

# SACHCHIDANAND PRASAD

## PERSONAL DATA

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PLACE AND DATE OF BIRTH: Birpur, India | 22 July 1994  
ADDRESS: G108, ICTS, Survey No. 151, Shivakote  
Bangalore, PIN- 560089, Karnataka, India  
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PERSONAL HOMEPAGE: <https://prasadsachchidanand.github.io/>

## EMPLOYMENT

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JAN-2023 - CURRENT    Postdoctoral Fellow  
SUPERVISOR: Prof. Rukmini Dey  
International Centre for Theoretical Sciences (ICTS) Bangalore

## ACADEMIC VISIT

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04 SEP - 25 SEP, 2023    University of Patras, Greece,  
26 SEP - 30 SEP, 2023    Shiv Nadar University, India  
15 NOV, 2023, 04 JAN, 2024    Nagoya University, Japan

## EDUCATION

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JULY 2017 - DEC-2022    Doctor of Philosophy (Ph.D.)  
SUPERVISOR: Dr. Somnath Basu  
Indian Institute Science Education and Research, Kolkata, India  
Thesis: *Cut Locus of Submanifolds: A Geometric and Topological Viewpoint*  
Defence date: 28 December 2022

JULY 2012 - MAY 2017    5 Year Integrated M.Sc. in MATHEMATICS  
National Institute of Technology, Rourkela, India  
Major: Mathematics  
CGPA: 9.17/10  
Thesis: *Differentiability of Convex Functions on a Banach Space and their Properties*

## RESEARCH INTERESTS

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- Differential Geometry (Cut locus of submanifolds)
- Differential Topology
- Algebraic Topology
- Combinatorial Topology (Independence complex)
- Image of Polynomial Maps over non-commutative variable
- Algebraic Graph Theory

## PUBLICATIONS & PREPRINTS

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- ✍ *On the cut locus of submanifolds of a Finsler manifold* (joint with A. Bhowmick), July 2023,  
<https://arxiv.org/abs/2307.11045> (Communicated)
- ✍ *Independence complexes of wedge of graphs* (joint with N. Daundkar and S. Panja), March 2023,  
<https://arxiv.org/abs/2303.08798> (Communicated)
- ✍ *The image of polynomials and Waring type problems on upper triangular matrix algebras* (joint with S. Panja), June 2022,  
<https://arxiv.org/abs/2206.08827>  
*Journal of Algebra*(Volume 631, October 2023, Pages 148-193)

- ✍ *Counterexample to a conjecture about dihedral quandle* (joint with S. Panja), May 2022,  
<https://arxiv.org/abs/2205.15024> (Accepted, to appear in Miskolc Mathematical Notes)
- ✍ *A connection between cut locus, Thom space and Morse-Bott functions* (joint with S. Basu), June 2021,  
<https://arxiv.org/abs/2011.02972> (Accepted, to appear in **Algebraic & Geometric Topology**)

## ONGOING WORK

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1. *Equivariant cut locus theorem and application to classifying spaces* (with S. Basu)
2. *Manifolds homomorphic to  $n$ -sphere* (with S. Basu)
3. *Hausdorff dimension of cut locus of submanifolds*
4. *Independence complex of grid graphs* (with S. Panja)
5. *Space-time cut locus* (with I. Biswas and P. Kumar)
6. *Fractal Cut Loci* (with J. Itoh)
7. *Zero divisor graph of finitely many products of fields* (with K. Samant)

## HONOURS & AWARDS

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Sep, 2023	Infosys Excellence Travel grant Got the Infosys Excellence Travel grant from the Director of ICTS-TIFR to travel Greece.
Jan, 2018	<b>Gold Medal</b> Awarded the Gold medal for the Best Postgraduate (Integrated M.Sc) .
Jan, 2018	<b>Gold Medal</b> Awarded the medal for first position in Mathematics in Integrated M.Sc.
2016-17	<b>NBHM Fellowship for Masters</b> Got National Board of Mathematics (NBHM) M.Sc. fellowship.
DEC 2010	<b>Mathematics Olympiad</b> Got 1 <sup>st</sup> rank in the Regional Mathematics Olympiad from Patna region and later got selected for the Indian National Mathematics Olympiad.

## TRAINING PROGRAMMES AND CONFERENCES ATTENDED

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Sep 08-11, 2023	The 7th Meeting of ICDG, 2023, University of Patras, Greece
May 15-26, 2023	Dualities in Topology and Algebra, ICTS-TIFR, Bengaluru, India
Dec 06-08, 2022	The 37th Annual Conference of Ramanujan Mathematical Society, SSN College of Engineering, Chennai, India
Nov 24-26, 2022	Operator Theory and Complex Geometry, IISER Kolkata, West Bengal, India
June 06-08, 2022	The 39th Annual Workshop in Geometric Topology (Online)
May 31-June 02, 2022	Inter IISER-NISER Mathematics Meet, 2022, IISER Kolkata
July 05-16, 2021	Young's Topologists Meet, 2021 (online), KTH Royal Institute of Technology and Stockholm University
June 17-18, 2021	Top Flavours, 2021 (online), University of Warwick
Nov 18-30, 2019	Sheaf Theory, Sheaf Cohomology and Spectral Sequences, University of Delhi

July 08-20, 2019	<a href="#">Advanced Instructional School on Riemannian Geometry, IISc Bengaluru</a>
May 13-25, 2019	<a href="#">Advanced Instructional School on Homotopy Theory, ISI Kolkata</a>
Dec 03-14, 2018	<a href="#">Advanced Instructional School on Contact and Symplectic Topology, IISER Bhopal</a>
July 10-22, 2017	<a href="#">J-holomorphic Curves and G-W Invariants at NISER Bhubenswar</a>
June-July, 2016	<a href="#">Summer Program in Mathematics (SPIM)</a>
2013,14,15,16	<a href="#">Mathematics Training and Talent Search (MTTS)</a>

## INVITED TALKS

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- “On Manifold Homeomorphic to  $d$ -sphere”, [ICDG 2023](#), University of Patras, Greece
- “A Tour of the Cut Locus”, Mathematical Society of the SNU, 2023, Shiv Nadar University,
- “Cut Locus of Submanifolds: A Geometric Viewpoint”, [GANIT Seminar](#), 2022, IIT Gandhinagar
- “Equivariant Cut Locus Theorem”, [Inter IISER-NISER Math Meet](#), 2022, IISER Kolkata
- “Cut locus, Morse-Bott Functions and their relation”, [Inter IISER-NISER Math Meet](#), 2021, IISER Tirupati
- “Introduction and advanced stuffs in Geogebra”, [Introductory workshops on GeoGebra \(Hindi\)](#), 2021, Online
- “Real Analysis and its Application”, [Department of Mathematics, Arts, Commerce & Science College, Maregaon](#), Online
- “Extension of Diffeomorphisms of a Circle to the Closed Disk”, National Institute of Technology, Rourkela

## CONTRIBUTED TALKS

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- “Independence Complex of Wedge of Graphs”, ICTS Bengaluru, In-House 2023
- “Cut Locus of Submanifolds: A Geometric and Topological Viewpoint”, [International Centre for Theoretical Sciences \(ICTS\)](#), Bengaluru, 2022, Online
- “Morse-Bott Flows and Cut Locus of Submanifolds”, [The 39<sup>th</sup> Workshop in Geometric Topology](#), 2022, Online
- “Morse-Bott functions, Cut locus and their relations”, [Young Topologists and Geometers, DMV-ÖMG annual meeting 2021](#), Universität Passau
- “Cut Locus and Morse-Bott Functions”, Contributed Talk, [Top Flavors-2021](#), University of Warwick
- “Sphere Eversion”, Gong-Show Talk, [Top Flavors-2021](#), University of Warwick
- “Extension of Diffeomorphisms of a Circle to the Closed Disk”, [Advanced Instructional School on Homotopy Theory, ISI Kolkata](#)
- “Orientation Preserving Diffeomorphisms of  $S^1$  is path connected”, [Graduate Student Seminar, IISER Kolkata](#), Autumn 2018
- “Convex Functions on a Real Banach Space”, [Graduate Student Seminar, IISER Kolkata](#), Spring 2018
- “The inverse and implicit function theorems”, [Graduate Student Seminar, IISER Kolkata](#), Autumn 2017
- “Infinitely Many Proofs for Infinitude of Primes”, Student Seminar, National Institute of Technology, Rourkela, 2017
- “Riemann Mapping Theorem: Levi’s Method”, Indian Statistical Institute, Chennai, 2016
- “Irrationality of  $\pi$ ”, National Institute of Technology, Rourkela, 2016
- “An Approach to Divisibility”, National Institute of Technology, Rourkela, 2015

## SERVICES

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- Volunteer at [Math Spark, ICTS](#)
- Facilitator at [ICTS RRI Maths Circle](#)
- Organizer for the [Curry Leaf Days, 2021 and 2022](#)
- Organizer for the [Graduate Student Seminar IISER Kolkata](#)
- An organizing member of [Curry Leaf: A math club of MTTs alumni](#)

## TEACHING ASSISTANT

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OFCM	Online Foundation Course in Mathematics, MTTs, 2023
MTTS, LEVEL-O	Mentor at the MTTs camp, IIT(ISM) Dhanbad, 2023
OFCM	Online Foundation Course in Mathematics, MTTs, 2022
SEVERAL VARIABLE CALCULUS	Online Foundation Course in Mathematics, MTTs, 2021
TOPOLOGY	3rd year undergraduate, IISER Kolkata (Jan 2021- April 2021)
OFCM	Online Foundation Course in Mathematics, MTTs, 2020
LINEAR ALGEBRA	2nd year undergraduate, IISER Kolkata (Aug 2020- Dec 2020)
ALGEBRA I	3rd year undergraduate, IISER Kolkata (Aug 2019- Nov 2019)
ANALYSIS II	2nd year undergraduate, IISER Kolkata (Jan 2019- May 2019)
ANALYSIS I	2nd year undergraduate, IISER Kolkata (Aug 2018- Nov 2018)
PROBABILITY AND STATISTICS	2nd year undergraduate, IISER Kolkata (Jan 2018- May 2018)
MEASURE THEORY	1st year Masters, NIT Rourkela (Jan 2017- May 2017)
REAL ANALYSIS II	1st year Masters, NIT Rourkela (July 2016- November 2016)

## TEACHING

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MTTS Overture	2 Days MTTs program at Patna Women's College
Svadhyaaya 1.2	One week lecture on quotient topology organized by curry leaf

## COMPUTER SKILLS

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PROGRAMMING LANGUAGES:	C/C++, MATLAB, JAVASCRIPT, MATHEMATICA, SAGE, PYTHON
Basic Knowledge:	PHP, CSS, Excel, LINUX, GIMP, DJANGO
Intermediate Knowledge:	HTML, Word, Geogebra, PowerPoint, ipe, Inkscape, $\text{\LaTeX}$

## REFERENCES

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DR. SOMNATH BASU	Associate Professor, Department of Mathematics and Statistics, IISER Kolkata <a href="mailto:somnath.basu@iiserkol.ac.in">somnath.basu@iiserkol.ac.in</a>
PROF. MAHUYA DATTA	Professor, Theoretical Statistics and Mathematics Unit Indian Statistical Institute <a href="mailto:mahuya@isical.ac.in">mahuya@isical.ac.in</a>
PROF. RUKMINI DEY	Professor, International Centre for Theoretical Sciences, Bangalore <a href="mailto:rukmini@icts.res.in">rukmini@icts.res.in</a>
PROF. JIN-ICHI ITOH	Professor, School of Education, Sugiyama Jogakuen University, Nagoya <a href="mailto:j-ito@sugiyama-u.ac.jp">j-ito@sugiyama-u.ac.jp</a>

## DECLARATION

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I hereby declare that all the statements made herein true to my best of knowledge and belief.

Place: Kolkata

Sachchidanand Prasad