# Saikat Mazumdar
*Curriculum Vitae*

---

Department of Mathematics
Indian Institute of Technology Bombay
Mumbai, Maharashtra 400076, India.

Office: G3-C
Phone: +91 22 2576 9475

Email: saikat.mazumdar@iitb.ac.in, saikat@math.iitb.ac.in

## Positions

- May 2019 − Present: *Assistant Professor*, Indian Institute of Technology Bombay, Mumbai, India.

- September 2018 −April 2019: *Postdoctoral Fellow*, McGill University, Montréal, Canada.
  Supervisors: Pengfei Guan, Niky Kamran and Jérôme Vétois.

- September 2016 −August 2018: *Postdoctoral Fellow*, University of British Columbia, Vancouver, Canada.
  Supervisor: Nassif Ghoussoub.

- October 2015 −August 2016 : *ATER-Doctorat*, Université de Lorraine, Nancy, France.

- November 2016 −September 2015: *Doctorant*, Institut Élie Cartan de Lorraine, Université de Lorraine, Nancy, France.
  Funding: Fédération Charles Hermite and Région Lorraine.

## Education

- 2016: *Ph.D in Mathematics*, Université de Lorraine, Institut Élie Cartan de Lorraine, Nancy, France.
  Advisors: Frédéric Robert and Dong Ye.

    *Thesis Title*: Polyharmonic Equations on Manifolds and Asymptotic Analysis of Hardy-Sobolev Equations with Vanishing Singularity.

    *Defended*: June 2016.

    *Ph.D. committee*: Emmanuel Hebey (Université de Cergy-Pontoise), Patrizia Pucci (Università degli Studi di Perugia), Tobias Weth (Goethe-Universität Frankfurt), Yuxin Ge (Université Paul Sabatier, Toulouse), David Dos Santos Ferreira (Université de Lorraine), Frédéric Robert (Université de Lorraine) and Dong Ye (Université de Lorraine).

- 2012: *M.Sc and M.Phil in Mathematics*, Tata Institute Of Fundamental Research-CAM, Bangalore, India.
  Advisor: K Sandeep.

    *Thesis Title*: On A Variational Problem with Lack of Compactness: The Effect of the Topology of the Domain .

    *Defended*: September, 2012.

- 2009: *B.Sc (Hons) in Mathematics*, University of Calcutta, Kolkata, India.

## Research Interests

Geometric analysis and Nonlinear partial differential equations : Blow-up analysis and Concentration phenomenon in Elliptic PDEs, Prescribing curvature problems, Higher-order conformally invariant PDEs.

## Publications

(9) Non-linear heat equation on the Hyperbolic space: Global existence and finite-time Blow-up, with Debdip Ganguly, Debabrata Karmakar. *Adv. Differential Equations.* 28 (2023), no. 9-10, 779−805.

(8) Non-synchronized solutions to nonlinear elliptic Schrödinger systems on a closed Riemannian manifold, with J. Vétois. *Discrete Contin. Dyn. Syst.* 42 (2022), no.11, 5273–5287.

(7) Hardy's identities and inequalities on Cartan-Hadamard manifolds, with J. Flynn, N. Lam, G. Lu. *Journal of Geometric Analysis* 33 (2023), no.1, Paper No. 27, 34 pp.

(6) The Hardy–Schrödinger Operator on the Poincaré Ball: Compactness, multiplicity, and stability of the Pohozaev obstruction, with N. Ghoussoub, F. Robert. *J. Differential Equations* 320 (2022), 510−557.

(5) Multiplicity and stability of the Pohozaev obstruction for Hardy-Schrödinger equations with boundary singularity, with N. Ghoussoub and F. Robert. *Memoirs of the Amer. Math. Soc.* 285 (2023), no.1415.

(4) Mass and Extremals Associated with the Hardy-Schroödinger Operator on Hyperbolic Space, with H. Chan, N. Ghoussoub, S. Shakerian, L. Faria. *Adv. Nonlinear Stud.* 18 (2018), no. 4, 671−689.

(3) Hardy-Sobolev equations with asymptotically vanishing singularity: Blow-up analysis for the minimal energy. *Nonlinear Anal.* 169 (2018), 190−217.

(2) Struwe's Decomposition for a Polyharmonic Operator on a Compact Riemannian Manifold with or without boundary. *Commun. Pure Appl. Anal.* 16 (2017), no. 1, 311−330.

(1) GJMS-type Operators on a compact Riemannian manifold: Best constants and Coron-type solutions. *J. Differential Equations* 261 (2016), no. 9, 4997−5034.

## Preprints

- *Sharp quantitative stability of Struwe's decomposition of the Poincaré-Sobolev inequalities on the hyperbolic space: Part I*, with M. Bhakta, D. Ganguly, D. Karmakar (2023).

- *Sharp quantitative stability of Poincaré-Sobolev inequality in the hyperbolic space and applications to fast diffusion flows*, with M. Bhakta, D. Ganguly, D. Karmakar (2022).

- *Existence result for the higher-order Q–curvature equation*, with J. Vétois (2020).

## Invited Talks

- 05/2023 : Journée de Contact FNRS, Université Libre de Bruxelles (ULB), Brussels, Belgium.

- 05/2023 : Séminaire EDP-Analyse de l'Institut Camille Jordan, Université Claude Bernard Lyon, France.

- 05/2023 : Workshop "Nonlinear and Geometric Analysis", Institut Elie Cartan de Lorraine, Nancy, France.

- 03/2023 : PDE Workshop, Indian Institute of Technology Gandhinagar, Gandhinagar, India.

- 11/2022 : Seminar, Tata Institute Of Fundamental Research-CAM, Bengaluru, India.

- 11/2022 : APRG seminar, Department of Mathematics, Indian Institute of Science, Bengaluru, India.

- 09/2022 : Colloquium, Department of Mathematics, Indian Institute of Technology Bombay, Mumbai, India.

- 02/2021 : Online Seminar, Geometric and Functional Inequalities and Applications.

- 07/2019 : Colloquium, Indian Institute of Technology Bombay, Mumbai, India.

- 03/2019 : Geometric Analysis seminar, McGill University, Montréal, Canada.

- 10/2018 : Geometric Analysis seminar, McGill University, Montréal, Canada.

- 07/2018 : Special session "Geometric and Nonlinear PDEs", The 12th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Taipei, Taiwan.

- 06/2018 : Scientific session "Partial Differential Equations and Variational Problems", 2018 Summer meeting of Canadian Mathematical Society, University of New Brunswick, Fredericton, New Brunswick, Canada.

- 12/2017 : Department of Mathematics, Indian Institute of Technology Bombay, Mumbai, India.

- 12/2017 : Analysis seminar, Indian Institute of Science Education and Research, Pune, India.

- 12/2017 : Colloquium, Tata Institute Of Fundamental Research-CAM, Bangalore, India.

- 11/2017 : Geometric Analysis seminar, McGill University, Montréal, Canada.

- 10/2016: Differential Geometry-Mathematical Physics-PDE seminar, University of British Columbia.

- 08/2016: DMS seminar, Indian Institute of Science Education and Research, Kolkata, India.

- 08/2016: Stat-Math Unit seminar, Indian Statistical Institute, Kolkata, India.

- 07/2016: Weekly seminar, Università degli Studi di Perugia, Italy.

- 06/2016 : Séminaire EDP, Analyse et Applications, Institut Élie Cartan, Metz, France.

- 06/2016 : Geometric Analysis seminar, Goethe-Universität Frankfurt, Germany.

- 04/2016 : Geometric Analysis seminar, McGill University, Montréal, Canada.

Short Visits

- 04/2016 : The Department of Mathematics and Statistics, McGill University, Montréal, Canada.

- 06/2016 : Institut für Mathematik, Goethe-Universität Frankfurt, Germany.

- 07/2016: Università degli Studi di Perugia, Italy.

- 11/2017 : The Department of Mathematics and Statistics, McGill University, Montréal, Canada.

- 02/2018 : La Sapienza Università di Roma, Rome, Italy.

- 10/2022 : Department of Mathematics, Indian Institute of Science, Bengaluru, India.

- 11/2022 : Tata Institute Of Fundamental Research-CAM, Bengaluru, India.

- 03/2023 : Indian Institute of Technology Gandhinagar, Gandhinagar, India.

- 05/2023 : Institut Elie Cartan, Université de Lorraine in Nancy, France

- 05/2023: Institut Camille Jordan, Université Claude Bernard Lyon 1, Lyon, France.

- 05/2023 : Université Libre de Bruxelles (ULB), Brussels, Belgium.

## Teaching

- *Indian Institute of Technology Bombay*

  | | |
  |---|---|
  | 2023-2024 Spring semester | MA 417: Ordinary Differential Equations |
  | 2022-2023 Spring semester | MA 534: Modern Theory of PDE |
  | 2022-2023 Autumn semester | MA 205: Complex Analysis |
  | 2021-2022 Spring semester | MA 581: Elements of Differential Topology |
  | 2021-2022 Autumn semester | MA 817: Partial Differential Equations I |
  | 2020-2021 Spring semester | MA 214: Introduction to Numerical Analysis |
  | 2020-2021 Autumn semester | MA 817: Partial Differential Equations I |
  | 2019-2020 Spring semester | SI 416: Optimization |
  | 2019-2020 Autumn semester | SI 507: Numerical Analysis |

- *McGill University*

  | | |
  |---|---|
  | Fall 2018 | MATH 262: Intermediate Calculus |

- *University of British Columbia*

  | | |
  |---|---|
  | 2017/2018 Summer Term 1 | MATH 257/316: Partial Differential Equations / Elementary Differential Equations II |
  | 2017/2018 Winter Term 2 | MATH 101: Integral Calculus with Applications to Physical Sciences and Engineering |
  | 2016/2017 Summer Term 2 | MATH 317: Vector Calculus |
  | 2016/2017 Winter Term 2 | MATH 103: Integral Calculus with application to Life Sciences |

- *Université de Lorraine*

  | | |
  |---|---|
  | 2015/2016 | Mathematics for Engineers, Computer Sciences, Physics. |

- Others

  | | |
  |---|---|
  | 12/2019−AIS on Geometric Analysis, Indian Institute of Technology Bombay | Series of four lectures on Critical Exponent PDEs. |

---