

Nicholas Loutrel, Ph.D.

Employment

Sept. 2018 - current	<i>Postdoctoral Research Associate in Theoretical Gravitational Physics</i> Department of Physics Princeton University
Aug. 2013 - July 2018	<i>Graduate Research Assistant in Theoretical Gravitational Physics</i> Department of Physics Montana State University Advisor: Prof. Nicol´as Yunes
Aug. 2010 - Aug. 2012	<i>Research Technologist in Infrared Astronomy</i> Department of Astronomy & Astrophysics The Pennsylvania State University
May 2007 - May 2010	<i>Undergraduate Research Assistant in Infrared Astronomy</i> Department of Astronomy & Astrophysics The Pennsylvania State University Advisor: Prof. Kevin Luhman

Education

May 2014 - May 2018	<i>Ph.D. in Physics</i> Montana State University
Aug. 2012 - May 2014	<i>M.S. in Physics</i> Montana State University
Aug. 2006 - May 2010	<i>B.S. in Astronomy & Astrophysics</i> <i>B.S. in Physics</i> <i>Minor in Mathematics</i> The Pennsylvania State University

Awards & Honors

2018	Honorable Mention, 2018 GWIC-Braccini Thesis Prize Gravitational Wave International Committee
2017	Outstanding Graduate Research Assistant Award Montana State University
Summer 2016	East Asia & Pacific Summer Institutes Fellowship National Science Foundation & Japanese Society for the Promotion of Science Host: Prof. Takahiro Tanaka, Kyoto University
2016	Montana Space Grant Consortium Travel Grant Montana State University

2015	Graduate School Travel Grant Montana State University
2014, 2015, 2016	College of Letters & Science Travel Grant Montana State University
2014, 2015	Division of Gravitational Physics Travel Award American Physical Society

Current Research Interests

<i>Dynamical Capture Binaries</i>	Constructing analytic models of gravitational wave bursts from highly eccentric binaries for use in data analysis.
<i>Neutron Stars</i>	Developing analytic models of the dynamical tidal interactions of binary neutron stars and determining constraints on the nuclear matter equation of state from observations.
<i>Testing General Relativity</i>	Using the effects of spin precession and eccentricity on gravitational waves to constrain new physics and test General Relativity.
<i>Black Hole Perturbation Theory</i>	Studying mode mixing for black hole quasi-normal modes at second order in perturbation theory.

Advising & Mentoring

Post-Baccalaureate Students

2019-current Jose Nijaid Arredondo, Princeton University

Undergraduate Students:

2016-2018 Samuel Liebersbach, MSU, co-advised with Prof. Yunes

Graduate Students:

2016-2018 Blake Moore, MSU, co-advised with Prof. Yunes

2016-2018 Travis Robson, MSU, co-advised with Prof. Yunes

2015-2016 Florent Bonnett, intern at MSU, co-advised with Prof. Yunes & Katerina Chatziouannou

Outreach

2013	Celebrating Einstein. Presenter for <i>Einstein in the Schools</i> . Presentations of General Relativity and astrophysics to K-12 schools.
2006 - 2010	Penn State Astronomy Club. Presenter and telescope operator. Club dedicated to educating the public about astronomy through open observing nights held on the roof of Davey Lab.
2006 - 2010	Penn State Mars Society. Presenter and outreach coordinator. Chapter of the International Mars Society, dedicated to educating the public about current and planned missions to explore Mars.

Talks

Invited Talks

Tail Effects in Gravitational Wave Fluxes for Generic Eccentricity, 2016, Locations: Kyoto University, University of Tokyo, Hirosaki University

Eccentric Fly-By Waveforms, 2019, University of Illinois Urbana-Champaign

Conference & Workshop Talks

Bursty Waves: Can Eccentric Encounters Reveal New Physics?, General Relativity & Gravitation: A Centennial Perspective, 2015, The Pennsylvania State University, State College, PA

Gravitational Waves from Spin-Precessing Binaries in Dynamical Chern-Simons Gravity, Testing Gravity 2019, Simon Fraser University Harbour Center, Vancouver, BC, Canada

Probing Fundamental Physics with Spin-Precessing Binaries, 22nd International Conference on General Relativity and Gravitation, 2019, Valencia, Spain

The Eccentric Behavior of Inspiral Compact Binaries, 22nd International Conference on General Relativity and Gravitation, 2019, Valencia, Spain

April American Physical Society Meetings

Bursty Gravitational Waves, 2014, Savannah, GA

Eccentric Post-Newtonian Bursts, 2015, Baltimore, MD

Tail Effects in Gravitational Wave Fluxes for Generic Eccentricity, 2016, Salt Lake City, UT Spin

Precessing Black Hole Binaries in Dynamical Chern-Simons Gravity, 2017, Washington, D.C.

Spin Precession in Dynamical Chern-Simons Gravity: A Complete Picture, 2018, Columbus, OH *Eccentric Fly-By Waveforms*, 2020, Virtual Meeting

Relativity & Astrophysics Seminar, Montana State University

Gravitational Wave Bursts from Highly Elliptical Binaries, Dec. 2013

Building a Better Burst Algorithm, Oct. 2014

Asymptotic Analysis of Gravitational Wave Tails, Feb. 2016

Spin Precessing Black Hole Binaries in Dynamical Chern-Simons Gravity, Nov. 2016