

## Astha Agrawal

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Homepage

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### RESEARCH INTERESTS

**Algebraic Coding Theory:** Small Dimensional Hull Codes over Finite Fields and Finite Non-chain Rings.

### PUBLICATIONS /PREPRINTS

A. Agrawal, G. K. Verma, and R. K. Sharma. *Galois LCD codes over  $\mathbb{F}_q + u\mathbb{F}_q + v\mathbb{F}_q + uv\mathbb{F}_q$* . **Bulletin of the Australian Mathematical Society**, 107, 2023.  
doi: 10.1017/S0004972722001344

G. K. Verma, A. Agrawal, and R. K. Sharma. *Construction Methods for Galois LCD codes over Finite Fields*. **Journal of Applied Mathematics and Computing**, 69:4023–4043, 2023.  
doi: 10.1007/s12190-023-01914-3

A. Agrawal and R. K. Sharma. *ACD Codes over Skew-symmetric Dualities*. **Cryptography and Communications**, 2024.  
doi: 10.1007/s12095-024-00709-y

A. Agrawal and R. K. Sharma. *Additive One-rank Hull codes over Finite Fields*. **Finite Fields and Their Applications**, 96, 2024  
doi.org/10.1016/j.faa.2024.102426

A. Agrawal and R. K. Sharma. Matrix product additive codes: symplectic duality and quantum code construction 2024 (Submitted)

### EDUCATION

**Indian Institute of Technology Delhi**, Hauz khas, Delhi, India  
*Ph.D.*, Mathematics, Under the Supervision of Prof. R.K. Sharma. Pursuing

**Banasthali Vidyapith**, Tonk, Rajasthan, India  
*Master of Science*, Mathematics, June 2018. CGPA: 9.25

**Banasthali Vidyapith**, Tonk, Rajasthan, India  
*Bachelor of Science*, Mathematics, June 2016. Percentage: 87.86

### AWARDS

**Gold-Medal** in Master of Science.

**Gold-Medal** in Bachelor of Science.

### NATIONAL EXAMINATION

Qualified ‘Joint CSIR-UGC NET December 2018’ organised by the Council of Scientific and Industrial Research for Lectureship/Assistant Professor (Rank 54 with JRF).

Qualified ‘GATE (Graduate Aptitude Test in Engineering) 2021’ exam organised by IIT Bombay.

Qualified ‘JAM (Joint Admission Test for Masters)’ 2016.

**SCHOLASTIC-ACHIEVEMENTS** Awarded Junior Research Fellowship (JRF) to pursue Ph.D. at Indian Institute of Technology Delhi, India from July 2019 to June 2021.

Awarded Senior Research Fellowship (SRF) to pursue Ph.D. at Indian Institute of Technology Delhi, India from July 2021 to Till date.

Research Scholar Travel Award, IIT Delhi to attend ‘International Conference on Finite Fields and Their Applications Fq 15 (2023), Paris, France .

Travel and local support: 100 euros in 2023 from CIMPA for attending the NCM-CIMPA school 2023, IIT Hyderabad, India, November 20-December 01, 2023

Research Excellence Travel Award from Promotional Fund of Industrial Research and Development (IRD) Unit, IIT Delhi.

**CONFERENCES** **06-08 December, 2022** Presented a research paper entitled “Galois LCD codes over  $F_q+uF_q+vF_q+uvF_q$ ” in the 37th Annual conference of Ramanujan Mathematical Society organized by SSN college of Engg., Chennai, India.

**10-12 January, 2023** Participated and presented a research paper entitled “Galois LCD codes over  $F_q+uF_q+vF_q+uvF_q$ ” in the International Conference on Graphs, Networks and Combinatorics (ICGNC 2023) organized by the Department of Mathematics, Ramanujan College, Delhi, India.

**19-23 June, 2023** Participated and presented a research paper entitled “Some results on Galois LCD codes over finite non-chain rings” in the International Conference on Finite Fields and Their Applications Fq15(2023) held at Paris, France.

**04-08 December, 2023** Presented a poster entitled “ACD codes over skew-symmetric dualities” in International Conference on Algebraic Geometry, Coding Theory and Combinatorics-2023, held at IIT Hyderabad.

**WORKSHOPS/SCHOOLS** **18-24 February, 2021** Participated in “Summer Workshop of Quantum Computing” organised online by IIT Delhi.

**20 August, 2021** International webinar on “Introduction and applications of Cryptography and Graph Theory” organized by BJB Autonomous College, Bhubaneswar, Odisha, India (2021).

**08-12 March, 2021** International Workshop on “Cryptography and Coding Theory” organized by Center of Excellence in Signal and Image Processing SGGS Institute of Engineering and Technology, Nanded, India (2021).

**28 April-1 June, 2020** Participated in “Annual Foundation School AFS-1” organised online by National Centre for Mathematics at Harish Chandra Research Institute, Allahabad, India.

**10-29 July, 2023** Participated in ‘Advanced Topics in Finite Fields’ organised by National Centre for Mathematics at The Institute of Mathematical Sciences, Chennai, India.

**20 November- 1 December, 2023** Participated in “CIMPA School on Finite Geometry and Coding Theory” held at Sangareddy (India).

**M.Sc.TERM PAPER**

*Title* “Review of Water’s Identity Based Encryption Scheme”.

*Supervisor:* Dr. Prashant Kushwah.

*Term paper link:* **M.sc. Term paper**

*About:* A review paper on the Water's identity based encryption scheme which involves security model of this scheme and some computational hard problems.

**TEACHING  
EXPERIENCE**

Teaching Assistant in Department of Mathematics, Indian Institute of Technology Delhi, New Delhi.

MTL 100: Calculus

MTL 750: Cryptography

MTL 101: Linear Algebra and Ordinary Differential Equations

MTL 860: Linear Algebra

MTL 105: Algebra.

**KNOWLEDGE  
AND SKILLS**

**Language:** Hindi(Mother tongue), English.

**Software Package:** MATLAB, MAGMA  $\text{\LaTeX}$ , Corel Draw, SageMath.

**REFERENCE**

Prof. Rajendra Kumar Sharma, (Ph.D. Supervisor)

Professor

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