Department of Mathematics
Indian Institute of Science
Bengaluru 560012, India
☎ *+91 80 2293 3755*
+91 87776 36741
✉ *swarnendusil@iisc.ac.in*
www.math.iisc.ac.in/~ssil

Swarnendu Sil

Positions

2020-Present **Assistant Professor**, *Department of Mathematics*
Indian Institute of Science (IISc), Bengaluru, India.

2018-2020 **Post Doctoral Fellow**, *Forschungsinstitut für Mathematik (FIM),*
ETH, Zürich, Switzerland.

2016–2018 **Post Doctoral Fellow**, *Chaire d'Analyse mathématique et Applications,*
EPFL, Lausanne, Switzerland.

Education

2016 **PhD**, *École polytechnique fédérale de Lausanne*, Lausanne, Switzerland.
Thesis advisor: Prof. Bernard Dacorogna

2012 **Master of Science**, *Tata Institute of Fundamental Research, Center for Applicable Mathematics*, Bangalore, India.
Masters Thesis advisor: Prof. Muthusamy Vanninathan

2009 **Bachelor of Mechanical Engineering**, *Jadavpur University*, Kolkata, India.

Personal Details

Date of Birth 9th May, 1984
Nationality Indian
Sex Male

Research Interests

My research area is broadly Calculus of Variations, Partial Differential Equations and Geometric Analysis. I am interested in nonlinear elliptic systems and variational problems coming from geometry and physics.

Publications

Published Journal Articles

H. M. Nguyen and S. Sil. Limiting absorption principle and well-posedness for the time-harmonic maxwell equations with anisotropic sign-changing coefficients. *Comm. Math. Phys.*, 379:145–176, 2020.

S. Sil. Nonlinear Stein theorem for differential forms. *Calc. Var. Partial Differential Equations*, 58(4):58:154, 2019.

S. Sil. Calculus of variations: A differential form approach. *Adv. Calc. Var.*, 12(1):57–84, 2019.

G. Csato, B. Dacorogna, and S. Sil. On the best constant in Gaffney inequality. *J. Funct. Anal.*, 274(2):461–503, 2018.

S. Sil. Regularity for elliptic systems of differential forms and applications. *Calc. Var. Partial Differential Equations*, 56(6):56:172, 2017.

S. Bandyopadhyay and S. Sil. Notions of affinity in calculus of variations with differential forms. *Adv. Calc. Var.*, 9(3):293–304, 2016.

S. Bandyopadhyay and S. Sil. Exterior convexity and classical calculus of variations. *ESAIM Control Optim. Calc. Var.*, 22(2):338–354, 2016.

S. Bandyopadhyay, B. Dacorogna, and S. Sil. Calculus of variations with differential forms. *J. Eur. Math. Soc. (JEMS)*, 17(4):1009–1039, 2015.

Forthcoming

Accepted Journal Articles

S. Sil. Topology of weak G-bundles via Coulomb gauges in critical dimensions. *Comm. Anal. Geom.*, To appear.

Awards and Honors

- 'Mathematics Doctoral Thesis Award 2016' for the best PhD thesis in Section de Mathématiques, EPFL.

Teaching

Courses taught

- Introduction to Partial Differential Equations, Fall 2021, Fall 2022
- Advanced functional analysis and PDEs, Spring 2022
- Introduction to the Calculus of Variations, Spring 2021, Spring 2023

Mentoring

PhD None

Post-Doctoral

- Dharmendra Kumar, Oct 2022-Present.

MS Project

- Harish Upadhyay, IISER Tirupati, 2022-23.
- Ritvik Vantipalli, IISER Pune, 2022-23.

Summer Project

- Sagar Ghosh, B.Math final year, ISI Bangalore, Summer 2021.
- Parthiv Chakrabarty, M.Sc final year, IIT Kharagpur, Summer 2021.

Other Professional Experience

Reviewer for Journals

Served/serving as a reviewer for submitted research articles for the journals

- Transaction of American Mathematical Society
- Analysis and PDE
- Journal of the European Mathematical Society (JEMS)
- Indian Journal of Pure and Applied Mathematics
- Journal of Mathematical Analysis and Applications.

Reviewer for Databases Served/serving as a reviewer for zbMath.

Other Referee work

Served/serving as a

- Referee for the thesis of a PhD candidate in IIT Kanpur
- Reviewer for PMRF (Prime Minister's Research Fellows) Scheme PhD applications.