

# Amrutha B Nair

## PERSONAL DATA

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DATE OF BIRTH: 22 January 1997  
ADDRESS: Choondasseril House, Velloor P.O, Kottayam, Kerala, India  
PHONE: +91 9744395699  
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## CAREER OBJECTIVES

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Seeking to acquire a position as a doctoral student to obtain advanced knowledge and make the best use of my skills and research experience in algebra to meaningfully contribute towards the development of research in mathematics.

## WORK EXPERIENCE

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2021-PRESENT University of Barcelona  
Marie Sklodowska-Curie ITN - Researcher at University of Barcelona

## EDUCATION

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| YEAR      | DEGREE            | INSTITUTION   | GRADE   |
|-----------|-------------------|---|---------|
| 2015-2020 | BS-MS DUAL DEGREE | INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH, THIRUVANANTHAPURAM ( <a href="#">link</a> ) | 8.44/10 |
| 2013-2015 | CLASS XII         | KERALA STATE BOARD; MOUNT CARMEL GIRLS H S S, KOTTAYAM  | 100%    |
| 2012-2013 | CLASS X           | KERALA STATE BOARD; MOUNT CARMEL GIRLS H S S, KOTTAYAM  | All A+  |

## RESEARCH INTERESTS

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- Computational Algebraic Geometry
- Arithmetic Geometry
- Modular forms and Moonshine

## SCHOLARSHIPS AND ACHIEVEMENTS

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2021-PRESENT Marie Sklodowska-Curie Fellowship

2015-2020 INSPIRE Fellowship  
From Dept. of Science and Technology(DST), Government of India.

CLASS IX-XII National Means Cum-Merit Scholarship Scheme(NMMSS)  
From MHRD govt. of India

## RESEARCH EXPERIENCES - PROJECTS

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|--|---|
| SYZYGIES OF MODULES<br>(Aug 2019-Present)                            | Guide: Dr Sarbeswar Pal, IISER-Tvm<br>Reading project on syzygies and related concepts and theorems like Hilbert Syzygy theorem, Green's Linear Syzygy theorem, Bernstein-Gelfand-Gelfand correspondence (BGG) and look into the conjectures of Green and Green-Lazarsfeld. |
| MODULAR FORMS AND Moonshine<br>(Dec 2018-Present)                    | Dr. Bindusar Sahoo ( <a href="#">homepage</a> )<br>Studied and took lectures on representations of finite groups, modular forms and moonshine.  |
| SOCIAL LEARNING IN FISHES<br>(Ecology Group Project)<br>2016 Aug-Nov | Hema Somanathan and Dr. Ullasa Kodandaramaiyah, IISER-Tvm<br>The project involved analyzing the effect of social learning in fishes on their foraging site preferences.   |

## RESEARCH EXPERIENCES - SUMMER & WINTER INTERNSHIPS

|   |   |
|---|---|
| LIE ALGEBRA<br>2019 Summer                                  | Dr. S Viswanath ( <a href="#">homepage</a> )<br>Reading Introduction to Lie Algebra by Erdmann and Wildon. Attended lectures and workshops and interacted with professors                               |
| ALGEBRAIC NUMBER THEORY<br>2018 Summer                      | Dr. S. A. Katre ( <a href="#">homepage</a> )<br>Reading project mainly referring to the books: The TIFR pamphlet on Algebraic Number Theory, Stewart and Tall's Algebraic Number Theory and some notes. |
| AFS 1(ANNUAL FOUNDATION SCHOOLS), IISER PUNE<br>2018 Summer | Workshop<br>Attended lectures on Algebra, Analysis and Topology   |
| COMMUTATIVE ALGEBRA<br>2017 Winter                          | Dr. Viji Z. Thomas ( <a href="#">homepage</a> )<br>Studied about some special fields, their properties and Berlekamp Factorization (a method of factorizing polynomials in finite fields)               |
| GROUP AND RING THEORY<br>2017 Summer                        | Dr. Guram Donadze<br>Followed "Abstract Algebra", Dummit and Foote.   |
| NUMBER THEORY<br>2017 Summer                                | Dr. Dipramit Majumdar ( <a href="#">homepage</a> )<br>Reading project following "Introduction to Analytic Number Theory", Apostol.  |
| SPECIAL THEORY OF RELATIVITY<br>2016 Winter                 | Dr. Bindusar Sahoo ( <a href="#">homepage</a> )<br>Followed "Introduction to Special Relativity", Robert Resnick.   |
| NUMERICAL ANALYSIS<br>2016 Summer                           | Guide: Dr. Ashish Awasthi ( <a href="#">homepage</a> )<br>Project on interpolation techniques mainly Splines.   |

## SKILLS

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LANGUAGES: English (TOEFL iBT- 109/120: R-28, L-29, S-27, W-25 )  
Malayalam (Mother Tongue)  
Hindi(Medium)

PROGRAMMING LANGUAGE: C, C++

SCRIPT LANGUAGE: Python

SOFTWARE: MATLAB, MATHEMATICA,  $\text{\LaTeX}$

ADDITIONAL: MACHINE LEARNING  
- University of Washington - Coursera  
APPLIED DATA SCIENCE WITH PYTHON  
- University of Michigan -Coursera

## DISSERTATIONS

| YEAR                         | PROJECT                         | TOPIC   | UNIVERSITY |
|------------------------------|---------------------------------|---|------------|
| 2019 NOVEMBER &<br>2020 JUNE | MAJOR PROJECT (MASTER'S THESIS) | SYZYGIES OF MODULES   | IISER-TVM  |
| 2019 MAY                     | MINOR PROJECT (PHYSICS)         | UNDERSTANDING MOONSHINE AND ITS APPLICATION TOWARDS CONFORMAL FIELD THEORY. | IISER-TVM  |
| 2016 NOVEMBER                | ECOLOGY GROUP PROJECT           | SOCIAL LEARNING IN FISHES   | IISER-TVM  |

## INTERESTS AND ACTIVITIES

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- Literary Writing, five poems got published in different chapbooks and participated in Kerala State Youth festival twice for English poetry writing
  - Drawing
  - Reading, especially classics, fiction and philosophy.
  - Trekking , hiking and bird watching.
  - Cooking
  - Numismatics, mainly rare Indian coins

## REFERENCES

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Dr. Sarbeswar Pal (spal@iisertvm.ac.in),  
Assistant Professor Grade I, School of Mathematics, IISER-TVM

Dr. Bindusar Sahoo (bsahoo@iisertvm.ac.in),  
Associate Professor, School of Physics, IISER-TVM.