Pinakinath Saha

Indian Institute of Technology, Delhi, Hauz Khas, New Delhi-110016, India
pinakinath@maths.iitd.ac.in • sites.google.com/view/pinakinath

Name and Details

Name: Pinakinath Saha.
Date of Birth: 02/03/1993.
Nationality: Indian.
Current Address: Indian Institute of Technology, Delhi, Hauz Khas, New Delhi-110016, India
Current Position: I am an Assistant Professor of Mathematics at the Indian Institute of Technology, Delhi, Hauz Khas, New Delhi, 110016, India. (October 1, 2024–)

Education

Suri Vidyasagar college, Burdwan University — **Suri, West Bengal 731101, India**
B.Sc., Mathematics Hons. — *Year: 2010–2013*
Marks obtained : *81 Percentage in Mathematics.*

Visva-Bharati — **Santiniketan, West Bengal 731235, India**
M.Sc., CPI obtained: 9.3 — *Year: 2013–2015*
Mathematics

Chennai Mathematical Institute — **Chennai, Tamil Nadu 603103, India**
Ph.D. in Mathematics — *2015–2020*
Thesis supervisor Prof. S. Senthamarai Kannan.

Chennai Mathematical Institute — **Chennai, Tamil Nadu 603103, India**
Short-term visiting position — *1st July 2020–31st August 2020*
Supervisor Prof. S. Senthamarai Kannan.

Tata Institute of Fundamental Research — **Mumbai, 400005, India**
Postdoctoral fellow in Mathematics — *1st September 2020–30th March 2022*
Working with Prof. A. J. Parameswaran and Prof. Indranil Biswas

Indian Institute of Technology Bombay, Mumbai — **Powai 400076, India**
Postdoctoral fellow in Mathematics — *31st March 2022–23rd June 2023*
Working with Prof. Saurav Bhaumik.

Indian Institute of Science, CV Raman Rd, Bengaluru — **Karnataka 560012, India**
NBHM Postdoctoral fellow in Mathematics — *30th June 2023– 25th Sept 2024*
Working with Prof. Apoorva Khare.

Research Interests

My research interests lie in algebraic groups, flag varieties, Schubert varieties, Bott-Samelson varieties, combinatorics of Weyl groups, and representation theory from the geometric point of view.

Teaching

- IIT Delhi MTL 101: Linear algebras and differential equations (Jan–April, 2025).

Teaching Activities in the Past

- Algebra II, Jan-April 2017 (Instructor Prof. S. Senthamarai Kannan).
- Graduate Topology I, Aug-Nov 2018 (Instructors Prof. S. Senthamarai Kannan and Prof. T.R. Ramadas).
- Linear Algebra, Aug-Nov 2019 (Instructor Prof. Kavita Sutar).
- Graduate Algebra II, Jan-April 2020 (Instructor Prof. S. Senthamarai Kannan).
- Teaching Assistant at Indian Institute of Science (IISc): MA 219 Linear Algebra: 2023 Autumn Semester; Instructor: Professor Apoorva Khare

Workshop and Conference attended

- AIS Algebraic Geometry 16th May –4th June, 2016, Indian Statistical Institute (ISI), Bangalore.
- Workshop Schubert varieties, 23rd Oct –4th Nov, 2017,The Institute of Mathematical Sciences (IMSc), Chennai.
- Workshop Geometric Invariant Theory, 14th–19th May 2018, Kerala School of Mathematics (KSOM), Kozhikode.
- AIS Linear Algebraic Groups, 24th June 2019 to 13th July,2019, IIT Bombay, Mumbai.

Honors and Awards

- CSIR (Council of Scientific and Industrial Research) Research Fellowship, Dec-2014.
- NBHM PhD fellowship, 2015.
- NBHM Postdoctoral fellowship, Dec-2021.
- Institute Postdoctoral Fellow, Institute of Mathematical Sciences, August 2023 (not avail).

Thesis

- *Automorphism groups of Schubert varieties and rigidity of Bott-Samelson-Demazure-Hansen varieties* (Thesis advisor : Prof. S. Senthamarai Kannan).

Publications

- S. Senthamarai Kannan, Pinakinath Saha, *Parabolic subgroups and automorphism groups of Schubert varieties,* C.R.Math.Acad.Sci.Paris 356(2018), no.5, 542–549. https://doi.org/10.1016/j.crma.2018.04.001.
- S. Senthamarai Kannan, Pinakinath Saha, *Rigidity of Bott-Samelson-Demazure-Hansen variety for* $PSO(2n+1,\mathbb{C})$*,* Journal of Lie Theory 29 (2019) 107–142. https://www.heldermann.de/JLT/JLT29/JLT291/jlt29005.htm.
- S. Senthamarai Kannan, Pinakinath Saha, *Rigidity of Bott-Samelson-Demazure-Hansen variety for* F_4 *and* G_2*,* Proceedings-Mathematical Sciences 130, Article number: 19, (2020). https://doi.org/10.1007/s12044-019-0535-3.
- S. Senthamarai Kannan, Arpita Nayek, and Pinakinath Saha, *Torus quotient of the Schubert varieties in the Grassmannians* $G_{2,n}$*,* Indian Journal of Pure and Applied Mathematics (2021). https://doi.org/10.1007/s13226-021-00017-8.
- S. Senthamarai Kannan, Pinakinath Saha, *Minimal Parabolic Subgroups and Automorphism Groups of Schubert varieties*, Journal of Lie Theory 32 (2022), No. 4, 1025–1052. https://www.heldermann.de/JLT/JLT32/JLT324/jlt32048.htm.
- S. Senthamarai Kannan, Pinakinath Saha, *Minimal Parabolic Subgroups and Automorphism Groups of Schubert varieties-II*, Journal of the Ramanujan Mathematical Society 38: 2 (2023), 139–156. http://www.mathjournals.org/jrms/2023-038-002/2023-038-002-004.html.
- A. Nayek, P. Saha, *Torus quotient of the Grassmannian* $G_{n,2n}$*,* C.R.Math.Acad.Sci.Paris (2023), Volume 361 (2023), 1499–1509. https://doi.org/10.5802/crmath.501
- I. Biswas, S. Senthamarai Kannan, P. Saha, *On the geometry of the anti-canonical bundle of the Bott-Samelson-Demazure-Hansen varieties,* Acta Mathematica Sinica, English Series (2024). https://doi.org/10.1007/

s10114-024-2739-4.

- Mahir Bilen Can, Pinaki Saha, *Application of Homogeneous Fiber Bundles to the Schubert Varieties,* Geom. Dedicata 217 (2023), no. 6, Paper No. 103, 24 pp. https://doi.org/10.1007/s10711-023-00839-2
- Saurav Bhaumik, Pinakinath Saha, *Line bundles on G-Bott-Samelson-Demazure-Hansen variety,* Journal of Pure and Applied Algebra Volume 228, Issue 7, July 2024, 107640. https://doi.org/10.1016/j.jpaa.2024.107640
- Arpita Nayek, A. J. Parameswaran, Pinakinath Saha, *On Automorphism group of a G-twisted variety*, New York J. Math. 30 (2024) 998–1023. https://arxiv.org/abs/2302.09960.
- Mahir Bilen Can, Pinakinath Saha, *Toric Richardson varieties,* appears in Communications in Algebra https://doi.org/10.1080/00927872.2024.2422028

Submitted

- Arpita Nayek, Pinakinath Saha, *On torus quotients of Schubert varieties in Orthogonal Grassmannian*, Submitted.
- Arpita Nayek, Pinakinath Saha, *On torus quotients of Schubert varieties in Orthogonal Grassmannian-II*, Submitted.
- Arghya Pramanik, Praveen Kumar Roy, Pinakinath Saha, Positivity on simple G-varieties, submitted.
- Mahir Bilen Can, S. Senthamarai Kannan, Pinakinath Saha, From Schubert Varieties to Doubly-Spherical Varieties, submitted.

Preprint

- S. Bhaumik, P. Saha, *Fibration with smooth rational projective scheme as fiber,* Preprint.
- Pinakinath Saha, *On the geometry of the anti-canonical bundle of the Bott-Samelson-Demazure-Hansen varieties-II,* Preprint.
- Pinakinath Saha, *Automorphism groups and local rigidity of Bott-Samelson-Demazure-Hansen varieties,* Preprint.
- Pinakinath Saha, *Ample Homogeneous Vector Bundles on Flag varieties*

Mathscinet Reviews

- MR4334374 Li, Hao, Zhong, Changlong: On equivariant oriented cohomology of Bott-Samelson varieties. New York J. Math. 27 (2021), 1443–1464.
- MR4310016 Bao, Huanchen, He, Xuhua: A Birkhoff-Bruhat atlas for partial flag varieties. Indag. Math. (N.S.) 32 (2021), no. 5, 1152–1173.
- MR4461077 Süß, Hendrik: Orbit spaces of maximal torus actions on oriented Grassmannians of planes. Interactions with lattice polytopes, Springer Proc. Math. Stat., 386, 335–349.
- MR4565639 Kiritchenko, Valentina: Push-pull operators on convex polytopes. Int. Math. Res. Not. IMRN 2023, no. 4, 3305–3328. 14M15 (14C20 52B20)
- MR4681307 Cho, Soojin; Hong, Jaehyun; Lee, Eunjeong: Permutation module decomposition of the second cohomology of a regular semisimple Hessenberg variety. Int. Math. Res. Not. IMRN 2023, no. 24, 22004–22044.
- MR4659445 Hu, Haoqiang, Li, Changzheng; Liu, Zhaoyang Effective good divisibility of rational homogeneous varieties. Math. Z. 305 (2023), no. 3, Paper No. 52, 23 pp. 14M17 (14M15 14N15 14N35)

Google site link

http://sites.google.com/view/pinakinath