



# Pavan Vynatheya

PhD student/researcher,  
MPA Garching

- MPA, Garching, Germany
- <https://www.mpa.mpa-garching.mpg.de/pavanvyn/>
- pavan.vynatheya@gmail.com
- Indian
- English, Kannada, Tamil, Hindi

## About Me

I received my BS-MS dual degree in Physics at IISER Kolkata, India. Currently, I am pursuing my PhD in the Multiple Star Evolution group at Max-Planck-Institut für Astrophysik, Garching, Germany.

## Technical Skills

- Programming languages
  - Proficient in Python
  - Working knowledge of C, C++,
  - MATLAB, Mathematica
- Web development
  - Proficient in HTML, CSS, Javascript
  - Basics of PHP, MySQL

## Research Experience

- |                       |  |                             |
|-----------------------|--|-----------------------------|
| Sep, 2020 – present   | <b>MPA, Garching, Germany</b><br>Compact object mergers in quadruple-star systems; Dynamical stability of triple- and quadruple-star systems ( <i>PhD projects</i> ) | Dr. Adrian Hamers           |
| Aug, 2019 – May, 2020 | <b>IUCAA Pune, India</b><br>Multiple pattern speeds in barred galaxies ( <i>Master thesis</i> )  | Prof. Kanak Saha            |
| May – Aug, 2019       | <b>Western Univesity, London, Canada</b><br>Comparison of real and simulated galaxies using Deep Learning ( <i>Summer internship</i> )                               | Prof. Pauline Barmby        |
| May – Jul, 2018       | <b>INAF OAB, Merate, Italy</b><br>Study of low frequency Quasi-Periodic Oscillations in accreting black hole binaries ( <i>Summer internship</i> )                   | Prof. Tomaso Belloni        |
| May – Jul, 2017       | <b>ARIES Nainital, India</b><br>Identification of Young Stellar Objects using Spitzer archive data ( <i>Summer internship</i> )                                      | Dr. Saurabh Sharma          |
| Jun – Jul, 2016       | <b>IIAP, Bangalore, India</b><br>Verification of star clusters using Colour-Magnitude Diagrams ( <i>Summer internship</i> )  | Prof. Annapurni Subramaniam |

## Education

- |                |  |
|----------------|--|
| 2020 – present | <b>Max-Planck-Institut für Astrophysik, Garching, Germany (IMPRS Munich program)</b><br>PhD in computational stellar dynamics and evolution                                |
| 2015 – 2020    | <b>Indian Institute of Science Education and Research (IISER) Kolkata, India</b><br>BS-MS Physics major + Mathematics minor<br>Final CGPA <b>9.19</b> (in a scale of 0-10) |
| 2013 – 2015    | <b>KLE Independent PUC, Bangalore, India</b><br>Classes 11-12  |
| 2003 – 2013    | <b>Sri Vani Public School, Bangalore, India</b><br>Classes 1-10  |

## Publications

- (Submitted to MNRAS) **Vynatheya, P.**; Mardling, R. A.; Hamers, A. S.: *Quadruple-star systems are not always nested triples: a machine learning approach to dynamical stability*. 2023
- Vynatheya, P.**; Hamers, A. S.; Mardling, R. A.; Bellinger, E. P.: *Algebraic and machine learning approach to hierarchical triple-star stability*. 2022, MNRAS, 516, 4146
- Vynatheya, P.**; Hamers, A. S.: *How important is secular evolution for black hole and neutron star mergers in 2+2 and 3+1 quadruple-star systems?*. 2021, ApJ, 926, 195
- Hamers, A. S.; Rantala, A.; Neunteufel, P.; Preece, H.; **Vynatheya, P.**: *Multiple Stellar Evolution: a population synthesis algorithm to model the stellar, binary, and dynamical evolution of multiple-star systems*. 2021, MNRAS, 502, 4479
- Bogensberger, D.; Ponti, G.; Jin, C.; Belloni, T. M.; Pan, H.; Nandra, K.; Russell, T. D.; Miller-Jones, J. C. A.; Muñoz-Darias, T.; **Vynatheya, P.**; Vincentelli, F.: *An underlying clock in the extreme flip-flop state transitions of the black hole transient Swift J1658.2-4242*. 2020, A&A, 641, A101

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## Soft Skills



### Teamwork

- ✂ Part of IISER Kolkata fest core committee 2016 – 2017
- ✂ Part of IISER Kolkata event organisations 2015 – 2016



### Leadership

- ✂ Student representative of IMPRS Munich cohort 2020 – 2023
- ✂ Head of IISER Kolkata music club 2016 – 2017
- ✂ Head of IISER Kolkata fest web design team 2016 – 2017



### Communication

- ✂ Co-host of the Stellar-group seminars at MPA 2021 – 2022
- ✂ Part of a paper presentation club to improve vocational skills 2019

## Scholarships and Awards

Jul, 2022

### Kippenhahn Prize

Best PhD student paper in 2021 at the Max-Planck-Institut für Astrophysik, Garching, Germany

May – Aug, 2019

### Mitacs Globalink Fellowship

Summer Research fellowship at Western University, London, Canada

May – July, 2017

### Indian Academy of Sciences Fellowship

Summer research fellowship at ARIES Nainital, India

2015 – 2020

### DST INSPIRE Scholarship

Five-year BS-MS scholarship at IISER Kolkata, India

## Conferences, Talks and Schools

Nov, 2022

### Talk at seminar

ICTS-TIFR, Bengaluru, India

Oct, 2022

### Talk at stellar-group seminar

Max-Planck-Institut für Astrophysik, Garching, Germany

Oct, 2022

### Talk at weekly seminar

Laboratoire d'Astrophysique de Marseille, France (online)

Sep, 2022

### Visitor whiteboard session

Monash University, Melbourne, Australia

Jul, 2022

### Summer School for Astrostatistics

University of Crete, Heraklion, Greece

May, 2022

### Growing Black Holes: Accretion and Mergers

Hotel Radisson, Kathmandu, Nepal

Jan, 2022

### Dynamical Formation of Gravitational Wave Sources

Aspen Center for Physics, Aspen, United States

Oct, 2021

### Talk at stellar-group seminar

Max-Planck-Institut für Astrophysik, Garching, Germany

Aug, 2021

### Summer School on Gravitational Wave Astrophysics

NBIA, Copenhagen, Denmark

Jul, 2021

### Talk at MPA retreat

Schloss Ringberg, Kreuth, Germany

Mar, 2021

### TRiple Evolution and Dynamics 3

Northwestern University, Evanston, United States (online)

## Pre-PhD events

Jun, 2019

### CASCA (Canadian Astronomical Society) meet

McGill University, Montreal, Canada

Dec, 2018

### IIST Astronomy and Astrophysics School

IIST, Thiruvananthapuram, India

Feb, 2017

### Telescope making workshop

IISER Kolkata, India

Dec, 2015

### Vijyoshi Science Camp

IISER Kolkata, India (and IISc, Bangalore, India)