

# Dharm Veer

## Curriculum Vitae

### Basic Information

Name Dharm Veer  
Occupation Post-Doctoral Fellow  
Institution Indian Institute of Technology Gandhinagar, India  
Gender Male  
Citizenship Indian  
e-mail dharm.v@iitgn.ac.in  
Homepage <https://cmidharm.github.io/>

### Research Interest

Commutative Algebra and Combinatorics.

### Academic Positions

November 25, 2022 – till date **Postdoctoral fellow**, *Indian Institute of Technology Gandhinagar*, Gandhinagar, India.

### Education

2016 – till date **Ph.D. in Mathematics**, *Chennai Mathematical Institute*, Chennai, India.  
Thesis submitted, expecting to complete doctorate in Mathematics in March 2023,  
Thesis title : Homological Invariants of Hibi Rings and Polyominoes.  
Thesis advisor : Prof. Manoj Kummini.

2014 – 2016 **Master of Science in Mathematics**, *Chennai Mathematical Institute*, Chennai, India.

2011 – 2014 **Bachelor of Science (Honours) in Mathematics**, *Motilal Nehru College, University of Delhi*, New Delhi, India.

2011 **12th CBSE Board Examination**, Jawahar Navodaya Vidyalaya, Faridabad, India.

### Research Experience

August, 2016 – November, 202 **Research Scholar**, CHENNAI MATHEMATICAL INSTITUTE, Chennai, India.

May 22 – August 6, 2016 **Summer Fellow**, CENTRE FOR EXCELLENCE IN BASIC SCIENCES (CBS), Mumbai, India,  
Supervisor : Prof. Balwant Singh.

May 3 – June 2, 2015 **Summer Fellow**, CENTRE FOR EXCELLENCE IN BASIC SCIENCES (CBS), Mumbai, India,  
Supervisor : Prof. Balwant Singh.

---

## Publications/Pre-prints

### Accepted papers

- Manoj Kummini and Dharm Veer. Charney-Davis conjecture for simple thin polyominoes, 2022. To appear in Commun. Algebra. arXiv:2203.03487.

### Submitted

- Manoj Kummini and Dharm Veer. The  $h$ -polynomial and the rook polynomial of some polyominoes, 2021. Submitted. arXiv:2110.14905.
- Dharm Veer. Green-Lazarsfeld property  $N_p$  for Hibi rings, 2021. Submitted. aXiv:2108.03915.
- Dharm Veer. Green-Lazarsfeld property  $N_p$  for Segre product of Hibi rings, 2021. Submitted. aXiv:2108.03915.

### In preparation

- Takayuki Hibi and Dharm Veer. Quadratic binomial ideals associated to certain combinatorial objects.
- Rizwan Jahangir, Ayesha Asloob Qureshi and Dharm Veer. Cohen-Macaulay edge ideals of certain graphs.
- Carmelo Cisto, Francesco Navarra and Dharm Veer. Algebraic invariants of certain non-prime polyomino ideals.

---

## Research Talks

- On Cohen-Macaulay posets of dimension 2 and permutation graphs, Conference on Commutative Algebra and Algebraic Geometry, IIT Hyderabad, India. February 2023.
- On the  $h$ -polynomial and the rook polynomial of some polyominoes, EMS Summer School on Combinatorial Commutative Algebra, Gebze Technical University, Istanbul, Turkey. August 2022.
- On Green-Lazarsfeld property  $N_p$  for Hibi rings, Virtual Commutative Algebra Seminars, IIT Bombay, Mumbai. March 2022. Video. Notes.
- On Green-Lazarsfeld property  $N_p$  for Hibi rings, National symposium on mathematics and applications, IIT Madras, Chennai. December 2021.
- On Green-Lazarsfeld property  $N_p$  for Hibi rings, 4<sup>th</sup> BRICS Mathematics Conference, IISER Tiruvananthapuram, Kerala. December 2021. Video.
- On Green-Lazarsfeld property  $N_p$  for Hibi rings, Research Seminar, CMI, Chennai. September, 2021.
- On  $h$ -Polynomials of Hibi rings, online talk in webinar Series: CATGT. August 2020. Video.
- Delivered three lectures on *Positive Characteristic Commutative Algebra*, Commutative Algebra Seminar, CMI, Chennai. January, 2020.
- Delivered two lectures on *Tate resolutions*, Commutative Algebra Seminar, CMI, Chennai. November, 2019.
- On  $h$ -Polynomials of Hibi rings, Research Seminar, CMI, Chennai. September, 2019.
- Delivered three lectures on *Homological Invariants of Modules*, Commutative Algebra Seminar, CMI, Chennai. April, 2019. Based on Prof. Srikanth Iyengar's lectures.
- Absolute Integral Closure In Positive Characteristic, Mates PhD Research Seminar, CMI, Chennai. March, 2017.

---

## Teaching Assistantships

- Computational Commutative Algebra, NPTEL Online course. July-November, 2022.  
Course Instructor : Prof. Manoj Kummini.
- Computational Commutative Algebra, NPTEL Online course. July-November, 2021.  
Course Instructor : Prof. Manoj Kummini.
- Computational Commutative Algebra, NPTEL Online course. September-December, 2020.  
Course Instructor : Prof. Manoj Kummini.
- Algebra I, Chennai Mathematical Institute, Chennai, India. August-November, 2019.  
Course Instructor : Prof. Purusottam Rath.
- Madhava Mathematics Competition Nurture Camp, *Invariant theory of finite groups*, CMI, Chennai, India. June 2019.  
Course Instructor : Prof. Manoj Kummini.
- Homological algebra, Chennai Mathematical Institute, Chennai, India. January-April, 2019.  
Course Instructor : Prof. Kumari Saloni.

---

## Research visit

- Sabancı University, Tuzla, Turkey. August, 2022.  
Host : Prof. Ayesha Asloob Qureshi.

---

## Participation in Workshops/Conferences

- Conference on Commutative Algebra and Algebraic Geometry, IIT Hyderabad, India. February 2023.
- EMS Summer School on Combinatorial Commutative Algebra, Gebze Technical University, Istanbul, Turkey. August, 2022.
- A Conference on Topics in Algebraic Geometry and Commutative Algebra, SRM University-AP, Andhra Pradesh, India. July, 2022.
- NCM Workshop on *maximal Cohen-Macaulay Modules*, Chennai Mathematical Institute, Chennai, India. July, 2022.
- 4<sup>th</sup> BRICS Mathematics Conference, IISER Tiruvananthapuram, Kerala, India. December, 2021.
- AIS School on *advanced commutative algebra*, IIT Kharagpur, India. December, 2019.
- Workshop on Hochschild Homology, Chennai Mathematical Institute, Chennai, India. July, 2019.
- NCM Workshop *commutative algebra and algebraic geometry in positive characteristics*, IIT Bombay, Mumbai, India. December, 2018.
- Projective Modules, IIT Bombay, Mumbai, India. May-June, 2018.
- AIS School on *Gröbner Bases and their Applications*, IIIT Delhi, New Delhi, India. December, 2017.
- ATM Workshop on *positive Characteristic Methods in Commutative Algebra*, IIT Bombay, Mumbai, India. June, 2017.
- Workshop on Seshadri constants, Chennai Mathematical Institute, Chennai, India. February, 2017.
- AIS School on commutative Algebra, Chennai Mathematical Institute, Chennai, India. December, 2015.

---

## Awards and Achievements

- August, 2018 – present **Senior Research Fellowship.**  
Awarded by Chennai Mathematical Institute, Chennai, India.
- August, 2016 – July, 2018 **Junior Research Fellowship.**  
Awarded by Chennai Mathematical Institute, Chennai, India.
- August, 2014 – April, 2016 **Postgraduate Scholarship.**  
Awarded by Chennai Mathematical Institute, Chennai, India.
- 2016 **Selected for PhD in IISER Pune (didn't avail)..**
- 2016 **Qualified Graduate Aptitude Test in Engineering(GATE).**  
Conducted by Indian Institute of Technology (IIT).
- December 2015 **73rd Rank in CSIR-JRF Dec-2015 Mathematical Science test.**  
Conducted by CSIR-UGC for Junior Research Fellowship and eligibility for lectureship.
- December 2014 **44th Rank in CSIR-NET Dec-2014 Mathematical Science test.**  
Conducted by CSIR-UGC for eligibility for lectureship.
- 2014 **62nd Rank in IIT – JAM 2014 Mathematics subject test.**  
Conducted by Indian Institute of Technology (IIT) for Master's programme in Mathematics.
- 2004 – 2011 **Free Education and Accommodation From Class 6th to 12th.**  
Awarded by HRD Ministry of India on the Basis of Aptitude Test.

---

## Referees

Prof. Manoj Kummini; mkummini@cmi.ac.in  
Prof. Ayesha Asloob Qureshi; ayesha.asloob@sabanciuniv.edu  
Prof. Clare D'Cruz; clare@cmi.ac.in