

## Michael Shao

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### Positions

Project Scientist, SIM Project, Jet Propulsion Laboratory	1997-Present
Project Scientist, Keck Interferometer Project, Jet Propulsion Laboratory	1997-2007
Spatial Interferometry Group Supervisor, Jet Propulsion Laboratory	1989-1996
Astrophysicist, Smithsonian Astrophysical Observatory	1984-1989
Astrophysicist, Naval Research Laboratory	1981-1984

### Education

Ph.D., Astronomy, Massachusetts Institute of Technology, Cambridge, MA	1978
B.S., Physics, Massachusetts Institute of Technology, Cambridge, MA	1971

### Memberships

American Astronomical Society	1981-present
Fellow, Optical Society of America	1991-present
Co-Chair Space Interferometry Mission Science Working Group (SIMSWG)	1996-2003
Ex-officio, Keck Interferometer Science Steering Group (KISSG)	1997-2007
Terrestrial Planet Finder Science Working Group	1999-2007
SIM Science Team Chair	2003-2007

### Selected Publications

1. Discovery and Characterization of a Faint Stellar Companion to the A3V Star  $\zeta$  Virginis, S. Hinkley, B. R. Oppenheimer, D. Brenner, N. Zimmerman, L. C. Roberts, I. R. Parry, R. Soummer, A. Sivaramakrishnan, M. Simon, M. D. Perrin, D. King, J. Lloyd, A. Bouchez, J. Roberts, R. Dekany, C. Beichman, L. Hillenbrand, R. Burruss, M. Shao, G. Vasisht, *The Astrophysical Journal*, Vol. 712, p. 421 (2010).
2. Sub-Microarcsecond Astrometry with SIM-Lite: A Testbed-based Performance, M. Shao, B. Nemati, *PASP*, Vol. 121, p. 41 (2009).
3. “Galileo Galilei” (GG) a small satellite to test the equivalence principle of Galileo, Newton and Einstein, A. M. Nobili, G. L. Comandi, S. Doravari, D. Bramanti, R. Kumar, F. Maccarrone, E. Polacco, S. G. Turyshv, M. Shao, J. Lipa, H. Dittus, C. Laemmerzhall, A. Peters, J. Mueller, C. S. Unnikrishnan, I. W. Roxburgh, A. Brillet, M. Alain; J. Luo, J. van der Ha, V. Milyukov, V. Iafolla, D. Lucchesi, P. Tortora, P. de Bernardis, F. Palmonari, S. Focardi, D. Zanello, S. Monaco, G. Mengali, L. Anselmo, L. Iorio, Z. Knezevic, *Experimental Astronomy*, Vol. 23, p. 689 (2009).
4. Advancing fundamental physics with the Laser Astrometric Test of Relativity. The LATOR mission, S. Turyshv, M. Shao, K. Nordvedt, et al., *Experimental Astronomy* Vol. 27, p. 27 (2009).

5. Starspot Jitter in Photometry, Astrometry, and Radial Velocity Measurements, V. V. Makarov, C. A. Beichman, J. H. Catanzarite, D. A. Fischer, J. Lebreton, F. Malbet, M. Shao, *ApJ Let*, Vol. 707, p.73 (2009).
6. A Search for New Physics with the Beacon Mission, S. G. Turyshev, M. Shao, A. Girerd, B. Lane, *International Journal of Modern Physics D*, Vol. 18, pp. 1025-1038 (2009).
7. Taking the Measure of the Universe: Precision Astrometry with SIM Planet Quest, S. Unwin, M. Shao, A. M. Tanner, R. J. Allen, C. A. Beichman, D. Boboltz, J. H. Catanzarite, B. C. Chaboyer, D. R. Ciardi, S. J. Edberg, A. L. Fey, D. A. Fischer, C. R. Gelino, A. P. Gould, C. Grillmair, T. J. Henry, K. V. Johnston, K. J. Johnston, D. L. Jones, S. R. Kulkarni, N. M. Law, S. R. Majewski, V. V. Makarov, G. W. Marcy, D. L. Meier, R. P. Olling, X. Pan, R. J. Patterson, J. E. Pitesky, A. Quirrenbach, S. B. Shaklan, E. J. Shaya, L. E. Strigari, J. A. Tomsick, A. E. Wehrle, G. Worthey, *PASP*, Vol. 120, p. 38 (2008).
8. Masses, Luminosities, and Orbital Coplanarities of the  $\mu$  Orionis Quadruple-Star System from Phases Differential Astrometry, M. W. Muterspaugh, B. F. Lane, F. C. Fekel, M. Konacki, B. F. Burke, S. R. Kulkarni, M. M. Colavita, M. Shao, S. J. Wiktorowicz, *ApJ*, Vol. 669, p.1354 (2008).
9. Sensing Phase Aberrations behind Lyot Coronagraphs, A. Sivaramakrishnan, R. Soummer, L. Pueyo, J. K. Wallace, M. Shao, *ApJ*, Vol. 688 (2008).
10. Picometer accuracy white light fringe modeling for SIM PlanetQuest spectral calibration development unit, C. Zhai, J. Yu, M. Shao, R. Goullioud, X. An, R. Demers, M. Milman, T. Shen, H. Tang, *Optical and Infrared Interferometry*. Edited by M. Schöller, Markus; W. C. Danchi, F. Delplancke. Proceedings of the SPIE, Vol. 7013, pp. 70134Z-70134Z-12 (2008).
11. DAVINCI, a dilute aperture visible nulling coronagraphic instrument, M. Shao, S. Bairstow, B. M. Levine, G. Vasisht, B. F. Lane, G. Vasudevan, R. Woodruff, R. Samuele, J. Wynn, M. Clampin, R. Lyon, O. Guyon, *Optical and Infrared Interferometry*. Edited by M. Schöller, W. C. Danchi, F. Delplancke. Proceedings of the SPIE, Vol. 7013, pp. 70132T-70132T-13 (2008).
12. Calibration of residual speckle in a nulling coronagraph, M. Shao, *Comptes Rendus Physique*, Vol. 8, pp. 340-384 (2007).
13. The Orbits of the Quadruple Star System 88 Tauri A from PHASES Differential Astrometry and Radial Velocity, B. Lane, M. W. Muterspaugh, F. C. Fekel, M. Williamson, S. Browne, M. Konacki, B. F. Burke, M. M. Colavita, S. R. Kulkarni, M. Shao, *ApJ*, Vol 669, p.1209 (2007).
14. Finding Earth clones with SIM: the most promising near-term technique to detect, find masses for, and determine three-dimensional orbits of nearby habitable planets, M. Shao, S. C. Unwin, C. Beichman, J. Catanzarite, S. J. Edberg, J. C. Marr, IV, G. Marcy, *Techniques and Instrumentation for Detection of Exoplanets III*. Edited by D. R. Coulter. Proceedings of the SPIE, Vol. 6693, pp. 66930C-66930C-8 (2007).
15. Using SIM for Double Star Astronomy, M. Shao, *Binary Stars as Critical Tools & Tests in Contemporary Astrophysics*. Proceedings of IAU Symposium #240, held August 22-25, 2006 in Prague, Czech Republic. Edited by W.I. Hartkopf, E.F. Guinan and P. Harmanec. Cambridge: Cambridge University Press, pp.54-58 (2007).
16. Post-coronagraph wavefront sensing for the TMT Planet Formation Imager, G. Vasisht,

- I. J. Crossfield, P. J. Dumont, B. M. Levine, M. Troy, M. Shao, J. C. Shelton, J. K. Wallace, *Advances in Adaptive Optics II*. Edited by B. L. Ellerbroek, D. Bonaccini Calia. Proceedings of the SPIE, Vol. 6272, pp. 627253 (2006).
17. The Pupil-swapping Coronagraph, O. Guyon, M. Shao, *PASP*, Vol. 118, p. 860 (2006).
  18. Search for terrestrial planets with SIM Planet Quest, M. Shao, *Advances in Stellar Interferometry*. Edited by J. D. Monnier, M. Schöller, W. C. Danchi. Proceedings of the SPIE, Vol. 6268, pp. 62681Z (2006).
  19. A nulling coronagraph for TPF-C, M. Shao, B. M. Levine, J. K. Wallace, G. S. Orton, E. Schmidtlin, B. F. Lane, S. Seager, V. Tolls, R. G. Lyon, R. Samuele, D. J. Tenerelli, R. Woodruff, J. Ge, *Space Telescopes and Instrumentation I: Optical, Infrared, and Millimeter*. Edited by J. C. Mather, H. A. M. MacEwen, W. M. de Graauw. Proceedings of the SPIE, Vol. 6265, pp. 626517 (2006).
  20. PHASES differential astrometry and the mutual inclination of the V819 Herculis triple star system, M. W. Muterspaugh, B. F. Lane, M. Konacki, B. F. Burke, M. M. Colavita, S. R. Kulkarni, M. Shao, *Astronomy and Astrophysics*, 446, pp. 723-732 (2006).
  21. PHASES differential astrometry and iodine cell radial velocities of the  $\kappa$  Pegasi triple star system, M. W. Muterspaugh, B. F. Lane, M. Konacki, S. Wiktorowicz, B. F. Burke, M. M. Colavita, S. R. Kulkarni, M. Shao, *Astrophys. J.*, 636, pp.1020-1032 (2006).
  22. The Dusty AGB Star RS CrB: First Mid-Infrared Interferometric Observations with the Keck Telescopes, B. Mennesson, C. Koresko, M. J. Creech-Eakman, E. Serabyn, M. M. Colavita, R. Akeson, E. Appleby, J. Bell, A. Booth, S. Crawford, W. Dahl, J. Fanson, C. Felizardo, J. Garcia, J. Gathright, J. Herstein, E. Hovland, M. Hrynevych, E. Johansson, D. Le Mignant, R. Ligon, R. Millan-Gabet, J. Moore, C. Neyman, D. Palmer, T. Panteleeva, C. Paine, S. Ragland, L. Reder, A. Rudeen, T. Saloga, M. Shao, R. Smythe, K. Summers, M. Swain, K. Tsubota, C. Tyau, G. Vasisht, P. Wizinowich, J. Woillez, *The Astrophysical Journal*, Vol. 634, pp. L169-L172 (2005).
  23. PHASES High-Precision Differential Astrometry of delta Equulei, M. W. Muterspaugh, B. F. Lane, M. Konacki, B. F. Burke, M. M. Colavita, S. R. Kulkarni, M. Shao, *The Astronomical Journal*, Vol. 130, pp. 2866-2875 (2005).
  24. The Near-Infrared Size-Luminosity Relations for Herbig Ae/Be Disks, J. D. Monnier, R. Millan-Gabet, R. Billmeier, R. L. Akeson, D. Wallace, J.-P. Berger, N. Calvet, P. D'Alessio, W. C. Danchi, L. Hartmann, L. A. Hillenbrand, M. Kuchner, J. Rajagopal, W. A. Traub, P. G. Tuthill, A. Boden, A. Booth, M. M. Colavita, J. Gathright, M. Hrynevych, D. Le Mignant, R. Ligon, C. Neyman, M. Swain, R. Thompson, G. Vasisht, P. Wizinowich, C. Beichman, J. Beletic, M. Creech-Eakman, C. Koresko, A. Sargent, M. Shao, G. van Belle, *The Astrophysical Journal*, Vol. 632, pp. 689-689 (2005).
  25. Reference Star Preparations for an Astrometric Search for Terrestrial Planets with SIM PlanetQuest, C. R. Gelino, M. Shao, A. M. Tanner, A. Niedzielski, *Protostars and Planets V*. Proceedings of the Conference. LPI Contribution No. 1286, p. 8602 (2005).
  26. Palomar AO+Coronagraph Companion Survey Around the Planet Search SIM PlanetQuest Targets, A. M. Tanner, C. R. Gelino, M. Shao, C. Beichman, *Protostars and Planets V*. Proceedings of the Conference. LPI Contribution No. 1286, p. 8492 (2005).
  27. Detection and Mass Characterization of Terrestrial Planets in the Habitable Zone with SIM PlanetQuest, A. M. Tanner, J. Catanzarite, M. Shao, *Protostars and Planets V*. Proceedings of the Conference. LPI Contribution No. 1286, p. 8304 (2005).

28. The Keck interferometer nuller: system architecture and laboratory performance, E. Serabyn, et al., *New Frontiers in Stellar Interferometry*. Edited by W. A. Traub. Proceedings of SPIE Vol. 5491, p. 806 (2004).
29. SIM spectral characteristics and accuracy analysis, X. Pan, R. Goullioud, J. Yu, M. Shao, *New Frontiers in Stellar Interferometry*. Edited by W. A. Traub. Proceedings of SPIE Vol. 5491, p.353 (2004).
30. Science overview and status of the SIM project, M. Shao, *New Frontiers in Stellar Interferometry*. Edited by W. A. Traub. Proceedings of SPIE, Vol. 5491, p. 328 (2004).
31. Science camera calibration for extreme adaptive optics, J. K. Wallace, J. J. Green, M. Shao, M. Troy, J. P. Lloyd, B. Macintosh, *Advancements in Adaptive Optics*. Edited by D. B. Calia, B. L. Ellerbroek, and R. Ragazzoni. Proceedings of the SPIE, Vol. 5490, pp. 370-378 (2004).
32. Visible nulling interferometer, M. Shao, J. K. Wallace, B. M. Levine, D. Liu. *Optical, Infrared, and Millimeter Space Telescopes*. Edited by J. C. Mather. Proceedings of the SPIE, Vol. 5487, pp. 1296-1303 (2004).
33. A distance of 133-137 parsecs to the Pleiades star cluster, X. Pan, M. Shao, and S.R. Kulkarni, *Nature*, Vol. 427, pp. 326-328 (2004).
34. Extrasolar Planetary Imaging Coronagraph (EPIC), M. Clampin, G. J. Melnick, R. G. Lyon, H. Ford, J. R. P. Angel, D. Y. Gezari, D. A. Golimowksi, G. F. Hartig, M. Marwit, M. Holman, G. D. Illingworth, L. Scott, N. Douglas, M. Marley, S. Olivier, L. Petro, D. D. Sasselov, J. L. Schneider, S. Seager, M. Shao, W. B. Sparks, V. Tolls, A. Weinberger, H. Smith, R. C. Carter, R. A. Woodruff, B. Hyatt, S. E. Kendrick, D. Purmot. *Optical, Infrared, and Millimeter Space Telescopes*. Edited by J. C. Mather. Proceedings of the SPIE, Vol. 5487, pp. 1538-1544 (2004).
35. Observations of DG Tauri with the Keck Interferometer, M. M. Colavita, R. Akeson, P. Wizinowich, M. Shao, S. Acton, J. Beletic, J. Bell, J. Berlin, A. Boden, A. Booth, R. Boutell, F. Chaffee, D. Chan, J. Chock, R. Cohen, S. Crawford, M. Creech-Eakman, G. Eychaner, C. Felizardo, J. Gathright, G. Hardy, H. Henderson, J. Herstein, M. Hess, E. Hovland, M. Hrynevych, R. Johnson, J. Kelley, R. Kendrick, C. Koresko, P. Kurpis, D. Le Mignant, H. Lewis, E. Ligon, W. Lupton, D. McBride, B. Mennesson, R. Millan-Gabet, J. Monnier, J. Moore, C. Nance, C. Neyman, A. Niessner, L. Reder, A. Rudeen, T. Saloga, A. Sargent, E. Serabyn, R. Smythe, P. Stomski, K. Summers, M. Swain, P. Swanson, R. Thompson, K. Tsubota, A. Tumminello, G. van Belle, G. Vasisht, J. Vause, J. Walker, K. Wallace, U. Wehmeier. *The Astrophysical Journal*, Vol. 592, pp. L83-L86 (2003).
36. Design and fabrication of a coherent array of single-mode optical fibers for the nulling coronagraph, D. T. Liu, B. M. Levine, M. Shao. *Techniques and Instrumentation for Detection of Exoplanets*. Edited by D. R. Coulter. Proceedings of the SPIE, Vol. 5170, pp. 217-228 (2003).
37. Interferometer Observations of Subparsec-Scale Infrared Emission in the Nucleus of NGC 4151, M. Swain, G. Vasisht, R. Akeson, J. Monnier, R. Millan-Gabet, E. Serabyn, M. Creech-Eakman, G. van Belle, J. Beletic, C. Beichman, A. Boden, A. Booth, M. M. Colavita, J. Gathright, M. Hrynevych, C. Koresko, D. Le Mignant, R. Ligon, B. Mennesson, C. Neyman, A. Sargent, A.; M. Shao, R. Thompson, S. Unwin, P. Wizinowich, *The Astrophysical Journal*, Vol. 596, pp. L163-L166 (2003).

38. MAM testbed data analysis: cyclic averaging, X. Pan, F. Zhao, M. Shao, *Interferometry in Space*. Edited by M. Shao. Proceedings of the SPIE, Vol. 4852, pp. 612-622 (2003).
39. Visible Light Terrestrial Planet Finder: planet detection and spectroscopy by nulling interferometry with a single aperture telescope, B. M. Levine, M. Shao, C. Beichman, B. Mennesson, R. Morgan, G. Orton, E. Serabyn, S. Unwin, T. Velusamy, N. Woolf. Edited by M. Shao. Proceedings of the SPIE, Vol. 4852, pp. 221-229 (2003).
40. Interferometry in Space, M. Shao, *Interferometry in Space*. Edited by M. Shao. Proceedings of the SPIE, Vol. 4852 (2003).
41. Overview of existing and future optical interferometers, M. Shao. Proceedings of the 36th Liège International Astrophysics Colloquium, Liège, Belgium, July 2-5, 2001.
42. Differential Astrometry of the 61 Cygni System with the Palomar Testbed Interferometer, M. Shao, A. F. Boden, M. M. Colavita, B. F. Lane, and P. R. Lawson, AAS 195.8714S (2000).
43. Space-based interferometric telescopes for the far infrared, M. Shao, W. Danchi, M. J. DiPirro, M. Dragovan, L. D. Feinberg, M. Hagopian, W. D. Langer, C. R. Lawrence, P. R. Lawson, D. T. Leisawitz, J. C. Mather, S. H. Moseley, M. R. Swain, H. W. Yorke, X. Zhang. Proc. SPIE Vol. 4006, p. 772-781, *Interferometry in Optical Astronomy*, J. L. Pierre, A. Quirrenbach; Eds (2002).
44. The Visual Orbit of 64 Piscium, A. F. Boden, B. F. Lane, M. J. Creech-Eakman, M. M. Colavita, P. J. Dumont, J. Gubler, C. D. Koresko, M. J. Kuchner, S. R. Kulkarni, D. W. Mobley, X. P. Pan, M. Shao, G. T. van Belle, J. K. Wallace, B. R. Oppenheimer, (The PTI Collaboration), *The Astrophysical Journal*, 527, 360 (1999).
45. The Visual Orbit of  $\iota$  Pegasi, A. F. Boden, C. D. Koresko, G. T. van Belle, M. M. Colavita, P. J. Dumont, J. Gubler, S. R. Kulkarni, B. F. Lane, D. W. Mobley, M. Shao, J. K. Wallace, G. W. Henry, (The PTI Collaboration), *The Astrophysical Journal*, 515, 356 (1999).
46. Radii and Effective Temperatures for G, K and M Giants and Supergiants, G. T. van Belle, B. F. Lane, R. R. Thompson, A. F. Boden, M. M. Colavita, P. J. Dumont, D. W. Mobley, D. Palmer, M. Shao, G. X. Vasisht, J. K. Wallace, M. J. Creech-Eakman, C. D. Koresko, S. R. Kulkarni, X. P. Pan, J. Gubler, (The PTI Collaboration), *The Astronomical Journal*, 117, 521 (1999).
47. The Palomar Testbed Interferometer, M. M. Colavita, J. K. Wallace, B. E. Hines, Y. Gursel, F. Malbet, D. L. Palmer, X. P. Pan, M. Shao, J. W. Yu, A. F. Boden, P. J. Dumont, J. Gubler, C. D. Koresko, S. R. Kulkarni, B. F. Lane, D. W. Moble, G. T. van Belle, (The PTI Collaboration), *The Astrophysical Journal*, 510, 505 (1999).
48. SIM: the space interferometry mission, M. Shao, *Astronomical Interferometry*. Edited by R. D. Reasenberg. Proceedings of the SPIE Vol. 3350, p. 536-540, (1998).
49. The Visual Orbit of the 0.002" RS CVn Binary Star TZ Triangulum from Near-Infrared Long-Baseline Interferometry, C. D., Koresko, G. T. van Belle, A. F. Boden, M. M. Colavita, M. J. Creech-Eakman, P. J. Dumont, J. Gubler, S. R. Kulkarni, B. F. Lane, D. W. Mobley, X. P. Pan, M. Shao, J. K. Wallace, (The PTI Collaboration), *The Astrophysical Journal (Letters)*, 509, L45 (1998).
50. FU Orionis Resolved by Infrared Long-Baseline Interferometry at a 2 AU Scale, F. Malbet, J.-P. Berger, M. M. Colavita, C. D. Koresko, C. Beichman, A. F. Boden,

- S. R. Kulkarni, B. F. Lane, D. W. Mobel, X. P. Pan, M. Shao, G. T. van Belle, J. K. Wallace, (The PTI Collaboration), *The Astrophysical Journal* (Letters), 507, L149, (1998).
51. An Interferometric Search for Bright Companions to 51 Pegasi, A. F. Boden, G. T. van Belle, M. M. Colavita, P. J. Dumont, J. Gubler, C. D. Koresko, S. R. Kulkarni, B. F. Lane, D. W. Mobley, J. K. Wallace, (The PTI Collaboration), *The Astrophysical Journal* (letters), 504, L39 (1998).
  52. Astrometric Observation of MACHO Gravitational Microlensing, A. F. Boden, M. Shao, and D. Van Buren, *The Astrophysical Journal*, 502, 538 (1998).
  53. Visibility Calibrations with the Palomar Testbed Interferometer, A. F. Boden, M. M. Colavita, G. T. van Belle, and M. Shao, *Astronomical Interferometry*. Edited by R. D. . Reasenberg. Proceedings of the SPIE, Vol. 3350, p. 872-880 (1998).
  54. Global Astrometry with the Space Interferometry Mission, A. F. Boden, S. Unwin, M. Shao. Proceedings of the ESA Symposium `Hipparcos - Venice '97, 13-16 May, Venice, Italy, ESA SP-402 (July 1997), p. 789-794.
  55. Ground-Based Interferometry, M. Shao, *Astrophysics and Space Science*, Vol. 241, p. 105-110 (1996).
  56. Astrometric Detection of Earth-Like Planets with OSI, M. Shao, *Astrophysics and Space Science*, Vol. 241, pp. 85-88 (1996).
  57. Space adaptive optics coronagraphy, F. Malbet, D. T. Liu, J. W. Yu, M. Shao. *Space Telescopes and Instruments*. Edited by P. Y. Bely, J. B. Breckinridge. Proceedings of the SPIE Vol. 2478, p. 230-238 (1995).
  58. System-wide design issues for the stellar interferometer technology experiment (SITE), D. W. Miller, S. L. Crawford, T. T. Hyde, B. P. Masters, E. F. Crawley, G. H. Blackwood, M. M. Colavita, J. W. Yu, M. Shao, R. A. Laskin. *Spaceborne Interferometry II*. Edited by R. D. Reasenberg. Proceedings of the SPIE Vol. 2477, p. 267-275 (1995).
  59. High-Dynamic-Range Imaging Using a Deformable Mirror for Space Coronagraphy, F. Malbet, J. W. Yu, M. Shao, *Publications of the Astronomical Society of the Pacific*, Vol. 107, p.386 (1995).
  60. Prospects for Ground Based Interferometric Astrometry, M. Shao, *Astrophysics and Space Science*, Vol. 223, pp. 119-121 (1995).
  61. Orbiting stellar interferometer, M. Shao, D. M. Wolff. *Spaceborne Interferometry II*, Edited by R. D. Reasenberg. Proceedings of the SPIE Vol. 2477, p. 228-239 (1995).
  62. Indirect planet detection with ground-based long-baseline interferometry, M. M. Colavita, M. Shao, *Astrophysics and Space Science*, Vol. 212, Nos. 1-2, pp. 385-390 (1994).
  63. Orbiting stellar interferometer, M. Shao. *Spaceborne Interferometry*. Edited by R. D. Reasenberg. Proceedings of the SPIE Vol. 1947, p. 89-90 (1993).
  64. High Angular Resolution Measurements of Algol, X. Pan, M. Shao, and M. M. Colavita, *The Astrophysical Journal* (Letters), 413, L129 (1994).
  65. The orbit of Phi Cygni measured with long-baseline optical interferometry - Component masses and absolute magnitudes, J. T. Armstrong, C. A. Hummel, A. Quirrenbach, D. F. Buscher, D. Mozurkewich, M. Vivekanand, R. S. Simon, C. S. Denison, K. J. Johnston, X. Pan, M. Shao, M. M. Colavita, *Astronomical Journal*, Vol. 104, No. 6, pp. 2217-2223 (1992).

66. Potential of Long-Baseline Infrared Interferometry for Narrow-Angle Astrometry, M. Shao and M. M. Colavita, *Astronomy and Astrophysics*, 262, 353 (1992).
67. The orbit of Alpha Equulei measured with long-baseline optical interferometry - Component masses, spectral types, and evolutionary state, J. T. Armstrong, D. Mozurkewich, M. Vivekanand, R. S. Simon, C. S. Denison, K. J. Johnston, X. Pan, M. Shao, M. M. Colavita, *Astronomical Journal*, Vol. 104, No. 1, pp. 241-252 (1992).
68. Interferometric observations of Mira (Omicron Ceti), A. Quirrenbach, D. Mozurkewich, J. T. Armstrong, K. J. Johnston, M. M. Colavita, M. Shao, *Astronomy and Astrophysics*, Vol. 259, No. 1, p. L19-L22 (1992).
69. Determination of the visual orbit of the spectroscopic binary Alpha Andromedae with submilliarcsecond precision, X. Pan, M. Shao, M. M. Colavita, J. T. Armstrong, D. Mozurkewich, M. Vivekanand, C. S. Denison, R. S. Simon, K. J. Johnston, *Astrophysical Journal*, Vol. 384, pp. 624-633 (1992).
70. Long-Baseline Optical and Infrared Stellar Interferometry, M. Shao and M. M. Colavita, *Annual Reviews of Astronomy and Astrophysics*, 30, 457 (1992).
71. Hubble Extra Solar Planet Interferometer, M. Shao. *Space Astronomical Telescopes and Instruments*. Proceedings of the SPIE (A92-45151 19-89), pp. 347-356 (1991).
72. Astronomy - when Big is Beautiful, S. R. Kulkarni, M. Shao, C. A. Haniff, *Nature*, Vol. 352, No. 6334/AUG1, p. 383 (1991)
73. Angular Diameter Measurements of Stars, D. Mozurkewich, K. J. Johnston, R. S. Simon, P. F. Bowers, R. Gaume, D. J. Hutter, M. M. Colavita, M. Shao, X. P. Pan, *The Astronomical Journal*, 101, 2207 (1991).
74. Design considerations for the USNO astrometric optical interferometer, J. A. Hughes, G. H. Kaplan, M. Shao, *Astrophysics and Space Science*, Vol. 177, No. 1-2, pp.151-159 (1991).
75. Apparent orbit of the spectroscopic binary Beta ARIETIS with the time Mark III Stellar Interferometer, X. Pan, M. Shao, M. M. Colavita, D. Mozurkewich, R. S. Simon, K. J. Johnston, *Astrophysical Journal*, Vol. 356, pp. 641-645 (1990).
76. Wide Angle Astrometry with the Mark III Stellar Interferometer, M. Shao, M. M. Colavita, B. E. Hines, J. L. Hershey, J. L. Hughes, D. J. Hutter, G. H. Kaplan, K. J. Johnston, D. Mozurkewich, R. S. Simon, X. P. Pan, *The Astronomical Journal*, 100, 1701 (1990).
77. Direct IR Interferometric Detection of Extra Solar Planets, M. Shao. Proceedings of Workshop on The Next Generation Space Telescope, at STSCI, p. 160 (1989).
78. Angular diameter measurements of 24 giant and supergiant stars from the Mark III optical interferometer, D. J. Hutter, K. J. Johnston, D. Mozurkewich, R. S. Simon, M. M. Colavita, X. Pan, M. Shao, B. E. Hines, D. H. Staelin, J. L. Hershey, J. A. Hughes, G. H. Kaplan, *Astrophysical Journal*, Part 1 (ISSN 0004-637X), Vol. 340, pp. 1103-1111 (1989).
79. Initial stellar diameter measurements with the Mark III interferometer, M. Shao, M. M. Colavita, B. E. Hines, D. H. Staelin, D. J. Hutter, K. J. Johnston, D. Mozurkewich, R. S. Simon, J. L. Hershey, J. A. Hughes, G. H. Kaplan, *Astrophysical Journal*, Vol. 327, pp. 905-910 (1988).
80. Preliminary measurements of star positions with the Mark III stellar interferometer, D. Mozurkewich, D J. Hutter, K. J. Johnston, R. S. Simon, M. Shao, M. M. Colavita, D. H.

- Staelin, B. Hines, J. L. Hershey, J. A. Hughes, G. H. Kaplan, *Astronomical Journal*, Vol. 95, pp. 1269-1277 (1988).
81. The Mark III stellar interferometer, M. Shao, M. M. Colavita, B. E. Hines, D. H. Staelin, D. J. Hutter. *Astronomy and Astrophysics*, Vol. 193, No. 1-2, pp. 357-371 (1988).
  82. Application of interferometry to optical astrometry, M. Shao, M. M. Colavita, D. H. Staelin, K. J. Johnston, R. S. Simon, J. A. Hughes, J. L. Hershey, *Astronomical Journal*, Vol. 93, pp. 1280-1286 (1987).
  83. The Mark III Astrometric Interferometer, M. Shao, M. M. Colavita, D. H. Staelin. *Advanced technology optical telescopes III*. Proceedings of the SPIE (A87-35201 15-89), p. 250-254 (1986)
  84. First Fringe Measurements with a Phase-Tracking Stellar Interferometer, M. Shao and D. H. Staelin, *Applied Optics*, 19, 1519 (1980).
  85. A long baseline optical interferometer for astrometry, Michael Shao, PhD Thesis, Massachusetts Institute of Technology (1978).
  86. Long-baseline optical interferometer for astrometry, M. Shao, D. H. Staelin, *Journal of the Optical Society of America*, Vol. 67, p. 81 (1977).