

Avery E. Broderick

Curriculum Vitae

Avery Earl Broderick

Department of Physics & Astronomy
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Education

California Institute of Technology, Pasadena CA

Ph.D. 2004, Physics
Thesis: *Radiative Transfer in Accreting Environments*
Advisor: Professor Roger Blandford

State University of New York at Stony Brook, Stony Brook NY

B.S. 1999, Physics & Mathematics, *Cum Laude with honors in Physics*

Employment

University of Waterloo, Waterloo ON

Assistant Professor, Department of Physics & Astronomy, 2011–

Perimeter Institute for Theoretical Physics, Waterloo ON

Associate Faculty Member, 2011–

Canadian Institute for Theoretical Astrophysics, Toronto ON

Senior Research Associate, 2007–2011

Harvard-Smithsonian Center for Astrophysics, Cambridge MA

Institute for Theory and Computation Postdoctoral Fellow, 2004–2007

Awards & Honors

Beatrice D. Tremaine Fellow, 2011

CITA Senior Research Associate, 2007–2011

Certificate of Distinction in Teaching, 2007 (Derek Bok Center, Harvard University)

ITC Fellow (Harvard), 2004–2007

ARCS Fellow, 2002–2004

Grants

Co-I (w/ S. Doeleman et al.) on NSF Mid-Scale Innovations Program Grant “The Event Horizon Telescope Experiment” (\$6,500,000, 2015–2020)

Co-I (w/ P. Chang) on Grant AST-1255469: “CAREER: The Physics and Cosmology of TeV Blazars” NSF Early Career, (\$456,000, 2013–2018)

Co-I (w/ P. Chang) on NASA Fermi Grant Guest Observer Program under Fermi Cycle 5 - NNN11ZDA001N-FERMI: “The Plasma Physics of TeV Blazars” (\$49,000, 2012–2013)

Co-I (w/ P. Chang) on UWM Research Growth Initiative: “The Plasma Physics and Cosmological Impact of TeV Blazars” (109,000, 2012–2013)

PI on NSERC Grant “The Nature, Astrophysics, and Cosmological Impact of Black Holes” (\$125,000, 2012–2016)

Co-I (w/ A. Loeb) on Grant AST0907890: “Testing Accretion Physics and Strong-Field Gravity by Imaging Accreting Black Holes,” (\$540,000, 2009–2012)

Co-I (w/ R.D. Blandford, J.C. McKinney, S. Akiyama & D. Uzdensky) on Grant AST080029: “Accurate

Direct Numerical Simulations of Magnetically-Driven Gamma-Ray Bursts and Supernovae” (8 million CPU-hours on Lonestar & Abe, at Teragrid, 2009-2010)

Professional Societies & Service

Editorial Board Member for *Scientific Reports*, 2011–2013, (<http://www.nature.com/srep>)
 American Astronomical Society (High Energy Astrophysics Division)
 Referee for ApJ, ApJL, Physics Letters B, MNRAS, JCAP, & Living Reviews
 Book Reviewer for Classical & Quantum Gravity
 Internal Reviewer for Cambridge University Press
 Author for *Scientific American*, December 2009
 Organizer of EHT2014 conference on Event Horizon Telescope science (2014, Waterloo, ON)
 Served on SOC for “Bringing Black Holes into Focus: The Event Horizon Telescope” (2012, Tucson, AZ) and “Revealing Radiative Processes Near Black Holes” (2013, Princeton, NJ)
 Currently advising or previously advised 1 Postdoc, 3 Ph.D. students, 2 M.Sc. students, and 5 undergraduate summer research projects

Press Coverage

Forbes.com, *Black Hole Challenge To Einstein’s Theory*, Paul Rodgers, 11/2014
 Discover Magazine, *A Black Hole Close-Up, and a Telescope as Big as the World*, Steve Nadis, 9/2014
 Astronomy, *Why everything you know about Black Holes might be wrong*, Bob Berman, 10/2014
 Scientific American Blog, *Dark Star Diaries*, Seth Fletcher, 4/2014 –
 National Geographic, *Star Eater*, Michael Finkel, 3/2014
 Space.com, *Mouth of Giant Black Hole Measured for the First Time*, Clara Moskowitz, 9/2012
 Popular Science, *Signals From the Void*, Seth Fletcher, 7/2012
 Sky & Telescope (cover story), *Einstein’s Shadow*, Camille M. Carlisle, 2/2012
 Space.com, *Scientists closing in on black hole at center of Milky Way*, Clara Moskowitz, 4/2012
 Science News (cover story), *Black hole silhouettes* by Charles Petit, 10/2010
 Sky & Telescope (website), *How To See a Black Hole*, Ivan Semeniuk, 10/2009
 Daily Planet (TV interview), Ivan Semeniuk, 12/2009
 New Scientist, *Coming soon: First pictures of a black hole* by Stephen Battersby, 5/2009
 New Scientist, *Vanishing matter points to black hole in Milky Way* by David Shiga, 4/2009
 Physics Today, *Measuring the black hole at the Milky Way’s center* by Bertram Schwarzschild, 11/2008
 Space.com, *Closest Look Yet at Milky Way’s Black Hole* by Clara Moskowitz 9/3/2008
 Astronomy.com, *To the edge of a black hole* 9/3/2008
 New Scientist, *The true nature of black holes* by Michael D. Lemonick, 10/6/2007
 Nature, *Physicists plan search for the known unknowns* by Jenny Hogan, 1/31/2007
 Economist, *Weighing the Universe* by Stephen Jeffrey, 1/25/2007
 USA TODAY, *Deep inside black holes* by Dan Vergano, 2/26/2006
 Space.com, *A Quest to See a Black Hole’s Shadow* by Bjorn Carey 10/11/2005

Popular Articles

Broderick, A.E. & Loeb, A. 2009. “Shedding Light on Darkness: Imaging Black Hole Silhouettes”, *Scientific American*, December, 2009
 – **Broderick, A.E.** & Loeb, A. 2010 “Portrait d’un trou noir”, *Pour la science* (Translated from the English)
 – **Broderick, A.E.** & Loeb, A. 2012 “L’ombre d’un trou noir”, *Dossier Pour la Science* (Translated from the English)

Refereed Journal Articles (most recent first)

53. Johannsen, T., **Broderick, A.E.**, Plewa, P.M., Chatzopoulos, S., Doeleman, S.S., Eisenhauer, F., Fish, V.L., Genzel, R., Gerhard, O., Johnson, M.D. 2015. Testing general relativity with the shadow size of Sgr A*, *Phys. Rev. Lett.*, *accepted*
52. Johnson, M.D., Fish, V.L., Doeleman, S.S., Marrone, D.P., Plambeck, R.L., Wardle, J.F.C., Akiyama, K., Asada, K., Beaudoin, C., Blackburn, L., Blundell, R., Bower, G.C., Brinkerink, C., **Broderick, A.E.**, Cappallo, R., Chael, A.A., Crew, G.B., Dexter, J., Dexter, M., Freund, R., Friberg, P., Gold, R., Gurwell, M.A., Ho, P.T.P., Honma, M., Inoue, M., Kosowsky, M., Krichbaum, T.P., Lamb, J., Loeb, A., Lu, R.-S., MacMahon, D., McKinney, J.C., Moran, J.M., Narayan, R., Primiani, R.A., Psaltis, D., Rogers, A.E.E., Rosenfeld, K., SooHoo, J., Tilanus, R.P.J., Titus, M., Vertatschitsch, L., Weintroub, J., Wright, M., Young, K.H., Zensus, J.A., Ziuys, L.M. 2015. “Resolved Magnetic-Field Structure and Variability Near the Event Horizon of Sagittarius A*”, *Science*, 350, 1242
51. Lamberts, A., Chang, P., Pfrommer, C., Puchwein, E., **Broderick, A.E.**, Shalaby, M. 2015. “Patchy blazar heating: diversifying the thermal history of the intergalactic medium”, *ApJ*, 811, 19
50. **Broderick, A.E.** & Tchekhovskoy A. 2014. “Horizon-scale Lepton Acceleration in Jets: Explaining the Compact Radio Emission in M87”, *ApJ*, 809, 97
49. Akiyama, K., Lu, R.-S., Fish, V.L., Doeleman, S.S., **Broderick, A.E.**, Dexter, J., Hada, K., Kino, M., Nagai, H., Honma, M., Johnson, M.D., Algaba, J.C., Asada, K., Brinkerink, C., Blundell, R., Bower, G.C., Cappallo, R., Crew, G.B., Dexter, M., Freund, R., Friberg, P., Gurwell, M., Ho, P.T.P., Inoue, M., Krichbaum, T.P., Loinard, L., MacMahon, D., Marrone, D.P., Moran, J.M., Nakamura, M., Nagar, N.M., Ortiz-Leon, G., Plambeck, R., Pradel, N., Primiani, R.A., Rogers, A.E.E., Roy, A.L., SooHoo, J., Tavares, J.-L., Tilanus, R.P.J., Titus, M., Wagner, J., Weintroub, J., Yamaguchi, P., Young, K.H., Zensus, A., Ziuys, L.M. 2014. “1.3 mm VLBI Observations of M87: Event-Horizon-Scale Structure at the Enhanced Very-High-Energy Gamma-ray State in 2012”, *ApJ*, 807, 150
48. Russell, H.R., Fabian, A.C., McNamara, B.R., **Broderick, A.E.** 2015. “Inside the Bondi radius of M87”, *MNRAS*, 451, 588
47. **Broderick, A.E.**, Narayan, R., Kormendy, J., Perlman, E.S., Rieke, M.J., Doeleman, S.S. 2015. “The Event Horizon of M87”, *ApJ*, 805, 179
46. Psaltis, D., Narayan, R., Fish, V.L., **Broderick, A.E.**, Loeb, A., Doeleman, S.S. 2014. “Event-Horizon-Telescope Evidence for Alignment of the Black Hole in the Center of the Milky Way with the Inner Stellar Disk”, *ApJ*, 789, 15
45. Pen, U.-L., **Broderick, A.E.** 2014. “Possible Astrophysical Observables of Quantum Gravity Effects near Black Holes”, *MNRAS*, 445, 3370
44. Chang, P., **Broderick, A.E.**, Pfrommer, C., Puchwein, E., Lamberts, A., Shalaby, M. 2014. “The Effect of Nonlinear Landau Damping on Ultrarelativistic Beam Plasma Instabilities”, *ApJ*, 797, 110
43. **Broderick, A.E.**, Pfrommer, C., Puchwein, E., Chang, P. 2014. “Lower Limits upon the Anisotropy of the Extragalactic Gamma-Ray Background implied by the 2FGL and 1FHL Catalogs”, *ApJ*, 796, 12
42. Johnson, M.D., Fish, V.L., Doeleman, S.S., **Broderick, A.E.**, Wardle, J.F.C., Marrone, D.P. 2014. “Relative Astrometry of Compact Flaring Structures in Sgr A* with Polarimetric Very Long Baseline Interferometry”, *ApJ*, 794, 150
41. Fish, V., Johnson, M., Lu, R.-S., Doeleman, S., Bouman, K., Zoran, D., Freeman, W., Psaltis, D., Narayan, R., Pankratius, V., **Broderick, A.E.**, Gwinn, C. 2014. “Imaging an Event Horizon: Mitigation of Scattering Toward Sagittarius A*”, *ApJ*, 795, 134

40. **Broderick, A.E.**, Pfrommer, C., Puchwein, E., Chang, P., Smith, K.M. 2014. “Implications of Plasma Beam Instabilities for the Statistics of the Fermi Hard Gamma-ray Blazars and the Origin of the Extragalactic Gamma-Ray Background”, *ApJ*, 790, 137
39. Lu R.-S., **Broderick, A.E.**, Baron, F., Monnier, J.D., Fish, V.L., Doeleman S.S., Pankratius, V. 2014. “Imaging the Supermassive Black Hole Shadow and Jet Base of M87 with the Event Horizon Telescope”, *ApJ*, 788, 120
38. **Broderick, A.E.**, Johannsen, T., Loeb, A., Psaltis, D. 2014. “Testing the No-hair Theorem with Event Horizon Telescope Observations of Sagittarius A*”, *ApJ*, 784, 7
37. Doeleman, S.S., Fish, V.L., Schenck, D.E.; Beaudoin, C., Blundell, R., Bower, G.C., **Broderick, A.E.**, Chamberlin, R., Freund, R., Friberg, P., Gurwell, M.A., Ho, P.T.P., Honma, M., Inoue, M., Krichbaum, T.P., Lamb, J., Loeb, A., Lonsdale, C., Marrone, D.P., Moran, J.M., Oyama, T., Plambeck, R., Primiani, R.A., Rogers, A.E.E., Smythe, D.L., SooHoo, J., Strittmatter, P., Tilanus, R.P.J., Titus, M., Weintroub, J., Wright, M., Young, K.H., Ziuys, L.M. 2012. “Jet-Launching Structure Resolved Near the Supermassive Black Hole in M87”, *Science*, 338, 355
36. Puchwein, E., Pfrommer, C., Springel, V., **Broderick, A.E.** & Chang, P. 2012. “The Lyman-alpha forest in a blazar-heated Universe”, *MNRAS*, 423, 149
35. Pfrommer, C., Chang, P. & **Broderick, A.E.** 2012. “The Cosmological Impact of Luminous TeV Blazars III: Implications for Galaxy Clusters and the Formation of Dwarf Galaxies”, *ApJ*, 752, 24
34. Chang, P., **Broderick, A.E.** & Pfrommer, C. 2012. “The Cosmological Impact of Luminous TeV Blazars II: Rewriting the Thermal History of the Intergalactic Medium”, *ApJ*, 752, 23
33. **Broderick, A.E.**, Chang, P. & Pfrommer, C. 2012. “The Cosmological Impact of Luminous TeV Blazars I: Implications of Plasma Instabilities for the Intergalactic Magnetic Field and Extragalactic Gamma-Ray Background”, *ApJ*, 752, 22
32. **Broderick, A.E.**, Fish, V.L., Doeleman, S.S. & Loeb, A. 2011. “Constraining the Structure of Sagittarius A*’s Accretion Flow with Millimeter-VLBI Closure Phases”, *ApJ*, 738, 38
31. **Broderick, A.E.**, Fish, V.L., Doeleman, S.S. & Loeb, A. 2011. “Evidence for Low Black Hole Spin and Physically Motivated Accretion Models from Millimeter-VLBI Observations of Sagittarius A*”, *ApJ*, 735, 110
30. **Broderick, A.E.**, Loeb, A. & Reid, M.J. 2011. “Localizing Sagittarius A* and M87 on Microarcsecond Scales with Millimeter Very Long Baseline Interferometry”, *ApJ*, 735, 57
29. **Broderick, A.E.** & McKinney, J.C. 2010. “Parsec-scale Faraday Rotation Measures from General Relativistic Magnetohydrodynamic Simulations of Active Galactic Nucleus Jets”, *ApJ*, 725, 750
28. **Broderick, A.E.** & Keto, E. 2010. “The Evolution of Cloud Cores and the Formation of Stars”, *ApJ*, 721, 493
27. **Broderick, A.E.** & Blandford, R.D. 2010. “Understanding the Geometry of Astrophysical Magnetic Fields”, *ApJ*, 718, 1085
26. Fish, V.L., Doeleman, S.S., **Broderick, A.E.**, Loeb, A. & Rogers, A.E.E. 2009. “Detecting Changing Polarization Structures in Sagittarius A* with High Frequency VLBI”, *ApJ*, 706, 1353
25. **Broderick, A.E.** & Loeb, A. 2009. “Signatures of Relativistic Helical Motion in the Rotation Measures of Active Galactic Nucleus Jets”, *ApJL*, 703, 104
24. **Broderick, A.E.**, Loeb, A. & Narayan, R. 2009. “The Event Horizon of Sagittarius A*”, *ApJ*, 701, 1357
23. **Broderick, A.E.** & Loeb, A. 2009. “Imaging the Black Hole Silhouette of M87: Implications for Jet Formation and Black Hole Spin”, *ApJ*, 697, 1164
22. **Broderick, A.E.**, Fish, V.L., Doeleman, S.S. & Loeb, A. 2009, “Estimating the Parameters of Sagittarius A*’s Accretion Flow Via Millimeter VLBI”, *ApJ*, 697, 45

21. Doeleman, S.S., Fish, V.L., **Broderick, A.E.**, Loeb, A. & Rogers, A.E.E. 2009. “Detecting Flaring Structure in Sagittarius A* with High-Frequency VLBI”, *ApJ*, 695, 59
20. Fish, V.L., **Broderick, A.E.**, Doeleman, S.S. & Loeb, A. 2009. “Using Millimeter VLBI to Constrain RIAF Models of Sagittarius A*”, *ApJL*, 692, 14
19. **Broderick, A.E.**, Narayan, R., Keto, E. & Lada, C.J. 2008. “The Damping Rates of Embedded Oscillating Starless Cores”, *ApJ*, 682, 1095
18. Reid, Mark J., **Broderick, A.E.**, Loeb, A., Honma, M. & Brunthaler, A. 2008. “Limits on the Position Wander of Sgr A*”, *ApJ*, 682, 1041
17. **Broderick, A.E.** & Narayan, R. 2008. “Magnetic helicity and the relaxation of fossil fields”, *MNRAS*, 383, 943
16. **Broderick, A.E.**, Keto, E., Lada, C.J. & Narayan, R. 2007. “Oscillating Starless cores: The Non-linear Regime”, *ApJ*, 671, 1832
15. **Broderick, A.E.** & Narayan, R. 2007. “Where are all the gravastars? Limits upon the gravastar model from accreting black holes”, *Classical & Quantum Gravity*, 24, 659
14. Keto, E., **Broderick, A.E.**, Lada, C.J. & Narayan, R. 2006. “Oscillations of Starless Cores”, *ApJ*, 652, 1366
13. **Broderick, A.E.** & Rathore, Y. 2006. “A multidimensional, adiabatic hydrodynamics code for studying tidal excitation”, *MNRAS*, 372, 923
12. **Broderick, A.E.** & Loeb, A. 2006. “Imaging optically-thin hotspots near the black hole horizon of Sgr A* at radio and near-infrared wavelengths”, *MNRAS*, 367, 905
11. **Broderick, A.E.** 2006. “Radiative transfer along rays in curved space-times”, *MNRAS*, 366, L10
10. **Broderick, A.E.** & Narayan, R. 2006. “On the Nature of the Dark Mass at the Galactic Center”, *ApJL*, 638, 21
9. **Broderick, A.E.** & Loeb, A. 2006. “Frequency-dependent Shift in the Image Centroid of the Black Hole at the Galactic Center as a Test of General Relativity”, *ApJL*, 636, 109
8. **Broderick, A.E.** & Loeb, A. 2005. “Imaging bright-spots in the accretion flow near the black hole horizon of Sgr A*”, *MNRAS*, 363, 353
7. **Broderick, A.E.** 2005. “Supernovae in helium star–compact object binaries: a possible gamma-ray burst mechanism”, *MNRAS*, 361, 955
6. Rathore, Y., Blandford, R. & **Broderick, A.E.** 2005. “Resonant excitation of white dwarf oscillations in compact binaries –I. The no back reaction approximation”, *MNRAS*, 357, 834
5. **Broderick, A.** & Blandford, R. 2004. “Covariant magnetoionic theory – II. Radiative transfer”, *MNRAS*, 349, 994
4. **Broderick, A.** & Blandford, R. 2003. “Covariant magnetoionic theory – I. Ray propagation”, *MNRAS*, 342, 1280
3. Rathore, Y., **Broderick, A.E.** & Blandford, R. 2003. “A variational formalism for tidal excitation: non-rotating, homentropic stars”, *MNRAS*, 339, 25
2. **Broderick, A.E.**, Prakash, M. & Lattimer, J.M. 2002. “Effects of strong magnetic fields in strange baryonic matter”, *Phys. Lett. B*, 531, 167
1. **Broderick, A.**, Prakash, M. & Lattimer, J.M., 2000. “The Equation of State of Neutron Star Matter in Strong Magnetic Fields”, *ApJ*, 537, 351

Posters & Proceedings

10. Benkevitch, L., Fish, V.L., Doeleman, S., Psaltis, D., Akiyama, K., Monnier, J.D., Baron, F., Johannsen, T., **Broderick, A.E.** 2013 “Testing General Relativity with the Event Horizon Telescope”, AAS Meeting 221 (Long Beach)
9. Ruprecht, J., Johannsen, T., Fish, V.L., **Broderick, A.E.**, Doeleman, S.S., Loeb, A., Rogers, A.E.E. 2011. “Testing General Relativity with the Event Horizon Telescope”, AAS Meeting 218
8. **Broderick, A.E.** 2009. “Imaging Black Hole Horizons”, CASCA 2009 (Toronto)
7. Fish, V.L., Doeleman, S.S., **Broderick, A.E.**, Loeb, A. & Rogers, A.E.E. 2008. “Detecting Flaring Structures in Sagittarius A* with (Sub)Millimeter VLBI”, XXIX URSI General Assembly (Chicago)
6. **Broderick, A.E.**, McKinney, J. & Morales, M. 2006. “Supernovae in Compact Binaries: A new GRB mechanism”, XXIII Texas Symposium on Relativistic Astrophysics (Melbourne, Australia)
5. **Broderick, A.E.** & Loeb, A. 2006. “Testing General Relativity with High-Resolution Imaging of Sgr A*”, From the Center of the Milky Way to Nearby Low-Luminosity Galactic Nuclei, Journal of Physics: Conference Series ed. R. Schödel, G.C. Bower, M.P. Muno, S. Nayakshin & T. Ott (Philadelphia: Institute of Physics Publishing)
4. **Broderick, A.** & Blandford, R. 2003. “General Relativistic Magnetoionic Theory”, Circular Polarisation From Relativistic Jet Sources, Astrophysics & Space Science ed. R.P. Fender & J.-P. Macquart (Dordrecht: Kluwer Academic Publishers)
3. **Broderick, A.** & Blandford, R. 2002, “General Relativistic Magnetoionic Theory”, ITP Conference on Black Holes: Theory Confronts Reality, Three Years Later (UC Santa Barbara)
2. Blandford, R.D., Agol, E., **Broderick, A.**, Heyl, J., Koopmans, L. & Lee, H.-W. 2001. “Compact Objects and Accretion Disks”, Astrophysical Spectropolarimetry ed. J. Trujillo-Bueno, F. Moreno-Inertis, F. Sanchez (Cambridge: Cambridge University Press)
1. **Broderick, A.** & Blandford, R.D. 2000. “Propagation of Plasma Modes Around a Kerr Black Hole”, AAS Meeting 197

Presented Talks

69. “EHT Constraints on Jet Launching in M87”, EHT2014 (Waterloo, ON), November 11, 2014 (*Invited*)
68. “Testing Black Hole Physics with the Event Horizon Telescope”, 2014 CAP Congress (Sudbury, ON), June 19, 2014 (*Invited*)
67. “Must is a Four Letter Word: The Role of Plasma Instabilities in the Intergalactic Magnetic Field Story”, 224th AAS Meeting (Boston), June 5, 2014 (*Invited*)
66. “Astrophysics Near the Event Horizon – Theory and Simulations”, The Strong Gravity Regime of Black Holes and Neutron Stars – 558th WE-Heraeus-Seminar (Bad Honnef, Germany), March 31, 2014 (*Invited*)
65. “How TeV Blazars Might Rewrite the Thermal History of the Universe: A Story about Non-Local AGN Feedback”, CITA Seminar (Toronto), March 3, 2014 (*Invited*)
64. “Staring into the Abyss”, Perimeter Institute Public Lecture, November 6, 2013 (*Invited*)
63. “How TeV Blazars Might Rewrite the Thermal History of the Universe: A Story about Non-Local AGN Feedback”, Cosmology Seminar (Penn State), October 18, 2013 (*Invited*)
62. “Imaging supermassive Black Holes on Horizon Scales”, Physics Colloquium (Penn State), October 17, 2013 (*Invited*)
61. “Modeling Accretion and Outflows on Horizon Scales for the Event Horizon Telescope”, IAU Symposium 303 (Santa Fe), October 3, 2013 (*Invited*)
60. “Resolving Black Holes with the Event Horizon Telescope”, GR20/Amaldi10 Conference (Warsaw), July, 10, 2013 (*Invited Plenary Talk*)
59. “Black Hole Imaging Horizons”, Wunch Talk (Princeton), May, 8, 2013 (*Invited*)
58. “Imaging Supermassive Black Holes on Horizon Scales”, Physics Colloquium (Western University), April 25, 2013 (*Invited*)
57. “VLBI Observations of Jets in M87”, Fermi Bubbles Workshop, April 12, 2013 (*Invited*)
56. “Imaging Supermassive Black Holes on Horizon Scales”, Joint Astronomical Colloquium (Astronomisches Rechen-Institut, Institut für theoretische Astrophysik, Landessternwarte, Max-Planck Institute für Astronomie, Max-Planck Institut für Kernphysik, Heidelberg Institute for Theoretical Studies; Heidelberg), December 4, 2012 (*Invited*)
55. “Imaging Supermassive Black Holes on Horizon Scales”, Physics Colloquium (Michigan State University), November 11, 2012 (*Invited*)
54. “Dancing in the Dark: Images of Quantum Black Holes”, Experimental Search for Quantum Gravity, October 23, 2012 (*Invited*)
53. “Imaging Supermassive Black Holes on Horizon Scales”, Physics Colloquium (Simon Fraser University), October 19, 2012 (*Invited*)
52. “Imaging Supermassive Black Holes on Horizon Scales”, Physics Colloquium (University of British Columbia), October 18, 2012 (*Invited*)
51. “Imaging Supermassive Black Holes on Horizon Scales”, Physics Colloquium (University of Victoria), October 17, 2012 (*Invited*)
50. “Imaging Supermassive Black Holes on Horizon Scales”, Physics Colloquium (Simon Fraser University), September 26, 2012 (*Invited*)

49. “Modeling M87 on Horizon Scales for the EHT”, Greenland Telescope Workshop (Cambridge, MA), September 19, 2012 (*Invited*)
48. “Testing GR with Imaging of SMBHs, part deux”, Testing General Relativity with Astrophysical Systems (Cambridge), May 15, 2012 (*Invited*)
47. “Early Results from the Event Horizon Telescope: Shedding light on the gastronomy and hair styles of black holes”, Theoretical Physics Workshop (Western), April 13, 2012
46. “Imaging Black Holes”, APS Invited Session *Homing in on the Galactic Center Black Hole*, (Atlanta), March 31, 2012 (*Invited*)
45. “The Other 99%: The Life and Times of the Black Hole Next Door”, Colloquium (Perimeter Institute), February 15, 2012 (*Invited*)
44. “Doughnuts, pancakes, and other black hole breakfast items: Constraining low-luminosity accretion physics with the EHT”, Bringing Black Holes into Focus, January 18, 2012 (*Invited, served on SOC*)
43. “Rewriting the Thermal History of the Universe: The Cosmological Implications of TeV Blazars”, Cosmology & Gravitation Seminar (Perimeter Institute), October 11, 2011 (*Invited*)
42. “The Dog Who Didn’t Bark: Missing Gamma Rays and the Cosmological Impact of Plasma Instabilities”, Astro Seminar, September 14th, 2011 (*Invited*)
41. “Imaging Black Hole Horizons with the Event Horizon Telescope”, The Central Kiloparsec in Galactic Nuclei: Astronomy at High Angular Resolution 2011 (Bad Honnef), August 30, 2012 (*Invited*)
40. “Imaging Black Hole Horizons: Probing the Nature and Habits of Black Holes”, JSI Seminar (University of Maryland), March 3, 2011 (*Invited*)
39. “Imaging Black Hole Horizons: Probing the Nature and Habits of Black Holes”, Tapir Seminar (Caltech), February 25, 2011 (*Invited*)
38. “Probing the Gastronomy of Supermassive Black Holes with High and Ultra-High Resolution Imaging”, Physics & Astronomy Colloquium (University of Waterloo), February 1, 2011 (*Invited*)
37. “The Event Horizon Telescope: Imaging Black Hole Horizons”, Special Seminar (Perimeter Institute), January 31, 2011 (*Invited*)
36. “The Life and Times of Black Holes and Other Stories: Research Topics in Compact Object Astrophysics”, Astrophysics Lunch Talk (University of Pittsburgh), January 24, 2011 (*Invited*)
35. “The Event Horizon Telescope: Imaging Black Hole Horizons”, Physics & Astronomy Colloquium (University of Pittsburgh), January 24, 2011 (*Invited*)
34. “The Hairstyles of Compact Objects”, Theory Meets Data Analysis at Comparable and Extreme Mass Ratios, CAPRA+NRDA Meeting (Perimeter Institute), June 20-26, 2010 (*Invited*)
33. “Measuring the Geometry of AGN Core Magnetic Fields”, Rotation Measure Analysis of Magnetic Fields in and around Radio Galaxies (Riccione, Italy), May 10-14, 2010
32. “Staring into the Abyss: Imaging Black Hole Horizons”, Special SAO Colloquium (CfA), March 8, 2010 (*Invited*)
31. “Staring into the Abyss: Imaging Black Hole Horizons”, Astro Seminar (NYU), February 26, 2010 (*Invited*)
30. “Imaging Black Hole Horizons”, Formation and Evolution of Black Holes, 2010 Winter Conference on Astrophysics (Aspen Center for Physics), February 16, 2010
29. “Nature of the black hole in the center of the Milky Way”, APS Invited Session *Probing strong-field gravity with observations of the galactic center black hole*, (Washington D.C.), February 13, 2010 (*Invited*)

28. “Staring into the Abyss: Imaging Black Hole Horizons”, Joint Astrophysics Colloquium (McGill University), February 2, 2010 (*Invited*)
27. “To the Edge and Back: Directly Imaging the Horizon of a Black Hole”, Royal Astronomical Society of Canada, October 28, 2009 (*Invited*)
26. “Staring Into the Abyss: Directly Imaging Black Hole Event Horizons”, Physics Colloquium (University of Guelph), October 13, 2009 (*Invited*)
25. “Imaging Nearby Black Holes: Providing a window on accretion, jet formation and general relativity”, Astronomy Colloquium (Columbia University), April 8, 2009 (*Invited*)
24. “Directly Imaging the Horizons of Black Holes”, Astrophysics Colloquium (MIT), January 29, 2009 (*Invited*)
23. “A New Window on Jet Formation: Millimeter & Submillimeter VLBI”, 213th AAS Meeting (Long Beach), January 6, 2009
22. “The Nature of Sagittarius A*”, AAS Special Session *Getting to the Event Horizon: Sgr A** (Long Beach), January 5, 2009 (*Invited*)
21. “Imaging Black Hole Horizons”, Special Colloquium (Northwestern University), November 20, 2008 (*Invited*)
20. “Imaging Horizons”, Astrophysics with Radio and Gravitational-Wave Observatories (Charlottesville), November 8, 2008 (*Invited*)
19. “On the Horizon: Imaging Nearby Black Holes”, ACKS Seminar (Kavli Institute for Particle Astrophysics and Cosmology, Stanford), August 14, 2008 (*Invited*)
18. “On the Horizon: Imaging Nearby Black Holes”, INPP+API Seminar (Ohio University), May 13, 2008 (*Invited*)
17. “At the horizon: Imaging black holes and testing general relativity”, Astronomy Colloquium (University of Illinois), February 15, 2008 (*Invited*)
16. “At the horizon: Imaging black holes and testing general relativity”, Astronomy Colloquium (University of Chicago), February 13, 2008 (*Invited*)
15. “Testing the Kerr Metric: Confronting Strong Field Relativity with Observations”, Physics Colloquium (Georgia Tech), March 26, 2007 (*Invited*)
14. “Imaging the Central Black Hole in the Milky Way”, Rethinking Gravity: From the Planck scale to the size of the Universe (Tucson), January 22, 2007 (*Invited*)
13. “Microarcsecond imaging of Sgr A*: A way to test the Kerr metric”, Special Theoretical Astrophysics Seminar (Northwestern University), January 18, 2007 (*Invited*)
12. “Microarcsecond imaging of Sgr A*: A way to test the Kerr metric”, CITA Seminar (Canadian Institute for Theoretical Astrophysics), January 16, 2007 (*Invited*)
11. “Testing the Kerr Metric with Micro-Arcsecond Imaging of Sgr A*”, XXIII Texas Symposium on Relativistic Astrophysics (Melbourne), December 11-15, 2006
10. “Microarcsecond Imaging of Sgr A* and Testing General Relativity”, RAL Seminar (UC Berkeley), October 16, 2006 (*Invited*)
9. “Radio Imaging of Sgr A*”, New Results on the Galactic Centre (XXVI IAU General Assembly, Prague), August 21, 2006 (*Invited*)
8. “Testing General Relativity with Images of Sgr A*”, The History of Nuclear Black Holes in Galaxies (Cambridge), May 15, 2006 (*Invited*)
7. “The possibility of testing general relativity with high-resolution imaging of Sgr A*”, Galactic Center Workshop 2006 (Bad Honnef), April 22, 2006

6. “Circular Polarisation from Tangled Magnetic Fields”, Institute of Astronomy Seminar (Cambridge University), August 11, 2004 (*Invited*)
5. “Polarization Effects Near Black Holes”, X-ray Polarimetry Workshop (SLAC), February 9, 2004 (*Invited*)
4. “Covariant Magnetoionic Theory (CP Production in BH Accretion Flows)”, TAC Seminar (UC Berkeley), January 28, 2004 (*Invited*)
3. “Circular Polarization in Black Hole Accretion Flows (The Role of Refraction)”, AAS Meeting (Atlanta), January 7, 2004
2. “General Relativistic Magnetoionic Theory”, Circular Polarisation from Relativistic Jet Sources (University of Amsterdam), July 19, 2002 (*Invited*)
1. “General Relativistic Magnetoionic Theory and Low Luminosity AGN”, Theoretical Astrophysics in Southern California (California Institute of Technology), October 26, 2001