

# CURRICULUM VITAE

## Name and Address

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## Education

University of Michigan: Ph.D. (Astronomy), 1992  
Dissertation – “A Search for Dead QSOs Among Nearby Luminous Galaxies”  
University of Oklahoma: B.S. (Astrophysics), 1986

## Professional Employment History

National Optical Astronomy Observatories  
Assistant Scientist, STIS GTO team, February 1998 – present  
Research Associate, STIS GTO team, August 1996 – January 1998  
Postdoctoral Fellow  
Dept. of Physics & Astronomy, Johns Hopkins University, July 1995 – July 1996  
Space Telescope Science Institute, July 1992 – June 1995  
Visiting Lecturer, Dept. of Astronomy, University of Michigan  
January 1992 – June 1992  
Research Assistant, Dept. of Astronomy, University of Michigan  
May 1987 – December 1991  
Teaching Assistant, Dept. of Astronomy, University of Michigan  
September 1986 – December 1991  
Research Assistant, Dept. of Physics & Astronomy, University of Oklahoma  
September 1985 – May 1986  
Summer Research Assistant, National Center for Atmospheric Research, High Altitude  
Observatory, Boulder, Colorado  
May 1985 – August 1985

## Research Interests

active galactic nuclei (AGNs): structure and evolution  
galaxies: internal mass distribution, dynamics, and evolution

## Observing Experience

Michigan Dartmouth MIT (MDM) Observatory, Kitt Peak, Arizona  
2.4 m Hiltner Telescope, 40 nights  
1.3 m McGraw-Hill Telescope, 6 nights  
Cerro Tololo Inter-American Observatory, Chile  
4 m telescope, 6 nights  
Kitt Peak National Observatory  
4 m telescope, 13 nights

## Hubble Space Telescope

(Listed by program number. GO = General Observer, GTO = Guaranteed Time Observer, ERO = Early Release Observation.)

- GO-5411 “The Circumnuclear Regions of Seyfert Galaxies”, A. S. Wilson, *G. A. Bower*, T. M. Heckman, J. H. Krolik, & G. K. Miley
- GO-5433 “Testing the AGN Paradigm in Nearby Seyfert Galaxies”, *G. A. Bower*, A. S. Wilson, D. O. Richstone, & T. M. Heckman
- GO-6094 “Kinematics of Nuclear Gas Disks in Nearby Radio Galaxies”, *G. A. Bower*, A. S. Wilson, D. O. Richstone, & T. M. Heckman
- ERO-7124 “Kinematics of the Nuclear Gas Disk in the Galaxy M84”, R. F. Green, *G. A. Bower*, V. Sarajedini
- GO-7350 “Testing the Supermassive Black Hole Paradigm in Nearby Radio-Quiet AGNs”, *G. A. Bower*, A. S. Wilson, D. O. Richstone, T. M. Heckman, B. M. Peterson, & R. F. Green
- GO-7388 “Black Holes and the Center of Galaxies”, D. O. Richstone, et al. (i.e., the Nuker team)
- GTO-7566, GTO-8018, GTO-8472 “Demographics of Nuclear Black Holes”, R. F. Green, & *G. A. Bower*
- GO-7868 “Near-IR Cores of Radio Galaxies: Are the AGN’s Moving in the Galaxy?”, A. Quillen, *G. Bower*, & G. Rieke
- GO-7886 “NICMOS Snap Shot Survey of Early-Type Galaxies”, A. Quillen, *G. Bower*, & G. Rieke
- GTO-8031 “Gaseous Disks in Galactic Nuclei”, M. E. Kaiser, *G. Bower*, & R. F. Green
- GO-8240 “Masses and Spins of Black Holes in Seyfert Galaxies”, A. S. Wilson, *G. A. Bower*, & P. Ferruit
- GO-8340 “Probing the Kinematics of the Narrow-line Region in Seyfert Galaxies with Slitless Spectroscopy”, D. M. Crenshaw, *G. Bower*, J. Hutchings, M. E. Kaiser, S. Kraemer, & D. Weistrop
- GO-8591 “The Smallest Nuclear Black Holes”, D. O. Richstone, et al. (i.e., the Nuker team)
- GO-8605 “Stellar-Dynamical Measurements of the Black Hole Masses of Reverberation Mapped AGN”, *G. A. Bower*, A. Wandel, T. Heckman, B. Peterson, A. Filippenko, & A. Barth
- GO-9106 “The Biggest Black Holes”, D. O. Richstone, et al. (i.e., the Nuker team)
- GO-9107 “The Fundamental Plane for Nuclear Black Holes”, D. O. Richstone, et al. (i.e., the Nuker team)

## Research Support

*Bower, G. A.*, et al., “Testing the AGN Paradigm in Nearby Seyfert Galaxies”, (HST GO project), NASA, \$103,166, 1994-1996

*Bower, G. A.*, et al., “Kinematics of Nuclear Gas Disks in Nearby Radio Galaxies”,

(HST GO project), NASA, \$68,855, 1996-1998

*Bower, G. A.*, et al., “Testing the Supermassive Black Hole Paradigm in Nearby Radio-Quiet AGNs”, (HST GO project), NASA, \$111,570, 1997-2001

*Bower, G. A.*, et al., “Stellar-Dynamical Measurements of the Black Hole Masses of Reverberation Mapped AGN”, (HST GO project), NASA, \$73,456, 2001-2003

### **Professional Society Memberships**

American Astronomical Society, 1982 – present

Astronomical Society of the Pacific, 1981 – present

International Astronomical Union, 1997 – present

### **Other Activities**

*Far Ultraviolet Satellite Explorer* (FUSE) Telescope Allocation Committee, Cycle 1,  
June 1998

Space Telescope Science Institute, Ad hoc Committee for Improving HST Scheduling,  
December 1998

Reviewer, NASA Astrophysics Theory Program, September 1999

Session Chair, “AGN Kinematics”, AAS Meeting, San Diego, CA; January 8, 2001

Invited Talks during 2000-2001

New Mexico State University, Dept. of Astronomy. Las Cruces, NM

National Radio Astronomy Observatory, Socorro, NM

University of Texas at Arlington, Dept. of Physics

University of Arkansas at Little Rock, Dept. of Physics

City University of New York–York College, Dept. of Natural Sciences

### **References**

Dr. Andrew S. Wilson  
Dept. of Astronomy  
University of Maryland  
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Dr. Timothy M. Heckman  
Physics & Astronomy  
Johns Hopkins University  
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Dr. Richard F. Green  
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Dr. Douglas O. Richstone  
Dept. of Astronomy  
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Dr. John Kormendy  
Dept. of Astronomy  
University of Texas  
Austin, TX 78712  
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## PUBLICATION LIST

### Refereed Journal Publications

- Richstone, D., *Bower, G.*, & Dressler, A. 1990, *ApJ*, 353, 118  
“Constraints on the Mass Distribution Near the Center of M31 and M32”
- Bower, G. A.*, Richstone, D. O., Bothun, G. D., & Heckman, T. M. 1993, *ApJ*, 402, 76  
“A Search for Dead Quasars among Nearby Luminous Galaxies. I. The Stellar Kinematics in the Nuclei of NGC 2613, NGC 4699, NGC 5746, and NGC 7331”
- Bower, G. A.*, Wilson, A. S., Mulchaey, J. S., Miley, G. K., Heckman, T. M., & Krolik, J. H. 1994, *AJ*, 107, 1686  
“*HST* Images of the Seyfert Galaxies NGC 5929 and MCG 8-11-11”
- Mulchaey, J. S., Wilson, A. S., *Bower, G. A.*, Heckman, T. M., Krolik, J. H., & Miley, G. K. 1994, *ApJ*, 433, 625  
“*Hubble Space Telescope* Imaging of the Seyfert 2 Galaxy NGC 2110”
- Bower, G. A.*, & Wilson, A. S. 1995, *ApJS*, 99, 543  
“*Hubble Space Telescope* Images of the Nuclear Star Forming Region in the Interacting Galaxy NGC 5930”
- Bower, G.*, Wilson, A., Morse, J. A., Gelderman, R., Whittle, M., & Mulchaey, J. 1995, *ApJ*, 454, 106  
“Radio and Emission-Line Jets in the Type 2 Seyfert Galaxy Markarian 1066 (UGC 2456)”
- Bower, G. A.*, Wilson, A. S., Heckman, T. M., & Richstone, D. O. 1996, *AJ*, 111, 1901  
“Double-Peaked Broad Emission Lines in the Nucleus of M81”
- Falcke, H., Wilson, A. S., Simpson, C., & *Bower, G. A.* 1996, *ApJ*, 470, L31  
“Helical Strands in the Jetlike Narrow-Line Region of ESO428-G14”
- Simpson, C., Wilson, A. S., *Bower, G.*, Heckman, T. M., Krolik, J. H., & Miley, G. K. 1997, *ApJ*, 474, 121  
“A One-sided Ionization Cone in the Seyfert 2 Galaxy NGC 5643”
- Bower, G. A.*, Heckman, T. M., Wilson, A. S., & Richstone, D. O. 1997, *ApJ*, 483, L33  
“The Nuclear Ionized Gas in the Radio Galaxy M84 (NGC 4374)”
- Bower, G. A.*, Green, R. F., Danks, A., Gull, T., Heap, S., Hutchings, J., Joseph, C., Kaiser, M. E., Kimble, R., Kraemer, S., Weistrop, D., Woodgate, B., Lindler, D., Hill,

R. S., Malumuth, E. M., Baum, S., Sarajedini, V., Heckman, T. M., Wilson, A. S., & Richstone, D. O. 1998, ApJ, 492, L111

“Kinematics of the Nuclear Ionized Gas in the Radio Galaxy M84 (NGC 4374)”

Magorrian, J., Tremaine, S., Richstone, D., Bender, R., *Bower, G.*, Dressler, A., Faber, S. M., Gebhardt, K., Green, R., Grillmair, C., Kormendy, J., & Lauer, T. 1998, AJ, 115, 2285

“The Demography of Massive Dark Objects in Galaxy Centers”

Richstone, D. O., Ajhar, E. A., Bender, R., *Bower, G.*, Dressler, A., Faber, S. M., Filippenko, A. V., Gebhardt, K., Green, R., Ho, L. C., Kormendy, J., Lauer, T. R., Magorrian, J., & Tremaine, S. 1998, Nature, 395, A14

“Supermassive Black Holes”

Quillen, A. C., & *Bower, G. A.* 1999, ApJ, 522, 718

“M84: A Warp Caused by Jet-Induced Pressure Gradients?”

Quillen, A. C., & *Bower, G. A.*, & Stritzinger, M. 2000, ApJS, 128, 85

“A NICMOS Survey of Early-Type Galaxy Centers: The Relation Between Core Properties, Gas and Dust Content and Environment”

*Bower, G. A.*, Green, R. F., Quillen, A. C., Danks, A., Gull, T., Hutchings, J., Joseph, C., Kaiser, M. E., Weistrop, D., Woodgate, B., Malumuth, E. M., and Nelson, C. 2000, ApJ, 534, 189

“The Ionization Source in the Nucleus of M84”

Gebhardt, K., Bender, R., *Bower, G.*, Dressler, A., Faber, S. M., Filippenko, A. V., Green, R., Grillmair, C., Ho, L. C., Kormendy, J., Lauer, T. R., Magorrian, J., Pinkney, J., Richstone, D., & Tremaine, S. 2000, ApJ, 539, L13

“A Relationship Between Nuclear Black Hole Mass and Galaxy Velocity Dispersion”

Gebhardt, K., Kormendy, J., Ho, L. C., Bender, R., *Bower, G.*, Dressler, A., Faber, S. M., Filippenko, A. V., Green, R., Grillmair, C., Lauer, T. R., Magorrian, J., Pinkney, J., Richstone, D., & Tremaine, S. 2000, ApJ, 543, L5

“Black Hole Mass Estimates from Reverberation Mapping and from Spatially Resolved Kinematics”

*Bower, G. A.*, Green, R. F., Bender, R., Gebhardt, K., Lauer, T. R., Magorrian, J., Richstone, D. O., Danks, A., Gull, T., Hutchings, J., Joseph, C., Kaiser, M. E., Weistrop, D., Woodgate, B., Nelson, C., & Malumuth, E. M. 2001, ApJ, 550, 75

“Evidence of a Supermassive Black Hole in the Galaxy NGC 1023 from the Nuclear Stellar Dynamics”

Joseph, C. L., Merritt, D., Olling, R., Valluri, M., Bender, R., *Bower, G.*, Danks, A., Gull,

T., Hutchings, J., Kaiser, M. E., Weistrop, D., Woodgate, B., Malumuth, E., Nelson, C., Plait, P., & Lindler, D. 2001, ApJ, 550, 668

“The Nuclear Dynamics of M32. I. Data and Stellar Kinematics”

Gebhardt, K., Lauer, T. R., Kormendy, J., Pinkney, J., *Bower, G. A.*, Green, R., Gull, T., Hutchings, J., Kaiser, M. E., Nelson, C. H., Richstone, D., & Weistrop, D. 2001, AJ, in press, astro-ph/0107135

“M33: A Galaxy with No Supermassive Black Hole”

Ruiz, J. R., Crenshaw, D. M., Kraemer, S. B., *Bower, G. A.*, Gull, T. R., Hutchings, J. B., Kaiser, M. E., & Weistrop, D. 2001, AJ, in press

“Kinematics of the Narrow-Line Region in the Seyfert 2 Galaxy Mrk 3”

### Contributed Conference Publications

*Bower, G.*, Richstone, D., Bothun, G., & Heckman, T. 1990, BAAS, 22, 1338 (see also 1992, BAAS, 24, 690)

“A Search for Dead QSOs Among Nearby Luminous Galaxies”

*Bower, G. A.*, Wilson, A. S., Mulchaey, J. S., Miley, G. K., Heckman, T. M., & Krolik, J. H. 1993, BAAS, 25, 790 (see also 1994, IAU Symp. 159. Multi-Wavelength Continuum Emission of AGN, ed. T.J.-L. Courvoisier & A. Blecha (Dordrecht: Kluwer), p. 440)

“*HST* Images of the Seyfert Galaxy NGC 5929 and Its Companion NGC 5930”

Mulchaey, J. S., Wilson, A. S., *Bower, G. A.*, Heckman, T. M., Krolik, J. H., & Miley, G. K. 1993, BAAS, 25, 826

“*HST* Imaging of the Seyfert 2 Galaxy NGC 2110”

*Bower, G. A.*, Wilson, A. S., Richstone, D. O., & Heckman, T. M. 1993, BAAS, 25, 1392  
“The Stellar Distribution in the Nuclear Region of the Low-Luminosity Seyfert Galaxy M81”

Wilson, A. S., *Bower, G. A.*, Heckman, T. M., Mulchaey, J. S., Braatz, J. A., Krolik, J. H., & Miley, G. K. 1994, in *The Physics of Active Galaxies*, ed. G. V. Bicknell, M. A. Dopita, & P. J. Quinn (San Francisco: Astronomical Society of the Pacific)

“*HST* Observations of the Seyfert 2 Galaxy NGC 5728”

*Bower, G.*, Wilson, A., Morse, J., Mulchaey, J., Gelderman, R., & Whittle, M. 1994, BAAS, 26, 1505

“Aligned Radio and Emission-Line Jets in the Type 2 Seyfert Galaxy Mkn 1066”

*Bower, G. A.*, Wilson, A. S., Heckman, T. M., & Richstone, D. O. 1996, in *The Physics of LINERs in View of Recent Observations*, ed. M. Eracleous, et al., ASP Conference

- Series v. 103, p. 163 (see also 1995, BAAS, 27, 1360)  
“Stellar Kinematics and Double-Peaked Broad Emission Lines in the Nearby LINER M81”
- Bower, G. A., Heckman, T. M., Wilson, A. S., & Richstone, D. O.* 1996, BAAS, 28, 1430  
“The Nuclear Ionized Gas in the Nearby Radio Galaxy NGC 4374”
- Green, R., Bower, G., et al.* 1997, BAAS, 29, 1112  
“STIS Observations of the Nucleus of M84”
- Bower, G. A., Green, R. F., Lindler, D., the STIS IDT.* 1997, “1997 HST Calibration Workshop”, ed. S. Casertano et al. (Baltimore: Space Telescope Science Institute), p. 70  
“STIS Observations of the Nuclear Ionized Gas in the Elliptical Galaxy M84”
- Bower, G. A., et al.* 1997, BAAS, 29, 1293  
“The Stellar Dynamics in the Center of the Galaxy NGC 1023”
- Bower, G. A.* 1998, in “Galaxy Dynamics”, ed. D. Merritt, J. A. Sellwood, & M. Valluri (San Francisco: Astronomical Society of the Pacific), p. 59  
“Long-Slit Spectroscopy of the Nuclear Point Source in M84: Further Evidence of a Supermassive Black Hole”
- Bower, G. A., Green, R. F., Gebhardt, K., Bender, R., & STIS team* 1999, BAAS, 31, 1548 (see also 2000, BAAS, 32, 701)  
“The STIS GTO Galaxy Nuclear Dynamics Project: The Stellar Dynamics in the Center of the Galaxy NGC 1023”
- Kaiser, M. E., Bower, G. A., Green, R. F., & STIS team* 1999, BAAS, 31, 1548 (see also 2000, BAAS, 32, 701)  
“The STIS GTO Galaxy Nuclear Dynamics Project: Preliminary Results for Galaxy NGC 4742”
- Green, R. F., Bower, G. A., & STIS team* 1999, BAAS, 31, 1548 (see also 2000, BAAS, 32, 703)  
“STIS Observations of the Nucleus of NGC 4486B”
- Nelson, C. H., Weistrop, D., Bower, G. A., Green, R. F., & STIS team* 1999, BAAS, 31, 1549 (see also 2000, BAAS, 32, 701)  
“The Nuclear Stellar Dynamics of the S0 Galaxy NGC 7332”
- Bower, G. A., Wilson, A. S., Heckman, T. M., Magorrian, J., Gebhardt, K., Richstone, D. O., Peterson, B. M., & Green, R. F.* 2000, BAAS, 32, 1566  
“The Stellar Dynamics in the Centers of the LINER Galaxies M81 and NGC 3998”