

# RAHUL KASHYAP

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- CONTACT INFORMATION** Department of Physics, *Cell: +1-8146992614*  
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The Pennsylvania State University University Park, PA 16802 *DoB: 8 January 1990*
- CURRENT POSITION** Postdoctoral Scholar in the Eberly College of Science, Department of Physics, Pennsylvania State University, USA. (since Nov 2017)
- EDUCATION**
- **Fall 2012 to Spring 2017 : Distinguished Doctoral Fellow** at University of Massachusetts Dartmouth, USA working on my PhD thesis, title “Simulations of Type Ia Supernovae” under supervision of Prof. Robert Fisher.
  - **Aug 2007-July 2012 : Dual Degree (Masters and Bachelors of Technology)** in Ocean Engineering & Naval Architecture at Indian Institute of Technology Kharagpur, India.
  - **Aug 2004-Apr 2006 : Intermediate of Science** (*equivalent of 11<sup>th</sup> and 12<sup>th</sup> grade*) majoring in Mathematics, Physics, Chemistry, Patna Science College, Bihar, India.
- PROFESSIONAL TRAINING**
- Max Planck Prize Postdoctoral Fellow at International Centre for Theoretical Sciences (ICTS), Bengaluru, India (Jul 2017-Oct 2019).
  - Selected for Argonne Training Programme in Extreme-Scale Computing (ATPESC) 2016, an advanced program to prepare for exascale computing and its application to sciences and engineering.
- RESEARCH INTERESTS**
- Gravitational and electromagnetic wave signals from binary neutron star and neutron star-black hole mergers by detailed GRMHD simulations.
  - Hydrodynamical and magnetohydrodynamical modelling of binary white dwarf mergers especially in the context of transients such as Type Ia Supernovae and accretion-induced collapse events.
  - Developing tools to distinguish gravitational wave signatures of exotic compact objects as compared to known compact binary mergers using GW data.
- PUBLICATIONS**
1. **Can Kilonova Light Curves Be Standardized?**  
**Rahul Kashyap**, Gayathri Raman, and Parameswaran Ajith
  2. **Double-Degenerate Carbon-Oxygen and Oxygen-Neon White Dwarf Mergers: A New Mechanism for Faint and Rapid Type Ia Supernovae**  
**Rahul Kashyap**, Tazkera Haque, Pablo Lorn-Aguilar, Enrique Garca-Berro, Robert T. Fisher
  3. **Constraining black hole mimickers with gravitational wave observations**  
Nathan K. Johnson-McDaniel, Arunava Mukherjee, **Rahul Kashyap**, Parameswaran Ajith, Walter Del Pozzo, Salvatore Vitale, *submitted to PRL*
  4. **Constraining the Single-degenerate Channel of Type Ia Supernovae with Stable Iron-group Elements in SNR 3C 397**  
Pranav Dave, **Rahul Kashyap**, Robert Fisher, Dean Townsley, Chris Byrohl, *The Astrophysical Journal, Volume 841, Issue 1, article id. 58, 15 pp. (2017)*
  5. **One-armed Spiral Instability in Double-degenerate Post-merger Accretion Disks**  
**Rahul Kashyap**, Robert Fisher, Enrique García-Berro, Gabriela Aznar-Siguán, Suoqing Ji, Pablo Lorén-Aguilar, *The Astrophysical Journal, Volume 840, Issue 1, article id. 16, 10 pp. (2017)*

6. **Light Curves and Spectra from a Thermonuclear Explosion of a White Dwarf Merger**  
Daniel R. van Rossum, **Rahul Kashyap**, Robert Fisher, Enrique García-Berro, Gabriela Aznar-Siguán, Suoqing Ji, Pablo Lorén-Aguilar, *The Astrophysical Journal*, Volume 827, Issue 2, article id. 128, 14 pp. (2016)
7. **Spiral Instability Can Drive Thermonuclear Explosions in Binary White Dwarf Mergers**  
**Rahul Kashyap**, Robert Fisher, Enrique García-Berro, Gabriela Aznar-Siguán, Suoqing Ji, Pablo Lorén-Aguilar, *The Astrophysical Journal Letters*, Volume 800, Issue 1, article id. L7, 6 pp. (2015)

PROFESSIONAL SERVICES

- LIGO Member since October 2017, active in the group responsible for published results of testing general relativity using gravitational wave observations by LIGO-Virgo collaborations.
- Public outreach of LIGO during first BNS merger press release.
- Involved in various review and analysis activities for upcoming collaboration paper from LIGO.

ACHIEVEMENTS AND AWARDS

- Distinguished Doctoral Fellow at University of Massachusetts Dartmouth for 2012-2016.
- Selected for Indian Academy of Sciences Research Fellowship (SRFP) 2009 from among 5000 Indian applicants (131 selected in all), amongst the only four participants selected from IIT Kharagpur.

CONFERENCES AND TALKS

- Talk on tidal deformability tests of binary black hole mergers at LVC Meeting Mar 2018, Sonoma State University, California, USA and Sept 2018 Maastricht, Netherlands.
- Summer School on Gravitational Wave Astronomy, ICTS, Bengaluru, July 2017
- Supernovae, Hypernovae and Binary Driven Hypernovae - Adriatic Workshop, ICRANet, Pescara, Italy: A talk.
- *The Transient Sky*, The Ninth Harvard-Smithsonian Conference on Theoretical Astrophysics, Sackler Meeting, CfA, Harvard, 2016: Poster Presentation
- Joint Fall Meeting of the APS and AAPT New England Sections, Dartmouth College: Talk
- Fifty-One Erg, 2015, University of North Carolina, Raleigh: A short talk and poster presentation.
- Spring 2015 Meeting of the APS New England Section, Boston University: Talk
- *The Unquiet Universe*, INAF - Astronomical Observatory of Rome, Cefalu, June, 2014 :Poster Presentation.

TEACHING EXPERIENCE

- Reading course for graduate students on Blackhole Astrophysics at ICTS.
- Full instructor for Precalculus Class to STEM major students in Fall 2016 and Finite Mathematics to business majors in Spring 2017, UMASS Dartmouth.
- Led sections as an instructor (from Spring 2013 to Spring 2016) to physics undergraduates for topics including electrodynamics, waves, optics and modern physics, UMASS Dartmouth.

COMPUTATIONAL SKILLS

- **Gravitational Wave Data Analysis Tools:** LALInference
- **Astrophysical Simulation Tools:** FLASH, Einstein Toolkit, MESA
- **Data Analysis and Visualization Tools:** yt, VisIt
- **Programming Language:** FORTRAN, C, Python, MATLAB
- **HPC Skills:** extensive experience in MPI/OpenMP, and parallel Python uses on large supercomputing clusters such as Stampede and Mira.