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EMPLOYMENT

Astrophysicist, Smithsonian Astrophysical Observatory (2006 - present)
Clay Fellow, Harvard-Smithsonian Center for Astrophysics (2005 - 2006)
CfA Fellow, Harvard-Smithsonian Center for Astrophysics (2002 - 2005)

EDUCATION

Harvard University, Ph.D. Astronomy (2002)
Harvard University, A.M. Astronomy (1998)
University of Arizona, B.S. Astronomy summa cum laude (1995)

CURRENT RESEARCH ACTIVITIES

Hypervelocity Stars

In 2005 I discovered the first hypervelocity star (HVS): a $3 M_{\odot}$ main sequence star whose extreme +853 km/s velocity can be explained only by dynamical ejection from a supermassive black hole (Brown et al 2005). We designed a follow-up survey that has resulted in 17 further HVS discoveries and evidence for a class of HVSs on bound orbits (Brown et al 2006a,b, 2007a,b, 2008c,d), allowing us to measure the history of stellar interactions with the central black hole.

Low Mass White Dwarfs

We discovered the lowest mass white dwarf known, with mass $0.17 M_{\odot}$ (Kilic et al 2007a). Such an object cannot evolve through single star evolution; follow-up observations revealed the presence of a close binary companion (Kilic et al 2007b). We are now measuring the binary fraction of low mass white dwarfs to test theories of binary evolution and mass-loss on the red giant branch.

Extremely Metal Poor Galaxies

We also discovered an unusual metal poor galaxy, with metallicity 0.5 dex lower for its luminosity than comparable samples of metal-poor galaxies, but with properties very similar to the host galaxies of nearby gamma ray bursts (Kewley et al 2007). We have designed a highly efficient strategy to find more such extremely metal poor galaxies (Brown et al 2008a).

Star Streams in the Halo

I am using our samples of halo stars to directly test the hierarchical picture for galaxy formation by mapping star streams in the Galactic halo (Brown et al. 2003). We have used 2MASS near-IR photometry as the basis for an all-sky survey of the inner halo (Brown et al. 2004a, 2005b, 2008b).

INSTRUMENTAL ACTIVITIES

Co-PI, MMT Magellan Infrared Spectrograph

I am assisting with the assembly, testing, and commissioning of the MMT Magellan Infrared Spectrograph.

PI, SAO Wide Field Infrared Camera (SWIRC)

Funded in May 2003 and commissioned in June 2004, I put SAO's first HAWAII-2 infrared array on the MMT in 13 months. SWIRC is a *YJH*-band imager with a $5.12' \times 5.12'$ field and 0.15 arcsec/pix plate scale. I worked on every aspect of SWIRC, in particular the optical and mechanical design and integration, motor control, and thermal modeling.

Integral Field Unit for the GMT

I am leading the integral field unit design study for SAO's near-IR spectrograph for the Giant Magellan Telescope.

Cryogenic Properties of Near-IR Glass

The Ohara glass S-FTM16 is the only intermediate dispersion material available in the near-IR and critical to SAO's MMT-Magellan Infrared Spectrograph optical design. I obtained the first refractive index measurements of S-FTM16 at cryogenic temperatures (Brown et al. 2004b).

FAST Spectrograph Refurbishment

I refurbished the workhorse FAST spectrograph and improved its total throughput by a factor of 3. This improvement has enabled my large halo star survey, and has enabled the 1.5m to observe 19 mag supernova for the first time.

HONORS

- 2008 Secretary's Research Prize, Smithsonian Institution.
- 2007 Bok Prize, Harvard University.
- 2002 Class Marshal, Harvard Graduate School of Arts & Sciences.
- 2000 Certificate of Distinction in Teaching, Harvard University.
- 1998 NASA Graduate Fellowship, Massachusetts Space Grant Consortium.
- 1998 Hanson Prize for Distinguished Contribution to Dudley House.
- 1995 University of Arizona, Honors College Academic Award of Excellence
- 1995 Douglass scholarship, Steward Observatory.
- 1994 Vesto Melvin Slipher scholarship, Steward Observatory.
- 1993 Planetary Society Fellowship.
- 1993 Barry M. Goldwater Scholar.

MEMBERSHIPS

- American Astronomical Society
- American Institute of Aeronautics and Astronautics
- International Astronomical Union
- Planetary Society
- Phi Beta Kappa
- Phi Kappa Phi

BIBLIOGRAPHY*Refereed Scientific Publications*

Bromley, B., Kenyon, S., **Brown, W.**, & Geller, M. 2009. “Hypervelocity Stars: From the Galactic Center to the Halo.” *ApJ*, submitted.

Brown, W., Geller, M., Kenyon, S. & Bromley, B. 2009b. “The Anisotropic Distribution of Hypervelocity Stars.” *ApJ*, 690, L69.

Brown, W., Geller, M. & Kenyon, S. 2009a. “MMT Hypervelocity Star Survey.” *ApJ*, 690, 1639.

Kilic, M., **Brown, W.**, Allende Prieto, C., Swift, B. Kenyon, S., Liebert, J. & Agueros M. 2009. “The Runaway White Dwarf LP400-22 Has a Companion” *ApJ*, 695, L92.

Kinman, T., Morrison, H. & **Brown, W.** 2009. “Do the nearby BHB stars belong to the Thick Disk or the Halo?” *AJ*, 137, 3198.

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Przybilla, N., Nieva, M. F., Tillich, A., Heber, U., Butler, K., & **Brown, W.** 2008, “HVS 7 – A Chemically Peculiar Hypervelocity Star.” *A&A Letters*, 488, L51.

Modjaz, M., ... **Brown, W.** and 32 co-authors, 2008. “From Shock Breakout to Peak and Beyond: Extensive Panchromatic Observations of the Aspherical Type Ib Supernova 2008D associated with Swift X-ray Transient 080109.” *ApJ*, accepted.

Utdike, A., ... **Brown, W.** and 53 co-authors, 2008. “The Rapidly Flaring Afterglow of the Very Bright and Energetic GRB 070125” *ApJ*, 685, 361.

Brown, W., McLeod, B., Geary, J., & Bowsher, E. 2008. “Smithsonian Widefield Infrared Camera.” in *Proc. SPIE Vol. 7014, Ground-based and Airborne Instrumentation for Astronomy II*, ed. M. Iye & A. Moorwood.

Heber, U., Hirsch, H., Edelmann, H., Napiwotzki, R., O’Toole, S., **Brown, W.**, & Altmann, M. 2008. “Hypervelocity Stars: Young and Heavy or Old and Light?” in *ASP Conf. Ser. 392 on Hot Subdwarf Stars*, eds. U. Heber, S. Jeffery, & R. Napiwotzki (San Francisco: ASP), 167.

Kenyon, S., Bromley, B., Geller, M. & **Brown, W.** 2008. “Hypervelocity Stars: From the Galactic Center to the Halo.” *ApJ*, 680, 312.

Brown, W., Beers, T., Wilhelm, R., Allende Prieto, C., Geller, M., Kenyon, S., & Kurtz 2008b. “The Century Survey Galactic Halo Project III: A Complete 4300 deg² Survey of Blue Horizontal Branch Stars in the Metal Weak Thick Disk and Inner Halo.” *AJ*, 135, 564.

Brown, W., Kewley, L., & Geller, M. 2008a. “MMT Extremely Metal Poor Galaxy Survey I. An Efficient Technique to Identify Metal Poor Galaxies.” *AJ*, 135, 92.

Brown, W., Geller, M., Kenyon, S., Kurtz, M., & Bromley, B., 2007c. “Hypervelocity Stars III. The Space Density and Ejection History of Main Sequence Stars from the Galactic Center.” *ApJ*, 671, 1708.

Kilic, M., **Brown, W.**, Allende Prieto, C., Pinsonneault, M., & Kenyon, S., 2007b. “The Discovery of a Companion to the Lowest Mass White Dwarf.” *ApJ*, 664, 1088.

Kilic, M., Allende Prieto, C., **Brown, W.**, & Koester D., 2007a. “The Lowest Mass White Dwarf.” *ApJ*, 660, 1451.

Brown, W., Geller, M., Kenyon, S., & Kurtz, M., 2007b. “Stellar Velocity Dispersion of the Leo A Dwarf Galaxy.” *ApJ*, 666, 231.

Brown, W., Geller, M., Kenyon, S., Kurtz, M., & Bromley, B., 2007a. “Hypervelocity Stars II: The Bound Population.” *ApJ*, 660, 311.

Kewley, L., **Brown, W.**, Geller, M., Kenyon, S., & Kurtz, M., 2007. “SDSS 0809+1729: Connections Between Extremely Metal Poor Galaxies and Gamma Ray Burst Hosts.” *AJ*, 133, 882.

Bromley, B., Kenyon, S., Geller, M., Barcikowski, E., **Brown, W.** & Kurtz, M., 2006. “Hypervelocity Stars: Predicting the Spectrum of Ejection Velocities.” *ApJ*, 653, 1194.

Brown, W., Geller, M., Kenyon, S., & Kurtz, M., 2006b. “Hypervelocity Stars I: The Spectroscopic Sample.” *ApJ*, 647, 303.

Modjaz, M. ... **Brown, W.** and 11 co-authors, 2006. “Early-time Photometry and Spectroscopy of the Fast Evolving SN 2006AJ Associated with GRB 060218.” *ApJ*, 645, L21.

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Brown, W., Geller, M., Kenyon, S., Beers, T., Kurtz, M., & Roll, J., 2004a. “Mapping the Inner Halo of the Galaxy with 2MASS-Selected Horizontal-Branch Candidates.” *AJ*, 127, 1555-1566.

Green, P., Aldcroft, T., **Brown, W.**, Kuhn, O., & Saha, A., 2004. “HS1216+5032; A Physical Quasar Pair with one Radio-Loud Broad Absorption line Quasar,” *MNRAS*, 349, 1261.

Matheson, T., ... **Brown, W.** and 46 co-authors, 2003. “Photometry and Spectroscopy of GRB030329 and Its Associated Supernova 2003dh: The First Two Months,” *AJ*, 599, 394.

Brown, W., Allende Prieto, C., Beers, T., Wilhelm, R., Geller, M., Kenyon, S., & Kurtz 2003. “The Century Survey Galactic Halo Project I: Stellar Spectral Analysis.” *AJ*, 126, 1362-1380.

Mink, D., **Brown, W.**, and Kurtz, M. 2003, “A Comparison of Large All-Sky Catalogs to the Sky.” in *ASP Conf. Ser. 314, Astronomical Data Analysis Software and Systems XIII*, ed. F. Ochsenbein, M. Allen, & D. Egret (San Francisco: ASP), 141.

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Fabricant, D., Epps, H., **Brown, W.**, Fata, R., and Mueller, M. 2002. "Development of Binospec and its optics." in *Proc. SPIE Vol. 4841, Instrument Design and Performance of Optical/Infrared Ground-based Telescopes*, ed. M. Iye & A. Moorwood, 1134-1144.

Szentgyorgyi, A., Fabricant, D., **Brown, W.**, and Epps, H. 2002, "Cross dispersion and an integral field unit for Hectochelle." in *Proc. SPIE Vol. 4841, Instrument Design and Performance of Optical/Infrared Ground-based Telescopes*, ed. M. Iye & A. Moorwood, 1026-1035.

Brown, W., Fabricant, D., and Boyd, D. 2002. "Thermal Considerations in Modern Spectrograph Design: the Binospec Spectrograph." in *Proc. SPIE Vol. 4841, Instrument Design and Performance of Optical/Infrared Ground-based Telescopes*, ed. M. Iye & A. Moorwood, 1265-1272.

Brown, W. "Studying Wolf-Rayet Galaxies with Integral Field Units." in *ASP Conf. Ser. 280, Next Generation Wide Field MultiObject Spectroscopy*, ed. M. J. I. Brown & A. Dey (San Francisco: ASP), 59.

Torres, M., ... **Brown, W.**, and 8 co-authors, 2002. "Optical Spectral Monitoring of XTE J1118+480 in Outburst: Evidence for a Precessing Accretion Disk." *ApJ*, 569, 423-431.

Brown, W., Geller, M., Fabricant, D., and Kurtz, M., 2001. "V- and R-band Galaxy Luminosity Functions and Low Surface Brightness Galaxies in the Century Survey." *AJ* 122, 714-728.

Wegner, G., Thorstensen, J., Kurtz, M., **Brown, W.**, Fabricant, D., Geller, M., Huchra, J., Marzke, R., and Sakai, S., 2001. "Redshifts for 2410 Galaxies in the Century Survey Region." *AJ* 122, 2893-2900.

Brown, W., Kenyon, S., Geller, M., and Fabricant, D., 2000. "UV Excess Galaxies: Wolf-Rayet Galaxies." *ApJL*, 540, L83-L86.

Jha, S., ... **Brown, W.** and 40 co-authors, 1999. "The Type IA Supernova 1998BU in M96 and the Hubble Constant." *ApJS*, 125, 73-97.

Riess, A., ... **Brown, W.** and 30 co-authors, 1999. "BVRI Light Curves for 22 Type IA Supernovae." *AJ*, 117, 707-724.

Groot, P., ... **Brown, W.** and 39 co-authors, 1998. "The Rapid Decay of the Optical Emission from GRB 980326 and Its Possible Implications." *ApJL*, 502, L123.

Brown, W., and Luu, J., 1998. "Properties of Model Comae around Kuiper Belt and Centaur Objects." *Icarus*, 135, 415-430.

Brown, W., and Luu, J., 1997. "CCD Photometry of the Centaur 1995 GO." *Icarus* 126, 218-224.

Bernstein, G., Tyson, J., **Brown, W.**, and Jarvis, J., 1994. "Correlation of Galaxies at $z=0.3$."

ApJ, 426, 516-523.

Circulars: My observations of Supernovae, Gamma Ray Bursts, and Kuiper Belt Objects have led to over a dozen IAU Circulars and 9 Minor Planetary Circulars.

Technical Reports: I have also published over two dozen technical reports on the Smithsonian Astrophysical Observatory Instrument Document Database.

RECENT INVITED TALKS

- 2009 Wesleyan University, astronomy colloquium.
- 2009 Dartmouth University, physics and astronomy colloquium.
- 2009 Boston University, astrophysics colloquium.
- 2009 Ohio State University, astronomy colloquium.
- 2008 Back to the Galaxy II conference, UCSB.
- 2008 Arizona State University, astrophysics seminar.
- 2008 Brown University, astrophysics seminar.
- 2008 MIT, astrophysics colloquium.
- 2008 Galactic Nuclei conference, Blue Mountains, Australia.
- 2008 Congressional Open House at the Smithsonian.
- 2008 Institute for Advanced Study, Princeton, colloquium.
- 2008 Institute for Theory and Computation, forum.
- 2008 Michigan State University, astrophysics seminar.
- 2007 CalTech, astronomy colloquium.
- 2007 Carnegie DTM, seminar.
- 2007 Space Telescope Science Institute, colloquium.
- 2007 Galactic Center workshop, Ringberg, Germany.
- 2007 The Milky Way Halo conference, Bonn, Germany.
- 2007 CfA, Bok Prize lecture.
- 2007 UCLA, astrophysics colloquium.
- 2007 Plenary speaker, 203rd AAS January Meeting.