Andrew Chael | CV

CONTACT

465 Jadwin Hall
Princeton Gravity Initiative
Princeton University
Princeton, NJ 08540

Phone: (505) 974-0538
E-mail: achael@princeton.edu
Website: achael.github.io
GitHub: github.com/achael
ORCiD: 0000-0003-2966-6220
Google Scholar link

RESEARCH INTERESTS

black holes, accretion, relativistic jets,
magnetohydrodynamic simulations, computational imaging.

EDUCATION

Harvard University, Cambridge, MA — 2013 – 2019
Ph.D. in Physics, May 2019
A.M. in Physics, March 2015

Carleton College, Northfield, MN — 2009 – 2013
B.A. in Physics summa cum laude*, June 2013*
Secondary Concentration in Medieval and Renaissance Studies

RESEARCH EXPERIENCE

Associate Research Scholar — 2022 –
Princeton Gravity Initiative, Princeton University

NASA Hubble Fellowship Program Einstein Fellow — 2019 – 2022
Princeton Center for Theoretical Science, Princeton University

Black Hole Initiative Visiting Postdoctoral Fellow — 2019
Center for Astrophysics | Harvard & Smithsonian

Graduate Student Researcher: Accretion Theory — 2015 – 2019
Center for Astrophysics | Harvard & Smithsonian
- Adviser: Ramesh Narayan

Graduate Student Researcher: VLBI Imaging — 2014 – 2019
Center for Astrophysics | Harvard & Smithsonian
- Advisers: Sheperd Doeleman and Michael Johnson

Undergraduate Student Researcher — 2011 – 2012
CSIRO Astronomy and Space Science
- Adviser: Ryan Shannon

Undergraduate Student Researcher — 2010 – 2013
Carleton College
- Adviser: Joel Weisberg

Teaching and Mentorship Experience

Undergraduate Summer Research Program Mentor 2023 – 2024
Princeton Department of Astrophysical Sciences

Resident Tutor 2015 – 2019
Dunster House, Harvard College

Fellowship Committee Chair 2017 – 2019
Dunster House, Harvard College

Teaching Consultant 2016 – 2018
Department of Physics, Harvard University

Teaching Fellow 2015 – 2016
Department of Physics, Harvard University

- PHYS 125: Widely Applied Physics, Fall 2015. (Prof. John Doyle)
- PHYS 175: Modern Optical Physics, Spring 2016. (Prof. Markus Greiner)

Physics Tutor 2010 – 2013
Carleton College Department of Physics

Writing Consultant 2010 – 2013
Carleton College Writing Center

Students Mentored

Zack Gelles (PhD Student, Princeton)	2023 –
Tejahni Desire (Undergraduate, Princeton)	2023 – 2025
Kate Sheldon (Undergraduate, Princeton)	2024
Antonio Fuentes (PhD Student, IAA)	2020 – 2022

Academic Service

Elected Member, EHT Collaboration Science Board	2024 – 2026
Jets Science Team Co-Lead, Black Hole Explorer Mission	2024 –
Coordinator, EHTC Polarimetry Working Group	2021 – 2024
Organizer, Princeton Gravity Initiative Colloquium Series	2023 – 2024
Panel Member, Hubble Space Telescope Cycle 31 TAC	2023
Member, EHTC Inclusion Task Force	2020 – 2024
Reviewer, *The Astrophysical Journal Letters*	2020 –
Reviewer, *The Astrophysical Journal*	2020 –
Reviewer, *Astronomy and Astrophysics*	2020 –
Reviewer, *Monthly Notices of the Royal Astronomical Society*	2019 –

Conference Organization	SOC Member, IAS Workshop on Accretion Models Princeton, NJ	Nov. 2023
	SOC Member, "Modeling Plasmas Around Black Holes" Lorentz Center, Leiden, Netherlands	Sep. 2023
	SOC Member, EHT Summer Collaboration Meeting Taichung, Taiwan	Jun. 2023
	SOC Member, "Improving Accretion Models with Plasma Theory" Princeton, NJ	Feb. 2023
	SOC Member, EHT Winter Collaboration Meeting Virtual	Dec. 2021
	Primary Organizer, "Polarized Radiation from SMBHs" Princeton, NJ	May 2021
	SOC Member, 3rd EHT Imaging Workshop Virtual	May 2020
	SOC Member, EHT Polarization Workshop Bonn, Germany	Jul. 2019
	SOC Member, 2nd EHT Imaging Workshop Cambridge, MA	Jul. 2018
	SOC Member, 1st EHT Imaging Workshop Cambridge, MA	Nov. 2017
Grants & Computer Time Allocations	NSF Collaborative AAG grant, co-PI. $326,000 (*proposal submitted*)	2024
	TACC Stampede3, 450000 node hours (PHY240214)	2024
	TACC Stampede2, 915000 node hours (AST190053, Renewal)	2022
	TACC Stampede2, 418268 node hours (AST190053)	2020

Honors

PCTS John Archibald Wheeler Fellow	2021
Event Horizon Telescope Early Career Award	2020
Event Horizon Telescope Outstanding Thesis Award	2020
Einstein Medal (to 347 members of the EHT collaboration)	2020
Breakthrough Prize in Theoretical Physics (to 347 members of the EHT collaboration)	2019
Eric Keto Prize in Theoretical Astrophysics, Harvard Astronomy	2019
Queerty.com Pride 50	2019
Harvard University Certificate of Distinction in Teaching	2016
NSF Graduate Research Fellowship Honorable Mention	2014
Phi Beta Kappa, Carleton College	2013
Distinction in Physics and Integrative Exercise, Carleton College	2013
Lawrence McKinley Gould Prize in Natural Science, Carleton College	2013
Catherine Boyd Prize in Medieval Studies, Carleton College	2013
Rhodes Scholarship Finalist	2013
Dean's List, Carleton College	2010, 2011, 2012
United States Department of Education Presidential Scholar	2009

First Author and Primary Collaboration Publications

1. **A Chael.**
   "Survey of radiative, two-temperature magnetically arrested simulations of the black hole M87* I: turbulent electron heating."
   MNRAS, 537, p. 2496-2515, 2025. doi:10.1093/mnras/staf200
2. **A Chael.**
   "Hybrid GRMHD and force-free simulations of black hole accretion."
   MNRAS 532, p. 3198-3221, 2024. doi:10.1093/mnras/stae1692
3. The Event Horizon Telescope Collaboration et al.
   (paper writing team)
   "First Sagittarius A* Event Horizon Telescope Results. VIII. physical interpretation of the polarized ring."
   ApJL 964, L26, 2024. doi:10.3847/2041-8213/ad2df1
4. The Event Horizon Telescope Collaboration et al.
   (paper writing team)
   "First Sagittarius A* Event Horizon Telescope Results. VII. polarization of the ring."
   ApJL 964, L25, 2024. doi:10.3847/2041-8213/ad2df0

5. **A Chael**, A Lupsasca, GN Wong, E Quataert.
"Black hole polarimetry I: a signature of electromagnetic energy extraction."
ApJ 958, 65, 2023. doi:10.3847/1538-4357/acf92d

6. The Event Horizon Telescope Collaboration et al.
(paper coordinator)
"First Event Horizon Telescope Results IX: detection of near-horizon circular polarization."
ApJL 957, L20, 2023. doi:10.3847/2041-8213/acff70

7. **A Chael**, D Pesce, S Issaoun et al.
"Multifrequency black hole imaging for the next-generation Event Horizon Telescope."
ApJ 945, 40, 2023. doi:10.3847/1538-4357/acb7e4

8. The Event Horizon Telescope Collaboration et al.
(paper writing team)
"First Sagittarius A* Event Horizon Telescope Results III: imaging of the Galactic Center supermassive black hole."
ApJL 930, L14, 2022. doi:10.3847/2041-8213/ac6429

9. **A Chael**, MD Johnson, A Lupsasca.
"Observing the inner shadow of a black hole: a direct view of the event horizon."
ApJ 918, 6, 2021. doi:10.3847/1538-4357/ac09ee

10. The Event Horizon Telescope Collaboration et al.
(paper coordinator)
"First M87 Event Horizon Telescope Results VIII: magnetic field structure near the event horizon."
ApJL 910, L13, 2021. doi:10.3847/2041-8213/abe4de

11. The Event Horizon Telescope Collaboration et al.
(paper writing team)
"First M87 Event Horizon Telescope Results VII: polarization of the ring."
ApJL 910, L12, 2021. doi:10.3847/2041-8213/abe71d

12. **A Chael**, R Narayan, MD Johnson.
"Two-temperature, Magnetically Arrested Disc simulations of the supermassive black hole in M87."
MNRAS 486, p.2873-2895, 2019. doi:10.1093/mnras/stz988

13. The Event Horizon Telescope Collaboration et al.
(paper coordinator)
"First M87 Event Horizon Telescope Results IV: imaging the central supermassive black hole."
ApJL 875, L4, 2019. doi:10.3847/2041-8213/ab0e85

14. **A Chael**, M Rowan, R Narayan, MD Johnson, L Sironi.
"The role of electron heating physics in images and variability of the Galactic Center black hole Sagittarius A*."
MNRAS 478, p.5209-5229, 2018. doi:10.1093/mnras/sty1261

15. **A Chael**, MD Johnson, KL Bouman et al.
"Interferometric imaging directly with closure phases and closure amplitudes."
ApJ 857, 23, 2018. doi:10.3847/1538-4357/aab6a8
16. **A Chael**, R Narayan, A Sadowski.
"Evolving non-thermal electrons in simulations of black hole accretion."
MNRAS 470, p.2367–2386, 2017. doi:10.1093/mnras/stx1345
17. **A Chael**, MD Johnson, R Narayan et al.
"High-resolution linear polarimetric imaging for the Event Horizon Telescope."
ApJ 829, 11, 2016. doi:10.3847/0004-637X/829/1/11

Student Publications

- Z Gelles, **A Chael**, E Quataert.
"Signatures of black hole spin and plasma acceleration in jet polarimetry."
ApJ, in press. arXiv:2410.00954
- T Desire, A Cárdenas-Avendaño, **A Chael**
"Multifrequency models of black hole photon rings from low-luminosity accretion disks."
ApJ. 980, 262, 2025. doi:10.3847/1538-4357/adac4d
- A Fuentes et al.
"Filamentary structures as the origin of blazar jet radio variability."
Nat. Astron. 7, 2024. doi:10.1038/s41550-023-02105-7

Other Publications (Selected)

- Y Tsunetoe, D Pesce, R Narayan, **A Chael** et al.
"Limb-brightened jet in M87 from anisotropic nonthermal electrons."
ApJ, submitted. ArXiv:2501.14862
- I Cho et al.
"Enhanced Imaging of M87*: Simulations with the EHT and extended-KVN."
JKAS 58, p. 17-29, 2025. doi:10.5303/JKAS.2025.58.1.17
- The Event Horizon Telescope Collaboration et al.
"The persistent shadow of the supermassive black hole of M 87. II. Model comparisons and theoretical interpretations."
A&A 693, A265, 2025. doi:10.1051/0004-6361/202451296
- A Saiz-Pérez et al.
"Probing jet dynamics and collimation in radio galaxies: Application to NGC 1052."
A&A 693, A169, 2025. doi: 10.1051/0004-6361/202451698
- A Raymond et al.
"First Very Long Baseline Interferometry detections at 870 μm."
AJ. 168, 3, 2024. doi:10.3847/1538-3881/ad5bdb

- MD Johnson et al.
  "The Black Hole Explorer: motivation and vision."
  Proc. SPIE Astron. 2024. doi:10.1117/12.3019835
- A Levis, **A Chael**, KL Bouman, M Wielgus, P Srinivasan.
  "Orbital polarimetric tomography of a flare near the Sagittarius A* supermassive black hole."
  Nat. Astron. 8, 2024. doi:10.1038/s41550-024-02238-3
- The Event Horizon Telescope Collaboration et al.
  "The persistent shadow of the supermassive black hole of M 87. I. Observations, calibration, imaging, and analysis."
  A&A 681, A79, 2024. doi:10.1051/0004-6361/202347932
- F Roelofs, MD Johnson, **A Chael** et al.
  "Polarized geometric modeling for mm-VLBI observations of black holes."
  ApJL. 957, L21, 2023. doi:10.3847/2041-8213/acff6f
- DCM Palumbo, GN Wong, **A Chael**, MD Johnson.
  "Demonstrating photon ring existence with single-baseline polarimetry."
  ApJL 952, L31, 2023. doi:10.3847/2041-8213/ace630
- R Qiu, A Ricarte, R narayan, GN Wong, **A Chael**, DCM Palumbo.
  "Using machine learning to link black hole accretion flows with spatially resolved polarimetric observables." *MNRAS* 520, p.4867-4888, 2023. doi:10.1093/mnras/stad466
- MD Johnson et al.
  "Key science goals for the next-generation Event Horizon Telescope."
  Galaxies 11, 3, 2023. doi:10.3390/galaxies11030061
- K Chatterjee, **A Chael** et al.
  "Accretion Flow Morphology in Numerical Simulations of Black Holes from the ngEHT Model Library: The Impact of Radiation Physics."
  Galaxies 11, 2, 2023. doi:10.3390/galaxies11020038
- S Issaoun et al.
  "Enabling transformational ngEHT science via the inclusion of 86 GHz capabilities."
  Galaxies 11, 1, 2023. doi:10.3390/galaxies11010028
- P Tiede, AE Broderick, DCM Palumbo, **A Chael**.
  "Measuring the ellipticity of M87* images."
  ApJ 940, 2, 2022. doi:10.3847/1538-4357/ac9cd2
- H Okino et al.
  "Collimation of the relativistic jet in the quasar 3C 273."
  ApJ 940, 1, 2022. doi:10.3847/1538-4357/ac97e5
- DCM Palumbo et al.
  "Bayesian accretion modeling: axisymmetric equatorial emission in the Kerr spacetime ."
  ApJ 939, 2, 2022. doi:10.3847/1538-4357/ac9ab7

- S Issaoun et al.
  "Resolving the inner parsec of the blazar J1924-2914 with the Event Horizon Telescope."
  ApJ 934, 2, 2022. doi:10.3847/1538-4357/ac7a40
- J Farah, P Galison, K Akiyama, KL Bouman, G Bower, **A Chael** et al.
  "Selective dynamical imaging of interferometric data."
  ApJL 930, L18, 2022. doi:10.3847/2041-8213/ac6615
- The Event Horizon Telescope Collaboration et al.
  "First Sagittarius A* Event Horizon Telescope Results I: the shadow of the supermassive black hole in the center of the Milky Way."
  ApJL 930, L12, 2022. doi:10.3847/2041-8213/ac6674
- The Event Horizon Telescope Collaboration et al.
  "First Sagittarius A* Event Horizon Telescope Results II: EHT and multiwavelength observations, data processing, and calibration."
  ApJL 930, L13, 2022. doi:10.3847/2041-8213/ac6675
- The Event Horizon Telescope Collaboration et al.
  "First Sagittarius A* Event Horizon Telescope Results IV: variability, morphology, and black hole mass."
  ApJL 930, L15, 2022. doi:10.3847/2041-8213/ac6736
- The Event Horizon Telescope Collaboration et al.
  "First Sagittarius A* Event Horizon Telescope Results V: testing astrophysical models of the Galactic Center black hole."
  ApJL 930, L16, 2022. doi:10.3847/2041-8213/ac6672
- The Event Horizon Telescope Collaboration et al.
  "First Sagittarius A* Event Horizon Telescope Results VI: testing the black hole metric."
  ApJL 930, L17, 2022. doi:10.3847/2041-8213/ac6756
- J Farah, P Galison, K Akiyama, KL Bouman, G Bower, **A Chael** et al.
  "Selective dynamical imaging of interferometric data."
  ApJL 930, L18, 2022. doi:10.3847/2041-8213/ac6615
- A Levis, P Srinivasan, **A Chael**, R Ng, KL Bouman.
  "Gravitationally lensed black hole emission tomography."
  IEEE CVPR, 2022. doi:10.1109/CVPR52688.2022.01922
- R Narayan, **A Chael**, K Chatterjee, A Ricarte, B Curd.
  "Jets in magnetically arrested accretion flows: geometry, power and black hole spindown."
  MNRAS 511, p.3795-3813, 2022. doi:10.1093/mnras/stac285
- M Janssen et al.
  "Event Horizon Telescope observations of the jet launching and collimation in Centaurus A."
  Nat. Astron 5, 2021. doi:0.1038/s41550-021-01417-w

- K Akiyama, **A Chael**, D Pesce.
  "New views of black holes from computational imaging."
  Nature Computational Science, 2021. doi:10.1038/s43588-021-00078-z
- S Issaoun et al.
  "Persistant non-Gaussian structure in the image of Sagittarius A* at 86 GHz."
  ApJ 915, 2, 2021. doi:10.3847/1538-4357/ac00b0
- R Narayan et al.
  "The polarized image of a synchrotron-emtting ring of gas orbiting a black hole."
  ApJ 912, 35, 2021. doi:10.3847/1538-4357/abf117
- M Wielgus et al.
  "Monitoring the morphology of M87* in 2009-2017 with the Event Horizon Telescope."
  ApJ 901, 67, 2020. doi:10.3847/1538-4357/abac0d
- L Blackburn et al.
  "Closure statistics in interferometric data."
  ApJ 894, 31, 2020. doi:10.3847/1538-4357/ab8469
- J-Y Kim et al.
  "Event Horizon Telescope Imaging of the archetypal blazar 3C 279 at an extreme 20 microarcsecond resolution"
  A&A 640, A69, 2020. doi:10.1051/0004-6361/202037493
- MD Johnson et al.
  "Universal interferometric signatures of a black hole's photon ring"
  Science Advances 6,12, 2020. doi:10.1126/sciadv.aaz1310
- L Blackburn et al.
  "Studying black holes on horizon scales with VLBI arrays."
  Astro2020 White Paper arXiv:1909.01411
- The Event Horizon Telescope Collaboration et al.
  "First M87 Event Horizon Telescope Results I: the shadow of the supermassive black hole."
  ApJL 875, L1, 2019. doi:10.3847/2041-8213/ab0ec7
- The Event Horizon Telescope Collaboration et al.
  "First M87 Event Horizon Telescope Results II: array and instrumentation."
  ApJL 875, L2, 2019. doi:10.3847/2041-8213/ab0c96
- The Event Horizon Telescope Collaboration et al.
  "First M87 Event Horizon Telescope Results III: data processing and calibration."
  ApJL 875, L3, 2019. doi:10.3847/2041-8213/ab0c57

- The Event Horizon Telescope Collaboration et al.
  "First M87 Event Horizon Telescope Results V: physical origin of the asymmetric ring."
  ApJL 875, L5, 2019. doi:10.3847/2041-8213/ab0f43
- The Event Horizon Telescope Collaboration et al.
  "First M87 Event Horizon Telescope Results VI: the shadow and mass of the central black hole."
  ApJL 875, L6, 2019. doi:10.3847/2041-8213/ab1141
- S Issaoun et al.
  "VLBI imaging of black holes via second moment regularization."
  A&A 629, A32, 2019. doi:10.1051/0004-6361/201936156
- S Issaoun et al.
  "The size, shape and scattering of Sagittarius A* at 86 GHz: first VLBI with ALMA."
  ApJ 871, 30, 2019. doi:10.3847/1538-4357/aaf732
- W Lu, C Dvorkin, **A Chael**.
  "Probing sub-GeV dark matter-baryon scattering with cosmological observables."
  Physical Review D 97, 103530, 2018. doi:10.1103/PhysRevD.97.103530
- KL Bouman, MD Johnson, A Dalca, **A Chael** et al.
  "Reconstructing video from interferometric measurements of time-varying sources."
  IEEE Trans. Comp. Imaging, 2018. doi:10.1109/TCI.2018.2838452
- MD Johnson, KL Bouman, L Blackburn, **A Chael** et al.
  "Dynamical imaging with interferometry."
  ApJ 850, 172, 2018. doi:10.3847/1538-4357/aa97dd
- A Sadowski, M Wielgus, R Narayan, D Abarca, J McKinney, **A Chael**.
  "Radiative, two-temperature simulations of low-luminosity black hole accretion flows in general relativity."
  MNRAS 466, p.705-725, 2018. doi:10.1093/mnras/stw3116
- V Fish et al.
  "Persistent asymmetric structure of Sagittarius A* on event horizon scales."
  ApJ 820, 90, 2016. doi:10.3847/0004-637X/820/2/90
- MD Johnson et al.
  "Resolved magnetic field structure and variability near the event horizon of Sagittarius A*."
  Science 350, p.1242-1245, 2015. doi:10.1126/science.aac7087
- MD Johnson, A Loeb, H Shiokawa, **A Chael**, SS Doeleman.
  "Measuring the direction and angular velocity of a black hole accretion disk via lagged interferometric covariance."
  ApJ 813, 132, 2015. doi:10.1088/0004-637X/813/2/132

- P Verbiest, JM Weisberg, **A Chael**, K Lee, D Lorimer.
  "On pulsar distance measures and their uncertainties."
  ApJ 775, 39, 2012. doi:10.1088/0004-637X/755/1/39

Invited Talks

"Black Hole Images with the EHT: Features, Uncertainties, and Interpretation"
Black Hole Mimickers: From Theory to Observation
Princeton, NJ. March 2025.

"Next Steps in Simulations for the EHT"
EHT Collaboration Winter Meeting
Virtual. December 2024.

"Black Hole Jet Launching Up Close"
Paris Observatory LUTH Seminar
Paris, France. November 2024.

"The Black Hole Explorer"
Princeton-IAS Bahcall Lunch
Princeton, NJ. October 2024.

"Simulating and Imaging Black Holes"
The Event Horizon and Beyond: 50 Years of Narayan
Cambridge, MA. June 2024.

"Polarized Signatures of Jet Launching on Horizon Scales"
EHT Collaboration Summer Meeting
Mexico City, MX. May 2024.

"Polarization Signatures of Jet Launching on Horizon Scales"
AAS HEAD Meeting
Horseshoe Bay, TX. April 2024.

"Black Hole Jet Launching Up Close"
Harvard BHI Colloquium
Cambridge, MA. March 2024.

"New Physics from Polarized Black Hole Images"
National Taiwan University Astronomy Seminar
Virtual. January 2024.

"Black Holes in Polarized Light"
Radboud University Astronomy Colloquium
Nijmegen, Netherlands. December 2023.

"Black Holes in Polarized Light"
Vanderbilt University, VandyGRAF Seminar
Nashville, TN. December 2023.

"M87* in Polarized Light"
Simons Collaboration on Extreme Electrodynamics of Compact Sources Meeting
Virtual. November 2023.

"Polarization spirals, energy extraction, and black hole spin"
Princeton-IAS Bahcall Lunch
Princeton, NJ. May 2023.

"The black hole-jet connection in simulations of M87"
Hamilton Workshop on Kinetic Models of Relativistic Plasmas
Dublin, Ireland. February 2023.

"Horizon-scale images of black hole accretion and jet launching"
Duke University Physics Colloquium
Durham, NC. February 2023.

"Horizon-scale images of black hole accretion and jet launching"
UC Berkeley Astronomy Colloquium
Berkeley, CA. February 2023.

"Imaging supermassive black holes with the Event Horizon Telescope"
Bard College Physics Colloquium
Annandale-on-Hudson, NY. November 2022.

"Multifrequency imaging for the ngEHT"
Broadening Horizons Workshop
Cambridge, MA. August 2022.

"Supermassive black holes and relativistic jets: insights from simulations and EHT observations"
IAU Focus Meeting 1
Busan, Korea. August 2022

"Polarization with the Event Horizon Telescope"
EHT Collaboration Summer Meeting
Granada, Spain. June 2022.

"Dynamic Imaging and Modeling of Sgr A*"
EHT US Focus Meeting
Tucson, Arizona. November 2021.

"Imaging supermassive black hole accretion flows: magnetic fields, jets, and inner shadows"
Princeton Gravity Initiative Seminar
Princeton, NJ. September 2021

"Observing the inner shadow of a black hole"
Goethe University Frankfurt Astronomy Seminar
Virtual. July 2021.

"Accretion, jet launching, and magnetic fields in M87 revealed by the EHT"
Event Horizon Telescope Summer Meeting
Virtual. June 2021.

"Magnetic fields at a supermassive black hole's event horizon"
CU Boulder Astronomy Colloquium
Virtual. April 2021.

"Magnetic fields at the event horizon in M87"
Princeton Center for Theoretical Science Seminar
Virtual. April 2021.

"ngEHT insights from radiative simulations: jets and lensed horizons"
Next-Generation Event Horizon Telescope Science Meeting
Virtual. February 2021.

"The eht-imaging software library"
Event Horizon Telescope Winter Collaboration Meeting
Virtual. December 2020.

"Photographing a black hole with the Event Horizon Telescope"
SciPy 2020 Keynote
Virtual. July 2020.

"Towards understanding black hole accretion and jet launching"
APS April Virtual Meeting
Virtual. April 2020.

"VLBI imaging techniques."
University of Arizona BH PIRE Webinar
Virtual. March 2020.

"Photographing a black hole with the Event Horizon Telescope."
NMSU College of Engineering Distinguished Lecture Series
Las Cruces, NM. February 2020.

"The black hole and jet in M87: connecting simulations and VLBI images."
Princeton Gravity Group Meeting
Princeton, NJ. November 2019.

"The black hole and jet in M87: connecting simulations and VLBI images."
Caltech TAPIR Seminar
Pasadena, CA. November 2019.

"The black hole and jet in M87: connecting simulations and VLBI images."
University of Waterloo Astronomy Seminar
Waterloo, ON. October 2019.

"In the shadow of the black hole."
GitHub Satellite 2019
Berlin, Germany. May 2019.

"Reconstructing an image of the black hole in M87 from EHT data."
2019 Black Hole Initiative Conference
Cambridge, MA. May 2019.

"Photographing a black hole with the Event Horizon Telescope."
Carleton College Physics Special Lecture.
Northfield, MN. May 2019.

"Simulating and imaging supermassive black hole accretion flows."
Black Hole Initiative Colloquium.
Cambridge, MA. May 2019.

"Two-temperature, radiative, MAD simulations of the supermassive black hole in M87."
Center for Astrophysics ITC lunch. (Keto Prize Talk).
Cambridge, MA. May 2019.

"Photographing black holes: first results from the Event Horizon Telescope."
Harvard University Special Colloquium.
Cambridge, MA. April 2019.

"What will the EHT see? Electron heating in simulations of Sgr A* and M87."
Columbia Astronomy Thursday Seminar.
New York, NY. November 2018.

"Electron heating and particle acceleration in GRMHD simulations of Sgr A*."
The Central Arcsecond: Towards Testing GR in the Galactic Center.
Ringberg, Germany. November 2018.

"What will the EHT see? Electron heating in simulations of Sgr A* and M87."
Northwestern CIERA Theory Group Meeting.
Evanston, IL. October 2018.

"Imaging a black hole with the Event Horizon Telescope."
907th Amateur Telescope Makers of Boston Monthly Meeting.
Cambridge, MA. March 2018.

"Imaging techniques for the Event Horizon Telescope."
3rd Event Horizon Telescope Collaboration Meeting.
Cambridge, MA. December 2016.

"Probing Dynamical Activity near the Event Horizon with the EHT."
2nd Event Horizon Telescope Collaboration Meeting.
Waterloo, ON. November 2014.

Interviews & Media

The Postdoc Path Podcast September 12, 2024

Physics Magazine March 15, 2024

New Scientist November 24, 2023

Physics Magazine February 11, 2022

Black Holes: The Edge of All We Know Documentary 2021

Quanta Magazine May 20, 2021

The New York Times March 24, 2021

Inverse March 24, 2021

New Scientist March 24, 2021

Carleton College Voice Winter 2020

Undark podcast March 30, 2019

The Washington Post March 12, 2019

WIRED.com March 4, 2019