Sheperd Samuel Doeleman - Curriculum Vitae

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Education

1986	BA in Physics, Reed College, Portland, OR.
1995	PhD in Physics, Massachusetts Institute of Technology, Cambridge, MA

Employment

1986-1988	Research Fellow, Bartol Research Institute, McMurdo Antarctica
1995-1998	Postdoctoral Fellow, MIT Haystack Observatory
1998-2009	Research Scientist, MIT Haystack Observatory
2009-present	Principal Research Scientist, MIT Haystack Observatory
2010-present	Assistant Director, MIT Haystack Observatory
2012-present	Astrophysicist, Harvard-Smithsonian Center for Astrophysics

Teaching/Mentoring

1991 – 1994	Graduate Teaching Assistant, MIT Physics Department
Spring 1993	Recitation Instructor, Introductory Mechanics, MIT Physics Department
Spring 2002	Recitation Instructor, Introductory E+M, MIT School of Engineering
Spring 2004	Course Instructor, Introductory E+M, MIT School of Engineering
1998-present	Mentor for Research Experience for Undergraduates (REU) Program (7 Summer students)
2010-present	Mentor for MIT Undergraduate Research Opportunity Program (UROP) (3 undergraduate students)
2008-present	Mentor for 6 MIT/SAO Postdoctoral Fellows (Vincent Fish, Rusen Lu, Laura Vertatschitsch, Michael Johnson, Lindy Blackburn, Andre Young)
2012-present	Advisor to 2 Harvard Graduate Students (Katherine Rosenfeld, Andrew Chael)

Awards

MIT Buechner Teaching Prize, 1993.
DAAD Grant for Research Visit to Max Planck Institut für Radioastronomie in Bonn, 1996.
MIT Excellence Award – Awarded for Community Outreach, 2003.
Guggenheim Fellow (Astronomy – Astrophysics), 2012.

Professional Activities

American Astronomical Society
Peer Reviewer: Astrophysical Journal, Science, PASJ, Nature, MNRAS
NSF Grant Reviewer: AST, OPP divisions
VLBI Future Committee (2003-2004)
Arecibo Users and Scientific Advisory Committee 2006-2008 (chair 2008)
NRAO Users Committee (2012 - 2015)
ALMA North America Science Advisory Committee – ANASAC (2012 – 2015)

Refereed Journal Publications

Johannsen, T., Broderick, A.E., Plewa, P.M., Chatzopoulos, S., Doeleman, S.S., et al, "Testing general relativity with the shadow size of SgrA*," *Phys Rev. Let, submitted.*

Johnson, M., Fish, V., Doeleman, S., et al, "Resolved Magnetic-Field Structure and Variability Near the Event Horizon of Sagittarius A*," *Science*, *submitted.*

Johnson, M., Loeb, A., Shiokawa, H., Chael, A. & Doeleman, S.S., "Measuring the Direction and Angular Velocity of a Black Hole Accretion Disk via Lagged Interferometric Covariance," *ApJ, submitted.*

Psaltis, D. & Doeleman, S., "The Black Hole Test," *Scientific American,* **313**, *Issue* **3**, (2015).

Wagner, J., et al "First 230 GHz VLBI Fringes on 3C 279 using the APEX Telescope," *A&A*, **581**, 32, (2015).

Akiyama, K., Ru-Sen, L., Fish, V., Doeleman, S.S., et al, "230 GHz VLBI observations of M87: event-horizon-scale structure at the enhanced very-high-energy gamma-ray state in 2012," *ApJ,* **807**, 150, (2015).

Broderick, A., Narayan, R., Kormendy, J., Perlman, E., Rieke, M. & Doeleman, S.S., "The Event Horizon of M87," *ApJ*, **805**, 179*,* (2015).

Bower, G.C., et al "The Proper Motion of the Galactic Center Pulsar Relative to Sagittarius A*," *ApJ*, **798**, 120, (2015).

Psaltis, D., Narayan, R., Fish, V.L., Broderick, A., Loeb, A. & Doeleman, S.S., "Event Horizon Telescope Evidence for Alignment of the Black Hole in the Center of the Milky Way with the Inner Stellar Disk," *ApJ*, **798**, 15, (2015).

Plambeck, R., Bower, G.C., Rao, R., Marrone, D., Jorstad, S.G., Marcher, A., Doeleman, S.S., Fish, V.L. & Johnson, M.D., "Probing the Parsec-scale Accretion Flow of 3C 84 with Millimeter Wavelength Polarimetry," *ApJ*, **797**, 66, (2014).

Fish, V.L., Johnson, M.D., Lu, R.-S., Doeleman, S.S., Bouman, K., Zoran, D., Freeman, W., Psaltis, D., Narayan, R., Pankratius, V., Broderick, A., Gwinn, C. & Vertatschitsch, L., "Imaging an Event Horizon: Mitigation of Scattering toward Sagittarius A*," *ApJ*, **795**, 134, (2014).

Johnson, M.D., Fish, V.L, Doeleman, S.S., Broderick, A.E., Wardle, J.F.C. & Marrone, D.P., "Relative Astrometry of Compact Flaring Structures in SgrA* with Polarimetric Very Long Baseline Interferometry," *ApJ*, **794**, 150, (2014).

Lu, R.-S., Broderick, Avery, A.E., Baron, F., Monnier, J.D., Fish, V.L., Doeleman, S.S. & Pankratius, V., "Imaging the Supermassive Black Hole Shadow and Jet Base of M87 with the Event Horizon Telescope," *ApJ*, **788**, 120L, (2014).

Lu, R.-S., Fish, V.L, Akiyama, K., Doeleman, S.S., et al, "Fine-scale structure of the quasar 3C279 measured with 1.3mm Very Long Baseline Interferometry," *ApJ,* **772**, 13L, (2013).

Whitney, A.R., Beaudoin, C.J., Cappallo, R.J., Corey, B.E., Crew, G.B., Doeleman, S.S., et al, "Demonstration of a 16 Gbps per Station Broadband-RF VLBI System," *PASP*, **125**, 196, (2013).

Doeleman, S.S., et al, "Jet launching structure resolved near the supermassive black hole in M87," *Science,* **338**, 355, (2012).

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Doeleman, S.S., Mai, T., Rogers, A.E.E., Hartnett, J.G., Tobar, M.E. & Nand, N., "Adapting a Cryogenic Sapphire Oscillator for Very Long Baseline Interferometry," *PASP*, **123**, 582, (2011).

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Fish, V.L., Doeleman, S.S., et al, "1.3 mm Wavelength VLBI of Sagittarius A*: Detection of Time-Variable Emission on Event Horizon Scales," *ApJL*, **727**, L36, (2011).

Fish, V.L., Doeleman, S.S., Broderick, A.E., Loeb, A. & Rogers, A.E.E., "Detecting Changing Polarization Structures in Sagittarius A* with High Frequency VLBI," *ApJ*, **706**, 1353, (2009).

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Bowman, J.D. et al, "Field Deployment of Prototype Antenna Tiles for the Mileura Widefield Array Low Frequency Demonstrator", *AJ*, **133**, 1505, 2007.

Lonsdale, C.J., Doeleman, S., D. Oberoi, "Imaging Strategies and Postprocessing Computing Costs for Large-N SKA Designs", *Experimental Astronomy*, **17**, 345, 2004.

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Phillips, R.B., Straughn, A.H., Doeleman, S.S., Lonsdale, C.J., "R Cassiopeiae: Relative Strengths of SiO Masers at 43 and 86 GHz," *ApJ*, **588**, L105, 2003.

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Samples of Research Described in the Popular Press

Overbye, D., "Black Hole Hunters,", *New York Times*, June 8, 2015.
http://www.nytimes.com/2015/06/09/science/black-hole-event-horizon-telescope.html

Nadis, S., "To the Edge and Back," *Discover Magazine*, p.38, September 2014.

"Dark Star Diaries", a web-log on the EHT hosted by Scientific American
http://blogs.scientificamerican.com/dark-star-diaries/

Cowen, R., "Closest look yet at a distant black hole," *Nature*, September 2012.
http://www.nature.com/news/closest-look-yet-at-a-distant-black-hole-1.11498

Fletcher, S., "Signals from the Void," *Popular Science*, p. 58, August 2012.

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PBS News Hour Interview (Jan 2012) "How to Catch a Black Hole, Explained"
http://video.pbs.org/video/2190487310/

Carlisle, C., "Einstein's Shadow", *Sky & Telescope*, p. 20, Feb 2012

BBC Horizon Documentary: “Who’s Afraid of a Big Black Hole?”, http://www.youtube.com/watch?v=N8Jxa2-ugSg

Petit, C., “Visualizing the void: How to capture a black hole”, *Science News*, p. 22, 9 Oct 2010.

Broderick, A. & Loeb, A., “Portrait of a Black Hole”, *Scientific American*, p.42, Dec 2009.

Reynolds, C.S., “Bringing black holes into focus”, *Nature*, v. 455, p. 39, 2008.

Schwarzschild, B., “Radio interferometry measures the black hole at the Milky Way’s center”, *Physics Today*, v. 61, p. 14, November 2008.