

## Curriculum Vitae

**Name:** Lincoln J. Greenhill

**Work Address:** Harvard-Smithsonian Center for Astrophysics  
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<http://cfa-www.harvard.edu/~lincoln>

**Birth:** New York, NY. September 25, 1963

**Education:** 1990 Ph.D., Astronomy, Harvard University  
Dissertation: *VLBI Observations of Extragalactic H<sub>2</sub>O masers*  
Supervisor: J. M. Moran  
1985 M.A., Astronomy, Harvard University  
1984 S.B., Physics, Massachusetts Institute of Technology  
Thesis: *Reprocessing of Gamma Ray Burst Radiation on Stellar Surfaces*  
Supervisor: S. A. Rappaport

### Professional Experience

2009 Visiting Professor, Miller Institute for Basic Research in Science, *University of California – Berkeley* (fall semester residence)

2008 – Appointed Project Scientist, Murchison Wide-field Array (MWA).

2007 – Senior Research Fellow, *Harvard University*.

2003 – 2004 Visiting Physicist, *Stanford University*,  
Kavli Institute for Particle Astrophysics and Cosmology (sabbatical).

2002 – Lecturer, *Harvard University*.

2000 – Radio Astronomer (permanent), *Smithsonian Astrophysical Observatory*.

1997 Assistant Director, *Maria Mitchell Observatory*.

1992 – 2000 Radio Astronomer (term), *Smithsonian Astrophysical Observatory*.

1990 – 1992 Fellow, Miller Institute for Basic Research in Science, *University of California – Berkeley*. Hosts: C. Townes/W. Welch.

1984 – 1990 Research Assistant, *Harvard-Smithsonian Center for Astrophysics*.

1983, 1984 Intern, *General Electric Corporate Research and Development Center*, Schenectady, NY.

### Honors and Awards

Achievement Award, Smithsonian Institution (1997, 2002, 2004)  
Bok Prize, Department of Astronomy, Harvard University, shared (1999)  
Miller Fellowship, University of California, Berkeley (1990-92)  
NASA Graduate Student Research Fellowship (1987-90)  
Phi Beta Kappa (1984)  
Sigma Xi (1984)  
Sigma Pi Sigma (1983)

## Principal Interests

Cosmology — cosmological reionization and structure formation, dark energy, estimation of cosmological parameters, the extragalactic distance scale. Supermassive black holes — accretion disk geometries, jets, the structures of active galactic nuclei. Star formation — structure and gas dynamics in close proximity to young stars. Late-type variable stars — circumstellar envelopes and mass-loss. Astronomical masers. Interferometry at radio and infrared wavelengths.

## Professional Societies

American Astronomical Society  
Internal Astronomical Union  
International Union of Radio Science – Commission J

## Committees and Service

(2008 –) JAXA/ISAS VSOP2 International Science Council, member at large  
(2007 –) Harvard Initiative for Innovative Computing core member, manager for Data Intensive Science  
(2007) GBT Dynamic Scheduling Concept Review Committee  
(2007) Science Advisory Group for EVLA  
(2006 – 2007) Mileura Wide-field Array Steering Committee  
(2006 –) Square Kilometer Array International Science Working Group  
(2006) NASA Deep Space Network Working Group  
(2005 – 2006) Strategic Science Planning Committee, Harvard-Smithsonian CfA  
(2003 – 2004) NASA Deep Space Network Executive Management Board  
(2002 – 2003) NRAO VLA/VLBA large proposal Skeptical Review Committee  
(2002) National Science Foundation AST Division proposal reviewer  
(2001) CfA Prize Committee (chair)  
(2000 – 03) AUI Visiting Committee to the NRAO  
(1999 –) U.S. SKA consortium, SAO representative  
(1999) NRAO VLA/VLBA Scheduling Committee  
(1997 – 99) ARISE Space VLBI Science Advisory Committee  
(1997 – 00) NRAO Users Committee  
(1997 – 98) NRAO VLA/VLBA proposal reviewer  
(1996 – 98) Harvard-Smithsonian CfA Fellowship Selection Committee

Referee for *The Astrophysical Journal*, *The Astronomical Journal*, *Nature*, *Astronomy & Astrophysics*, *Monthly Notices of the Royal Astronomical Society*, and *Proceedings of the Astronomical Society of Japan*

## Supervision of Student Research

### *Indirect*

(2006) External Examiner, doctoral defense, M. Gustafsson, Univ. Århus, DK

- (2005 – 2006) SAO predoctoral fellow advisory committee, S. Qin
- (2003 – 2007) Thesis Advisory Committee, P. Kondratko, Harvard
- (2003 – 2005) Thesis Advisory Committee, G. Ball, Harvard
- (2001) SAO predoctoral fellow advisory committee (chair), A. Brunthaler
- (1999 – 01) Thesis Advisory Committee (chair), S. Ransom, Astronomy (Harvard)
- (1997) Dissertation Exam Committee, J. Herrnstein, Astronomy (Harvard)
- (1996 – 00) Thesis Advisory Committee, A. Trotter, Astronomy (Harvard)

*Direct*

- (2007 –) R. Harris, Harvard, summer intern, later Ph.D. candidate (*research advisor*)
- (2006 –) B. Maruca, Harvard Ph.D. candidate (*research advisor*)
- (2006) R. Michney, Dartmouth, undergraduate summer researcher
- (2002 – 2005) G. Ball, Harvard, Ph.D. candidate
- (2002 – 2004) M. Modjaz, Harvard, Ph.D. candidate
- (2000 – 2007) P. Kondratko, Harvard, Ph.D. candidate (*research advisor*)
- (1999 – 00) A. Seth, SAO astrophysicist/technician
- (1998 – 00) I. Zaw, Harvard, undergraduate
- (1998 – 99) J. A. Eisner, Harvard, Senior Honors Thesis, Astronomy\* (*research advisor*)
- (1998 – 99) B. P. Holder, technician
- (1997 – 99) A. Bragg, Harvard, Ph.D. candidate
- (1997) C. Schwartz, Colby College, REU intern Maria Mitchell Observatory
- (1996 – 00) A. S. Trotter, Harvard, Ph.D. candidate
- (1994 – 97) J. R. Herrnstein, Harvard, Ph.D. candidate
- (1994) I. Frommer, Harvard, undergraduate

\* Recipient of Goldberg and Hoopes thesis prizes within Department and University.

**Supervision and Hosting of Post-doctoral and Visiting Fellows**

- (2006 –) C. Goddi (Post-doctoral Fellow SAO; shared)
- (2007 –) S. M. Ord (Post-doctoral Fellow SAO)
- (2006 –) R. B. Wayth (Post-doctoral Fellow SAO)
- (2006 –) A. Tilak (Post-doctoral Fellow SAO)
- (2005 –) D. A. Mitchell (Post-doctoral Fellow SAO)
- (2005 – 2008) L. D. Matthews (Visiting Scientist SAO)
- (1999 – 2002) J. D. Monnier (CfA-wide Post-doctoral Fellow; now faculty, U. Michigan)

**Teaching Experience (Harvard University)**

- 2007/F Astronomy 98f (Astronomy Junior Tutorial)  
Lecture for I. Shapiro
- 2006/F Astronomy 208 (The Interstellar Medium)  
Lecture for P. Casselli
- 2002/S Astronomy 191 (Astrophysics Laboratory)  
Lectures for M. Reid and D. Wilner
- 1999/F Astronomy 192 (Astronomical Measurements)  
Lecture for I. Shapiro
- 1998/S Astronomy 218 (Radio Astronomy)

	Lecture for J. Moran
1996/S	Astronomy 97 (Introductory Tutorial)
	Lecture for J. Moran
1996/F	Astronomy 208 (The Interstellar Medium)
	Lecture for A. Goodman
1995/S	Astronomy 145 (Topics in Astrophysics)
	Lecture for A. Goodman
1995/F	Astronomy 145 (Topics in Astrophysics)
	Lecture for A. Goodman
1993/S	Astronomy 97 (Introductory Tutorial)
	Lecture for J. Moran
1987/S	Astronomy 145 (Topics in Astrophysics)
	Assistant to M. Birkinshaw
1986/S	Astronomy 145 (Topics in Astrophysics)
	Assistant to M. Birkinshaw
1985/F	Astronomy 192 (Astronomical Techniques)
	Assistant to J. P. Huchra

### **Invited Papers, Seminars, and Colloquia**

ANU Research School of Astronomy & Astrophysics colloquium, January 2009  
 Sackler Conference on 21 cm Cosmology, invited talk, May, 2008  
 Massive Star Formation: Observations Confront Theory, invited talk, September, 2007  
 IAU Symposium 242, Alice Springs, Australia, invited review, March, 2007  
 The History of Nuclear Black Holes in Galaxies, Cambridge, MA, invited overview, March, 2007  
 AAS special session on the Epoch of Reionization, Washington, DC, invited talk, January, 2006  
 New Techniques and Results in Low Frequency Radio Astronomy, Hobart, Tasmania,  
 invited review, December, 2005  
 International Union of Radio Science meeting, Boulder, CO, invited talk, January, 2005  
 Oxford University, Astrophysics Seminar, March, 2004  
 Center for Star Formation Research, NASA/Ames, invited talk, January, 2004  
 Stanford University, Astronomy-CSSA Seminar, December, 2003  
 University of California, Berkeley, Radio Astronomy Laboratory Seminar, December, 2003  
 University of Toronto, Department of Astronomy colloquium, October, 2003  
 Future Directions in High Resolution Astronomy, Socorro, NM, invited review, June, 2003  
 Stanford University, Astronomy-CSSA Seminar, March, 2003  
 Meeting on The Centers of Galaxies, Schloss-Ringberg, Germany, invited paper, November, 2002  
 AAS topical session on The New Radio Universe, Albuquerque, NM, invited review, June, 2002  
 IAU Symposium 206, Mangaratiba, Brazil, invited review, March 2001  
 European VLBI Network Symposium 2000, Gothenburg, Sweden, invited review, July, 2000  
 AAS topical session on Supermassive Black Holes, Rochester, NY, invited review, June, 2000  
 Harvard-Smithsonian Center for Astrophysics colloquium, May, 1999  
 International Union of Radio Science meeting, Boulder, CO, invited paper, January, 1998  
 University of Colorado, Department of Astronomy colloquium, December, 1997  
 California Institute of Technology, Department of Astronomy colloquium, April, 1997  
 Lawrence Livermore Laboratory, IGPP Seminar, April, 1997  
 NOAO/KPNO/NSO/Steward Obs./NRAO colloquium, April, 1997  
 Max-Planck-Institut für Radioastronomie colloquium, September, 1996

## Invited Papers, Seminars, and Colloquia

IAU Colloquium 159 on Emission Lines in Active Galaxies: New Methods, Shanghai, June, 1996  
University of British Columbia, Department of Physics colloquium, February, 1996  
University of New Mexico, Department of Physics and Astronomy colloquium, January, 1996  
University of California, Berkeley, Department of Astronomy colloquium, September, 1995  
Symposium on The Physics of LINERS in View of Recent Observations, STScI, September, 1995  
Massachusetts Institute of Technology, Astrophysics colloquium, December, 1994  
Massachusetts Institute of Technology, Astrophysics colloquium, December, 1993

## Public Talks and Invited Lectures

University of Tasmania, Hobart, Australia, December, 2005  
“When the First Stars Formed”

Summer Science Program, Ojai, CA, August, 2003  
“Brobdingnagian Black Holes in the Centers of Galaxies”

Massachusetts Institute of Technology, Cambridge, MA, November, 2001  
“Evidence for Supermassive Black Holes,” an evening lecture to Physics students

Harvard-Smithsonian Center for Astrophysics, Cambridge, MA, November, 1999  
“Black Holes of Brobdignagian Proportions,” part of *Observatory Night* monthly series

## Contracts and Grants

Pfister, H., Aspuru-Guzik, A., Greenhill, L. J.  
“CDI Type II: Scientific Computation for Astronomy, Neurobiology and Chemistry using Graphics Processing Units and Solid-State Storage ”  
NSF (\$1,993,877) *in process of award*

Nowak, M. A., Markoff, S., Canizares, C., Reynolds, C. R., Chiang, J., Greenhill, L., Young, A., and Wilms, J.  
“The Definitive Chandra Observations of NGC4258”  
NSF (\$48,286) *active*

Lonsdale, C. J., Hewitt, J. N., Salah, J. E., Greenhill, L. J.  
“Mileura Wide-Field Array Science and Technology Demonstrator”  
NSF (\$613,097; \$4,898,882 total ) *active*

Humphreys, E.M.L., Greenhill, L. J., and Chandler, C. J.  
“What Does High Mass Star Formation “Look” Like? Movies of Accretion and Outflow 10 - 1000 AU from a Massive YSO” NSF (\$532,294) *active*

Greenhill, L. J. and Blundell, R.  
“Mapping EoR Structures Present During the Epoch of Reionization II,” SAO  
(\$163,947) *closed*

- Kondratko, P. T., Greenhill, L. J., Moran, J. M., Lovell, J., Kuiper, T., and Jauncey, D. L.  
 “Monitoring of Five NGC4258-like Water Megamasers Discovered with the GBT and the DSN II,” NRAO-GBT (\$35,000) *closed*
- Greenhill, L. J. and Blundell, R.  
 “Mapping EoR Structures Present During the Epoch of Reionization,” SAO (\$157,178) *closed*
- Greenhill, L., Madejski, G., Wilson, A., Henkel, C., and Kondratko, P.  
 “Masers as Beacons of Compton Thick AGN-Implications for X-ray Background Studies,” NASA-XMM (\$75,911) *closed*
- Greenhill, L. J., Bersier, D., Macri, L. M., Reid, M. J., and Stanek, K.  
 “Accurate and Robust Calibration of the Extragalactic Distance Scale with the Maser Galaxy NGC4258 II,” NASA-HST (\$69,892; \$184,130 total) *closed*
- Kondratko, P. T., Greenhill, L. J., Moran, J. M., Lovell, J., Kuiper, T., and Jauncey, D. L.  
 “Monitoring of Five NGC4258-like Water Megamasers Discovered with the GBT and the DSN,” NRAO-GBT (\$28,463) *closed*
- Greenhill, L. J., Elvis, M., Fabbiano, G., Madejski, G., Ellingsen, S., McCallum, J., and Lovell, J.  
 “Chandra Study of H<sub>2</sub>O Megamaser AGN: Do Type-2 Objects Form a Heterogeneous Class?” (NASA-CXO) (\$48,200) *closed*
- Greenhill, L. J.  
 “GBT Water Maser Survey of Herbig Ae/Be Stars,” NRAO-GBT (\$2,600) *closed*
- Greenhill, L. J., Bersier, D., Macri, L. M., Reid, M. J., and Stanek, K.  
 “Accurate and Robust Calibration of the Extragalactic Distance Scale with the Maser Galaxy NGC4258,” NASA-HST (\$53,256; \$155,092 total) *closed*
- Greenhill, L. J. and Wilner, D. J.  
 “Square Kilometer Array Development,” SAO (\$11,000) *closed*
- Greenhill, L. J., Madejski, G., McGregor, P. J., Ellingsen, S. P., and Moran, J. M.  
 “Is there an AGN in the ‘Normal’ Galaxy IRASF01063-8034?” NASA-XMM (\$42,900 total) *closed*
- Greenhill, L. J. et al.  
 “Detection of AGN in Apparently Normal Galaxies,” NRAO-GBT (\$24,390) *closed*
- Greenhill, L. J., Goodman, A. A., & Gaensler, B. M.  
 “SKA R&D: The Use of Fiber Optic Networks and the Design of a Polarization Capable Interferometer,” NSF-AST (\$60,160) *closed*
- Greenhill, L. J. and Moran, J. M.  
 “All-sky Megamaser Survey: Accretion Disks and Supermassive Blackholes,” SAO (\$15,700) *closed*

Reid, M. J., Greenhill, L. J., and Moran, J. M.

“Measurement of Precision Geometric Distances to Three Anchor Points in the Local Universe,” NASA OSS-SARA (\$210,000) *closed*

Greenhill, L. J., Moran, E. C., Filippenko, A. V., Moran, J. M., Herrnstein, J. R.

“Multi-epoch XMM Observations of NGC4258,” NASA-XMM (\$44,300) *closed*

Greenhill, L. J. and Moran, J. M.

“H<sub>2</sub>O Megamasers, Accretion Disks, and Supermassive Blackholes,” SAO (\$75,000) *closed*

Moran, J. M. and Greenhill, L. J.

“Sources of outflow in the Orion BN/KL Region,” SI-SSP (\$35,000) *closed*

Madejski, G., Done, C., Zycki, P., Greenhill, L., Moran, J., and Herrnstein, J.

“X-ray Observations of the Megamaser Seyfert 2 Galaxy NGC 4945,” NASA-AXAF (\$20,000) *closed*

Moran, J. M., Genzel, R., Quirrenbach, A., Greenhill, L. J., Menten, K., Drapatz, S., Kegel, W., and Lo, K.-Y.

“High Spectral Resolution Observations of Megamaser Galaxies,” NASA-ISO (\$50,000) *closed*

Reid, M. J., Greenhill, L. J., Menten, K. M., and Moran, J. M.

“The Nuclear Jet in M87,” NASA-VSOP (\$245,300) *closed*

Cecil, G., DePree, C., Greenhill, L. J., and Moran, J. M.

“The Helical Jet/ISM Interaction in NGC 4258,” NASA-HST (\$9,000) *closed*

## **Bibliography**

### **Dissertation, Thesis, and Reports**

- 1983 Greenhill, L. J. and Dakin, J. T., High Pressure Sodium Lamps in the Red and Near-Infrared, General Electric Co. Technical Report.
- 1984 Greenhill, L. J., On Optical Counterparts of Cosmic Gamma-Ray Bursts, S.B. Thesis, Massachusetts Institute of Technology, Cambridge, Massachusetts.
- 1986 Greenhill, L. J., VLBI Mapping of 43 GHz SiO Emission Associated with IRc2 in Orion-KL, second year exam, Harvard University, Cambridge, Massachusetts.
- 1990 Greenhill, L. J., Observations of Extragalactic Water Vapor Masers, Ph.D. Dissertation, Harvard University, Cambridge, Massachusetts.

### **Articles in Refereed Journals**

- 1989 McIntosh, G. C., Predmore, C. R., Moran, J. M., Greenhill, L. J., Reid, M. J., Rogers, A. E. E., and Barvanis, R. E. "VLBI and Polarimetric Observations of the SiO Masers in R Cassiopeia," *Ap. J.*, **337**, 934.
- 1990 Greenhill, L. J., Moran, J. M., Reid, M. J., Gwinn, C. R., Menten, K. M., Eckart, A., and Hirabayashi, H., "VLBI Observations of H<sub>2</sub>O Masers in the Galaxy M33," *Ap. J.*, **364**, 513.
- 1992 Bester, M., Danchi, W.C., Degiacomi, C. G., Greenhill, L. J., and Townes, C. H., "Atmospheric Fluctuations – Structure Functions and Projected Performance of Future Instruments," *Ap. J.*, **392**, 357.
- 1993 Greenhill, L. J., Moran, J. M., Reid, M. J., Menten, K. M., and Hirabayashi, H., "Microarcsecond Proper Motions of Extragalactic Water Vapor Masers in M33," *Ap. J.*, **406**, 482.
- 1994 Argon, A. L., Greenhill, L. J., Moran, J. M., Reid, M. J., Menten, K. M., Henkel, C., and Inoue, M., "The Angular Structure and Intraday Variability of a Water Vapor Maser in IC10," *Ap. J.*, **422**, 586.
- 1994 Danchi, W. C., Bester, M., Degiacomi, C. G., Greenhill, L. J., and Townes, C. H., "Characteristics of Dust Shells Around 13 Late-type Stars," *Astron. J.*, **107**, 1469.
- 1994 Rogers, A. E. E., Doeleman, S., Wright, M. C. H., Bower, G. C., Backer, D. C., Padin, S., Phillips, J. A., Emerson, D., Greenhill, L. J., Moran, J. M., and Kellermann, K. I., "Small Scale Structure of Sgr A\* from VLBI at 3 mm Wavelength," *Ap. J. (Lett.)*, **434**, 59.
- 1994 Townes, C. H., Bester, M., Danchi, W. C., Degiacomi, C. G., and Greenhill, L. J., "An IR Spatial Interferometer at 10  $\mu$ m Wavelength and Measurement of Stellar Dust Shells," *IR Phys. Tech.*, **5**, 503.
- 1995 Greenhill, L. J., Jiang, D. R., Moran, J. M., Reid, M. J., Lo, K.-Y., and Claussen, M. J., "Detection of a Subparsec Diameter Disk in the Nucleus of NGC 4258," *Ap. J.*, **440**, 619.
- 1995 Greenhill, L. J., Colomer, F., Moran, J. M., Backer, D. C., Danchi, W. C., and Bester, M., "Interferometric Observations of the SiO Masers and Dust Shell of VX Sagittarii," *Ap. J.*, **449**, 365.
- 1995 Greenhill, L. J., Henkel, C., Becker, R., Wilson, T. L., and Wouterloot, J. G. A., "Centripetal Acceleration within the Subparsec Nuclear Maser Disk of NGC 4258," *Astron. and Astrophys.*, **304**, 21.
- 1995 Miyoshi, M., Moran, J. M., Herrnstein, J. R., Greenhill, L. J., Nakai, N., Diamond, P. J., and Inoue, M., "Evidence for a Massive Black Hole from High Rotation Velocities in a Sub-parsec Region of NGC 4258," *Nature*, **373**, 127.

### Articles in Refereed Journals

- 1995 Koekemoer, A. M., Henkel, C., Greenhill, L. J., Dey, A., van Breugel, W., Codella, C., and Antonucci, R., “A Water-Vapour Giga-Maser in the Active Galaxy TXFS2226–184,” *Nature*, **378**, 697.
- 1996 Herrnstein, J. R., Greenhill, L. J., and Moran, J. M., “The Warp in the Subparsec Molecular Disk in NGC 4258 as an Explanation for Persistent Asymmetries in the Maser Spectrum,” *Ap. J. (Lett.)*, **468**, L17.
- 1996 Greenhill, L. J., Gwinn, C. R., Antonucci, R., and Barvainis, R., “VLBI Imaging of Water Maser Emission from the Nuclear Torus of NGC 1068,” *Ap. J. (Lett.)*, **472**, L21.
- 1997 Greenhill, L. J., Ellingsen, S. P., Norris, R. P., Gough, R. G., Sinclair, M. W., Moran, J. M., and Mushotzky, R., “Extremely Rapid Variations of Water Maser Emission from the Circinus Galaxy,” *Ap. J. (Lett.)*, **474**, L103.
- 1997 Herrnstein, J. R., Moran, J. M., Greenhill, L. J., Diamond, P. J., Miyoshi, M., Nakai, N., and Inoue, M., “Discovery of a Subparsec Jet 4000 Schwarzschild Radii Away from the Central Engine of NGC 4258,” *Ap. J. (Lett.)*, **475**, L17.
- 1997 Greenhill, L. J., Moran, J. M., and Herrnstein, J. R., “The Distribution of H<sub>2</sub>O Maser Emission in the Nucleus of NGC 4945,” *Ap. J. (Lett.)*, **481**, L23.
- 1997 Trotter, A. S., Moran, J. M., Greenhill, L. J., Zheng, X. W., and Gwinn, C. R., “VLBA Imaging of the OH Maser in III Zw 35,” *Ap. J. (Lett.)*, **485**, L79.
- 1997 Greenhill, L. J., Herrnstein, J. R., Moran, J. M., Menten, K. M., and Velusamy, T., “A Search for H<sub>2</sub>O Maser Emission Toward Active Galactic Nuclei: Discovery of a Nuclear Maser Source in NGC 3735,” *Ap. J. (Lett.)*, **486**, L15.
- 1997 Lopez, B., Danchi, W. C., Bester, M., Hale, D. D. S., Lipman, E. A., Monnier, J. D., Tuthill, P. G., Townes, C. H., Degiacomi, C. G., Geballe, T. R., Greenhill, L. J., Cruzalebes, P., Lefevre, J., Mekarina, D., Mattei, J. A., Nishimoto, D., and Kervin, P. W., “Nonspherical Structures and Temporal Variations in the Dust Shell of o Ceti Observed with a Long Baseline Interferometer at 11 Microns,” *Ap. J.*, **488**, 807.
- 1998 Doleman, S. S., Lonsdale, C. J., and Greenhill, L. J., “VLBI Imaging of the 86 GHz SiO Maser Emission in the Circumstellar Envelope of VX Sagittarii,” *Ap. J.* **494**, 400.
- 1998 Herrnstein, J. R., Greenhill, L. J., Moran, J. M., Diamond, P. J., Inoue, M., Nakai, N., and Miyoshi, M., “VLBA Continuum Observations of NGC 4258: Constraints on an Advection-Dominated Accretion Flow,” *Ap. J. (Lett.)*, **497**, 69.
- 1998 Herrnstein, J. R., Moran, J. M., Greenhill, L. J., Blackman, E. G., and Diamond, P. J., “Polarimetric Observations of the Masers in NGC 4258: An Upper Limit on the Large-Scale Magnetic Field 0.2 Parsecs from the Central Engine,” *Ap. J.*, **508**, 243.

### Articles in Refereed Journals

- 1998 Trotter, A. S., Greenhill, L. J., Moran, J. M., Reid, M. J., Irwin, J. A., and Lo, K.-Y., “Water Maser Emission and the Parsec-Scale Jet in NGC 3079,” *Ap. J.*, **495**, 740.
- 1998 Greenhill, L. J., Gwinn, C. R., Schwartz, C., Moran, J. M., and Diamond, P. J., “Coexisting Conical Bipolar and Equatorial Outflows from a High-Mass Protostar,” *Nature*, **396**, 650.
- 1999 Herrnstein, J. R., Moran, J. M., Greenhill, L. J., Diamond, P. J., Inoue, M., Nakai, N., Miyoshi, M., Henkel, C., and Riess, A., “A Geometric Distance to the Galaxy NGC 4258 from Orbital Motions in a Nuclear Gas Disk,” *Nature*, **400**, 539.
- 1999 Moran, J. M., Greenhill, L. J., and Herrnstein, J. R., “Observational Evidence for Massive Black Holes in the Centers of Active Galaxies,” proceedings of conference, *Black Holes and Relativity*, Bangalore, India, December 1997. *J. Astrophys & Astron.*, **20**, 165.
- 1999 Masheder, M. R. W., van Langevelde, H. J., Richards, A. M. S., Greenhill, L., and Gray, M. D. “VLBI Observations of OH stars: S Persei,” *New Astr. Rev.*, **43** (8-10), 563-567.
- 2000 Bragg, A. E., Greenhill, L. J., and Moran, J. M., “Accelerations of Water Masers in NGC 4258,” *Ap. J.*, **535**, 73.
- 2000 Patel, N. A., Greenhill, L. J., Herrnstein, J. R., Zhang, Q., Moran, J. M., Ho, P. T. P., and Goldsmith, P. F., “Proper Motions of Water Masers Associated with IRAS 21391+5802,” *Ap. J.*, **538**, 268.
- 2000 Cecil, G., Greenhill, L. J., DePree, C. G., Nagar, N., Wilson, A. S., Dopita, M. A., Pérez-Fournon, I., Argon, A. L., and Moran, J. M., “The Active Jet in NGC 4258 and its Associated Shocks,” *Ap. J.*, **536**, 675.
- 2001 Torrelles, J. M., Patel, N. A., Gómez, J. F., Ho, P. T. P., Rodríguez, L. F., Anglada, G., Garay, G., Greenhill, L. J., Curiel, S., and Cantó, J., “Spherical episodic ejection of material from a young star,” *Nature*, **411**, 277.
- 2001 Ransom, S. M., Greenhill, L. J., Herrnstein, J. R., Manchester, R. N., Camilo, F., Eikenberry, S. S., Lyne, A. G., “A Binary Millisecond Pulsar in Globular Cluster NGC 6544,” *Ap. J.*, **546**, L25.
- 2002 Curiel, S., Trinidad, M. A., Cantó, J., Rodríguez, L. F., Torrelles, J. M., Ho, P. T. P., Patel, N. A., Greenhill, L., Gómez, J. F., Garay, G., Hernández, L., Contreras, M. E., Anglada, G., “Detection of a Candidate for the Exciting Source of the Expanding Water Maser Bubble in Cepheus A,” *Ap. J.*, **564**, 35.
- 2002 Greenhill, L. J., Ellingsen, S. P., Norris, R. P., McGregor, P. J., Gough, R. G., Sinclair,

### Articles in Refereed Journals

- M. W., Rayner, D. P., Phillips, C. J., Herrnstein, J. R., and Moran, J. M., “A Search for H<sub>2</sub>O Maser Emission in Southern AGN and Star Forming Galaxies – Discovery of a Maser in the Edge-on Galaxy IRAS F01063-8034,” *Ap. J.*, **565**, 836.
- 2002 Monnier, J. D., Greenhill, L. J., Tuthill, P. G., and Danchi, W. C. “Radio Properties of Pinwheel Nebulae,” *Ap. J.*, **566**, 399.
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