

## DHARMENDRA KUMAR

Department of Mathematics  
Indian Institute of Science  
Bangalore, India

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WORK EXPERIENCE	<p>Postdoc Fellow at Department of Mathematics, Indian Institute of Science, Bangalore (From October 17, 2022 to present).</p> <p>Advisor: Dr. Swarnendu Sil</p> <p>Postdoc Fellow at Tata Institute of Fundamental Research, Centre For Applicable Mathematics, Bangalore (From October 5, 2020 to October 4, 2022).</p> <p>Advisor: Prof. Agnid Banerjee</p>
EDUCATION	<p><b>Ph.D. in Mathematics</b> (2014 – 2020) (Thesis defended successfully on July 29, 2020)</p> <p>Indian Institute of Technology, Gandhinagar</p> <p>Dissertation Topic: “Studies on the existence and qualitative questions of singular elliptic PDE”</p> <p>Advisor: Prof. Jagmohan Tyagi</p> <p><b>M.Sc in Mathematics</b> (2010 – 2012)</p> <p>IIT, Guwahati</p> <p><b>B.Sc in Mathematics</b> (2007 - 2010)</p> <p>Patna Science College, Patna</p>
RESEARCH INTERESTS	<ul style="list-style-type: none"><li>◊ Calculus of Variations</li><li>◊ Partial Differential Equations</li><li>◊ Nonlinear Functional Analysis</li></ul>
REFEREED PUBLICATIONS	<p>[P1] Kumar Dharmendra, Sil Swarnendu: BMO estimates for Hodge-Maxwell systems with discontinuous anisotropic coefficients, <a href="https://arxiv.org/abs/2310.06615">https://arxiv.org/abs/2310.06615</a>.</p> <p>[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.</p> <p>[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.</p> <p>[P4] Kumar, Dharmendra: Positive solution to singular semilinear elliptic problems. Complex Var. Elliptic Equ. 67 (2022), no. 11, 2708–2718.</p> <p>[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.</p> <p>[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.</p> <p>[P7] Kumar, Dharmendra; Tyagi, Jagmohan: Lyapunov-type inequalities for singular elliptic partial differential equations. Math. Methods Appl. Sci. 44 (2021), no. 7, 5593–5616.</p> <p>[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.</p> <p>[P9] Kumar, Dharmendra: Positive solution to singular elliptic problems with subcritical nonlinearities. Nonauton. Dyn. Syst. 6 (2019), no. 1, 99–107.</p>

[P10] Kumar, Dharmendra: Semilinear elliptic problems with singular terms on the Heisenberg group, Complex Var. Elliptic Equ. 64 (2019), no. 11, 1844–1853.

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 ADVANCED  
COURSES ATTENDED AT  
IISC BANGALORE

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

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.

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 ”

TEACHING  
EXPERIENCE

**Teaching Assistant at IIT Gandhinagar**

Linear Algebra and Ordinary Differential Equation  
Complex Analysis and Partial Differential Equation  
Mathematical Methods in Engineering  
Introduction to Real Analysis

*Spring 2016, 2017, 2018*

*Fall 2015, 2018*

*Fall 2016, 2017*

*Summer Term 2018, 2019*

**Teaching Assistant at TIFR CAM Bangalore**

Analysis and Linear Algebra

*Summer Workout in Mathematics (SWIM) 2022*

**Teaching Assistant at IISC Bangalore**

Analysis and Linear Algebra  
Functional Analysis

*Fall 2023*

*Spring 2023*

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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Swarnendu Sil

Assistant Professor

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Mohan Joshi

Visiting Professor

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