

Joel Craig Berrier

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Citizenship: United States

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Education:

Ph.D. (Physics and Astronomy) – September 2008, University of California, Irvine
M.S. (Physics and Astronomy) – March 2005, University of California, Irvine
B.S. (Physics) – May 2002, Hope College

Research Interests:

Theory
Galaxy dynamics
- Dynamics of disk galaxies
Galaxy morphology
- Spiral structure, simulations of disk galaxies, galaxy evolution
Large scale structure formation
- Galaxy clustering statistics and evolution of clustering statistics
Galaxy formation
- Cluster galaxy properties
Color bi-modality, accretion histories, environmental effects
- Supermassive black hole relations

Academic Appointments:

August 2016 – Present: *Supervisor: Janet Steele*
Assistant Professor
Department of Physics and Astronomy
University of Nebraska Kearney, Kearney, NE

May 2016 – July 2016: *Supervisor: John Deisz*
Adjunct Professor
Department of Physics
California Lutheran University, Thousand Oaks, CA

August 2015 – May 2016: *Supervisor: John Deisz*
Visiting Assistant Professor
Department of Physics
California Lutheran University, Thousand Oaks, CA

November 2013 – August 2015: *Contact: J. Sellwood*
Postdoctoral Research Associate
Department of Physics and Astronomy
Rutgers, The State University of New Jersey, Piscataway, NJ

November 2012 – May 2013: *Contact: J. Knapen*
Postdoctoral Research Associate
Instituto de Astrofísica de Canarias and Universidad de La Laguna
La Laguna, Tenerife, Spain

August 2009 – September 2012:

Contact: J. Kennefick

Research Associate

Department of Physics and The Arkansas Center for Space and Planetary Science
The University of Arkansas, Fayetteville, AR

July 2008 – July 2009:

Supervisor: Richard Mawhorter and Bryan Penprase

Visiting Professor

Department of Physics and Astronomy
Pomona College, Claremont, CA

July 2008:

Supervisor: William Parker

Instructor

Department of Physics and Astronomy
The University of California, Irvine, Irvine, CA
Instructor for a five week summer session Introduction to Astronomy course.

August 2007 – June 2008:

Supervisor: J. McLarty-Schroeder

Instructor

Department of Physics and Astronomy
Cerritos College, Norwalk, CA

September 2004 – June 2008:

Supervisor: J. Bullock

Graduate Research Assistant

Center for Cosmology
The University of California, Irvine, Irvine, CA

September 2002 – December 2004:

Supervisor: Various

Discussion and Laboratory Teaching Assistant

Department of Physics and Astronomy
The University of California, Irvine, Irvine, CA

May 2000 – July 2000:

Supervisor: P. Gonthier

Undergraduate Research

Hope College, Holland, MI

Observing Experience:

Keck II - 10m: DEIMOS (*DEep Imaging Multi-Object Spectrograph*) – 3 nights

KPNO 2m: SQUID (*Simultaneous Quad Infrared Imaging Device*) – 4 nights

TMO Pomona College Telescope 1m: Apogee U16 CCD

Pomona College Brackett Observatory 14inch Telescope: SBIG STL-11000M

Computer Skills:

Experienced in C, C++, *FORT RAN IRAF*, *LINUX*, *Shellscripting*, *Python Maple*, *Mathematica*, *GADGET* – 2, *MS-Office*, *The Sky*, *Equinox Image*, and *CCD Soft*. Some *IDL* and *SQL* experience.

Outreach:

- Regularly participated in talks and demonstrations at regional k-12 schools to inspire young students
- Regularly provide talks in the UNK planetarium

Organizations:

The American Astronomical Society
The American Physical Society
The Association of Physics Teachers

References:

Dr. James Bullock, University of California Irvine, (949) 824-7727, bullock@uci.edu
Dr. Daniel Kenefick, University of Arkansas, Fayetteville, (479) 575-5916, danielk@uark.edu
Dr. Julia Kenefick, University of Arkansas, Fayetteville, (479) 575-5916, jkenef@uark.edu
Dr. Philip Choi, Pomona College, (909) 607-0890, pchoi@pomona.edu
Dr. Marcus Seigar, University of Minnesota Duluth, (218) 726-6704, msseigar@d.umn.edu
Dr. Jeff Cooke, Swinburne University of Technology, +61 3 9214 5392, jcooke@astro.swin.edu.au
Dr. Jerry Sellwood, Rutgers University, (848) 445-8879, sellwood@physics.rutgers.edu
Dr. John Deisz, California Lutheran University, (805) 493-3984, jdeisz@callutheran.edu

Refereed Publications:

- “The Illustris Simulation: Supermassive Black Hole-Galaxy Connection Beyond the Bulge” Burçin Mutlu-Pakdil, Marc S. Seigar, Ian B. Hewitt, Patrick Treuhardt, **Joel C. Berrier**, Lauren E. Koval, 2018, Monthly Notices of the Royal Astronomical Society, 474, 2594M
- “Mass Distribution and Bar Formation in Growing Disk Galaxy Models” Joel C. Berrier, J. A. Sellwood, 2016, The Astrophysical Journal, 831, 65B
- “A Fundamental Plane of Spiral Structure in Disk Galaxies” Benjamin L. Davis, Daniel Kennefick, Julia Kennefick, Kyle Westfall, Douglas Shields, Russell Flatman, Matthew Hartley, Joel C. Berrier, Thomas P.K. Martinsson, and Rob A. Swaters, 2015, The Astrophysical Journal, 802, 13D
- “Smoothing Rotation Curves and Mass Profiles” Joel C. Berrier, J. A. Sellwood, 2015, The Astrophysical Journal, 799, 213B
- “Constraining dark matter halo profiles and galaxy formation models using spiral arm morphology. II. Dark and stellar mass concentrations for 13 nearby face-on galaxies” Marc S. Seigar, Benjamin L. Davis, Joel C. Berrier, and Daniel Kennefick, 2014, The Astrophysical Journal, 795, 90S
- “The Black Hole Mass Function Derived from Local Spiral Galaxies” Benjamin L. Davis, Joel C. Berrier, Lucas Johns, Douglas W. Shields, Matthew T. Hartley, Daniel Kennefick, Julia Kennefick, Marc S. Seigar, Claud H. S. Lacy, 2014, The Astrophysical Journal, 789, 124D
- “Further Evidence for a Supermassive Black Hole Mass - Pitch Angle Relation” Joel C. Berrier, Benjamin L. Davis, Daniel Kennefick, Julia D. Kennefick, Marc S. Seigar, R. Scott Barrows, Matthew Hartley, Doug Shields, Misty C. Bentz, Claud H. S. Lacy, 2013, The Astrophysical Journal, 769, 132B
- “Identification of Outflows and Candidate Dual Active Galactic Nuclei in SDSS Quasars at $z = 0.8 - 1.6$ ” R. Scott Barrows, Claud H. Sandberg Lacy, Julia Kennefick, Julia M. Comerford, Daniel Stern, Daniel Kennefick, and Joel C. Berrier, 2013, The Astrophysical Journal, 769, 95B
- “Close galaxy pairs at $z = 3$: a challenge to UV luminosity abundance matching” Joel C. Berrier, Jeff Cooke, 2012, Monthly Notices of the Royal Astronomical Society, 426, 1647

- “Measurement of Galactic Logarithmic Spiral Arm Pitch Angle Using Two-Dimensional Fast Fourier Transform Decomposition” Benjamin L. Davis, Joel C. Berrier, Marc S. Seigar, Douglas W. Shields, Julia Kennefick, Daniel Kennefick, Claud H. S. Lacy, Ivanio Puerari, 2012, *The Astrophysical Journal*, 199, 33
- “Galaxy Rotation Curves in the Context of Lambda CDM Cosmology” Marcus S. Seigar, Joel C. Berrier, 2011, *Advances in Astronomy*, 1, 77
- “Counts-in-Cylinders in the Sloan Digital Sky Survey With Comparisons to N-Body Simulations” Heather D. Berrier, Elizabeth J. Barton, Joel C. Berrier, James S. Bullock, Andrew R. Zentner, Risa H. Wechsler, 2011, *The Astrophysical Journal*, 726, 1B
- “Lyman break galaxy close and interacting pairs at $z \sim 3$ ” Jeff Cooke, Joel C. Berrier, Elizabeth J. Barton, James S. Bullock, Arthur M. Wolfe, 2010, *MNRAS*, 403, 1020C
- “Assembly of Galaxy Clusters” Joel C. Berrier, Kyle R. Stewart, Chris W. Purcell, James S. Bullock, Elizabeth J. Barton, Risa H. Wechsler, 2009, *The Astrophysical Journal*, 690, 1292B
- “Close Galaxy Counts as a Probe of Hierarchical Structure Formation” Joel C. Berrier, James S. Bullock, Elizabeth J. Barton, Heather D. Guenther, Andrew R. Zentner, Risa H. Wechsler 2006, *The Astrophysical Journal*, 652, 56
- “Galactic Populations of Radio and Gamma-Ray Pulsars in the Polar Cap Model” Peter L. Gonthier, Michelle S. Ouellette, Joel C. Berrier, Sean O’Brien, Alice K. Harding 2002, *The Astrophysical Journal*, 565, 482

Ebook Chapters:

- “Fundamentals of Data Analytics - Chapter 8 Monte Carlo”, Joel C. Berrier, 2016, <https://zybooks.zyante.com/>
- “Statistics for Data Analytics - Chapter 4 - Nonparametric Analysis”, Joel C. Berrier, 2016, <https://zybooks.zyante.com/>
- “Statistics for Data Analytics - Chapter 6 - Principal Component Analysis”, Joel C. Berrier, 2016, <https://zybooks.zyante.com/>

Conference Talks

- “Mass Distribution and Bar Formation in Growing Disk Galaxy Models” Mid American Regional Astrophysics Conference, Lawrence, Kansas, April 13, 2018
- “Rotation Curves and the Mass Distribution of Growing Disk Galaxy Models” Mid American Regional Astrophysics Conference, Lawrence, Kansas, April 8, 2017
- “Smoothing Rotation Curves in Spiral Galaxies” AAS Division on Dynamical Astronomy Meeting, Philadelphia, Pennsylvania, April 29, 2014
- “Galaxy Cluster Assembly and Environmental Effects on Galaxy Morphology” Mid-American Regional Astrophysics Conference, Kansas City, Missouri, April 15, 2011
- “Simulating Galaxy Cluster Assembly: Do Clusters Form From Groups?” 211th Meeting of the American Astronomical Society, Austin, Texas, January 9, 2008
- “Close Galaxy Counts as a Probe of Hierarchical Structure Formation” Theoretical Astrophysics in Southern California 2006, (TASC06), Kavli Institute for Theoretical Physics, University of California, Santa Barbara, October 2006

Invited Talks

- “Computational Galaxy Evolution and Cosmology” California Lutheran University, Thousand Oaks California, October 13, 2015
- “Smoothing Galaxy Rotation Curves and Mass Profiles” University of Arkansas, Fayetteville, January 16, 2015
- “Spiral Structure as an Indicator of Mass Distribution in Disk Galaxies” Rutgers, The State University of New Jersey, Piscataway, December 5, 2013
- “Galaxy Pairs and Clusters: Bridging Simulation and Observation” University of Arkansas, Fayetteville, June 17, 2009
- “Galaxy Pairs and Clusters in Λ CDM: Bridging Simulations and Observations” University of California, Berkeley, May 13, 2008
- “Using Galaxy Mergers to Understand Cosmological Structure Formation” Pomona College, March 4, 2008