

## Benjamin C. Bromley

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### Overview

- Professor of Physics and Astronomy, specializing in theoretical and computational astrophysics (planet formation, galactic dynamics, and relativistic astrophysics).
- 88 refereed publications; 3600+ citations, h-index=38 (normalized: 22); PI/CoI on 7 grants, ~\$1M total; Supercomputing allocations of ~6M processor-hours per year.
- Taught over 2000 students; Courses include Intro Physics, Astronomy and grad-level Computational Physics; Advisees: 10 B.S., 6 M.S. and 4 PhD.
- Administrative positions include Department Chair, Associate Chair, Director of Graduate Studies, University Graduate Council.

### Education

Ph.D. Physics, *Dartmouth College*, Hanover, NH, 1994.

*Thesis:* Wavelet analysis of the large-scale structure of the universe.

M.S. Physics, *University of Vermont*, Burlington, VT, 1987.

*Thesis:* Information theoretical study of quasi-elastic photon scattering.

B.A. Physics/Chemistry (Honors), *Middlebury College*, Middlebury, VT, 1982.

*Thesis:* X-ray spectroscopy of supernova remnant Puppis A.

### Experience

Professor, Department of Physics and Astronomy, *University of Utah*, Salt Lake City, UT (July, 2006–present).

Associate Professor, Department of Physics, *University of Utah*, Salt Lake City, UT (July, 2003–June, 2006).

Assistant Professor, Department of Physics, *University of Utah*, Salt Lake City, UT (August, 1998–June, 2003).

Postdoctoral Fellow, Department of Physics, *Harvard University*, Cambridge MA (September, 1996–July, 1998).

Postdoctoral Research Fellow, Theoretical Astrophysics, *Los Alamos National Laboratory*, Los Alamos, NM (June, 1994–September, 1996).

### Research Interests

*Planet formation:* beginning-to-end simulation of planetary systems, including observable planetary debris disks, formation of terrestrial planets, and the origin of the Solar System.

*Astrophysical black holes:* relativistic accretion flows and binary black hole mergers.

*Galactic dynamics:* hypervelocity stars and the mass distribution of the Galaxy; galaxy pairs.

*Astrophysical cosmology:* large-scale structure and galaxy clustering.

*Parallel computation:* parallel algorithm design with message passing models (C++ with MPI).

### **Honors and Fellowships**

University Professor, *University of Utah*, 2005–2006.

NASA GSRP Fellowship, *NASA Headquarters*, 1991–1993.

### **Funding Awards**

NASA Emerging Worlds grant (S. Kenyon & B. Bromley), 2017–2021.

NASA Outer Planets grant (S. Kenyon & B. Bromley), 2011–2016.

NASA Origins of Solar Systems grant (S. Kenyon & B. Bromley), 2010–2013.

NASA Terrestrial Planet Finder grant (S. Kenyon & B. Bromley), 2006–2009.

NASA Astrophysical Theory Program grant (R. Price et al.), 2005–2008.

NASA Astrophysical Theory Program grant (S. Kenyon & B. Bromley), 2002–2005.

NASA Astrophysical Theory Program grant (B. Bromley), 1999–2002.

### **Teaching and Mentoring**

#### *Courses at University of Utah*

Computational and Statistical Methods in Physics and Astronomy (ASTR/PHYS 7730; Spring 2019)

Foundations of Astronomy (ASTR/PHYS 2500; Fall 2013–2015)

Introduction to Computers in Physics (PHYS 3730/6720; seven terms, Fall 1998–2014, 2020).

Physics for Scientists & Engineers II (PHYS 2220, E&M; 2001–2004, 2010–2013).

Einstein in the 20<sup>th</sup> Century & Beyond (PHYS 1905; Fall 2005, 2006)

Case Studies in Computational Engineering and Science (MATH 6790; Spring 2001).

Computational Physics I (PHYS 6730; Spring 1999–2001).

#### *Students/postdocs supervised*

Served as research mentor to 10 undergraduates (one honors thesis), 6 Master's students, and 4 doctoral students; Supervised 1 post-doc (with R. Price).

### **Selected Academic Service**

#### *Department of Physics and Astronomy*

Chair (2016–2018); Associate Chair (2015–2016, 2019–present); Astronomy Program Task Force (2010–2016, 2018–present); Director of Graduate Studies (2010–2012);

#### *University*

Graduate Council, Graduate Admissions Committee (2011–2014).

M.S. Computational Engineering & Sciences Executive Committee (2001–2014).

#### *Research community*

Reviewer/panelist: NASA (2007–2015); DFG (2011–2017, 2019); FGF (2015); NSF Astronomy Division (2010, 2014); CSCS (supercomputing, 2014); DOE (supercomputing, 2011); Canadian Space Agency Mission Concepts (2007).

Ad hoc reviewer: *Astron. J.*, *Astrophys. J.*, *Icarus*, *Parallel & Distributed Computing*, *Mon. Not. Royal Astron. Soc.*, *Nature*, *New Astron.*, *Phys. Rev. Letters*, *Science*, *Space Sciences Review*.

#### *Outreach*

Presentations to grade schools in Granite School District, UT (misc. dates since 1998).

In the Media. *Astronomy magazine*, *BBC*, *CNN*, *Christian Science Monitor*, *FoxNews*, *MSNBC*, *New York Times*, *Science News*, *Scientific American*; *Public Radio* (Australia, Germany, U.S.).

## Publications

## Refereed articles

- Bromley, B. C., & Kenyon, S. J. 2021, "On the Estimation of Circumbinary Orbital Properties," *Astronomical Journal*, 161, 25.
- Kenyon, S. J., & Bromley, B. C. 2020, "Craters on Charon: Impactors From a Collisional Cascade Among Trans-Neptunian Objects," *Planetary Science*, 1, 40.
- Bromley, B. C., & Kenyon, S. J. 2020, "A Pluto-Charon Concerto: An Impact on Charon as the Origin of the Small Satellites," *Astronomical Journal*, 160, 85.
- Kenyon, S. J., & Bromley, B. C. 2019, "A Pluto-Charon Sonata III: Growth of Charon from a Circum-Pluto Ring of Debris," *Astronomical Journal*, 158, 142.
- Kenyon, S. J., & Bromley, B. C. 2019, "A Pluto-Charon Sonata: Dynamical Limits on the Masses of the Small Satellites," *Astronomical Journal*, 158, 69.
- Bromley, B. C., & Kenyon, S. J. 2019, "Ohmic heating of asteroids around magnetic stars," *Astrophysical Journal*, 876, 17.
- Kenyon, S. J., & Bromley, B. C. 2019, "A Pluto-Charon Sonata: The Dynamical Architecture of the Circumbinary Satellite System," *Astronomical Journal*, 157, 79.
- Bromley, B. C., Kenyon, S. J., Brown, W. R., & Geller, M. J. 2018, "Nearby high-speed stars in Gaia DR2," *Astrophysical Journal*, 868, 25.
- Mann, C., Tellesbo, C. A., Bromley, B. C., & Kenyon, S. J. 2018, "A framework for planet detection with faint lightcurve echoes," *Astronomical Journal*, 156, 200.
- Kenyon, S. J., Bromley, B. C., Brown, W. R., & Geller, M. J. 2018, "Impact of the Galactic Disk and Large Magellanic Cloud on the Trajectories of Hypervelocity Stars Ejected from the Galactic Center," *Astrophysical Journal*, 864, 130.
- Meisner, A. M., Bromley, B. C., Kenyon, S. J., Anderson, T. E. 2018, "A  $3\pi$  search for Planet Nine at  $3.4 \mu\text{m}$  with WISE and NEOWISE," *Astronomical Journal*, 155, 166.
- Kenyon, S. J., & Bromley, B. C. 2017, "Numerical Simulations of Gaseous Disks Generated from Collisional Cascades at the Roche Limits of White Dwarf Stars," *Astrophysical Journal*, 850, 50.
- Dall'Asen, Y. G., Dimas, S. I., Tyler, S. J., Johnston, J. F., Anderton, T. R., Ivans, I. I., Gerton, J. M., Bromley, B. C., Kenyon, S. J. 2017, "Mapping the composition of chondritic meteorite Northwest Africa 3118 with micro-Raman spectroscopy," *Spectroscopy Letters*, 50, 417.
- Kenyon, S. J., & Bromley, B. C. 2017, "Numerical Simulations of Collisional Cascades at the Roche Limits of White Dwarf Stars," *Astrophysical Journal*, 844, 116.
- Bromley, B. C., & Kenyon, S. J. 2017, "Terrestrial Planet Formation: Dynamical Shake-up and the Low Mass of Mars," *Astronomical Journal*, 153, 216.
- Kenyon, S. J., & Bromley, B. C. 2017, "Variations on Debris Disks. IV. An Improved Analytical Model for Collisional Cascades," *Astrophysical Journal*, 839, 38.
- Meisner, A. M., Bromley, B. C., Nugent, P. E., Schegel, D. J., Kenyon, S. J., Schlafly, E. F., Dawson, K. S. 2017, "Searching for Planet Nine with Coadded WISE and NEOWISE-Reactivation Images," *Astronomical Journal*, 153, 65.
- Kenyon, S. J., Najita, J. R., & Bromley, B. C. 2016, "Rocky Planet Formation: Quick and Neat," *Astrophysical Journal*, 831, 8.
- Bromley, B. C., & Kenyon, S. J. 2016, "Making Planet Nine: A Scattered Giant in the Outer Solar System," *Astrophysical Journal*, 826, 46.
- Kenyon, S. J., & Bromley, B. C. 2016, "Making Planet Nine: Pebble Accretion at 250–750 AU in a Gravitationally Unstable Ring," *Astrophysical Journal*, 825, 33.
- Kenyon, S. J., & Bromley, B. C. 2016, "Variations on Debris Disks III. Collisional Cascades and Giant Impacts in the Terrestrial Zones of Solar-type Stars," *Astrophysical Journal*, 817, 51.
- Kenyon, S. J., & Bromley, B. C. 2015, "Collisional Cascade Calculations for Irregular Satellite Swarms in Fomalhaut b," *Astrophysical Journal*, 811, 60.

## Publications

*Refereed articles (cont.)*

- Bromley, B. C., & Kenyon, S. J. 2015, "Evolution of a Ring Around the Pluto-Charon Binary," *Astrophysical Journal*, 809, 88.
- Bromley, B. C., & Kenyon, S. J. 2015, "Planet Formation Around Binary Stars: Tatooine made easy," *Astrophysical Journal*, 806, 98.
- Kenyon, S. J., & Bromley, B. C. 2015, "Formation of Super-Earth Mass Planets at 125-250 AU from a Solar-type Star," *Astrophysical Journal*, 806, 42.
- Bromley, B. C., & Kenyon, S. J. 2014, "The Fate of Scattered Planets," *Astrophysical Journal*, 796, 141.
- Czaja, B., & Bromley, B. C. 2014, "Distortion of the cosmic microwave background by the Milky Way," *Physical Review D*, 90, 047302.
- Kenyon, S. J., Bromley, B. C., Geller, M. J., & Brown, W. R. 2014, "Predicted space motions for hypervelocity and runaway stars: proper motions and radial velocities for the GAIA era," *Astrophysical Journal*, 793, 122.
- Kenyon, S. J., Currie, T., & Bromley, B. C. 2014, "Fomalhaut b as a cloud of dust: Testing aspects of planet formation theory," *Astrophysical Journal*, 786, 70.
- Kenyon, S. J., & Bromley, B. C. 2014, "Coagulation Calculations of Icy Planet Formation Around 0.1–0.5  $M_{\odot}$  Stars: Super-Earths From Large Planetesimals," *Astrophysical Journal*, 780, 4.
- Kenyon, S. J., & Bromley, B. C. 2014, "The formation of Pluto's low mass satellites," *Astronomical Journal*, 147, 8.
- Bromley, B. C., & Kenyon, S. J. 2013, "Migration of small moons in Saturn's rings," *Astrophysical Journal*, 764, 192.
- Currie, T., Burrows, A., Madhusudhan, N., et al. 2013, "A Combined Very Large Telescope and Gemini Study of the Atmosphere of the Directly Imaged Planet,  $\beta$  Pictoris b," *Astrophys. Journal*, 776, 15
- Bromley, B. C., Kenyon, S. J., Geller, M. J., & Brown, W. R. 2012, "Binary Disruption by Massive Black Holes: Hypervelocity Stars, S Stars, and Tidal Disruption Events," *Astrophys. J. Letters*, 749, L42.
- Kenyon, S. J., & Bromley, B. C. 2012, "Coagulation Calculations of Icy Planet Formation at 15–150 AU: A Correlation between the Maximum Radius and the Slope of the Size Distribution for Transneptunian Objects," *Astronomical Journal*, 143, 63.
- Bromley, B. C. 2011, "Gravitationally focused dark matter around compact stars," *Astrophysical Journal Suppl.*, 197, 37.
- Bromley, B. C., & Kenyon, S. J. 2011, "Migration of planets embedded in a circumstellar disk," *Astrophysical Journal*, 735, 29.
- Bromley, B. C., & Kenyon, S. J. 2011, "A New Hybrid N-Body-Coagulation Code for the Formation of Gas Giant Planets," *Astrophysical Journal*, 731, 101.
- Kenyon, S. J., & Bromley, B. C. 2010, "Variations on Debris Disks II. Icy Planet Formation as a Function of the Bulk Properties and Initial Sizes of Planetesimals," *Astrophysical Journal Suppl.*, 188, 242.
- Bromley, B. C., Kenyon, S. J., Brown, W. R., & Geller, M. J. 2009, "Runaway Stars, Hypervelocity Stars, and Radial Velocity Surveys," *Astrophysical Journal*, 706, 925.
- Kenyon, S. J., & Bromley, B. C. 2009, "Rapid Formation of Icy Super-Earths and the Cores of Gas Giant Planets," *Astrophysical Journal Letters*, 690, 140.
- Brown, W. R., Geller, M. J., Kenyon, S. J., & Bromley, B. C., 2009, "The Anisotropic Spatial Distribution of Hypervelocity Stars," *Astrophysical Journal Letters*, 690, 69.
- Kenyon, S. J., & Bromley, B. C. 2008, "Variations on Debris Disks: Icy Planet Formation at 30–150 AU around 1–3 Solar Mass Main Sequence Stars," *Astrophysical Journal Supplement Series*, 179, 451.
- Kenyon, S. J., Bromley, B. C., Geller, M. J., & Brown, W. R. 2008, "Hypervelocity Stars: From the Galactic Center to the Halo," *Astrophysical Journal*, 680, 312.
- Kenyon, S. J., Bromley, B. C., O'Brien, D. P., & Davis, D. R. 2008, "Formation and Collisional Evolution of Kuiper Belt Objects," in *The Solar System Beyond Neptune*, Barucci et al. eds. (Tucson: University of Arizona Press), 293.

## Publications

*Refereed articles (cont.)*

- Currie, T., Kenyon, S. J., Rieke, G., Balog, Z., Bragg, A., & Bromley, B. C., 2008, "The Rise and Fall of Debris Disks: MIPS Observations of  $\eta$  and  $\chi$  Persei and the Evolution of Mid-IR Emission from Planet Formation," *Astrophysical Journal*, 672, 558.
- Brown, W. R., Geller, M. J., Kenyon, S. J., Kurtz, M. J., & Bromley, B. C. 2007, "Hypervelocity Stars III: The Space Density and Ejection History of Main Sequence Stars from the Galactic Center," *Astrophysical Journal*, 671, 1708.
- Beetle, C., Bromley, B., Hernández, N., & Price, R. H. 2007, "Periodic standing-wave approximation: Post-Minkowski computations" *Physical Review D*, 76, 084016.
- Currie, T., Kenyon, S. J., Rieke, G., Balog, Z., & Bromley, B. C., 2007, "Terrestrial Zone Debris Disk Candidates in  $\eta$  &  $\chi$  Persei," *Astrophysical Journal Letters*, 663, 105.
- Kennedy, G. M., Kenyon, S. J., & Bromley, B. C. 2007, "Planet formation around M-dwarfs: the moving snow line and super-Earths," *Astrophysics and Space Science*, 311, 9.
- Brown, W. R., Geller, M. J., Kenyon, S. J., Kurtz, M. J., & Bromley, B. C. 2007, "Hypervelocity Stars II: The Bound Population," *Astrophysical Journal*, 660, 331.
- Nagasawa, M., Thommes, E. W., Kenyon, S. J., Bromley, B. C., & Lin, D. N. C. 2007, "The Diverse Origins of Terrestrial Planet Systems," in *Protostars and Planets V*, V. B. Reipurth, D. Jewitt, and K. Keil, eds. (Tucson: University of Arizona), 639.
- Bromley, B. C., Kenyon, S. J., Geller, M. J., Barcikowski, E., Brown, W. R., & Kurtz, M. J. 2006, "Hypervelocity Stars: Predicting the Spectrum of Ejection Velocities," *Astrophysical Journal*, 653, 1194.
- Kennedy, G. M., Kenyon, S. J., & Bromley, B. C. 2006, "Planet formation around low mass stars: the moving snow line and super-Earths," *Astrophysical Journal Letters*, 650, 139.
- Yoshida, S., Bromley, B. C., Read, J. S., Uryu, K., Friedman, J. L. 2006, "Models of Helically Symmetric Binary Systems," in *Classical and Quantum Gravity*, 23, 599.
- Beetle, C., Bromley, B. C., Price, R. H. 2006, "Eigenspectral computations for linear gravity and nonlinear toy models," *Physical Review D*, 74, 024013.
- Bromley, B. C. & Kenyon, S. J., 2006, "A Hybrid  $N$ -body–Coagulation Code for Planet Formation" *Astronomical Journal*, 131, 2737.
- Kenyon, S. J., & Bromley, B. C. 2006, "Terrestrial Planet Formation I. The Transition from Oligarchic to Chaotic Growth," *Astronomical Journal*, 131, 1837.
- Bromley, B. C., Owen, R., & Price, R. H. 2005, "Periodic standing-wave approximation: Nonlinear scalar fields, adapted coordinates, and the eigenspectral method," *Physical Review D* 71, 105017.
- Kenyon, S. J., & Bromley, B. C. 2005, "Prospects for Detection of Catastrophic Collisions in Debris Disks," *Astronomical Journal* 130, 269.
- Kenyon, S. J., & Bromley, B. C. 2004, "Stellar encounters as the origin of distant Solar System objects in highly eccentric orbits," *Nature*, 432, 598.
- Kenyon, S. J., & Bromley, B. C. 2004, "The Size Distribution of Kuiper Belt Objects," *Astronomical Journal*, 128, 1916.
- Andrade, Z., Beetle, C., Blinov, A., Bromley, B. C., Burko, L. M., Cranor, M., Owen, R., & Price, R. H. 2004, "The Periodic Standing-Wave Approximation: Overview and Three Dimensional Scalar Models," *Physical Review D*, 70, 064001.
- Kenyon, S. J., & Bromley, B. C. 2004, "Detecting the Dusty Debris of Terrestrial Planet Formation," *Astrophysical Journal Letters*, 602, 133.
- Kenyon, S. J., & Bromley, B. C. 2004, "Collisional Cascades in Planetesimal Disks II. Embedded Planets," *Astronomical Journal*, 127, 513.
- Kenyon, S. J., & Bromley, B. C. 2002, "Dusty Rings: Signposts of Recent Planet Formation," *Astrophysical Journal Letters*, 577, 35.
- Kenyon, S. J., & Bromley, B. C. 2002, "Collisional Cascades in Planetesimal Disks I. Stellar Flybys," *Astronomical Journal*, 123, 1757.

## Publications

### *Refereed articles (cont.)*

- Bromley, B. C., Melia, F., & Liu, S. 2001, "Polarimetric Imaging of the Massive Black Hole in the Galactic Center," *Astrophysical Journal Letters*, 555, 83.
- Melia, F., Bromley, B. C., Liu, S., & Walker, C. K. 2001, "Measuring the Black Hole Spin in Sgr A\*," *Astrophysical Journal Letters*, 554, 37.
- Pariev, V. I., Bromley, B. C., & Miller, W. A. 2001, "On the Estimation of Relativistic Accretion Disk Parameters from Iron Emission Lines," *Astrophysical Journal*, 547, 649.
- Barton, E. J., Geller, M. J., Bromley, B. C., van Zee, L., & Kenyon, S. J. 2001, "The Tully-Fisher Relation as a Measure of Luminosity Evolution: A Low Redshift Baseline for Evolving Galaxies," *Astronomical Journal*, 121, 625.
- Kenyon, S. J., & Bromley, B. C. 2001, "Gravitational Stirring in Planetary Debris Disks," *Astronomical Journal*, 121, 538–551.
- Tegmark, M., & Bromley, B. C. 2000, "Bias is Complicated," *Physica Scripta*, T85, 59.
- Bromley, B. C., & Tegmark, M. 1999, "Is the Cosmic Microwave Background really non-Gaussian?" *Astrophysical Journal Letters*, 542, 79.
- Tegmark, M., & Bromley, B. C. 1999, "Observational Evidence for Stochastic Biasing," *Astrophysical Journal Letters*, 518, 69.
- Barton, E. J., Bromley, B. C., & Geller, M. J. 1999, "Kinematic Effects of Tidal Interaction on Galaxy Rotation Curves," *Astrophysical Journal Letters*, 511, 25.
- Pariev, V. I., & Bromley, B. C. 1998, "Line emission from an Accretion Disk around a Black Hole: Effects of Disk Structure," *Astrophysical Journal*, 508, 590.
- Bromley, B. C., Press, W. H., Lin, H., & Kirshner, R. P. 1998, "Spectral Classification and Luminosity Function of Galaxies in the Las Campanas Redshift Survey," *Astrophysical Journal*, 505, 25.
- Bromley, B. C., Miller, W. A., & Pariev, V. I. 1998, "The inner radius of the accretion disk around a supermassive black hole," *Nature*, 391, 54.
- Bromley, B. C., Warren, M. S., & Zurek, W. H. 1997, "Estimating  $\Omega$  from Galaxy Redshifts: Linear Flow Distortions and Nonlinear Clustering," *Astrophysical Journal*, 475, 414.
- Bromley, B. C., Chen, K., & Miller, W. A. 1997, "Line Emission from an Accretion Disk Around a Rotating Black Hole: Toward a Measurement of Frame Dragging," *Astrophysical Journal* 475, 57.
- Bromley, B. C. 1996, "Quasirandom Number Generators for Parallel Monte Carlo Algorithms," *Journal of Parallel and Distributed Computing*, 38, 101.
- Brainerd, T. G., Bromley, B. C., Warren, M. S., & Zurek, W. H. 1996, "Velocity Dispersion and the Redshift Space Power Spectrum," *Astrophysical Journal Letters*, 464, 103.
- Bromley, B. C. 1996, "Finite-Size Gravitational Microlenses," *Astrophysical Journal*, 476, 537.
- Tegmark, M. & Bromley, B. C. 1995, "Real-Space Cosmic Fields from Redshift-Space Distributions: A Green Function Approach," *Astrophysical Journal*, 453, 533.
- Bromley, B. C. 1994, "Sampling Functions for Measuring the Cosmic Mass Density," *Astrophysical Journal Letters*, 423, 81.
- Bromley, B. C. 1994, "Correlations in Cosmic Density Fields," *Astrophysical Journal*, 437, 541.
- Bromley, B. C. 1992, "Detecting Faint Echoes in Stellar-Flare Light Curves," *Publication of the Astronomical Society of the Pacific*, 104, 1057.

### *Selected Conference Proceedings*

- Kenyon, S. J., & Bromley, B. C. 2005, "Formation of planets and debris disks in the terrestrial zone" in *Star Formation in the Era of Three Great Observatories*, Cambridge, MA [cxc.harvard.edu/stars05/agenda/program.html](http://cxc.harvard.edu/stars05/agenda/program.html), p. 20.
- Vassiliev, V. V. *et al.*, 2003, "Search for TeV Annihilation Radiation from Supersymmetric Dark Matter in nearby Galaxies", in *International Cosmic Ray Conference*, 5, p. 2679.

## Publications

### *Selected Conference Proceedings (cont.)*

- Bromley, B. C., & Kenyon, S. J. 2004, "Numerical calculations of terrestrial planet formation," in *The Second TPF/Darwin International Conference*, San Diego, CA (<http://planetquest1.jpl.nasa.gov/TPFDarwinConf/confProceedings.cfm>).
- Kenyon, S. J., & Bromley, B. C. 2002, "Evolution of planetesimals in planetary debris disks," in *Astrophysical Supercomputing using Particle Simulations: Proceedings of IAU Symposium 208 in Tokyo*, eds. J. Makino & P. Hut (San Francisco: A. S. P.).
- Pariev, V. I., Bromley, B. C., & Miller, W. A., 2001, "Estimation of Relativistic Accretion Disk Parameters from Iron Line Emission," in *20th Texas Symposium on relativistic astrophysics, Austin, Texas, 10-15 December 2000*, eds. J. C. Wheeler & H. Martel (New York: AIP).
- Rybicki, G. B., & Bromley, B. C. 1998, "Spectral signatures of a relativistic accretion disk," in *Accretion Processes in Astrophysical Systems: Proceedings of the 8th Annual Astrophysics Conference in Maryland*, eds. S. Holt & T. Kallman (New York: AIP).
- Bromley, B. C., Miller, W. A., & Pariev, V. I. 1998, "Bounds on the inner radius of emission around supermassive black holes," in *Accretion Processes in Astrophysical Systems: Proceedings of the 8th Annual Astrophysics Conference in Maryland*, eds. S. Holt & T. Kallman (New York: AIP).
- Bromley, B. C., Laflamme, R., Warren, M. S., & Zurek, W. H. 1996, "The Distribution of Matter Around Luminous Galaxies," in *Dark Matter in Cosmology, Quantum Measurements, Experimental Gravitation, 31st Rencontre de Moriond*.
- Bromley, B. C., Brainerd, T. G., Warren, M. S., & Zurek, W. H. 1996, "Cosmic Structure on Small Scales: Results on Cluster Cores and Redshift-Space Power Spectra," in *Mapping, Measuring and Modeling the Universe, Valencia Proceedings*, ed. P. Coles (San Francisco: A. S. P. Conf. Ser.).
- Bromley, B. C., Brainerd, T. G., Warren, M. S., Zurek, W. H., & Quinn, P. J. 1995, "On Cluster Cores and Power Spectra" in *Clustering in the Universe, Proceedings of the XXX<sup>th</sup> Moriond Meeting*.
- Bromley, B. C., Warren, M. S., Zurek, W. H., & Quinn, P. J. 1995, "Rich Cluster Simulation: Dynamics and Mass Estimates" in *Dark Matter, Proceedings of the Fifth Annual Astrophysics Conference in Maryland*, eds. S. Holt & D. Bennett (New York: AIP). pp. 433–436.
- Bromley, B. C. 1993, "Multiresolution Analysis in Two or More Dimensions," in *Astronomical Data Analysis Software and Systems II*, ed. Hanisch, R., Brissenden, R., & Barnes, J. (San Francisco: A. S. P. Conf. Ser.).
- Bromley, B. C. 1992, "The Large-Scale Structure of the Universe: A Multiresolution Analysis," in *IEEE-SP International Symposium on Time-Frequency and Time-Scale Analysis*, ed. Atlas, L. E., & Mallat, S. (Piscataway: IEEE).

### Selected Invited Talks and Presentations

- Bromley, B. C., 2020, "Charon's legacy? On the origin of Pluto's small moons," invited presentation to the New Horizons GGI team.
- Dall'Asén, A. G., *et al.* 2020, "Analyzing the Thermal Metamorphism Process of Carbonaceous Chondrites Using Raman Spectroscopy," *Lunar and Planetary Science Conference*, 51, 2920.
- Dall'Asén, A. G., *et al.* 2019, "Comparing Carbonaceous Chondritic Meteorites Using Micro-Raman Spectroscopy and SEM/EDS," *Lunar and Planetary Science Conference*, 50, 2897.
- Dall'Asén, A. G., *et al.* 2018, "Mineralogical and Elemental Composition of Carbonaceous Chondrites by Micro-Raman Spectroscopy and SEM/EDS," *Lunar and Planetary Science Conference*, 49, 2571.
- Bromley, B. C., & Kenyon, S. J. 2017, "Dynamical shake-up and the low mass of Mars," *AAS/Division for Planetary Sciences Meeting Abstracts*, 49.
- Bromley, B. C., & Kenyon, S. J. 2016, "From Disk to Planets: A Theoretical Perspective," *Resolving planet formation in the era of ALMA and extreme AO*, Santiago, Chile.

*Selected Talks and Presentations (cont.)*

- Dall'Asén, *et al.* 2016, "Structural Characterization of carbonaceous meteoritic fragments found in Antarctica by high-resolution Raman spectroscopy and SEM/EDS," *American Physical Society April Meeting Abstracts*, L1.034.
- Zollinger, R., Armstrong, J. C., & Bromley, B. C. 2014, "Tidal Evolution of Exomoons using a Self-Consistent Tidal and Dynamical Model," *American Astronomical Society Meeting Abstracts*, 223, 347.06.
- Bromley, B. C. 2015, "The Revenge of Pluto (and other stories from the outer Solar System)," College of Science *Science at Breakfast* talk to the SLC business community.
- Bromley, B. C., & Kenyon, S. J. 2013, "Satellite formation around Pluto-Charon," *American Astronomical Society/DPS Meeting #45*, 303.05.
- Bromley, B. C., Brown, W. J., Kenyon, S. J., & Geller, M. J. 2013 "Binary Star Disruptions & the Growth of Massive Black Holes," SnowPAC – Black Hole Fingerprints: Dynamics, Disruptions and Demographics, Snowbird, UT.
- Bromley, B. C., & Kenyon, S. J. 2013, "Brightening up the Infrared Sky: Debris disks and terrestrial planet formation," *American Astronomical Society Meeting Abstracts*, 221, 325.01.
- Bromley, B. C., & Kenyon, S. J. 2011, "The Diversity of Planetary Systems," The First Kepler Science Conference, NASA/Ames, Moffett Field, CA.
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