# Koustav Chandra

Indian Institute of Technology, Bombay

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## RESEARCH INTEREST

Gravitational Wave Searches, Bayesian inference, Intermediate-Mass Black Holes

## EDUCATION

**Indian Institute of Technology, Bombay** | Research Scholar — Aug 2018-Present
Department of Physics

- Expected: July 2023
- Theme: Probing Compact Objects with Gravitational Wave Transients
- Supervisor: Prof. Archana Pai

**National Institute of Technology, Rourkela** | Graduate Student — April 2013-May 2018
Department of Physics & Astronomy

- Integrated Masters in Science (Physics)
- Thesis: An Algebraic Study of $SO(10)$ Grand Unified Theory
- Supervisor: Prof. Sasmita Mishra

## INTERNSHIP

**Indian Institute of Technology, Bombay** — Summer 2017
Department of Physics

- Topic: A study of $\rho^0$ decay kinematics
- Supervisor: Prof Basanta Kumar Nandi

**Indian Institute of Technology, Bombay** — Summer 2016
Department of Physics

- Topic: Elliptic Flow of $\varphi^0$ meson and strange quark collectivity
- Supervisor: Prof Basanta Kumar Nandi

**Indian Institute of Technology, Mandi** — Summer 2015
Department of Physics

- Topic: Magneto-Transport Study of Superconducting materials
- Supervisor: Prof Chandra Shekhar Yadav

## PUBLICATIONS

### Short Author Papers

- GW190521 as a black-hole merger coincident with the ZTF19abanrhr flare
  Juan Calderón Bustillo, Samson H.W. Leong, **Koustav Chandra** , Barry McKernan, K. E. S. Ford
  arXiv:2112.12481
- An optimized PyCBC search for gravitational waves from intermediate-mass black hole mergers
  **Koustav Chandra,** V. Villa-Ortega, T. Dent, C. McIsaac, Archana Pai, I. W. Harry, G. S. Cabourn Davies, K. Soni
  Physical Review D 104, 042004 arxiv:2106.00193
- Chirp mass based glitch identification in long-duration gravitational-wave detection.
  Nirban Bose, Archana Pai, **Koustav Chandra** and V. Gayathri
  Physical Review D 102, 084034 arXiv:2007.03623
- Numerical relativity injection analysis of signals from generically spinning intermediate mass black hole binaries in Advanced LIGO data.
  **Koustav Chandra,** V. Gayathri, Juan Calderón Bustillo, and Archana Pai
  Physical Review D 102, 044035 arXiv:2002.10666

### Large Collaboration publications to which I contributed significantly

- Search for intermediate mass black hole binaries in the third observing run of Advanced LIGO and Advanced Virgo
  Abbott et al. (LIGO Scientific and Virgo Collaborations, including **Koustav Chandra**,
  Accepted by Astronomy & Astrophysics arxiv:2105.15120
- LIGO Detector Characterization in the Second and Third Observing Runs
  Derek Davis et al. including **Koustav Chandra**,
  Classical and Quantum Gravity 38 135014 arxiv:2101.11673
- GWTC-2: Compact Binary Coalescences Observed by LIGO and Virgo During the First Half of the Third Observing Run
  Abbott et al. (LIGO Scientific and Virgo Collaborations, including **Koustav Chandra**,
  Physical Review X 11, 021053 arXiv:2010.14527
- GW190521: A Binary Black Hole Merger with a Total Mass of 150 $M_\odot$
  Abbott et al. (LIGO Scientific and Virgo Collaborations, including **Koustav Chandra**,
  Physical Review Letters 125, 101102 arXiv:2009.01075

## CONFERENCE PARTICIPATION

### Talks

- Hunting for intermediate-mass black hole with international gravitational-wave observatory network
  2nd Chennai Symposium on Gravitation and Cosmology†
  Chennai, India, (online), Feb'22
- An optimised PyCBC search for gravitational waves from intermediate-mass black hole mergers
  14th Edoardo Amaldi Conference
  Melbourne, Australia, (online), Jul'21.
- An optimised PyCBC search for gravitational waves from intermediate-mass black hole mergers
  Sixteenth Marcel Grossmann Meeting Meeting
  Rome, Italy, (online), Jul'21
- Search for Intermediate Mass Black Hole Binary with higher order modes
  LIGO-Virgo-KAGRA Collaboration Meeting,
  University of Wisconsin-Madison, USA (online), Mar'21
- Search Sensitivity of IMBHB systems in the gravitational wave window
  XXXVIII Meeting of Astronomical Society of India,
  Indian Institute of Science Education and Research, Tirupati, India, Feb'20

† - indicates an invited talk

### Posters

- NuRIA: Sensitivity study of generically spinning intermediate mass black hole binaries in Advanced LIGO data
  31st meeting of the Indian Association for General Relativity and Gravitation,
  Indian Institute of Technology, Gandhinagar, India (Online), Dec'20
- Increasing the sensitivity of ground-based gravitational wave detectors to a non-GR mode of polarisation
  International Conference on Gravitation & Cosmology 2019,
  Indian Institute of Science Education and Research, Mohali, India, Dec'19

## SCIENTIFIC OUTREACH

### Talks

- How to search Gravitational Waves with PyCBC (tutorial)
  Krittika-Winter-Workshops, Techfest-2021,
  Indian Institute of Technology, Bombay, India (Online), Jan'21
- Gravitational Waves-101
  Vigyan Samagam,
  Nehru Science Centre, Mumbai, May 2019

### Articles

- GW190521: The Most Massive Black Hole Collision Observed To Date,
  Tyson Littenberg, Juan Calderón Bustillo and **Koustav Chandra,**
  Summaries of LSC Scientific Publications, Sep'20
- Search for intermediate mass black hole binaries in the first and second observing runs of the Advanced LIGO and Virgo network
  **Koustav Chandra and** Archana Pai
  Summaries of LSC Scientific Publications, Jun'19

# SKILLS

## Computing

- **Programming Languages:** Very familiar with both Python and C. Comfortable with Shell Script
- **Operating System:** Familiar with various Linux distributions and macOS
- **Other Scientific Tools:** Familiar with LaTeX and Git

## Language

- **Proficient:** English, Hindi
- **Native:** Bengali
- **Basic:** Odia