

Joshua Edward Barnes – Curriculum Vitae

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Current Positions

<i>Astronomer</i>	08/2003–Present
Institute for Astronomy, University of Hawaii at Manoa	
Graduate Program Chair, 01/2005–08/2007, 08/2008–06/2010	
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Yukawa Institute for Theoretical Physics, Kyoto, Japan	

Previous Positions

<i>Associate Astronomer</i>	01/1991–07/2003
Institute for Astronomy, University of Hawaii at Manoa, HI	
Tenure granted: 7/1995.	
 <i>Senior Research Associate</i>	 09/1989–12/1990
Canadian Institute for Theoretical Astrophysics, Toronto, Canada	
 <i>Member</i>	 09/1984–07/1989
Institute for Advanced Study, Princeton, NJ	
 <i>Research Assistant</i>	 09/1982–06/1984
Astronomy Department, University of California, Berkeley, CA	
Supervisors: Simon White, Marc Davis.	

Education

- Graduate Student* 09/1982–06/1984
Astronomy Department, University of California, Berkeley, CA
Supervisors: Simon White, Marc Davis. Received Ph.D. in Astronomy.
- Visiting Student* 08/1981–08/1982
Institute of Astronomy, Cambridge, England
Sponsor: Craig Hogan.
- Graduate Student* 09/1979–07/1981
Astronomy Department, University of California, Santa Cruz, CA
Supervisor: William Burke.
- Undergraduate Student* 09/1974–05/1979
Harvard University, Cambridge, MA (on leave 05/1976–09/1977)
Supervisor: David Layzer. Received B.A. in Astronomy and Astrophysics.

Publications

BOOKS

1. ‘Galaxies: Interactions and Induced Star Formation’, R.C. Kennicutt, F. Schweizer, **J.E. Barnes**, 1998. (Springer-Verlag: Berlin).

CHAPTERS

2. ‘Interactions and Mergers in Galaxy Formation’, **J.E. Barnes**, 1995. *The Formation of Galaxies: Proceedings of the V Canary Islands Winter School of Astrophysics*, ed. C. Munoz-Tunon, F. Sanchez (Cambridge University Press: Cambridge), p. 399.
3. ‘Dynamics of Interacting Galaxies’, **J.E. Barnes**, L. Hernquist, 1992. *Annual Review of Astronomy and Astrophysics* **30**, 705.

EDITED VOLUMES

4. ‘Galaxy Interactions at Low and High Redshift’, **J.E. Barnes**, D.B. Sanders, eds. 1999. (Kluwer: Dordrecht).

ARTICLES IN PREPARATION

5. ‘Mergers and Acquisitions: Tracing the Gas in Galaxy Collisions’, Kelly A. Blumenthal, **Joshua E. Barnes**.
6. ‘HI vs. H α – Comparing the Kinematic Tracers in Modeling the Initial Conditions of the Mice’, S. Alireza Mortazavi, Jennifer M. Lotz, **Joshua E. Barnes**.

SUBMITTED ARTICLES

7. ‘ALMA Resolves the Nuclear Disks of Arp 220’, Nick Scoville, Lena Murchikova, Fabian Walter, Catherine Vlahakis, Jin Koda, Paul Vanden Bout, **Joshua Barnes**, Lars Hernquist, Kartik Sheth, Min Yun, David Sanders, Lee Armus, Pierre Cox, Todd Thompson, Brant Robertson, Laura Zschaechner, Linda Tacconi, Paul Torrey, Christopher C. Hayward, Reinhard Genzel, Phil Hopkins, Paul van der Werf, Roberto Decarli, *Astrophys. J.*

REFEREED JOURNAL ARTICLES

8. ‘Morphology and Molecular Gas Fractions of Local Luminous Infrared Galaxies as a Function of Infrared Luminosity and Merger Stage’, K.L. Larson, D.B. Sanders, **J.E. Barnes**, C.M. Ishida, A.S. Evans, V. U, J.M. Mazzarella, D.-C. Kim, G.C. Privon, I.F. Mirabel, H.A. Flewelling, 2016. *Astrophys. J.* **825**, #128
9. ‘Modeling the Initial Conditions of Interacting Galaxy Pairs Using Identikit’, S. Alireza Mortazavi, Jennifer M. Lotz, **Joshua E. Barnes**, Gregory F. Snyder, 2016. *Mon. Not. R. astr. Soc.*, **455**, 3058
10. ‘Transformations of galaxies. III. Encounter dynamics and tidal response as functions of galaxy structure’, **Joshua E. Barnes**, 2016. *Mon. Not. R. astr. Soc.*, **455**, 1957
11. ‘ALMA Imaging of HCN, CS, and Dust in Arp 220 and NGC 6240’, Scoville, N., Sheth, K., Walter, F., Manohar, S., Zschaechner, L., Yun, M., Koda, J., Sanders, D., Murchikova, L., Thompson, T., Robertson, B., Genzel, R., Hernquist, L., Tacconi, L., Brown, R., Narayanan, D., Hayward, C.C., **Barnes, J.**, Kartaltepe, J., Davies, R., van der Werf, P., Fomalont, E., 2015. *Astrophys. J.* **800**, #70.
12. ‘Erratum: “Spitzer Quasar and ULIRG Evolution Study (QUEST). IV. Comparison of 1 Jy Ultraluminous Infrared Galaxies with Palomar-Green Quasars”’, Veilleux, S., Rupke, D.S.N., Kim, D.-C., Genzel, R., Sturm, E., Lutz, D., Contursi, A., Schweitzer, M., Tacconi, L.J., Netzer, H., Sternberg, A., Mihos, J.C., Baker, A.J., Mazzarella, J.M., Lord, S., Sanders, D.B., Stockton, A., Joseph, R.D., **Barnes, J.E.**, 2014. *Astrophys. J. Supp.* **213**, #36.
13. ‘A Comparison of the Morphological Properties between Local and $z \sim 11$ Infrared Luminous Galaxies: Are Local and High- z (U)LIRGs Different?’, Hung, C.-L., Sanders, D.B., Casey, C.M., Koss, M., Larson, K.L., Lee, N., Li, Y., Lockhart, K., Shih, H.-Y., **Barnes, J.E.**, Kartaltepe, J.S., Smith, H.A., 2014. *Astrophys. J.* **791**, #63.
14. ‘The Role of Galaxy Interaction in the SFR- M_* Relation: Characterizing Morphological Properties of Herschel-selected Galaxies at $0.2 < z < 1.5$ ’, C.-L. Hung, D.B. Sanders, C.M. Casey, N. Lee, **J.E. Barnes**, P. Capak, J.S. Kartaltepe, M. Koss, K.L. Larson, E. Le Floch, K. Lockhart, A.W.S. Man, A.W. Mann, L. Riguccini, N. Scoville, M. Symeonidis, 2013. *Astrophys. J.* **778**, #129.
15. ‘Dynamical Modeling of Galaxy Mergers Using Identikit’, G.C. Privon, **J.E. Barnes**, A.S. Evans, J.E. Hibbard, M.S. Yun, J.M. Mazzarella, L. Armus, J. Surace, 2013. *Astrophys. J.* **771**, #120.
16. ‘Spectral Energy Distributions of Local Luminous and Ultraluminous Infrared Galaxies’, V. U, D.B. Sanders, J.M. Mazzarella, A.S. Evans, J.H. Howell, J.A. Surace, L. Armus, K. Iwasawa, D.-C. Kim, C.M. Casey, T. Vavilkin, M. Dufault, K.L. Larson, **J.E. Barnes**, B.H.P. Chan, D.T. Frayer, S. Haan, H. Inami, C.M. Ishida, J.S. Kartaltepe, J.L. Melbourne, A.O. Petric, 2012. *Astrophys. J. Supp.* **203**, #9.
17. ‘Gravitational softening as a smoothing operation’, **J.E. Barnes**, 2012. *Mon. Not. R. astr. Soc.* **425**, 1104.
18. ‘Multi-wavelength GOALS Observations of Star Formation and Active Galactic Nucleus Activity in the Luminous Infrared Galaxy IC 883’, F. Modica, T. Vavilkin, A.S. Evans, D.-C. Kim, J.M. Mazzarella, K. Iwasawa, A. Petric, J.H. Howell, J.A. Surace, L. Armus, H.W.W. Spoon, D.B. Sanders, A. Wong, **J.E. Barnes**, 2012. *Astron. J.* **143**, #16.
19. ‘Identikit 2: an algorithm for reconstructing galactic collisions’, **J.E. Barnes**, 2011. *Mon. Not. R. astr. Soc.* **413**, 2860.

20. 'A Radio Perspective on the Wet Merger Remnant NGC 34', X. Fernandez, J.H. van Gorkom, F. Schweizer, **J.E. Barnes**, 2010. *Astron. J.* **140**, 1965.
21. 'Dynamically driven star formation in models of NGC 7252', L.-H. Chen, **J.E. Barnes**, 2010. *Mon. Not. R. astr. Soc.* **407**, 43.
22. 'The Buried Starburst in the Interacting Galaxy II Zw 096 as Revealed by the Spitzer Space Telescope', H. Inami, L. Armus, J.A. Surace, J.M. Mazzarella, A.S. Evans, D.B. Sanders, J.H. Howell, A. Petric, T. Vavilkin, K. Iwasawa, S. Haan, E.J. Murphy, S. Stierwalt, P.N. Appleton, **J.E. Barnes**, G. Bothun, C.R. Bridge, B. Chan, V. Charmandaris, D.T. Frayer, L.J. Kewley, D.C. Kim, S. Lord, B.F. Madore, J.A. Marshall, H. Matsuhara, J.E. Melbourne, J. Rich, B. Schulz, H.W.W. Spoon, E. Sturm, V. U, S. Veilleux, K. Xu, 2010. *Astron. J.* **140**, 63.
23. 'Galaxy Mergers and the Mass-Metallicity Relation: Evidence for Nuclear Metal Dilution and Flattened Gradients from Numerical Simulations', D.S.N. Rupke, L.J. Kewley, **J.E. Barnes**, 2010. *Astrophys. J.* **710**, 156.
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26. 'Identikit 1: A Modeling Tool for Interacting Disk Galaxies', **J.E. Barnes**, J.E. Hibbard, 2009. *Astron. J.* **137**, 3071.
27. 'Off-Nuclear Star Formation and Obscured Activity in the Luminous Infrared Galaxy NGC 2623', A.S. Evans, T. Vavilkin, J. Pizagno, F. Modica, J.M. Mazzarella, K. Iwasawa, J.H. Howell, J.A. Surace, L. Armus, A.O. Petric, H.W.W. Spoon, **J.E. Barnes**, T.A. Suer, D.B. Sanders, B. Chan, S. Lord, 2008. *Astrophys. J. Lett.* **675**, 69.
28. 'S-COSMOS: The Spitzer Legacy Survey of the Hubble Space Telescope ACS 2 deg² COSMOS Field I: Survey Strategy and First Analysis', D.B. Sanders, M. Salvato, H. Aussel, O. Ilbert, N. Scoville, J.A. Surace, D.T. Frayer, K. Sheth, G. Helou, T. Brooke, B. Bhattacharya, L. Yan, J. Kartaltepe, **J.E. Barnes**, A.W. Blain, D. Calzetti, P. Capak, C. Carilli, C.M. Carollo, A. Comastri, E. Daddi, R.S. Ellis, M. Elvis, M. Fall, A. Franceschini, M. Giavalisco, G. Hasinger, C. Impey, A. Koekemoer, O. Le Fevre, S. Lilly, M.C. Liu, H.J. McCracken, B. Mobasher, A. Renzini, M. Rich, E. Schinnerer, P.L. Shopbell, Y. Taniguchi, D.J. Thompson, C.M. Urry, J.P. Williams, 2007. *Astrophys. J. Supp.* **172**, 86.
29. 'COSMOS: Hubble Space Telescope Observations', N. Scoville, R.G. Abraham, H. Aussel, **J.E. Barnes**, A. Benson, A.W. Blain, D. Calzetti, A. Comastri, P. Capak, C. Carilli, J.E. Carlstrom, C.M. Carollo, J. Colbert, E. Daddi, R.S. Ellis, M. Elvis, S.P. Ewald, M. Fall, A. Franceschini, M. Giavalisco, W. Green, R.E. Griffiths, L. Guzzo, G. Hasinger, C. Impey, J.-P. Kneib, J. Koda, A. Koekemoer, O. Lefevre, S. Lilly, C.T. Liu, H.J. McCracken, R. Massey, Y. Mellier, S. Miyazaki, B. Mobasher, J. Mould, C. Norman, A. Refregier, A. Renzini, J. Rhodes, M. Rich, D.B. Sanders, D. Schiminovich, E. Schinnerer, M. Scodreggio, K. Sheth, P.L. Shopbell, Y. Taniguchi, N. D. Tyson, C.M. Urry, L. Van Waerbeke, P. Vettolani, S.D.M. White, L. Yan, 2007. *Astrophys. J. Supp.* **172**, 38.
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32. 'Hubble Space Telescope Observations of NGC 6240: A Case Study of an Ultraluminous Infrared Galaxy with Obscured Activity', J. Gerssen, R.P. van der Marel, D. Axon, J.C. Mihos, L. Hernquist, **J.E. Barnes**, 2004. *Astron. J.* **127**, 75.
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35. 'Core Density Profile Survival in Dissipationless Mergers', E. Fulton, **J.E. Barnes**, 2001. *Astrophysics and Space Science* **276**, 851.
36. 'A Simple Algorithm for Orbit Classification', E.E. Fulton, **J.E. Barnes**, 2001. *Mon. Not. R. astr. Soc.* **321**, 507.
37. 'The Line of Sight Velocity Distributions of Simulated Merger Remnants', G.J. Bendo, **J.E. Barnes**, 2000. *Mon. Not. R. astr. Soc.* **316**, 315.
38. 'Transformations of Galaxies. II. Gas Dynamics in Merging Disk Galaxies: Addendum', **J.E. Barnes**, L. Hernquist, 1998. *Astrophys. J.* **495**, 187.
39. 'Transformations of Galaxies. II. Gas Dynamics in Merging Disk Galaxies', **J.E. Barnes**, L. Hernquist, 1996. *Astrophys. J.* **471**, 115.
40. 'Dynamical Instabilities in Hollow Halo Models', **J.E. Barnes**, 1993. *Astrophys. J. Lett.* **419**, L17.
41. 'Formation of Dwarf Galaxies in Tidal Tails', **J.E. Barnes**, L. Hernquist, 1992. *Nature* **360**, 715.
42. 'Transformations of Galaxies. I. Mergers of Equal-Mass Stellar Disks', **J.E. Barnes**, 1992. *Astrophys. J.* **393**, 484.
43. 'Origin of Kinematic Subsystems in Elliptical Galaxies', L. Hernquist, **J.E. Barnes**, 1991. *Nature* **354**, 210.
44. 'Fueling Starburst Galaxies With Gas-Rich Mergers', **J.E. Barnes**, L. Hernquist, 1991. *Astrophys. J. Lett.* **370**, L65.
45. 'Are Some N-body Algorithms Intrinsically Less Collisional than Others?', L. Hernquist, **J.E. Barnes**, 1990. *Astrophys. J.* **349**, 562.
46. 'A Modified Tree Code: Don't Laugh, It Runs', **J.E. Barnes**, 1990. *J. Comp. Phys.* **87**, 161.
47. 'Error Analysis of a Tree Code', **J.E. Barnes**, P. Hut, 1989. *Astrophys. J. Supp.* **70**, 389.
48. 'Evolution of Compact Groups and the Formation of Elliptical Galaxies', **J.E. Barnes**, 1989. *Nature* **338**, 123.
49. 'Encounters of Disk/Halo Galaxies', **J.E. Barnes**, 1988. *Astrophys. J.* **331**, 699.
50. 'Angular Momentum From Tidal Torques', **J. Barnes**, George Efstathiou, 1987. *Astrophys. J.* **319**, 575.
51. 'Programming a Highly Parallel Computer', D. Hillis, **J. Barnes**, 1987. *Nature* **326**, 27.
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53. 'Dynamical Instabilities in Spherical Stellar Systems', **J. Barnes**, J. Goodman, P. Hut, 1986. *Astrophys. J.* **300**, 112.
54. 'The Dynamical State of Groups of Galaxies', **J. Barnes**, 1985. *Mon. Not. R. astr. Soc.* **215**, 517.
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56. 'The Response of a Spheroid to a Disk Field or Were Bulges Ever Ellipticals?', **J. Barnes**, S.D.M. White, 1984. *Mon. Not. R. astr. Soc.* **211**, 753.

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INVITED REVIEW ARTICLES

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CONFERENCE PROCEEDINGS & OTHER CONTRIBUTIONS

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81. ‘Dynamical Modeling of Galaxy Mergers Using Identikit’, G.C. Privon, **J.E. Barnes**, A.S. Evans, J.E. Hibbard, J.M. Mazzearella, 2013. *Bul. AAS*, #221, #405.01.
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96. ‘Evolution of Compact Groups and Formation of Ellipticals’, **J.E. Barnes**, 1988. *The Epoch of Galaxy Formation*, ed. C. Frenk., R. Ellis, T. Shanks, A. Heavens, J. Peacock (Kluwer: Dordrecht), p. 179.
97. ‘Encounters and Mergers of Disk/Halo Galaxies’, **J. Barnes**, 1988. *Bul. AAS* **20**, 2, 733.
98. ‘An Environment for Experiments in Stellar Dynamics’, **J. Barnes**, L. Hernquist, P. Hut, P. Teuben, 1988. *Bul. AAS* **20**, 2, 706.
99. ‘Halo Response to Galaxy Formation’, **J.E. Barnes**, 1987. *Nearly Normal Galaxies*, ed. S. Faber (Springer-Verlag: New York), p. 154.
100. ‘An Efficient N-Body Algorithm for a Fine-Grain Parallel Computer’, **J.E. Barnes**, 1986. *The Use of Supercomputers in Stellar Dynamics*, ed. S. McMillan, P. Hut. (Springer-Verlag: Berlin). p. 175.
101. ‘Dynamical Instabilities in Spherical Stellar Systems’, **J. Barnes**, 1985. *Dynamics of Star Clusters*, ed. J. Goodman, P. Hut (Reidel: Dordrecht), p. 297.
102. ‘Were Bulges Ever Ellipticals?’, **J. Barnes**, S.D.M. White, 1983. *Bul. AAS* **15**, 4, 962.
103. ‘The Origin of Rotation in Galaxies and Clusters’, G. Efstathiou, **J. Barnes**, 1983. *Formation and Evolution of Galaxies and Large Structures in the Universe*, ed. J. Audouze, J. Tran Thanh Van (Reidel: Dordrecht), p. 361.

INVITED REVIEW LECTURES

1. ‘N-Body Methods: Review and Topics’, at *Valsov–Poisson: toward numerical methods without particles*, Kyoto, Japan, 06/2015.
2. ‘Experiments with IDENTIKIT’, at *Galaxy Mergers in an Evolving Universe*, Hualien, Taiwan, 10/2011.
3. ‘Dynamics of Galaxies. I, II’, at *Frontiers in Numerical Gravitational Astrophysics*, Erice, Sicily, 07/2008.
4. ‘Numerical Simulations of Mergers’, at *Galaxy Mergers*, STScI, Baltimore, MD, 10/2006.
5. ‘Dynamical Triggers of Star Formation in Luminous Infrared Galaxies’, at *Infrared Diagnostics of Galaxy Evolution*, IPAC, Pasadena, CA, 11/2005.
6. ‘Galactic Mergers’, at *Astrophysics of Massive Black Hole Coalescence*, State College, PA, 11/2002.
7. ‘Merger Time Scales’, at *Astrophysical Ages and Time Scales*, Hilo, HI, 02/2001.
8. ‘Dynamics of Galaxy Interactions’, at *IV Reunion Cientifica de la Sociedad Espanola de Astronomica*, Santiago de Compostella, 09/2000.
9. ‘Dynamics of Stellar Collisions’, at *Stellar Collisions and Mergers*, New York, 06/2000.
10. ‘Gas Dynamics in Galaxy Mergers’, at *Gas & Galaxy Evolution*, Socorro, 05/2000.
11. ‘Mergers and Galaxy Transformation’, at *Dynamics of Galaxies: From the Early Universe to the Present*, Paris, 07/1999.
12. ‘The Formation of Tidally Induced Dwarf Satellites’, at *Satellite Galaxies*, Ringberg, 06/1999.
13. ‘Galaxy Transformation by Merging’, at *The Evolution of Galaxies on Cosmological Timescales*, Tenerife, 12/1998.
14. ‘Mergers and Galaxy Assembly’, at *After the Dark Ages: When Galaxies Were Young*, University of Maryland, 10/1998.
15. ‘Galaxy Interactions’ at *Galaxy Dynamics*, Rutgers, 08/1998.

16. 'Dynamics of Mergers & Remnants', at *Galaxy Interactions at Low and High Redshift*, Kyoto, 08/1997.
17. 'Dynamics of Mergers & Remnants', at *Evolution of Galaxies*, Leiden, 07/1997.
18. 'Dynamical Evolution of Compact Groups', at *The Nature of Elliptical Galaxies*, Canberra, 08/1996.
19. 'Structure of Simulated Merger Remnants', at *Galaxy Interactions at Low and High Redshift*, Aspen, 06/1996.
20. 'Dynamics of Galaxy Interactions. I–IX.', at *Galaxies: Interactions and Induced Star Formation*, Les Diablerets, 03/1996.
21. 'Memory in Mergers Major and Minor', at *Formation of the Galactic Halo...Inside and Out*, Tucson, 10/1995.
22. 'Dynamical Effects of Mergers', at *New Light on Galaxy Evolution*, Heidelberg, 06/1995.
23. 'Dynamics of Galaxy Mergers', at *Galaxy Mergers*, London, 03/1995.
24. 'Dynamics of Interacting Galaxies', at *Activity in the Central Parts of Galaxies*, IAU J.D. 5, XXIIInd General Assembly, The Hague, 08/1994.
25. 'Formation of Dwarf Galaxies During Galaxy Interactions', at *N-Body Simulations of Stellar Clusters and Planetary Systems*, Lake Tahoe, 07/1994.
26. 'Interactions and Mergers in Galaxy Formation. I–IV.', at *The Formation of Galaxies*, Tenerife, 12/1993.
27. 'Experimental Study of Mergers', at *Physics of Nearby Galaxies: Nature or Nurture?*, Les Arcs, 03/1992.
28. 'Strong Interactions', at *Morphological and Physical Classification of Galaxies*, Naples, 08/1990.
29. 'Stellar and Gas Dynamics of Merging Galaxies', at *Dynamics of Galaxies and Molecular Cloud Distribution*, Paris, 06/1990.
30. 'N–body Studies of Major Mergers', at *Dynamics and Interactions of Galaxies*, Heidelberg, 06/1989.

DEPARTMENTAL & CONTRIBUTED LECTURES

1. 'Encounter Dynamics and Tidal Response as Functions of Galaxy Structure', IAU, Honolulu, 08/2015.
2. 'Reconstructing Galaxy Collisions: an Ensemble Approach', RIKEN AICS, Kobe, 04/2015.
3. 'Collisions as Probes of Galactic Structure', Yukawa Institute, Kyoto, 12/2014.
4. 'Probing Galaxy Halos with Tidal Interactions', ELSI, Tokyo Institute of Technology, 07/2013.
5. 'Probing Galaxy Halos with Tidal Interactions', Astronomy Department, Kyoto University, 07/2013.
6. 'Experiments with IDENTIKIT', Rose Center, New York, 07/2017.
7. 'Modeling NGC 4676 with IDENTIKIT', Institute for Astronomy, 04/2011.
8. 'Identikit 2: An Algorithm for Reconstructing Galaxy Collisions', Nat. Astr. Obs. of Japan, 07/2010.
9. 'Identikit 2: An Algorithm for Reconstructing Galaxy Collisions', Astronomy Department, Columbia University, 10/2009.
10. 'Identikit 2: An Algorithm for Reconstructing Galaxy Collisions', Institute for Astronomy, 09/2009.
11. 'Photo-Dynamic Models of Isolated and Merging Galaxies', Kyoto University, 07/2008
12. 'Identikit 1: A Modeling Tool for Interacting Disk Galaxies', Academia Sinica, Taipei, 06/2008

13. 'Matching Models to Merging Galaxies: Lost and Found in Parameter Space', Yukawa Institute, Kyoto University, 01/2008
14. 'Matching Models to Merging Galaxies: Lost and Found in Parameter Space', CALTECH, Pasadena, CA, 09/2007
15. 'Matching Models to Merging Galaxies: Lost and Found in Parameter Space', Carnegie Institute, Pasadena, CA, 09/2007
16. 'Numerical Simulations of Star Formation in Interacting Galaxies', IfA, 04/2004.
17. 'Mergers of "Cuspy" Galaxies', Kyoto University, 06/2002.
18. 'Tidal Dwarf (Pseudo) Galaxies', IfA, 01/2001.
19. 'Dynamics of Colliding Galaxies', Ann Arbor, 10/2000.
20. 'Dynamics of Colliding Galaxies', Madison, 10/2000.
21. 'Tidal Dwarf (Pseudo) Galaxies', University of Tokyo, 08/1999.
22. 'Merging and Galaxy Evolution', Academia Sinica, Taipei, 04/1999.
23. 'Simulating Gas in Galaxies', Academia Sinica, Taipei, 04/1999.
24. 'Memory in Mergers Major and Minor', Physics Dept., UH Manoa, 12/1995.
25. 'Forming Dwarf Galaxies in Tidal Tails', University of Washington, 08/1994.
26. 'Whither N ?', University of Washington, 07/1994.
27. 'Gas Dynamics in Merging Galaxies', IfA, 04/1993.
28. 'Dynamics of Merging Disk Galaxies', Fermilab, 02/1993.
29. 'Dynamics of Merging Disk Galaxies', Columbia University, 01/1993.
30. 'Dynamics of Merging Disk Galaxies', CFHT HQ, 07/1991.
31. 'Transformations of Galaxies', University of Hawaii, 03/1991.
32. 'Orbital Structure of Merger Remnants', Lick Observatoy, 03/1991.

PUBLIC LECTURES

1. 'When Galaxies Collide', IfA Open House, 04/2007
2. 'Cosmic Collisions (Hitchhikers Guide to the End of Everything)', Ka'ahumanu Mall, Maui, 12/2005
3. 'Cosmic Collisions (Hitchhikers Guide to the End of Everything)', UH Hilo, Hawaii, 12/2005
4. 'Cosmic Collisions (Hitchhikers Guide to the End of Everything)', UH Manoa, Honolulu, 05/2005
5. 'Galaxy Collisions', IfA Open House, 10/2000

Teaching

Semester	Course	Title	Hours	Students
F. 2016	Astr 241	Foundations of Astrophysics. I. The Solar System	3	20
F. 2016	Astr 699	Directed Research	7	2
S. 2016	Astr 242	Foundations of Astrophysics. II. Galaxies & Stars	3	6
S. 2016	Astr 699	Directed Research	4	2
F. 2015	Astr 241	Foundations of Astrophysics. I. The Solar System	3	10
F. 2015	Astr 699	Directed Research	2	1
S. 2014	Astr 242	Foundations of Astrophysics. II. Galaxies & Stars	3	5
F. 2013	Astr 241	Foundations of Astrophysics. I. The Solar System	3	5
F. 2012	Astr 241	Foundations of Astrophysics. I. The Solar System	3	8
F. 2011	Astr 110L	Survey of Astronomy: Laboratory	3	19
F. 2010	Astr 110L	Survey of Astronomy: Laboratory	3	22
S. 2010	Astr 110	Survey of Astronomy	3	68
S. 2010	Astr 699	Directed Research	2	1
F. 2009	Astr 699	Directed Research	2	1
S. 2009	Astr 626	Galaxies	3	18
F. 2008	Astr 110L	Survey of Astronomy: Laboratory	3	18
F. 2006	Astr 110	Survey of Astronomy	3	52
S. 2006	Astr 699	Directed Research	6	1
F. 2005	Astr 110L	Survey of Astronomy: Laboratory	3	25
F. 2005	Astr 699	Directed Research	6	1
S. 2005	Astr 626	Galaxies	3	10
F. 2004	Astr 699	Directed Research	2	1
S. 2004	Astr 699	Directed Research	2	1
F. 2003	Astr 110L	Survey of Astronomy: Laboratory	3	26
F. 2003	Astr 699	Directed Research	1	1
S. 2003	Astr 110L	Survey of Astronomy: Laboratory	3	24
S. 2003	Astr 626	Galaxies	3	8
F. 2001	Astr 110	Survey of Astronomy	3	68
S. 2001	Astr 626	Galaxies	3	8
F. 1999	Astr 110	Survey of Astronomy	3	62
S. 1998	Astr 110	Survey of Astronomy	3	85
F. 1997	Astr 699	Directed Research	2	1
S. 1997	Astr 699	Directed Research	2	1
S. 1997	Astr 626	Astrophysical Dynamics	3	6
F. 1996	Astr 699	Directed Research	2	1
F. 1995	Astr 110	Survey of Astronomy	3	183
S. 1995	Astr 626	Astrophysical Dynamics	3	11
F. 1994	Astr 699	Directed Research	2	1
S. 1994	Astr 735	Numerical Stellar Dynamics	1	8
S. 1994	Astr 699	Directed Research	1	1
S. 1994	Astr 399	Directed Study	1	1
F. 1993	Astr 110	Survey of Astronomy	3	190
F. 1992	Astr 140	Foundations of Astronomy	3	16
F. 1991	Astr 110	Survey of Astronomy	3	167
F. 1991	Astr 699	Directed Research	1	1