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School of Mathematics and Statistics
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WORK EXPERIENCE Assistant Professor at University of Hyderabad, Hyderabad, India (From March 2024 to present).

Postdoc Fellow at Department of Mathematics, Indian Institute of Science, Bangalore (From October 2022 to March 2024).

Advisor: Prof. Swarnendu Sil

Postdoc Fellow at Tata Institute of Fundamental Research, Centre For Applicable Mathematics, Bangalore (From October 2020 to October, 2022).

Advisor: Prof. Agnid Banerjee

EDUCATION **Ph.D. in Mathematics** (2014–2020) (Thesis defended successfully on July 29, 2020)

Indian Institute of Technology, Gandhinagar

Dissertation Topic: “Studies on the existence and qualitative questions of singular elliptic PDE”

Advisor: Prof. Jagmohan Tyagi

M.Sc in Mathematics

IIT, Guwahati

B.Sc in Mathematics

Patna Science College, Patna

RESEARCH INTERESTS

- ◇ Partial Differential Equations
- ◇ Calculus of Variations
- ◇ Nonlinear Functional Analysis

REFEREED PUBLICATIONS

- [P1] Kumar Dharmendra, Sil Swarnendu: BMO estimates for Hodge-Maxwell systems with discontinuous anisotropic coefficients, to appear in Nonlinear Analysis.
- [P2] Arya, Vedansh; Kumar, Dharmendra: Borderline gradient continuity for fractional heat type operators. Proc. Roy. Soc. Edinburgh Sect. A 153 (2023), no. 5, 1651–1682.
- [P3] Arya, Vedansh; Kumar, Dharmendra: Carleman estimates for sub-Laplacians on Carnot groups. Anal. Math. Phys. 13 (2023), no. 4, Paper No. 55, 17 pp.
- [P4] Kumar, Dharmendra: Positive solution to singular semilinear elliptic problems. Complex Var. Elliptic Equ. 67 (2022), no. 11, 2708–2718.
- [P5] Kumar, Dharmendra: Boundary differentiability of solutions to elliptic equations in convex domains in the borderline case. Anal. Math. Phys. 12 (2022), no. 6, Paper No. 131, 20 pp.
- [P6] Ghosh, Suchandan; Kumar, Dharmendra; Prasad, Harsh; Tewary, Vivek: Existence of variational solutions to doubly nonlinear nonlocal evolution equations via minimizing movements. J. Evol. Equ. 22 (2022), no. 3, Paper No. 74, 40 pp.
- [P7] Kumar, Dharmendra; Tyagi, Jagmohan: Lyapunov-type inequalities for singular elliptic partial differential equations. Math. Methods Appl. Sci. 44 (2021), no. 7, 5593–5616.

- [P8] Kumar, Dharmendra; Tyagi, Jagmohan: Singular elliptic equations with quadratic gradient term. J. Math. Anal. Appl. 502 (2021), no. 1, Paper No. 125245, 20 pp.
- [P9] Kumar, Dharmendra: Positive solution to singular elliptic problems with subcritical nonlinearities. Nonauton. Dyn. Syst. 6 (2019), no. 1, 99–107.
- [P10] Kumar, Dharmendra: Semilinear elliptic problems with singular terms on the Heisenberg group, Complex Var. Elliptic Equ. 64 (2019), no. 11, 1844–1853.

TEACHING
EXPERIENCE

Current Semester at University of Hyderabad

Probability and Statistics - MM 212 (For Integrated MSc Students) *Spring 2025*

Math - I (For Integrated MTech Students) *Spring 2025*

Past Courses at University of Hyderabad

Math - II (MM 161) (For Integrated MTech Students) *Fall 2025*

Real Analysis - II (Advanced Multivariable Calculus)- MM 451 (For MSc Students) *Fall 2025*

Functional Analysis - MA 501 (For MSc Students) *Spring 2024*

Probability and Statistics - MM 212 (For Integrated MSc Students) *Spring 2024*

Teaching Assistant in the workshop

NCM AIS on "Elliptic and Parabolic PDEs" at IISc Bangalore *December 4 - 23, 2023*

Teaching Assistant at IISc Bangalore

Analysis and Linear Algebra *Fall 2023*

Functional Analysis *Spring 2023*

Ordinary Differential Equation *Fall 2024 (Till Midterm Exam)*

Teaching Assistant at TIFR CAM Bangalore

Analysis and Linear Algebra *SWIM - 2022*

Teaching Assistant at IIT Gandhinagar

Linear Algebra and Ordinary Differential Equation *Spring 2016, 2017, 2018*

Complex Analysis and Partial Differential Equation *Fall 2015, 2018*

Mathematical Methods in Engineering *Fall 2016, 2017*

Introduction to Real Analysis *Summer Term 2018, 2019*

INVITED
TALK/SEMINARS

- ◇ April 13, 2023, IISc Bangalore, India
"Borderline regularity results for Dirichlet problem in nondivergence form "
- ◇ Sept 27, 2021, TIFR CAM, Bangalore, India
"Borderline regularity results for Dirichlet problem in nondivergence form "
- ◇ Jan 24, 2020, TIFR CAM, Bangalore, India
"Singular Elliptic Equations with Quadratic Gradient Term "

- ◇ Jan 29, 2020, IIT Gandhinagar, India
“ Singular Elliptic Equations with Quadratic Gradient Term ”
- ◇ Jan 18, 2019, IIT Gandhinagar, India
“ Semilinear Elliptic Problems With Singular Terms On The Heisenberg Group ”

SERVICE TO IISC,
BANGALORE

- Grading of the NBHM scholarship exam (2024)
- Judges in STEMposium, Pravega X (2024)

LIST OF ADVANCED
COURSES ATTENDED
AT IISC
BANGALORE

- Fourier Analysis, Spring 2023
- Introduction to the Calculus of Variations, Spring 2023

LIST OF ADVANCED
COURSES ATTENDED
AT TIFR CAM,
BANGALORE

- Topics course on Regularity Theory, Fall 2020
- Topics course on Harmonic Function Theory, Fall 2020
- Graduate course on Harmonic Analysis, Spring 2021
- Topics course on Calculus of Variations, Spring 2021
- Graduate course in Advanced PDE, Spring 2022

LIST OF
WORKSHOPS
ATTENDED

- Annual Foundation School, Part II (2013), IIT Kanpur.
- Annual Foundation Schools, Part I (2014), NISER, Bhubaneswar.
- Variational Analysis and Optimization, 2015, IIT Gandhinagar.

HONORS AND
AWARDS

- ◇ Qualified JAM in Mathematics.
- ◇ Qualified NET in Mathematics.
- ◇ Qualified GATE in Mathematics.
- ◇ NBHM Postdoc Fellowship.

REFERENCES

Jagmohan Tyagi
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Agnid Banerjee
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School of Mathematical and Statistical Sciences at Arizona State University, Tempe
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Mohan Joshi
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