatami, D., Matzner, C. D., Moon, D.-S, & Ni, Y. Q. “The Nickel Mass Distribution of Stripped-Envelope Supernovae: Implications for Additional Power Sources”, 2021, *ApJ*, 918, 89 (27 pg.)
57. Matzner, C. D. & Ro, S. “Wave-Driven Shocks in Stellar Outbursts: Dynamics, Envelope Heating, and Nascent Blastwaves”, 2021, *ApJ*, 908, 23 (11 pg.)
56. Chen, C-Y. and 28 co-authors. “Relative Alignment between Dense Molecular Cores and Ambient Magnetic Field: The Synergy of Numerical Models and Observations”, 2020, *MNRAS*, 494, 1971 (17 pg.)
55. Li, X., Chang, P., Levin, Y., Matzner, C. D., & Armitage, P. “Simulation of a Compact Object with Outflows Moving Through a Gaseous Background”, 2020, *MNRAS*, 494, 2327 (10 pg.)
54. Chen, C.-Y. and 28 co-authors. “Velocity-coherent Filaments in NGC 1333: Evidence for Accretion Flow?” *AJ*, 891, 84 (24 pg.)

53. Shen, R.-F., Matzner, C. D., Howard, A. W., & Zhang, W. “Constraints on the binary black hole hypothesis for system LB-1”, 2019, *arXiv:191112581S* (5 pg.)
52. Yalinewich, A. & Matzner, C. D. “Optical Transient from an Explosion Close to the Stellar Surface”, 2019, *MNRAS*, 490, 312 (7 pg.)
51. Gruzinov, A., Levin, Y., & Matzner, C. D., “Negative Dynamical Friction on compact objects moving through dense gas”, 2020, *MNRAS*, 492, 2755 (7 pg.)
50. **Afsariardchi, N.**, and 14 coauthors, “KSP-SN-2016kf: A Long-Rising H-Rich Type II Supernova with Unusually High  $^{56}\text{Ni}$  Mass Discovered in the KMTNet Supernova Program”, 2019, *ApJ*, 881, 22 (18 pg.)
49. **A. Singh**, C.D. Matzner, & P.H. Jumper., “Virial Ratio: Direct Estimation from Molecular Cloud Data”, 2019, *ApJ*, 878, 22 (7 pg.)
48. H. Chen *et al.* “Droplets I: Pressure-Dominated Sub-0.1 pc Coherent Structures in L1688 and B18”, 2019, *ApJ*, 877, 93 (42 pg.)
47. **P. H. Jumper** & C. D. Matzner, “Capture and Escape: The Dependence of Radiation Forces on Clumping in Dusty Envelopes”, 2018, *MNRAS*, 480, 4424 (9 pg.)
46. **P. H. Jumper** & C. D. Matzner, “Radiation Forces on Dust Envelopes”, 2018, *MNRAS*, 480, 905 (9 pg.)
45. Redaelli, E., et al. 2017, ”The Green Bank Ammonia Survey: Unveiling the Dynamics of the Barnard 59 Star-forming Clump”, *ApJ*, 850, 202 (14 pg.)
44. **N. Afsariardchi** & C. D. Matzner, “Aspherical Supernovae: Effects on Early Light Curves”, 2018, *ApJ*, 856, 146 (21 pg.)
43. J. Keown *et al.*, “The Green Bank Ammonia Survey: Observations of Hierarchical Dense Gas Structures in Cepheus-L1251”, *ApJ*, 850, 3 (24 pg.)
42. H. Kirk *et al.*, “Dense Cores Under Pressure in Orion A”, 2017, *ApJ*, 846, 144 (19 pg.)
41. R. K. Friesen *et al.*, “The Green Bank Ammonia Survey (GAS): First Results of  $\text{NH}_3$  Mapping the Gould Belt”, 2017, *ApJ*, 843, 63 (26 pg.)
40. **S. Ro** & C. D. Matzner, “Shock Dynamics in Stellar Outbursts: I. Shock Formation”, 2017, *ApJ*, 841, 9 (9 pg.)
39. **S. Ro** & C. D. Matzner, “On the Launching and Structure of Radiatively Driven Winds in Wolf-Rayet Stars”, 2016, *ApJ*, 821, 109 (14 pg.)
38. C. D. Matzner & **P. H. Jumper**, “Star Cluster Formation with Stellar Feedback and Large-scale Inflow”, 2015, *ApJ*, 815, 68 (18 pg.)
37. S. C. C. Yeh, E. Seaquist, C. D. Matzner, & E. Pellegrini, “Molecular and Ionized Hydrogen in 30 Doradus. I. Imaging Observations”, 2015, *ApJ*, 807, 117 (10 pg.)
36. **P. Salbi**, C. D. Matzner, **S. Ro** & Y. Levin, “Oblique Shock Breakout

- in Supernovae and Gamma-Ray Bursts: II. Numerical Solutions For Non-Relativistic Pattern Speeds”, 2014, *ApJ*, 790, 71 (12 pg)
35. **R.-F. Shen** & C. D. Matzner, “Evolution and Precession of Accretion Disks in Tidal Disruption Events”, 2014, *ApJ*, 784, 87 (21 pg)
34. C. D. Matzner, Y. Levin, & **S. Ro**, “Oblique Shock Breakout in Supernovae and Gamma-Ray Bursts: I. Dynamics and Observational Implications”, 2013, *ApJ*, 779, 60 (10 pg)
33. **S. Ro** & C. D. Matzner, “Shock Emergence in Supernovae: Limiting Cases and Accurate Approximations”, 2013, *ApJ*, 773, 79 (5 pg)
32. S. Verdolini, **S. C. C. Yeh**, M. R. Krumholz, C. D. Matzner, & A. Tielens, “Line Emission from Radiation-Pressurized H II Regions. II: Dynamics and Population Synthesis”, 2013, *ApJ*, 769, (12 pg)
31. **S. C. C. Yeh**, S. Verdolini, M. R. Krumholz, C. D. Matzner, & A. Tielens, “Line Emission from Radiation-Pressurized H II Regions. I: Internal Structure and Line Ratios”, 2013, *ApJ*, 769, (8 pg)
30. **M. Rahman**, C. D. Matzner, & D.-S. Moon, “OB Associations at the Upper End of the Milky Way Luminosity Function”, 2013, *ApJ*, 766, 135-154
29. **S. C. C. Yeh** & C. D. Matzner, “Ionization Parameter as a Diagnostic of Radiation and Wind Pressures in H II Regions and Starburst Galaxies” 2012, *ApJ*, 757, 108-125
28. **R. F. Shen**, & C. D. Matzner, “Coasting external shock in wind medium: an origin for the X-ray plateau decay component in *Swift* GRB afterglows”, 2012, *ApJ*, 744, 36-45
27. **M. Rahman**, D.-S. Moon, & C. D. Matzner, “Spectroscopic Confirmation of the Dragonfish Association: The Galaxy’s Most Luminous OB Association”, 2011, *ApJ*, 743, L28-32.
26. N. J. Goldbaum, M. R. Krumholz, C. D. Matzner, & C. F. McKee, “The Global Evolution of Molecular Clouds: II. The Role of Accretion”, 2011, *ApJ*, 738, 101-120
25. B. Pang, U.-L. Pen, C. D. Matzner, **S. R. Green** & M. Liebendörfer, “Numerical Parameter Survey of Nonradiative Black Hole Accretion – Flow Structure and Variability of the Rotation Measure”, 2011, *MNRAS*, 415, 1228-1239
24. **M. Rahman**, C. D. Matzner, & D.-S. Moon, “A Candidate for the Most Luminous OB Association in the Galaxy”, 2011, *ApJ*, 728, L37-L41
23. S. Offner, **K. M. Kratter**, C. D. Matzner, M. R. Krumholz, & R. I. Klein, “The Formation of Low-mass Binary Star Systems Via Turbulent Fragmentation”, 2010, *ApJ*, 725, 1485-1494
22. S.F. Graves *et al.*, “The JCMT Legacy Survey of the Gould Belt: a First Look at Serpens with HARP”, 2010, *MNRAS*, 409, 1412-1428

21. S. M. Fall, M. R. Krumholz, & C. D. Matzner, “Stellar Feedback in Molecular Clouds and its Influence on the Mass Function of Young Star Clusters” 2010, *ApJ*, 710, L142-L146
20. **K.M. Kratter**, C. D. Matzner, M. R. Krumholz, M. R., & R. I. Klein, “On the Role of Disks in the Formation of Stellar Systems: A Numerical Parameter Study of Rapid Accretion” 2010, *ApJ*, 708, 1585-1597
19. M. R. Krumholz & C. D. Matzner, “The Dynamics of Radiation Pressure-Dominated HII Regions” 2009, *ApJ*, 703, 1352-1362
18. **K.M. Kratter**, C. D. Matzner, and M. Krumholz, “Global Models for the Evolution of Embedded, Accreting Protostellar Disks” 2008, *ApJ*, 681, 375-390
17. C. D. Matzner & **R. Krasnopolsky**, “Radiative Bubbles Blown by Slow Stellar Winds” 2008, *MNRAS* 386, 903-908
16. D. Ward-Thompson *et al.*, “The JCMT Gould Belt Legacy Survey” 2007, *PASP*, 119, 855-870
15. C. D. Matzner, “Protostellar Outflow-Driven Turbulence” 2007, *ApJ*, 659, 1394-1403
14. M. Krumholz, C. D. Matzner, & C.F. McKee, “The Global Evolution of Giant Molecular Clouds. I. Model formulation and Quasi-Equilibrium Behavior” 2006, *ApJ*, 653, 361-382
13. **K.M. Kratter** & C. D. Matzner, “Fragmentation of Massive Protostellar Disks” 2006, *MNRAS*, 373, 1563-1576
12. C. D. Matzner and Y. Levin, “Protostellar Disks: Formation, Fragmentation, and the Brown Dwarf Desert” 2005, *ApJ*, 628, 817-831
11. **A.J. Calzavara** and C. D. Matzner, “Supernova Properties from Shock Breakout X-Rays” 2004, *MNRAS*, 351, 694-706
10. U.L. Pen, C. D. Matzner, and **W. Shingkwong**, “The Fate of Nonradiative Black Hole Accretion: Magnetically-Frustrated Convection” 2003, *ApJL*, 596, 207-210
9. C. D. Matzner, “Supernova Hosts for Gamma-Ray Burst Jets: Dynamical Constraints.” 2003, *MNRAS*, 345, 575-589
8. C. D. Matzner. “The Role of Massive Stars in the Support and Destruction of Giant Molecular Clouds.” 2002, *ApJ*, 566, 302-314
7. J. Tan, C. D. Matzner, and C.F. McKee. “Trans-relativistic Blastwaves in Supernovae as Gamma Ray Burst Progenitors.” 2001, *ApJ*, 551, 946-972
6. Y.Q. Wu, C. D. Matzner, and P. Arras. “R-modes in Neutron Stars with Crusts: Turbulent Saturation, Spin-down, and Crust Melting.” 2001, *ApJ*, 549, 1011-1020
5. C. D. Matzner and C.F. McKee. “Efficiencies of Low-Mass Star and Star Cluster Formation.” 2000, *ApJ*, 545, 364-378
4. C. D. Matzner and C.F. McKee. “Bipolar Molecular Outflows Driven by Hydromagnetic Protostellar Winds.” 1999, *ApJL*, 526, 109-112

3. C. D. Matzner and C.F. McKee. “The Expulsion of Stellar Envelopes in Core-Collapse Supernovae.” 1999, *ApJ*, 510, 379-403
2. G. Ushomirsky, C. D. Matzner, E.F. Brown, L. Bildsten, V.G. Hilliard, and P.C. Schroeder. “Light Element Depletion in Contracting Brown Dwarfs and Pre-Main-Sequence Stars.” 1998, *ApJ*, 497, 253-266
1. L. Bildsten, E.F. Brown, C. D. Matzner, and G. Ushomirsky. “Lithium Depletion in Fully Convective Pre-Main-Sequence Stars.” 1997, *ApJ*, 482, 442-447

#### 8. Non-Refereed Publications, Book Reviews and Invited Reviews

##### *Policy Reports*

19. R. Fernández and 16 coauthors. “Large-Parallel Supercomputer Simulations – Frontiers in Canadian Research”, 2020. (5 pg.) White paper for the Canadian New Digital Research Infrastructure Organization (NRDIO)
18. C. D. Matzner and 14 coauthors. “Astronomy in a Low-Carbon Future: LRP 2020 White Paper”, 2019, arXiv:1910.0127. (16 pg.) White paper for the Canadian astronomy community’s 2020 *Long Range Plan*. [Primary author and organizer]
17. J. E. Taylor and 11 coauthors. “Theoretical Astrophysics in Canada”, 2019, DOI:10.5281/zenodo.3824903 (11pg.) White paper for the Canadian astronomy community’s 2020 *Long Range Plan*.
16. J. Di Francesco, James and 18 coauthors. “The Formation of Stars - From Filaments to Cores to Protostars and Protoplanetary Disks” 2019 (10 pg.) White paper for the Canadian astronomy community’s 2020 *Long Range Plan*.
15. E. Rosolowsky and 10 coauthors. “Star Formation in the Galactic Ecosystem” 2019 (10 pg.) White paper for the Canadian astronomy community’s 2020 *Long Range Plan*.

##### *Encyclopedia Entry*

14. “Diffuse Matter in Space” (15 pages) in *McGraw-Hill Science Encyclopedia*. [Editor and author, 2004 and 2010]

##### *Book Review*

13. “Astrophysical Fluid Dynamics,” C.J. Clarke & R.F. Carswell, Cambridge University Press [Book review for publisher, 2004]

##### *Gamma-Ray Community Network Circulars*

12. A. Tohuvavohu and 4 coauthors. “GRB 230307A: Swift/BAT upper limits on the early afterglow”, GCN 33431, 2023
11. J. Ruan and 16 coauthors “LIGO/Virgo S190814bv: Optical non-detection of radio source AT2019osy from CFHT”, GCN 25492, 2019
10. J. Ruan and 17 coauthors “LIGO/Virgo S190814bv: a potential faint optical counterpart in CFHT imaging”, GCN 25443, 2019



*Conference Proceedings*

10. **A. Tohuvavohu** et al. (incl. CDM), “LUVCam the Little Ultraviolet Camera: a low-cost high-performance UV CMOS camera” in *SPIE proceedings: Space Telescopes and Instrumentation 2024: Ultraviolet to Gamma Ray*, Yokohama, Japan
  9. **N. Afsariardchi** & C. D. Matzner, “Aspherical Supernovae and Oblique Shock Breakout” in *Proceedings, IAU Symposium No. 331, 2017: SN 1987A, 30 years later: Cosmic Rays and Nuclei from Supernovae and their Aftermaths*, Saint-Gilles-Les-Bains, La Réunion Island, France (5 pg.)
  8. C. D. Matzner, “Accretion and Feedback in Star Cluster Formation”, in *Proceedings of the Star Formation in Different Environments*, ICISE, Quy Nhon, Vietnam, 2016. (6 pg.)
  7. **R.-F. Shen** & C. D. Matzner, “Evolution and Precession of Accretion Disk in Tidal Disruption Events” 2012, in *Tidal Disruption Events and AGN Outbursts*, Madrid, Spain, ed. R. Saxton; S. Komossa; EPJ Web of Conferences, Volume 39 (4pg)
  6. **S.C.C. Yeh** & C. D. Matzner, “Mass-Loading In Galactic Winds: The Role Of Photoevaporation And Wind Ablation” 2009, in *The Role of Disk-Halo Interaction in Galaxy Evolution: Outflow vs Infall?*, ed. M. de Avillez
  5. **K.M. Kratter**, C. D. Matzner, & M. Krumholz, “Embedded, Accreting Disks in Massive Star Formation,” (8 pg.) 2008, in *Massive Star Formation: Observations Confront Theory*, ed. H. Buether & H. Linz
  4. C. D. Matzner, “Gamma-Ray Bursts and Relativistic Phenomena in Supernovae: Solutions to the Baryon-Loading Problem,” 2003, Proceedings of AAS Special Session on Core-Collapse Supernovae, ed. C.L. Fryer
  3. C. D. Matzner, J.C. Tan, & C.F. McKee. “Trans-Relativistic Supernovae, Circumstellar Gamma-Ray Bursts, and Supernova 1998bw.” 2001, in *Gamma 2001*, ed. S. Barnes
  2. C. D. Matzner. “Feedback from Protostellar Outflows in Star and Star Cluster Formation.” 2000, in *From Darkness to Light: Origin and Early Evolution of Young Stellar Clusters* ed. T. Montmerle and P. André
  1. C. D. Matzner & C.F. McKee. “The Formation of Clusters of Low-Mass Stars.” 1999, in *Star Formation 1999*, ed. T. Nakamoto
9. Manuscripts in Preparation
1. **N. Jiang** & C. D. Matzner, ‘Star Formation on Sub-Parsec Scales’
10. Invited Lectures
64. “Dynamics of H II Regions in Star Cluster Formation”, in *Topical Overview of Star Cluster Astrophysics*, Siena, Italy, 29 October 2024
  63. “Stellar Masses and Globular Clusters: An Origin Story’, CITA Blackboard Talk, Toronto, 25 September 2024
  62. “Feedback Regimes and Stellar Masses During Intense Star Cluster Formation”, in *The Fullness of Space*, Berkeley, CA, 14 May 2024

61. “Unexpected Outbursts from Massive Stars.” UBC Astronomy Colloquium, Vancouver, BC, 27 February 2023
60. “Supernova outbursts, crashes, and flashes, and a small satellite concept” Melbourne University Astronomy Colloquium, Melbourne, Australia, 6 July 2022
59. “Do rapid circumstellar transients arise in compact aspherical supernovae?” DAO Tea Seminar, Herzberg Research Centre, Victoria, BC, 28 April 2022
58. “Astronomy in the Anthropocene”. Herzberg DAO Colloquium, Herzberg Research Centre, Victoria, BC, 26 April 2022
57. “Sonoluminescence in Stars: Wave-Driven Shocks as the Source of Stellar Outbursts”, Seminar, Walker Dept. of Mechanical Engineering, University of Texas, Austin, TX, 26 February 2021
56. “Star Formation” (invited 3-hr lecture), in *CRAQ Summer School on Stellar Astrophysics*, Montréal, Quebec, 14 June 2019
55. “Interstellar feedback and HII regions” (invited review), in *Henk van de Hulst: Centennial Symposium*, Leiden, the Netherlands, 6 November 2018
54. “Squeezing Supernovae”, Flatiron Institute lunch seminar, New York, NY, 21 June 2018
53. “Aspherical Shock Breakout and Early Light”, seminar in *Mysteries of Massive Stars*, KITP, Santa Barbara, CA, 10 May 2017
52. “Waves and Shocks in Massive Stars: Wave Heating and Outbursts”, seminar in *Mysteries of Massive Stars*, KITP, Santa Barbara, CA, 28 April 2017
51. “Massive Star Clusters: Rapid Growth and Regional Consequences”, *Mt. Stromlo Observatory Colloquium*, Canberra, Australia, 3 May 2016
50. “Star Cluster Formation: Accretion and Feedback”, *Australian Astronomical Observatory Colloquium*, Sydney, Australia, 28 April 2016
49. “Massive star clusters: Birth to Adolescence”, *Monash Centre for Astrophysics Seminar*, Melbourne, Australia, 12 April 2016
48. “Oblique shock breakout in supernovae and x-ray flashes”, *Monash Centre for Astrophysics High-Energy Seminar*, Melbourne, Australia, 31 March 2016
47. “Supernova hydrodynamics: shock propagation, shock breakout, and non-spherical effects”, in *Central Engines in the High-Energy Universe*, KEK, Tsukuba, Japan, 6-9 Oct 2015 [three 90-min lectures]
46. “Turbulent birth of a massive star cluster”, University of Arizona Astronomy Colloquium, Tucson, AZ, 24 Sept 2015
45. “Accretion and feedback dynamics in star cluster formation”, McMaster Star Formation Journal Club, Hamilton, ON, 9 April 2015
44. “Investment Advice for Star Destroyers”, Inst. for Advanced Study / Princeton Joint Colloquium, Princeton, NJ, 17 March 2015

43. “Shock Breakout and Exotic Transients from Supernovae”, ITC Lunch Talk, Cambridge, MA, 30 October 2014
42. “Dynamics of Star Cluster Formation in Molecular Clouds” Harvard/ITC colloquium, Cambridge, MA, 30 October 2014
41. “Star formation feedback on intermediate scales”, KITP Blackboard Talk, Kavli Institute for Theoretical Physics, Santa Barbara, CA, 18 June 2014
40. “Feedback and accretion in star cluster formation”, in *Fire Down Below*, Kavli Institute for Theoretical Physics, Santa Barbara, CA, 16 April 2014
39. “Supernova Shocks and Breakout Transients”, Joint Institute for Laboratory Astrophysics Colloquium, Boulder, CO, 4 November 2013
38. “Stellar Tidal Disruptions by Super-Massive Black Holes: A Laboratory for Young Disk Evolution”, Physics colloquium, Monash University, Melbourne, Australia, 26 July 2012
37. “Jets from Various Systems: Their Similarities and Differences” (Panelist), ALMA/NAASC 2012 Workshop: Outflows, Winds and Jets, Charlottesville, VA, 3 March 2012
36. “Massive Star Feedback and Large-Scale Interactions,” International Summer Institute for Modeling in Astrophysics (ISIMA), KIAA-PKU, Beijing, China, 31 July 2011
35. “Protostellar Outflows and Stellar Feedback in Low-Mass Star Formation,” ISIMA, KIAA-PKU, Beijing, China, 30 July 2011
34. “Self-Gravitational Instability in Star Formation: Disks and the Formation of Stellar Systems,” ISIMA, KIAA-PKU, Beijing, China, 28 July 2011
33. “Outflow-Driven Turbulence in Star Cluster Formation” Institute for Theory and Computation lunch seminar, Harvard-Smithsonian CfA, Cambridge, MA, 6 May 2010
32. “Non-Radiative Accretion in Sgr A\*” Institute for Theory and Computation colloquium, Harvard-Smithsonian CfA, Cambridge, MA, 6 May 2010
31. “Accretion and polarization in Sgr A\*, the Galactic Center black hole” University of Virginia Astronomy colloquium, Charlottesville, VA, 15 April 2010
30. “What is the nature of accretion onto Sgr A\*?” University of Laval Astronomy Colloquium, Quebec, QC, 20 November 2009
29. “Transrelativistic blastwaves and prompt SN signals from ordinary SNe” *RogerFest*, Caltech, 22 August 2009
28. “Environmental effects in stellar multiplicity” Theoretical Astrophysics Center Seminar, University of California, Berkeley, CA, 4 May 2009
27. “New developments in Shock Breakout Models for Gamma-Ray Bursts” UC Berkeley Theory Lunch talk, 25 Feb 2009
26. “Mystery of the Low-Luminosity Gamma-Ray Bursts” UC Santa Cruz/Lick Observatory FLASH seminar, 20 Feb 2009

25. “Shock Breakouts and Low-Luminosity Gamma-Ray Bursts” University of Wisconsin-Madison Astronomy Colloquium, 11 November 2008
24. “Three Kinds of Feedback in Star Formation” Mt Stromlo Observatory Colloquium, Canberra, 28 August 2008
23. “Large-Scale Aspects of Star Formation,” lecture in the *Naramata Summer School on the Interstellar Medium*, 29 August 2007
22. “Dynamical Feedback in Star Formation” in *Star Formation through Cosmic Time*, KITP, U.C. Santa Barbara, 27 August 2007
21. “Dynamics of Star Cluster Formation” (Discussion leader, with Ralf Klessen) in *Star Formation, Then & Now*, KITP, U.C. Santa Barbara, 16 August 2007
20. “Turbulence in Star Formation” (Discussion leader, with Steven Balbus) in *Star Formation, Then & Now*, KITP, U.C. Santa Barbara, 14 August 2007
19. “Circumstellar Gamma-Ray Bursts” 8 June 2007, in *RAMfest: Relativistic Astrophysics*, University of Texas, Austin
18. “Environment and Multiplicity” in *Multiplicity and Star Formation*, 17 May 2007, University of Toronto
17. “Star Formation – Feedback and Environmental Effects” Interstellar Medium Seminar, 16 May 2007, University of Wisconsin, Madison
16. “The Influence of Stars on Star Cluster Formation” Astronomy Colloquium, 15 May 2007, University of Wisconsin, Madison
15. “Stellar feedback, the ends of the IMF, and star cluster formation” 4 May 2007, CfA Radio Group Lunch Talk, Harvard-Smithsonian Center for Astrophysics
14. “Disk Fragmentation, the Brown Dwarf Desert, and the Stellar Upper Mass Limit” 13 April 2007, *From Stars to Planets*, University of Florida, Gainesville
13. “Relativistic Potentials: Context and Feedback” 2 June 2006, Toronto, ON: *FLAMR workshop on relativistic numerical astrophysics*, University of Toronto
12. “Feedback in the Formation of Star Clusters” 7 February 2006, Toronto, ON: York University Physics Colloquium
11. “Characteristic Masses in Star Formation” 14 December 2005, Melbourne, Australia: Melbourne University Astronomy Colloquium
10. “Regimes of Black Hole Accretion” 18 May 2005, Rochester Astronomy Colloquium, Rochester, NY
9. “Magnetized Black Hole Accretion” 16 April 2005, *The Paradoxes of Massive Black Holes* KITP, Santa Barbara, CA
8. “Energy Feedback in Supernova Core Collapse.” 14 June 2004, CASCA Annual General Meeting, Winnipeg, Manitoba
7. “Nonradiative Accretion at the Galactic Center.” 25 September 2003, University of Michigan Astronomy Colloquium, Ann Arbor, MI

6. “Accretion onto Sgr A\*.” 30 July 2003, IfA Astronomy Colloquium, Honolulu, HI
  5. “Massive Stars and Molecular Cloud Disruption.” 21 April 2003, Northwestern University Astrophysics Seminar, Evanston, IL
  4. “Gamma-Ray Bursts and Relativistic Phenomena in Supernovae.” 4 June 2002, AAS Topical Session, Albuquerque, NM
  3. “Feedback from Star Formation and its Implications.” 22 March 2002, Astronomy Colloquium, University of Toronto, ON
  2. “Supernova Hosts for Gamma-Ray Bursts.” 10 March 2001, Astronomy Colloquium, Columbia University
  1. “Feedback from Protostellar Outflows in Stellar Cluster Formation.” 2000, Three-Islands Conference on Stellar Cluster Formation, Cargèse, Corsica
11. Contributed Presentations
56. “How do stars get their masses?” CITA blackboard seminar, Toronto, ON, 7 June 2023
  55. “Nonlinear acoustics of shocked stellar outbursts: Bells, not whistles.” Toronto Astronomy TASTY talk, Toronto, ON, 25 October 2022
  54. “Pre-Collapse Massive Star Evolution: Stimulating and Quenching Mass Ejection”, CASCA symposium, Waterloo, ON (virtual), 17 May 2022 (poster)
  53. “The density structure of supersonic self-gravitating turbulence” (presented by S. Khullar), CASCA symposium, online, 13 May 2021 (poster)
  52. “Pair Pulsations and Stellar Outbursts: Dynamics of Wave-Driven Shock Ejection”, CASCA symposium, online, 11 May 2021 (poster)
  51. “Are massive dense clumps truly sub-virial? A new analysis using Gould Belt ammonia data” (presented by A. Singh), CASCA symposium, online, 11 May 2021 (poster)
  50. “Wave-driven shocks for super-Eddington stellar outbursts”, CITA blackboard seminar, Toronto, ON, 15 Dec 2020
  49. “Dynamics of sound-driven stellar outbursts”, CASCA Online Symposium, York, ON, 28 May 2020
  48. “Virial Ratios of Gould’s-Belt Molecular Clouds: Are massive clouds truly sub-virial?” (presented by A. Singh), CASCA Online Symposium, York, ON, 27 May 2020
  47. “Star Formation Thresholds: Real or Illusory?” (presented by S. Khullar), CASCA Online Symposium, York, ON, 27 May 2020
  46. “Supernova shock breakout - physics and detection”, CITA blackboard talk, Toronto, ON, 7 April 2020
  45. “Acoustic Dynamics of Super-Eddington Outbursts and Supernova Imposers”, CASCA Symposium, Montreal, QC, 18 June 2019

44. “Stellar outbursts: loud sounds within stars”, CITA blackboard talk, Toronto, ON, 28 May 2019
43. “Stellar binarity: a metallicity signal and its physical interpretation”, CITA blackboard talk, Toronto, ON, 2 October 2018
42. “Stellar feedback and accretion: star cluster growth”, *Star Formation in Different Environments*, ICISE, Quy Nhon, Vietnam, 27 July 2016
41. “Star Cluster Formation: Stellar Feedback Versus Large-Scale Mass Accretion”, *ANITA Workshop*, Melbourne, Australia, 11 Feb 2016
40. “Weak Explosions: Shock Formation and Mass Ejection”, *Electron Capture Supernovae and Super-AGB Stars*, Monash University, Melbourne, Australia, 4 Feb 2016
39. “Observational Handles on Feedback Regimes in H II Regions and Starburst Galaxies”, U.C. Berkeley Astrophysics Lunch Seminar, 3 June 2013
38. “Oblique Shock Breakouts in Asymmetrical Supernovae”, U.C. Berkeley Astrophysics Lunch Seminar, 3 June 2013
37. “Feedback Modes around Massive Star Clusters”, Ontario Star Formation Jamboree, McMaster University Origins Institute, Hamilton, ON, 7 May 2013
36. “The 30 Doradus Nebula: An Imaging Study of Molecular and Ionized Hydrogen” (poster, presented by S.Yeh), American Astronomical Society, Long Beach, CA, 4 Jan 2013
35. “The Evolution and Precession of a Tidal Disruption Event Accretion Disk” (presented by R. F. Shen), *Tidal Disruption Events and AGN Outbursts Workshop*, 27 June 2012, ESAC, Madrid, Spain.
34. “Line Diagnostics of Jet Confinement in Ultracompact HII Regions” (poster), ALMA/NAASC 2012 Workshop: Outflows, Winds and Jets, Charlottesville, VA, 4 March 2012
33. “Feedback Mechanisms in Turbulent Star Formation” *SISSA seminar*, SISSA, Trieste, Italy, 2 August 2011
32. “When and How Does Protostellar Dynamical Feedback Matter?” *ALMA Science Workshop*, Charlottesville, VA, 26 September 2008
31. “Protostellar Outflows, Turbulence, and Feedback in Star Cluster Formation,” *Ontario Star Formation Jamboree*, Toronto, ON, 28 February 2008
29. “Stellar Masses in Massive Cluster Formation,” American Astronomical Society 207th Meeting (oral), 11 January 2006
28. “Small Stars in Big Clusters” 15 December 2005, Melbourne, Australia: Swinburne University Astronomy Colloquium
27. “Low-Mass Star Formation: Initial Conditions and Disk Instabilities” 2004, *Cores, Disks, Jets and Outflows*, Banff, Alberta
26. “Nonradiative Accretion onto Black Holes.” 2003, University of Utah Astronomy Seminar, Salt Lake City, UT

25. “Magnetically-Frustrated Accretion: a Solution to the Sgr A\* Enigma?” [Poster]. 2003, CASCA Symposium, Waterloo, ON
24. “The Formation of Binary Stars.” 2002, CITA seminar, Toronto, ON
23. “H II Regions and the Evolution of Giant Molecular Clouds.” 2002, Northwestern University Astronomy Seminar, Evanston, IL
22. “H II Regions and the Evolution of Giant Molecular Clouds.” 2002, IGPS (International Galactic Plane Survey) Conference, Edmonton, AB
21. “Feedback from Star Formation and the Evolution of Giant Molecular Clouds.” 2002, CASCA Symposium, Penticton, BC
20. “Massive Stars and the Nature of Molecular Clouds.” 2001, Astronomy Seminar, University of Texas, Austin, TX
19. “The Molecular Galaxy.” 2001, Astronomy Seminar, St. Mary’s University, Halifax, NS
18. “Massive Stars Dominate Feedback in Giant Molecular Clouds.” 2001, American Astronomical Society 198th Meeting, Pasadena, CA
17. “The Collapsar Model for Gamma-Ray Bursts: Viability and Implications.” 2001, Caltech theory seminar, Pasadena, CA
16. “Trans-Relativistic Supernovae and Gamma-Ray Bursts.” 2001, *Gamma 2001*, Baltimore, MD
15. “Supernovae and Gamma-Ray Bursts.” 2001, University of Waterloo Astronomy Seminar, Waterloo, ON
14. “Feedback and Forcing in Molecular Clouds.” 2001, *Ontario Star Formation Jamboree*, Toronto, ON
13. “GRBs from Supernovae and Hypernovae.” 2000, *Kingston 2000*, Toronto, ON
12. “The Nature of Protostellar Outflows and Their Effects on Star and Star Cluster Formation.” 2000, CITA seminar, Toronto, ON
11. “The Nature of Protostellar Outflows and Their Effects on Star and Star Cluster Formation.” 2000, CfA star formation seminar, Cambridge, MA
10. “Core-Collapse Supernovae: from Star to Remnant.” 2000, Caltech theory seminar, Pasadena, CA
9. “Modeling Bipolar Outflows as Agents of Feedback in Low-Mass Star and Star Cluster Formation.” 2000, Caltech Astronomy tea talk, Pasadena, CA
8. “Hydromagnetic Protostellar Winds, Molecular Outflows, and Feedback in Star Formation.” 2000, *Ontario Star Formation Jamboree*, Toronto, ON
7. “Gas Dynamics of Stellar Cluster Formation.” 1999, American Astronomical Society 192d Meeting, #118.03
6. “Gas Dynamics of Stellar Cluster Formation.” 1998, Center for Star Formation Seminar, NASA-Ames Research Center, Mountainview, CA
5. “Age Constraints for Young Clusters from the Depletion of Light Elements in Contracting Low-Mass Stars and Brown Dwarfs” [Poster]. 1998, Protostars

and Planets IV, Univ. of CA at Santa Barbara

4. “Model-Independent Cluster Ages from Lithium Depletion in Low-Mass Members.” [Poster] 1998, NATO Advanced Study Institute, Heraklion, Crete, Greece
3. “Dating Young Stellar Clusters Using Lithium Depletion.” 1997, Center for Star Formation Seminar, NASA–Ames Research Center, Mountainview, CA
2. “The Expulsion of Stellar Envelopes in Core-Collapse Supernovae” [Poster]. 1997, American Astronomical Society, 191st Meeting, #39.08
1. “Light-Element Depletion in Pre–Main Sequence Stars.” 1997, Les Houches Summer School on Star Formation and Starburst Galaxies, Les Houches, France

## D. Teaching and Supervision

### 12a. Undergraduate Courses

AST 425	Supervised Reading Course	2024 (N. Jiang)
AST 431Y	Supervised Reading Course	2017/18 (Z. Lu)
AST 430H	Supervised Reading Course	F16 (V. Sok), S16 (E. Deibert)
AST 320	Introduction to Astrophysics	S08, S10, S11, S12, S13, S24
AST 425	Supervised Research	03-04, 07-08
AST 251	Life on Other Worlds	F03, F04, S04, F05, S06
AST 221	Stars & Planets	F14
AST 101	The Sun and its Neighbours	F12
AST 198/199	First-Year Seminar: Astronomy at the Frontier	S12, S15, F20, F21(×2)
SCI/PMU 199	First-Year Seminar: Formation of Stars, Planets, and Life	F09, F10, S11

### 12b. Graduate Courses

AST 1440	Radiation Processes	F13, F15, S21, S22, F22, F23, F24
Mini-course	Order-of-Magnitude Astrophysics	F14, F18, F22
Mini-course	Astrophysical Hydrodynamics Codes	Summer 18
AST 1501Y	Introduction to Research	2016/17, 17/18, 18/19, 19/20
AST 1500H	Introduction to Research	2017, 18, 19, 20
G2000	Graduate Research Seminars	2003/04, 12/13, 13/14, 16/17
AST 2030H	Physics of the Interstellar Medium	F02, F04, S07, F09, F11, S14, F15
AST 3020H	Advanced Topics in Star Formation	F12
Mini-course	Astrophysical Fluid Dynamics	S02

### 12c. Theses Supervised

*Undergraduate*



Brody McManus	Sept. 2024 – present
Gurman Sachdeva	Sept. 2024 – present
Stuart Williamson (coadv. with D. Curtin)	June 2024 – present
Franco Cabral (coadv. with D. Curtin)	June 2024 – present
Nan Jiang	June 2022 – June 2024
Isabella Armstrong	Feb 2022 – Nov 2023
Berkin Gurbuz	Feb 2022 – Nov 2023
Ben Scully	May 2022 – Aug 2023
Rishabh Saini	Sept 2021 – May 2022
Kass Fishleigh	Sept 2019–April 2020
Michael Primrose (coadv. with H. Neilsen)	Oct. 2016 – April 2017
Ziling Lu	Sept 2016 – April 2017
Nicholas Zomparelli	Sept 2016 – April 2017
Emily Deibert	April 2016 – April 2017
Carly Berard	Sept 2014 – April 2015
Ryan Underwood	Sept 2013 – April 2014
Yi Feng	June 2012 – Sept 2012
Jason Leung	Sept 2010 – July 2011
Heidi White	Summer 2010
Brent Arsennault	Summer 2010
Dan Wallbank	April 2008 – Sept 2009
Micha Gorelick	March 2008 – April 2010
George Conidis	Oct 2007 – Sept 2008
Jane Lee	May – Aug 2007
Stephen Green (coadv. with U. Pen)	Summer 2004
Lucy Zhang	Feb 2003 – Sept 2005
Andrew Calzavara	Sept 2002 – Sept 2004
Nazim Hussain (coadv. with U. Pen)	Summer 2003
Hans Hamm (coadv. with U. Pen)	Summer 2003
Adrian Mariampillai	Summer 2001

*Graduate – Masters*

Nan Jiang	Sept 2024 – present
Shannon Bowes	Sept 2024 – present
Mairead Heiger	Sept 2021 – April 2022
Bolin Fan	Sept 2020 – April 2021
Shivan Khullar	Sept 2019 – April 2020
Eesha das Gupta (coadv. with U. Pen)	Sept 2019 – April 2020
Aaron Tohuvavohu	Sept 2019 – April 2020
Yuan Ni	May 2019 – Sept 2019
Alex Laguë (coadv. with U. Pen)	June 2018 – Oct 2018
Ayushi Singh	June 2016 – Oct 2017
Niloufar Afsariardchi	Oct 2014 – Aug 2016
Peter Jumper	Oct 2013 – June 2014

Pegah Salbi	Sept. 2012 – May 2014
Stephen Ro	Jan 2012 – Dec 2012
Etsuko Mieda	May 2010 – May 2011
Sherry Yeh	May 2007 – Sept 2007
Daniela Goncalves	May 2006 – Oct. 2006
Kaitlin M. Kratter	Sept 2005 – May 2006
Luke Stern	Sept 2004 – Dec 2004
Hans Hamm (coadv. with U. Pen)	Sept 2003 – April 2004
Hilding Neilsen	Sept. 2003 – May 2004
Wong Shingkwong (coadv. with U. Pen)	Summer 2003
I-Hui Li	Oct 2002 – Dec. 2003

*Graduate – Ph.D.*

Michael Power, <i>Magnetism in Star Formation</i>	Sept 2024 – present
Shivan Khullar,* <i>Turbulent Dynamics of Star Formation</i>	July 2020 – present
Aaron Tohuvavohu,** <i>High-Energy Transients</i>	July 2020 – October 2024
Ayushi Singh, <i>Physical Interpretation of ISM Observations</i>	Oct 2017 – Sept 2022
Niloufar Afsariardchi, <i>Progenitors and Light Curves of Core-collapse Supernovae</i>	Aug 2016 – July 2020
Peter Jumper, <i>Feedback in Star and Galaxy Formation</i>	Oct 2014 – Aug 2018
Britta Hansen, <i>Star Cluster Formation</i>	Mar 2014 – April 2015
Pegah Salbi, <i>Supernova-Related Transients: Theory and Observation</i>	Oct 2013 – May 2014
Stephen Ro, <i>Stars: Structure, Winds, Explosions</i>	Sept 2012 – Aug 2017
Sherry Yeh, <i>Interplay Between Starbursts and their Interstellar Medium</i>	Nov 2007 – Nov 2012
Mubdi Rahman,† <i>The Milky Way's Largest Star Clusters: Engines of Galaxy Evolution</i>	January 2009 - July 2012
Kaitlin M. Kratter,‡ <i>Protostellar Disks: Formation and Fragmentation During Star Cluster Creation</i>	Jan 2007 – June 2010
Heather Cameron, <i>Collimation in MHD Winds</i>	June 2003 – Sept. 2004

\* Allen Yen Award

\*\* 2021 NTCO Fellow, Yen Award recipient; 2022 Vanier Award; 2024 Millikan Fellow, Caltech

† 2011 Adel S. Sedra Graduate Scholar

‡ Yen Award; 2011 CASCA Plaskett Award for Best Dissertation; 2012 Hubble Fellow; Assoc. Prof. at U. Arizona

*Postdoctoral*

James Leung (co-advised)	Sept. 2023 – present
Rongfeng Shen	Sept. 2010 – Aug. 2013
Rhianne Attwood	Feb. 2009 – May 2009
Ruben Krasnopolsky	Sept. 2005 – Mar. 2008

12d. Other Teaching

Invited senior lecturer, *CRAQ Astrophysics Summer School*, Montreal, Quebec, June 2019

Invited senior lecturer, *High-Energy Astrophysics Summer School*, Tsukuba, Japan, October 2015

Invited senior lecturer, *2011 International Summer Institute on Modeling in Astrophysics*, Beijing, China, June-July 2011

Invited speaker, *Academic Jobs Panel*, Harvard-Smithsonian Center for Astrophysics, 5 May 2010

Author, *Resources for the Ambitious Undergraduate or Beginning Graduate Researcher in Astronomy & Astrophysics*, web document, 2004 – 2019

Invited speaker for “Teaching in Higher Education” (THE500H), on two occasions: 27 Oct. and 11 Nov., 2003

*Seminar Organization*

“Order-of-Magnitude Astrophysics” problem-solving sessions, Dec 2004.

“Toronto Astrophysical Gas and Fluid Dynamics Group” weekly seminar of presentations by CITA, Astronomy, and Geology members, Oct. 2003 – June 2004, Sept-Dec 2004. (41 sessions: <http://www.cita.utoronto.ca/~matzner/TGGD/>)

“Interstellar Medium Discussion Group” weekly seminar, Sept-Dec 2002.

“Gamma-Ray Burst Discussion Seminars” 2001.

*Public Lectures and Outreach Activities*

14. “Black Holes in 2020: What We Know, What We Don’t” [Invited], ASX Star Talk, 29 Jan 2020

13. “Communing with Aliens” [Invited], Toronto Public Library System Public Lecture, 2016

12. “Cosmic Origins of Everyday Life” [Invited], Toronto Public Library System Public Lecture, 2016

11. “Interstellar Messaging” [Invited], Monash University Public Astronomy Talk, Melbourne, Australia, 10 May 2016

10. “Three Mysteries of Stellar Death”, Huntsville High School guest lecture, Huntsville, Ontario, 2013

9. “Star Clusters: Engines of Galactic Turmoil” Toronto Library System Public Lecture, 2013

8. “Stellar Demise: Three Mysteries and Three Prophecies” Toronto Library System Public Lecture, 2013

7. “The Spectacular Deaths of Stars” Astronomy & Space Exploration Society Star Talk, University of Toronto, 2013

6. “Stars, Atoms, and Us” Royal Astronomical Society of Canada public lecture, David Dunlop Observatory, 2010

5. “Meteorites and the Formation of our Solar System” Bloor Collegiate High School (9th-grade class of Kathleen Leroy), 2010
4. Webcast lecture and interview with Grade 3 class of Cindy Jensen, Victoria, BC, 2 March 2010 (in collaboration with Mike Reid and Libby Harper-Clark).
3. “The Sky in Motion” Royal Astronomical Society of Canada, 2002
2. “The Sky in Motion” University of Toronto, 2001
1. “Why Stars Form in the Dark” San Mateo Astronomical Society, 1998

## E. Administrative Positions

### 13a. Within University

Associate Chair (Undergraduate), Dept. of Astronomy & Astrophysics, 2023-  
 Associate Chair (Graduate), Dept. of Astronomy & Astrophysics, 2016-20  
 Dean’s Representative, Physics Dept. Search Committee, 2016-17, 18, 21-22  
 Member, CFI Review College, 2019  
 Trillium Award Selection Committee, 2018  
 NSERC Fellowship Selection Committee, 2016, 2017, 2018  
 Walter C. Sumner Memorial Fellowship Awards Committee, 2017  
 Vanier Fellowship Nomination Committee, 2016  
 Astronomy & Astrophysics Chair Search Committee, 2015  
 Astronomy Graduate Chair Search Committee, 2015  
 UTEA (U. Toronto Excellence Award) Selection Committee, 2013  
 Astronomy Dept. / Dunlap Institute Joint Search Committee, 2011-2012  
 Dunlap Institute Lecturer Search Committee, 2011  
 SciNet Local Resource Allocation Committee, 2009, 2010, 2011  
 CITA Director Search Committee, 2006

#### *Dissertation Exam Chair:*

Jesse Velay-Vitow (Physics), 5 Dec. 2023  
 Catherine Cheng (Sociology), 20 Aug 2018  
 Catherine Fleming (English), 26 March 2018  
 Shayna Gardiner (Linguistics), 19 May 2017  
 Tomoko Arimura (Ontario Institute for Studies in Education), 24 Aug. 2015  
 Le Zhang (Electrical & Computer Engineering), 23 July 2015  
 Scott Briggs (Civil Engineering), 11 Sept. 2014  
 Ko-Lun Chen (Mech. Eng.), 3 Sept. 2013  
 Trevor VandenBoer (Chemistry), 16 Aug. 2012  
 Yonggang Liu (Physics), 2011  
 Saba Zuberi (Physics), 2010  
 Elias Guestrin (Electrical & Computer Eng.), 5 October 2009  
 Todd Chisholm (Aerospace Eng.), 13 June 2007  
 Stephane Levesque (Chem. Eng.), 13 Sept. 2006

#### *Within Department*

Interim teaching review panel member, 2018, 24

Undergraduate Curriculum Committee, 2023-present  
Climate Committee, 2022-23  
General Qualifier Exam Committee, 2004-15, 17-19, 23  
Advancement/Tenure Promotion Committee, 2013, 14, 15, 17, 18, 19, 20 ( $\times 2$ ),  
21 ( $\times 3$ ), 22 ( $\times 2$ ), 23 ( $\times 2$ )  
Administrator Hiring Committee, 2022  
Ontario Graduate Scholarship Ranking Committee, 2021  
Chair, Dept. Sustainability Committee, 2021-  
Mentor for a postdoctoral student (Dunlap mentoring program), 2019-21  
Associate Chair (Graduate), July 2016 - June 2020  
General Qualifying Exam renewal committee, 2016-19  
Departmental Values committee, 2018  
Graduate curriculum committee, 2017-20  
Astronomy Colloquium Co-Organizer, 2006-09, 10/11, 13/14, 5/16  
Chair Search Committee Member, 2015, 2019  
Astronomy Faculty Search Committee, 2003-04, 13, 14, 17, 18  
Astronomy Graduate Admissions Committee, 2005 – 2020 (except 09, 14)  
Vanier Fellowship Nomination Committee, 2013  
Banting Fellowship Nomination Committee, 2014  
Astronomy Mini-Course Coordinator, 2006/7, 2013/14  
Astronomy Qualifying Exam Committee, 2010, '12, '13, '14  
Undergraduate Curriculum Committee, 2012  
Chair, Astronomy First-Year Graduate Guidance Committees, 2005-14  
Co-Organizer, DAA-CITA day, 2009  
OGSST Scholarship Selection Committee, 2007  
Helen Sawyer Hogg Visitorship Committee, 2004  
Astronomy Mini-course Coordinator, 2006-07, 14, 17-20  
Astronomy Preliminary Exam Committee, 2004  
*PhD Supervisory Committees (51; 16 active):* Emma Jarvis, James Garner,  
Ethen Sun, Braden Gail, Mark Anthony Dodici, Alicia Savelli, Alex Laroche,  
Yansong Qian, Erika Hornecker, Jacob Meadus, Yuyang Chen, Mairead  
Heiger, Adaeze Ibik, Daven Cocroft, Bo Peng, Bethany Ludwig, Aaron Tohu-  
vavohu, Yuan Ni, Fei Li, Rebecca Lin, Tomas Cassanelli, Taylor Kutra, Anita  
Bahmanyar, Deborah Lockhorst, Natalie Price-Jones, Epon Heringer, Eliot  
Meyer, Peter Jumper, Britta Hansen, Nick Tacik, Charles Zhu, Jeffrey Fung,  
Guillaume Barlet (Geology), Zhiqi Huang, Alana Rivera-Ingraham, Ilana  
MacDonald, Greg Paciga, Dan Taranu, Richard Chou, Laura Fissel, Eliz-  
abeth Harper-Clark, Daniela Goncalves, Duy Nguyen, Lawrence Mudryk,  
Marija Stankovic, I-Hui Li, Heather Cameron, Jenna O'Neill, Paula Ehlers,  
Tim Rothwell, Jennifer Karr

*Qualifying Exam Committees (56)*: 2024: Alicia Savelli, Braden Seefeldt-Gail, Mark Dodici, Aryanna Schiebelbein-Zwack; 2023: Mairead Heiger, Jacob Meadus, Erika Hornecker, Jibrán Haider; 2022: Alice Chen, 2021: Aaron Tohuvavohu, Daven Cocroft, Adaeze Ibik, Eesha das Gupta, Ashley Stock, Fergus Horrobin, Seery Chen, Bethany Ludwig; 2020: Taylor Kutra, Bo Peng, Hannah Dykaar; 2019: Theirry Serafin-Nadeau; 2018: Morgan Bennett, Ryan McKinven; 2017: Ayushi Singh, Adiv Paradise, Natalie Price-Jones, Anita Bahmanyar; 2016: Nilou Afsariardchi, Dana Simard, Epton Heringer, Shenglin Jing; 2015: Andrey Vayner; 2014: Eliot Meyer, Jielai Zhang; 2013: Nathan Heatherington, J.D. Emberson; 2010: Dan Taranu, Ilana MacDonald; 2009: Mubdi Rahman, Alana Rivera-Ingraham; 2008: Elizabeth Harper-Clark; 2007: Daniela Goncalves, Bijia Pang (Physics), Kaitlin Kratter, Zhiqi Huang; 2006: Rodrigo Fernandez, Duy Nguyen; 2004: Tim Rothwell, Heather Cameron, Tingting Lu, I-Hui Li, Martin Durant; 2003: Paula Ehlers; 2002: Lawrence Mudryk, Megan McClure, Jenna O'Neill; 2001: Jennifer Karr

*First-Year Graduate Project committees*: Kaitlin Kratter (twice), Tingting Lu, Arabindo Roy, Caroline d'Angelo, Marco Viero, Mirza Ahmic, Zhiqi Huang, Libby Harper-Clark, Sherry Yeh, Alana Rivera-Ingraham, Mubdi Rahman, Jamil Shariff, Peter Jumper, Nilou Afsari, Emil Terziev

*Thesis Defense Committees (44)*: Yuan Chris Ni (2024), Victor Chan (2023), Rebecca Lin (2023), Mohammad Shabaan (2023), Taylor Kutra (2023), Alysa Obertas (2023), Rebecca Lin (2023), Ayushi Singh (2022), Tomas Cassinelli, (2022), Deborah Lockhorst (2021), Ryan McKinven (2021), Shenglin Jing (2021), Natalie Price-Jones (2020), Niloufar Afsariardchi (2020), Sasha Kostenko (2020), Steven Janssens (2020), Elliot Meyer (2019), Epton Heringer (2019), Peter Jumper (2018), Catherine Fleming (2018, English), Stephen Ro (2017), Charles Zhu (2016), Sergei Ossokine (2015), Matt Russo (2015, Physics), Scott Briggs (2014, Civil Engineering), Ilana Macdonald (2013), Ko-Lun Chen (2013, Mech. Eng.), Greg Paciga (2013), Laura Fissel (2013), Juan Soler (2013), Trevor vandenBoer (2012, Chemistry), Mubdi Rahman (2012), Sherry Yeh (2012), Elizabeth Harper-Clark (2011), Yonggang Liu (2011, Physics), Bijia Pang (2010, Physics), Zhiqi Huang (2010), Saba Zuberi (2010, Physics), Elias Guestrin (2010, Electrical & Computer Engineering), Lihong Yao (2009), Lawrence Mudryk (2007), Todd Chisholm (2007, Aerospace), Stephane Levesque (2006, Chem. Eng.), Robert Reid (2003), Jennifer Karr (2002)

Public Liaison, U.C. Berkeley Astronomy Department, 1998

### 13b. Outside University

External examiner, Ph.D. dissertations and exams, 2017, 2022, 2023, 2024

Co-coordinator, Sustainability/EDI Session of CASCA 2021 Annual General Meeting, 2021, 2022

Reviewer, Israeli Science Foundation, 2012, 2013, 2017, 2018, 2021, 2023  
Reviewer, German Science Foundation (DFG), 2021, 2022  
Inaugural Chair, Sustainability Committee of the Canadian Astronomical Society, 2019-present  
Member, Online Organizing Committee, 2020 CASCA Annual General Meeting, 2020  
Mentor, via the Dunlap Institute, for a young Senegalese physicist, 2018  
Regular referee for *ApJ*, *ApJL*, *MNRAS*; occasional referee for *Nature*  
Judge, Toronto Science Fair, 2017  
Judge, Forest Hill Secondary School Science Fair, 2017  
Reviewer, Austrian Science Fund (FWF), 2013  
Reviewer, J.C. Maxwell Telescope proposals, 2012, 2013  
Reviewer, CFHT telescope proposals, 2012, 2013  
Advancement reviewer for a Canadian university, 2013  
Reviewer for *Cosmic Evolution: An Introduction to the Sciences of Astrobiology* by David Koerner (W.H. Freeman), 2012  
Chair, Ontario Graduate Scholarship adjudication committee, 2010  
Panelist, U.S. National Science Foundation, 2008, 2009, 2011, 2012  
Review panel member, NASA, 2008, 2014  
Referee, Canada Research Chairs Program, 2007  
Reviewer, Gemini telescope proposals, 2004 (two), 2006  
Referee, NSERC Discovery Grant program, 2005, 2010, 2012, 2013  
Referee, U.S. National Science Foundation major computation grant, 2014  
Referee, U.S. National Science Foundation major institution grant, 2004  
Judge, John G. Althouse Middle School Science Fair, Toronto, 2003  
Consultant on supernovae (2006) for *The Ten Most Fascinating Phenomena*, J. D. Wilhelm, ed (Oakville, ON: Rubicon)  
Astrophysics consultant (1999, 2000) for *Who We Are: A Chronicle of the Ideas That Shaped Our World* (both editions), Kirk Heriot, 2000. (San Francisco: Lost Coast)  
Mosby Brothers Publishing. Physics Textbook Consultant, 1994  
Brooks/Cole Publishers. Physics Textbook Consultant, 1994  
Chinatown After-School Program of Phillips Brooks House, Harvard University. Volunteer, 1991–1993

## F. Supplementary Information

I have taken two parental leaves after the birth of my son (3 Jan - 13 March 2005) and daughter (16 Oct 2006 - 5 Jan 2007). On both occasions I joined my partner who was working in the United States.

*Outreach activities*

39. “Black Holes: What We Know, What We Don’t”, a Star Talk hosted by the University of Toronto Astronomy and Space Exploration Society (ASX), 29 January 2020 (60 minutes)
38. Interviewed for CBC’s *Day 6* coverage of Event Horizon Telescope discovery, 11 Apr. 2019
37. “Everyday Clues to the Wider Universe”, presentation in the Wednesday Program at Ursula Franklin Academy high school, Toronto, 13 Dec. 2017
36. “Ontario Robotic Telescope Proposal Contest”, a student-organized conference (with PMU199H1S students) for 5th and 6th graders, culminating in an award ceremony, robotic observing, and planetarium show, 20 April 2015 (75 minutes)
35. “Colour, Vision, and Spectra”, a student-led presentation (with PMU199H1S students) at the Christie Gardens assisted-living facility, Toronto, 15 April 2015 (120 minutes)
34. Sidewalk solar observing, a student-led presentation (with PMU199H1S students) at Queen’s Park, Toronto, 1 April 2015 (120 minutes)
33. “Sound and Light”, a hands-on set of classroom demonstrations of wave physics, Orde St. Public School, Toronto, 28 May 2014 (120 minutes)
32. “Spectacular deaths of massive stars” a Star Talk hosted by the University of Toronto Astronomy and Space Exploration Society (ASX), 26 September 2013 (60 minutes)
31. Toronto Library Public Talk, “Spectacular Deaths of Massive Stars”, 6 February 2014 (1.5 hours; Jane & Dundas Branch)
30. Toronto Library Public Talk, “Star clusters: engines of galactic turmoil”, 4 March 2014 (1.5 hours; Kennedy & Eglinton Branch)
29. Interviewed on supernovae and alien life by Rudy Moscoso for Skedline News, a Humber College news website, 6 February 2014
28. Guest lecturer on supernovae (via videoconferencing) for the 12th grade class of Ryan Smith of Huntsville High School, Huntsville, Alabama, 27 November 2013
27. Interviewed on stellar feedback and supernovae by Justin Trottier for “The Star Spot” podcast, 15 March 2013
26. Interviewed on meteorites and the impact hazard by Alex Pipes of Discovery Channel’s Daily Planet, 15 February 2013
25. 29 April 2010: Interviewed by Yvette Lang of Marble Media for a History Channel program on the naming of the “Dragonfish” HII region
24. 12 March 2007: Interviewed by Nicole Girardin of the National Post on meteor sightings
23. 7 March 2007: Interviewed by Jennifer Kwan of Reuters Newswire on government disclosure of UFO files
22. November 2006: Letter to the Editor (invited) in *The Walrus*, regarding the article “The Planet Hunters” (appeared Nov 1)



21. 15 June 2006: Interviewed on “Human space exploration and Stephen Hawking’s Hong Kong announcement” by Shawna Rae and Scott Kitching of CJBK radio, London, ON (Live radio interview)
20. 15 June 2006: Interviewed for Discovery.ca article “The Science of Superman” by Peter McMahon
19. 13 February 2006: Source for Boston Globe article “For ‘Man in the Moon’, A Bump on the Head” by Sridhar Nadamuni
18. 11 Oct 2005: Source for UofT Magazine article “U of T’s Oddball Charms: 16 Unusual, Outrageous and Delightful Tales of Campus Life”, by Graham F. Scott, Winter 2005/2006 edition
17. 13 May 2003: Interviewed by Natasha Eloy for Space/ChumTV with regard to Panspermia (Television interview)
16. 23 May 2003: Interviewed by Sharon of CFTO Television with regard to Panspermia and SARS (Telephone interview)
15. 2 September 2003: Interviewed by Ian Ha of The Varsity on the uses of the McKenzie computer cluster (Published 15 Sept)
14. 6 September 2003: Interviewed by Natasha Eloy of Space/ChumTV on the end of the Galileo mission (Television interview, aired 19 Sept)
13. 18 September 2003: Interviewed by Natasha Eloy of Space/ChumTV about carbon dioxide in Lake Vostok (Television interview, aired 24 Sept)
12. 25 January 2004: Interviewed by Paul Taylor of *The Globe & Mail* on results from the Mars rovers (Front page article, 26 January)
11. 5 February 2004: Interviewed by Katalin Eszterhai of Viva Domenica (Telelatino) on travel to Mars (Television interview, aired 8 Feb.)
10. 10 February 2004: Interviewed by Carmen Marra of *The Varsity* on the possibility of water on Mars.
9. 27 February 2004: Interviewed by Paul Taylor of *The Globe & Mail* about the Rosetta mission to a comet (Telephone interview, printed 1 March).
8. 2 March 2004: Interviewed by Stephen Strauss of *The Globe & Mail* about possible results from the NASA Mars rovers (Telephone interview)
7. 2 March 2004: Interviewed by Sheila Callum of CBC Morning News on results from the NASA Mars rovers (Telephone interview)
6. 4 March 2004: Interviewed by Rob Brakenridge of “The World Tonight”, CHQR Radio (Calgary) on implications of the Mars findings (Live telephone interview).
5. 15 March 2004: Interviewed by Natasha Eloy of Space/ChumTV about the “Sedna” planetoid (Television interview)
4. 15 March 2004: Interviewed by Stephen Strauss of *The Globe & Mail* on the “Sedna” planetoid (Telephone interview)
3. 16 March 2004: Interviewed by Emily Ford for a Ryerson University article on “Sedna” (Telephone interview)

2. 18 March 2004: Interviewed on CBC Newsworld about Asteroid 2004dh, a close shave for Earth. (Live television interview).
1. 29 March 2004: Interviewed by Natasha Eloy of Space/ChumTV on implications of methane on Mars (Television Interview)