

## Curriculum Vitae – Eric Coughlin

Assistant Professor, Syracuse University  
Physics Building, Syracuse University, Syracuse, New York 13244  
(as of Sep 25, 2024)

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### EDUCATION

2013 — 2016	Ph.D.	University of Colorado at Boulder, Boulder, Colorado Department: Astronomy and Astrophysics Advisor: Mitchell C. Begelman
2011 — 2013	M.S.	University of Colorado at Boulder, Boulder, Colorado Department: Astronomy and Astrophysics Advisor: Mitchell C. Begelman
2007 — 2011	B.S.	Lehigh University, Bethlehem, Pennsylvania Major: Astrophysics Advisor: George McCluskey

### RESEARCH APPOINTMENTS

08/2020 — Present	Assistant Professor Assistant Professor, Syracuse University, Syracuse, New York
07/2019 — 08/2020	Postdoctoral Researcher Hubble & Lyman Spitzer Fellow, Princeton University, Princeton, NJ
06/2018 — 07/2019	Postdoctoral Researcher Einstein Fellow, Columbia University, New York, NY
07/2016 — 05/2018	Postdoctoral Researcher Einstein Fellow, UC Berkeley, Berkeley, California
08/2011 — 06/2016	Graduate Research Assistant Research Assistant, CU Boulder, Boulder, Colorado

**PUBLICATIONS** (Student authors mentored by Coughlin highlighted in blue)  
(Purple, orange, and green numbers denote papers published as a professor, postdoc, and graduate student)

81. *From coasting to energy-conserving: new self-similar solutions to the interaction phase of strong explosions*  
**Coughlin, E.R.**, 2024, *The Astrophysical Journal Letters*, *Under Review*
80. *Tidal Disruption Events*  
Mockler, B., Hammerstein, E., **Coughlin, E.R.**, & Nicholl, M., 2024, *The Encyclopedia of Astrophysics*, *Under Review*
79. *The partial disruption of a star on a 700-day orbit around a supermassive black hole*  
Makrygianni, L., Arcavi, I., Newsome, M., **Bandopadhyay, A.**, **Coughlin, E.R.**, et al., *Nature*, *Under Review*
78. *Alive and Strongly Kicking: Stable X-ray Quasi-Periodic Eruptions from eRO-QPE2 over 3.5 Years*  
Pasham, D.R., Kejriwal, S., **Coughlin, E.R.**, et al., 2024, *The Astrophysical Journal*, *Under Review*
77. *Episodic X-ray Ultrafast Outflows from the Tidal Disruption Event ASASSN-14li*  
Yukta, A., Pasham, D.R., Tombesi, F., **Coughlin, E.R.**, Wevers, T., Steiner, J.F., & Guolo, M., 2024, *The Astrophysical Journal Letters*, *Under Review*
76. *Repeating nuclear transients from repeating partial tidal disruption events: reproducing ASASSN-14ko and AT2020vdq*  
**Bandopadhyay, A.**, **Coughlin, E.R.**, Nixon, C.J., & Pasham, D.R., 2024, *The Astrophysical Journal*, *In Press*
75. *Quasi-stars as a means of rapid black hole growth in the early universe*

- Coughlin, E.R.**, & Begelman, M.C., 2024, *The Astrophysical Journal*, 970, 158
74. *A Potential Second Shut-off from AT2018fyk: An updated Orbital Ephemeris of the Surviving Star under the Repeating Partial Tidal Disruption Event Paradigm*  
Pasham, Dheeraj, **Coughlin, E. R.**, Guolo, M., Wevers, T., et al., 2024, *The Astrophysical Journal Letters*,
73. *Ultra-deep cover: an exotic and jetted tidal disruption event candidate disguised as a gamma-ray burst*  
Eyles-Ferris, R., Nixon, C.J., **Coughlin, E.R.**, & O'Brien, P.T., 2024, *The Astrophysical Journal Letters*, 965, 20
72. *Lense-Thirring precession after a supermassive black hole disrupts a star*  
Pasham, D.R., Zajacek, M., Nixon, C.J., **Coughlin, E.R.**, et al., 2024, *Nature*, 630, 325
71. *A case for a binary black hole system revealed via quasi-periodic outflows*  
Pasham, D.R., Tombesi, F., Sukova, P., Zajacek, M., Rakshit, S., **Coughlin, E.R.**, et al., 2024, *Science Advances*, 10, 13
70. *Alive but Barely Kicking: News from 3+ years of Swift and XMM-Newton X-ray Monitoring of Quasi-Periodic Eruptions from eRO-QPE1*  
Pasham, D.R., **Coughlin, E.R.**, Zajacek, M., et al., 2024, *The Astrophysical Journal Letters*, 963, 47
69. *Low-energy Explosions in a Gravitational Field: Implications for Sub-energetic Supernovae and Fast X-ray Transients*  
**Paradiso, D.**, **Coughlin, E.R.**, Zrake, J., & Pasham, D.R., 2024, *The Astrophysical Journal*, 961, 158
68. *Delayed X-ray Brightening Accompanied by a Transient Ultra-fast Outflow Following a Tidal Disruption Event*  
Wevers, T., Guolo, M., Pasham, D.R., Tombesi, F., **Coughlin, E.R.**, Yao, Y., & Gezari, S., 2024, *The Astrophysical Journal*, 963, 75
67. *X-ray eruptions every 22 days from the nucleus of a nearby galaxy*  
Guolo, M., Pasham, D.R., Zajacek, M., **Coughlin, E.R.**, et al., 2024, *Nature Astronomy*, 8, 347
66. *The Peak of the Fallback Rate from Tidal Disruption Events: Dependence on Stellar Type*  
**Bandopadhyay, A.**, **Fancher, J.**, **Athian, A.**, **Indelicato, V.**, **Kapalanga, S.**, **Kumah, A.**, **Paradiso, D.A.**, **Todd, M.**, **Coughlin, E.R.**, & Nixon, C.J., 2024, *The Astrophysical Journal Letters*, 961, L2
65. *On the Relative Importance of Shocks and Self-gravity in Modifying Tidal Disruption Event Debris Streams*  
**Fancher, J.**, **Coughlin, E.R.**, & Nixon, C.J., 2023, *Monthly Notices of the Royal Astronomical Society*, 526, 2323
64. *The Division between Weak and Strong Explosions from Failed Supernovae*  
**Coughlin, E.R.**, 2023, *The Astrophysical Journal*, 955, 110
63. *Measuring the Properties of f-mode Oscillations of a Protoneutron Star by Third-generation Gravitational-wave Detectors*  
Afle, C., **Kundu, S.K.**, Cammerino, J., **Coughlin, E.R.**, Brown, D.A., Vartanyan, D., Burrows, A., 2023, *PhRvD*, 107, 123005
62. *The Luminosity Function of Tidal Disruption Events from Fallback-powered Emission: Implications for the Black Hole Mass Function*  
**Coughlin, E.R.**, Nicholl, M., 2023, *The Astrophysical Journal Letters*, 948, L22
61. *The Dynamics of Debris Streams from Tidal Disruption Events: Exact Solution, Critical Stream Density, and Hydrogen Recombination*  
**Coughlin, E.R.**, 2023, *Monthly Notices of the Royal Astronomical Society*, 522, 5500
60. *Tidal capture of stars by supermassive black holes: implications for periodic nuclear transients and quasi-periodic eruptions*

- Cufari, M., Nixon, C.J., **Coughlin, E.R.**, 2023, Monthly Notices of the Royal Astronomical Society Letters, 520, L38
59. *Live to Die Another Day: The Rebrightening of AT2018fyk as a repeating partial tidal disruption event*  
Wevers, T., **Coughlin, E.R.**, Pasham, D.R., et al., 2023, The Astrophysical Journal Letters, 942, L33
58. *Simulated optical lightcurves of super-Eddington tidal disruption events with ZEBRA flows*  
Eyles-Ferris, R.A.J., Starling, R.L.C., O'Brien, P.T., Nixon, C.J., & **Coughlin E.R.**, 2022, Monthly Notices of the Royal Astronomical Society, 517, 6013
57. *The Birth of a Relativistic Jet Following the Disruption of a Star by a Supermassive Black Hole*  
Pasham, D.R., Lucchini M., Laskar, T., Gompertz, B.P., Srivastav, S., Nicholl, M., Smartt, S.J., Miller-Jones, J.C.A., Alexander, K.D., Fender, R., Smith, G.P., Fulton, M., Dewangan, G., Gendreau, K., **Coughlin, E.R.**, et al., 2023, Nature Astronomy, 7, 88
56. *Stars Crushed by Black Holes. III. Mild Compression of Radiative Stars by Supermassive Black Holes*  
**Kundu, S.K.**, **Coughlin, E.R.**, & Nixon, C.J., 2022, The Astrophysical Journal, 939, 71
55. *A Simple and Accurate Prescription for the Tidal Disruption Radius of a Star and the Peak Accretion Rate in Tidal Disruption Events*  
**Coughlin, E.R.**, & Nixon, C.J., 2022, Monthly Notices of the Royal Astronomical Society Letters, 517, L26
54. *Spherically Symmetric Accretion onto a Compact Object through a Standing Shock: The Effects of General Relativity in the Schwarzschild Geometry*  
**Kundu, S.K.**, & **Coughlin, E.R.**, 2022, Monthly Notices of the Royal Astronomical Society, 516, 481
53. *On the Impact of Relativistic Gravity on the Rate of Tidal Disruption Events*  
**Coughlin, E.R.**, & Nixon, C.J., 2022, The Astrophysical Journal, 936, 70
52. *Using the Hills Mechanism to Generate Repeating Partial Tidal Disruption Events and ASASSN-14ko*  
**Cufari, M.**, **Coughlin, E.R.**, & Nixon, C.J., 2022, The Astrophysical Journal Letters, 929, L20
51. *Stellar Revival and Repeated Flares in Deeply Plunging Tidal Disruption Events*  
Nixon, C.J., & **Coughlin, E.R.**, 2022, The Astrophysical Journal Letters, 927, L25
50. *A Physical Model of Delayed Rebrightenings in Shock-interacting Supernovae without Narrow-Line Emission*  
**Coughlin, E.R.**, & Zrake, J., 2022, The Astrophysical Journal, 927, 148
49. *Stars Crushed by Black Holes. II. A Physical Model of Adiabatic Compression and Shock Formation in Tidal Disruption Events*  
**Coughlin, E.R.**, & Nixon, C.J., 2022, The Astrophysical Journal, 926, 47
48. *The Eccentric Nature of Eccentric Tidal Disruption Events*  
**Cufari, M.**, **Coughlin, E.R.**, & Nixon, C.J., 2022, The Astrophysical Journal, 924, 34
47. *Tidal Disruption Disks Formed and Fed by Stream-Stream and Stream-Disk Interactions in Global GRHD Simulations*  
Andalman, Z., Liska, M., Tchekhovskoy, S., **Coughlin, E.R.**, & Stone, N.C., 2021, Monthly Notices of the Royal Astronomical Society, 510, 1627
46. *Stars Crushed by Black Holes. I. On the Energy Distribution of Stellar Debris in Tidal Disruption Events*  
Norman, S.M.J., Nixon, C.J., & **Coughlin, E.R.**, 2021, The Astrophysical Journal, 923, 184
45. *Partial, Zombie, and Full Tidal Disruption of Stars by Supermassive Black Holes*  
Nixon, C.J., **Coughlin, E.R.**, & **Miles, P.R.**, 2021, The Astrophysical Journal, 922, 168
44. *Dynamical Stability of Giant Planets: the Critical Adiabatic Index in the Presence of a Solid Core*

- [Kundu, S.K.](#), [Coughlin, E.R.](#), Youdin, A.N., & Armitage, P.J., 2021, Monthly Notices of the Royal Astronomical Society, 507, 6215
43. *Non-thermal Filaments from the Tidal Destruction of Clouds in the Galactic Center*  
[Coughlin, E.R.](#), Nixon, C.J., & Ginsburg, A., 2021, Monthly Notices of the Royal Astronomical Society, 501, 1868
42. *Structured, Relativistic Jets Driven by Radiation*  
[Coughlin, E.R.](#), & Begelman, M.C., 2020, Monthly Notices of the Royal Astronomical Society, 499, 3158
41. *The Persistence of Pancakes and the Revival of Self-gravity in Tidal Disruption Events*  
[Coughlin, E.R.](#), Nixon, C.J., & Miles, P.R., 2020, The Astrophysical Journal, 900, L39
40. *Fallback Rates from Partial Tidal Disruption Events*  
[Miles, P.R.](#), [Coughlin, E.R.](#), & Nixon, C.J., 2020, The Astrophysical Journal, 899, 36
39. *Variability in Short Gamma-ray Bursts: Gravitationally Unstable Tidal Tails*  
[Coughlin, E.R.](#), Nixon, C.J., Barnes, J., Metzger, B.D., & Margutti, R., 2020, The Astrophysical Journal, 896, L38
38. *The Structure of Nearly Isothermal, Adiabatic Shockwaves*  
[Coughlin, E.R.](#), 2020, Monthly Notices of the Royal Astronomical Society Letters, 496, L43
37. *The Gravitational Instability of Adiabatic Filaments*  
[Coughlin, E.R.](#), & Nixon, C.J., 2020, The Astrophysical Journal Supplement, 247, 51
36. *Short Gamma-ray Bursts and the Decompression of Neutron Star Matter in Tidal Streams*  
Nixon, C.J., [Coughlin, E.R.](#), & Pringle, J.E., 2020, The Astrophysical Journal Letters, 900, L12
35. *Emission from Elliptical Streams of Dusty Debris around White Dwarfs*  
Nixon, C.J., Pringle, J.E., [Coughlin, E.R.](#), Swan, A., & Farihi, J., 2020, arXiv: 2006.07639
34. *A Mildly Relativistic Outflow from the Energetic, Fast-rising Blue Optical Transient CSS161010 in a Dwarf Galaxy*  
Coppejans, D.L., Margutti, R., Terreran, G., Nayana, A.J., [Coughlin, E.R.](#), et al., 2020, The Astrophysical Journal Letters, 895, L23
33. *Partial Stellar Disruption by a Supermassive Black Hole: Is the Lightcurve Really Proportional to  $t^{-9/4}$ ?*  
[Coughlin, E.R.](#), & Nixon, C.J., 2019, The Astrophysical Journal Letters, 883, L17
32. *Energy-conserving, Relativistic Corrections to Strong Shock Propagation*  
[Coughlin, E.R.](#), 2019, The Astrophysical Journal, 880, 108
31. *The Influence Black Hole Binarity on Tidal Disruption Events*  
[Coughlin, E.R.](#), Armitage, P.J., Lodato, G., & Nixon, C., 2019, Space Science Reviews, 215, 45
30. *On the Diversity of Fallback Rates from Tidal Disruption Events with Accurate Stellar Structure*  
[Golightly, E.C.A.](#), Nixon, C.J., & [Coughlin, E.R.](#), 2019, The Astrophysical Journal Letters, 882, L26
29. *Ultra-deep Tidal Disruption Events: Prompt Self-intersections and Observables*  
[Darbha, S.](#), [Coughlin, E.R.](#), Kasen, D., & Nixon, C., 2019, Monthly Notices of the Royal Astronomical Society, 488, 5267
28. *Weak Shock Propagation with Accretion. III. A Numerical Study on Shock Propagation and Stability*  
Ro, S., [Coughlin, E.R.](#), & Quataert, E., 2019, The Astrophysical Journal, 878, 150
27. *Thawing the Frozen-in Approximation: Implications for Self-gravity in Deeply-plunging Tidal Disruption Events*  
Steinberg, E., [Coughlin, E.R.](#), Stone, N., & Metzger, B.D., 2019, Monthly Notices of the Royal

26. *Black Hole Accretion Disks and Luminous Transients in Failed Supernovae from Non-rotating Supergiants*  
Quataert, E., Leccoanet, D., & **Coughlin, E.R.**, 2019, Monthly Notices of the Royal Astronomical Society, 485, L83
25. *An Embedded X-ray Source Shines Through the Aspherical AT2018COW: Revealing the Inner Workings of the Most Luminous Fast-evolving Optical Transients*  
Margutti, R., Metzger, B.D., Chornock, R., et al. (incl. **Coughlin, E.R.**), 2019, The Astrophysical Journal, 872, 18
24. *Tidal Disruption Events: the Role of Stellar Spin*  
**Golightly, E.**, **Coughlin, E.R.**, & Nixon, C.J., 2019, The Astrophysical Journal, 872, 163
23. *Gravitational Interactions of Stars with Supermassive Black Hole Binaries. II. Hypervelocity Stars*  
**Darbha, S.**, **Coughlin, E.R.**, Kasen, D., & Quataert, E., 2019, Monthly Notices of the Royal Astronomical Society, 482, 2132
22. *A Loud Quasi-periodic Oscillation after a Star is Disrupted by a Massive Black Hole*  
Pasham, D.J., et al. (incl. **Coughlin, E.R.**), 2019, Science, 363, 531
21. *Weak Shock Propagation with Accretion. II. Stability of Self-similar Solutions to Radial Perturbations*  
**Coughlin, E.R.**, Ro, S., & Quataert, E., 2018, The Astrophysical Journal, 874, 58
20. *Weak Shock Propagation with Accretion. I. Self-similar Solutions and Application to Failed Supernovae*  
**Coughlin, E.R.**, Quataert, E., & Ro, S., 2018, The Astrophysical Journal, 863, 158
19. *Stellar Binaries Incident on Supermassive Black Hole Binaries: Implications for Double Tidal Disruption Events, Calcium-rich Transients, and Hypervelocity Stars*  
**Coughlin, E.R.**, **Darbha, S.**, Kasen, D., & Quataert, E., 2018, The Astrophysical Journal, 863, L24
18. *Super-Eddington Accretion in Tidal Disruption Events: The Impact of Realistic fallback Rates on Accretion Rates*  
**Wu, S.**, **Coughlin, E.R.**, & Nixon, C., 2018, Monthly Notices of the Royal Astronomical Society, 478, 3016
17. *Tidal Disruption by Extreme Mass Ratio Binaries and Application to ASASSN-15lh*  
**Coughlin, E.R.**, & Armitage, P.J., 2018, Monthly Notices of the Royal Astronomical Society, 474, 3857
16. *Gravitational Interactions of Stars with Supermassive Black Hole Binaries. I. Tidal Disruption Events*  
**Darbha, S.**, **Coughlin, E.R.**, Kasen, D., & Quataert, E., 2018, Monthly Notices of the Royal Astronomical Society, 477, 4009
15. *A Physical Model of Mass Ejection in Failed Supernovae*  
**Coughlin, E.R.**, Quataert, E., Fernandez, R., & Kasen, D., 2018, Monthly Notices of the Royal Astronomical Society, 477, 1225
14. *Mass Ejection in Failed Supernovae: Variation with Stellar Progenitor*  
Fernandez, R., Quataert, E., Kashiyama, K., & **Coughlin, E.R.**, 2018, Monthly Notices of the Royal Astronomical Society, 476, 2366
13. *Circumbinary Discs from Tidal Disruption Events*  
**Coughlin, E.R.**, & Armitage, P.J., 2017, Monthly Notices of the Royal Astronomical Society, 471, L115
12. *Spherically Symmetric, Cold Collapse: the Exact Solutions and a Comparison with Self-Similar Solutions*  
**Coughlin, E.R.**, 2017, The Astrophysical Journal, 835, 40
11. *Tidal Disruption Events from Supermassive Black Hole Binaries*

**Coughlin, E.R.**, Armitage, P.J., Nixon, C., & Begelman, M.C., 2017, Monthly Notices of the Royal Astronomical Society, 465, 3840

10. *Electric and Magnetic Variations in the Near-Mars Environment*  
Fowler, C.M., Andersson, L., Halekas, J., Espley, J.R., Mazelle, C., **Coughlin, E.R.**, et al., 2017, Journal of Geophysical Research, 122, 8536
9. *The Fine Line Between Total and Partial Tidal Disruption Events*  
Mainetti, D., Lupi, A., Campana, S., Colpi, M., **Coughlin, E.R.**, Guillochon, J., & Ramirez-Ruiz, E., 2017, Astronomy & Astrophysics, 600, 124
8. *The Radiation Hydrodynamics of Relativistic Shear Flows*  
**Coughlin, E.R.**, & Begelman, M.C., 2016, The Astrophysical Journal, 821, 21
7. *On the Structure of Tidally-disrupted Stellar Debris Streams*  
**Coughlin, E.R.**, Nixon, C., Begelman, M.C., & Armitage, P.J., 2016, Monthly Notices of the Royal Astronomical Society, 459, 3089
6. *Post-periastron Pancakes: Sustenance for Self-gravity in Tidal Disruption Events*  
**Coughlin, E.R.**, Nixon, C., Begelman, M.C., Armitage, P.J., & Price, D.J., 2016, Monthly Notices of the Royal Astronomical Society, 455, 3612
5. *Viscous Boundary Layers of Radiation-dominated, Relativistic Jets. II. The Free-streaming Jet Model*  
**Coughlin, E.R.**, & Begelman, M.C., 2015, The Astrophysical Journal, 809, 2
4. *Viscous Boundary Layers of Radiation-dominated, Relativistic Jets. I. The Two-stream Model*  
**Coughlin, E.R.**, & Begelman, M.C., 2015, The Astrophysical Journal, 809, 1
3. *Variability in Tidal Disruption Events: Gravitationally Unstable Streams*  
**Coughlin, E.R.**, & Nixon, C., 2015, The Astrophysical Journal Letters, 808, L11
2. *The General Relativistic Equations of Radiation Hydrodynamics in the Viscous Limit*  
**Coughlin, E.R.**, & Begelman, M.C., 2014, The Astrophysical Journal, 797, 103
1. *Hyperaccretion During Tidal Disruption Events: Weakly Bound Debris Envelopes and Jets*  
**Coughlin, E.R.**, & Begelman, M.C., 2014, The Astrophysical Journal, 781, 82

## **SUCCESSFUL PROPOSALS**

- 2024 *Exploring Repeating Partial Tidal Disruption Events as Sources of Extragalactic Periodic Nuclear Transients*  
NASA FINESST Proposal  
PI: **Coughlin, E.R.**, FI: [Bandopadhyay, A.](#)  
Amount: \$147,986
- 2024 *Extragalactic Outbursts and Repeating Nuclear Flares from Tidal Disruption Events*  
NASA Astrophysics Theory Proposal  
PI: **Coughlin, E.R.**  
Amount: \$346,831
- 2023 *Chandra/ACIS observations to confirm the X-ray cutoff from a repeating partial tidal disruption event*  
NASA/SAO Chandra ToO Proposal  
PI: Pasham, D.R., Co-I: **Coughlin, E.R.**  
Amount: \$63,000
- 2023 *Observing a Repeating Partial Tidal Disruption Event During a Flux Shutoff Phase*  
ESA XMM-Newton Guest Investigator Proposal  
PI: Pasham, D.R., Co-I: **Coughlin, E.R.**  
Amount: \$53,737

- 2023 *Continued NICER+Swift Monitoring of Repeating Stellar Tidal Disruption Events: Building a Legacy Dataset*  
 NASA NICER Guest Observer Proposal  
 PI: Pasham, D.R., Co-I: **Coughlin, E.R.**  
 Award: \$42,999
- 2023 *Continued Swift Monitoring of Repeating Stellar Tidal Disruption Events: Towards a Legacy Dataset*  
 NASA Swift Guest Investigator Proposal  
 PI: **Coughlin, E.R.**, Co-I: Pasham, D.R.  
 Award: \$40,000
- 2022 *Stars Crushed at the Gravitational Hand of a Supermassive Black Hole*  
 Oakridge Associated Universities Ralph E. Powe Junior Faculty Enhancement Award  
 PI: **Coughlin, E.R.**  
 Award: \$10,000
- 2020 *Understanding the Long-term Evolution of Tidal Disruption Events*  
 PI: **Coughlin, E.R.**  
 NSF Astronomy and Astrophysics Grant, AST-2006684  
 Award: \$291,724+\$38,593 in supplements
- 2019 *The Appearance of Disappearing Stars: Mass Ejection, Fallback Accretion, and Jets from Weak and Failed Supernovae*  
 PI: **Coughlin, E.R.**  
 NASA Hubble Fellowship  
 Award: \$330,000
- 2016 *Black Hole Enlightenment from Tidal Disruption Events*  
 PI: **Coughlin, E.R.**  
 NASA Einstein Fellowship  
 Award: \$330,000

## **TEACHING EXPERIENCE**

- 08/2024 — 12/2024 Independent Study (PHY 490)  
 Working with Syracuse University undergraduate student Sarah Vallejo on weak explosions from neutrino-induced mass loss.
- 01/2023 — 05/2023 Independent Study (PHY 490)  
 Worked with Syracuse University undergraduate student Julia Fancher on simulations of tidal disruption events, studying the importance of self-gravity and shocks in modifying tidally disrupted debris streams.
- 08/2022 — 12/2022 Independent Study (PHY 690)  
 Worked with Syracuse University graduate student Daniel Paradiso on propagation of sub-energetic blastwaves including gravitational fields.
- 01/2022 — 05/2022 Advanced Graduate Course (PHY 890)  
 Designed and implemented an independent study with Duncan Brown, Charles Brightman Professor of Physics, on tides in interacting systems and applications to compact object coalescence.
- 01/2022 — 05/2022 Stellar and Interstellar Astrophysics (PHY 317)  
 01/2023 — 05/2023 Instructor; upper level course for majors and non-majors that offers an overview of contemporary/modern astrophysics; typical enrollment ~ 15 students.
- 08/2021 — 12/2021 Independent Study (PHY 690)  
 Designed and implemented an independent study with Duncan Brown, Charles Brightman Professor of Physics, on gravitational physics and fluid dynamics of compact objects.
- 08/2021 — 12/2021 Introductory Electricity and Magnetism (PHY 212)  
 08/2023 — 12/2023 Instructor for calculus-based, introductory electromagnetism  
 08/2024 — 12/2024 typical enrollment ~ 200 students, non-majors
- 08/2020 — 12/2020 Independent Study (PHY 690)  
 Worked with Syracuse University student Faraz Chahili on an

independent study of the disruption of asteroids by white dwarfs.

## **RESEARCH ADVISING EXPERIENCE**

- 01/2024 — Present      Research advisor for Syracuse University undergraduate student Sarah Vallejo
- 05/2023 — Present      Mentor/Advisor for Syracuse University graduate student Ananya Bandopadhyay  
Publications: Bandopadhyay, A., Fancher, J., et al., 2024, ApJL, 961, L2  
Bandopadhyay, A., Coughlin, E.R., et al., ApJ, *In Press*  
Awards: **NASA FINESST Award Recipient 2024**
- 10/2022 — Present      Mentor/Advisor for Syracuse University undergraduate student Julia Fancher  
Focus of Research: Numerical simulations of tidal disruption events  
Publications: Fancher, J., Coughlin, E.R., Nixon, C., 2023, MNRAS, 526, 2323  
Awards: **Goldwater Scholarship, Astronaut Scholarship**
- 06/2022 — Present      Mentor/Advisor for Syracuse University graduate student Daniel Paradiso  
Publications: Paradiso, D., Coughlin, E.R., Zrake, J., Pasham, D.R., 2024, ApJ, 961, 158  
Awards: **NSF GRFP Fellowship 2024**
- 10/2020 — 05/2023      Mentor/Advisor for Syracuse University undergraduate student Matt Cufari  
Publications: Cufari, M., Coughlin, E.R., Nixon, C.J., 2022, ApJ, 924, 34  
Cufari, M., Coughlin, E.R., Nixon, C.J., 2022, ApJ, 929, L20  
Cufari, M., Coughlin, E.R., Nixon, C.J., 2022, MNRASL 520, L38  
Awards and Honors: **Goldwater Scholarship, Astronaut Scholarship, LeRoy Apker Award**  
Degree: BSc, Spring 2023  
Current Occupation: Graduate student, MIT, physics
- 05/2020 — 07/2023      Mentor/Advisor for Syracuse University graduate student Suman Kumar Kundu  
Publications: Kundu, S.K., Coughlin, E.R., Youdin, A.N., Armitage, P.J., 2021, MNRAS, 507, 6215  
Kundu, S.K., Coughlin, E.R., MNRAS, 516, 4814  
Kundu, S.K., Coughlin, E.R., Nixon, C.J., ApJ, 939, 71  
Degree: PhD, Summer 2023  
Current Occupation: Tenure-track professor, Kansas Wesleyan University
- 05/2019 — 05/2021      Mentor/Advisor for Syracuse University graduate student Patrick Miles  
Publications: Miles, P.R., Coughlin, E.R., Nixon, C.J., 2020, ApJ, 899, 36  
Coughlin, E.R., Nixon, C.J., Miles, P.R., 2020, ApJL, 900, 39  
Nixon, C.J., Coughlin, E.R., Miles, P.R., 2021, ApJ, 922, 168  
Degree: MSc, Fall 2021  
Current Occupation: Software Engineer at Lawrence Livermore National Lab

## **OUTREACH**

- 06/2022 — 08/2024      Initiated the Syracuse University Research in Physics (SURPh) program. Worked with Syracuse high school students for 6 weeks, during summers of 2022, 2023, 2024, on research; published a paper in ApJL with 4 of those students (Bandopadhyay et al. 2024; see above)
- 2022, 2023, 2024      Led discussion about supermassive black holes and career path as a scientist to 4, AP physics classrooms at Ithaca High School, Ithaca, NY.
- 4/22/2022      Led a virtual presentation and panel discussion with Kathryn Gabriel to ~ 150 art educators across the country on our science and art program. Sponsored by the National Art Educators Association.



- 08/2020 — 02/2021      Designed a Science and Art Curriculum with Kathryn Gabriel  
Working with Kathryn Gabriel, a professional artist and art teacher at Fayetteville-Manlius High School in New York, to develop a multidisciplinary curriculum that blends science and art. Individual programs and modules will be co-taught in the classroom, with standalone units (in video format) available for download for use anywhere.
- 01/2020 — 02/2020      Created and Lead a Science and Art Program at Emmaus High School  
Collaborated with Alexis Soboleski, an art teacher at Emmaus High School, Emmaus, PA, to teach a class combining science and art; led a three-class lecture series on tidal disruption events; created visualizations of tidal disruption events with gelatin molding and Corel Painter; critically assessed the progress and works of the students.
- 11/2019                      Astronomy on Tap, Trenton  
Gave an Astronomy on Tap talk in Trenton, NJ about tidal disruption events
- 11/2016 — 05/2018      Bay Area Scientist in School, Berkeley, California  
Traveled to local elementary schools to give science demonstrations

### **RECENT PRESENTATIONS**

- Weak Explosions and Phantom Shock Breakouts: Possible Progenitors of Fast X-ray Transients*  
Colloquium, Radboud University, 2024, February 20th
- How a Black Hole Destroys a Star: New Advances in Understanding Tidal Disruption Events*  
Colloquium, University of Colorado at Boulder, 2024, Boulder, Colorado, January 29th
- Peak Luminosities from Tidal Disruption Events: Dependence on Stellar Type and Implications for Massive-star Disruptions*  
243rd Meeting of the American Astronomical Society talk, 2024, New Orleans, LA, January 11th
- Peak Fallback Rates from TDEs: Dependence on Stellar Type and Implications for Massive-star Disruptions*  
RESCEU/NBIA Workshop 45-minute talk, University of Tokyo Hongo, Tokyo, Japan, 2023, December 14th
- How a Black Hole Destroys a Star: New Advances in Understanding Tidal Disruption Events*  
Colloquium, Clemson University, Clemson, SC, 2023, November 16th
- Black Hole Accretion in Transient Astrophysical Phenomena*  
European Astronomical Society Meeting, Kraków, Poland, 2023, July 13th
- Stars Crushed by Black Holes in Extreme Tidal Disruption Events*  
Aspen Center for Physics eXtreme Black Holes Conference, 2023, March 9th
- Live to Die Another Day: Discovery of a Repeating Partial Tidal Disruption Event*  
American Astronomical Society 241 Press Debriefing, Seattle WA, 2023, January 12th
- Galactic Flares from Repeating Tidal Disruption Events*  
Colloquium, University of Florida, 2022, April 7th
- A Mechanism for Interacting Supernovae and Rebrightening without Narrow Line Emission*  
High-Energy Astrophysics Division (HEAD) Meeting, 2022, March 17th
- Stars Crushed by Black Holes in Extreme Tidal Disruption Events*  
Deutsches Elektronen-Synchrotron (DESY) Seminar, 2022, February 4th
- Stars Crushed by Black Holes*  
Colloquium, Cornell University, 2021, December 4th
- Mildly Relativistic Shock Propagation*  
Astroplasmas Seminar, Princeton University, 2020, July 17th
- A Universal Fallback Rate from Partial Tidal Disruption Events*  
235th Meeting of the AAS, Honolulu, HI, 2020, January 7th

### **PROGRAMS AND CONFERENCES ORGANIZED**

- 2024      “Towards a Physical Understanding of Tidal Disruption Events,”  
One of four scientific organizers for a four-week, Kavli Institute for Theoretical Physics (KITP) program, April 22nd — May 17, 2024, Santa Barbara, CA.
- 2024      “Anticipating the Rising Tide of Tidal Disruption Events,”  
Lead organizer for the conference associated with our KITP program, April 23rd — April 26th, 2024, Santa Barbara, CA

2022 “Theoretical Advances in Tidal Disruption Events,”  
Organized 90-minute special session at the High-Energy Astrophysics Division (HEAD) meeting  
of the American Astronomical Society, Pittsburgh, PA, 2022, March 15th,

### **RECENT HONORS AND AWARDS**

2024 Selected as LSST Scialog Fellow  
2022 Ralph E. Powe Junior Faculty Enhancement Award  
2022 Syracuse University Teaching Excellence Award (for large-class instruction)  
2019 Hubble Fellowship (taken to Princeton University)  
2019 Lyman Spitzer Jr. Fellowship (Princeton University)  
2019 CITA Fellowship (declined)  
2018 International Astronomical Union Thesis Prize  
2017 High Energy Division of the American Astronomical Society Dissertation Prize  
2016 R.N. Thomas Award (University of Colorado, Boulder)  
2016 Theoretical Astrophysics Center Fellowship (UC Berkeley)  
2016 Einstein Fellowship (taken to UC Berkeley)  
2016 Hubble Fellowship (declined)  
2016 Burke Fellowship (Caltech; declined)

### **PUBLIC SERVICE**

*Manuscript Referee* Monthly Notices of the Royal Astronomical Society  
The Astrophysical Journal  
The Astrophysical Journal Letters  
Science Advances  
Nature  
Computational Astrophysics and Cosmology  
Physical Review  
Physical Review Letters  
Publications of the Astronomical Society of Japan  
Springer Space Science Reviews  
Physics of Fluids  
Astronomy and Astrophysics

*Proposal Reviewer* European Research Council Advanced Grant  
NASA Postdoctoral Program  
NASA Hubble Space Telescope Guest Observer Program  
NASA FINNEST Program  
National Science Foundation Astronomy and Astrophysics Grants  
United States-Israel Binational Science Foundation Grants  
NASA Astrophysics Theory Program  
Neil Gehrels Swift Observatory Guest Investigator Program  
NASA Earth and Space Science Fellowship  
Polish National Science Center Grant

### **PROFESSIONAL MEMBERSHIPS**

2022 — Present American Physical Society  
2013 — Present American Astronomical Society  
2011 — Present Phi Beta Kappa