Soma Purkait · Curriculum Vitae

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Date of birth: August 24, 1985
Nationality: Indian

Current Affiliation

Tokyo Institute of Technology, Special Associate Professor (2018 – current)

Academic History

· **Postdoctoral Fellow**, Tokyo University of Science, April 2017–September 2018.
· **Research Assistant**, Sophia University, October 2016–March 2017.
· **JSPS Postdoctoral Fellow**, Kyushu University, September 2014–September 2016 under host Professor Masanobu Kaneko.
· **Research Fellow**, University of Warwick, July 2012–June 2014.
· **Guest Researcher**, Max Planck Institute for Mathematics, Bonn, January–March 2013.
· **Ph.D. in Mathematics**, University of Warwick, July 2012, under Professor Samir Siksek.
· **Junior Research Fellow**, Indian Statistical Institute, Bangalore, 2007–2008.
· **Master of Mathematics**, Indian Statistical Institute, Bangalore, 2005–2007.
· **B. Sc. Mathematics**, St. Stephen's College, University of Delhi, 2002–2005.

Research Interests

Number Theory, Modular Forms, Automorphic Representations

Publications

· (Joint with J. T. Dimabayao) *A variant of Congruent number Problem*, submitted.
· (Joint with E. M. Baruch) *Newforms of half-integral weight: The minus space counterpart*, Canadian Journal of Mathematics, **72**, Issue 2 (2020), 326–372.
· (Joint with E. M. Baruch) *Newforms of half-integral weight: The minus space of $S_{k+1/2}(\Gamma_0(8M)$*, Israel Journal of Mathematics **232** (2019) 41–73.
· (Joint with E. M. Baruch) *Hecke algebras, new vectors and newforms on $\Gamma_0(m)$* Mathematische Zeitschrift, **287** (2017), Issue 1-2, 705–733.
· (Joint with N. Kumar) *A note on the Fourier coefficients of half-integral weight modular forms*, Arch. Math. (Basel) **102** (2014), no. 04, 369–378.
· *Hecke operators in half-integral weight*, J. Théor. Nombres Bordeaux **26** (2014), no. 01, 233–251.
· *Explicit applications of Waldspurger's Theorem*, LMS J. Comp. Math. **16** (2013), 216–245.
· *On Shimura's decomposition*, Int. J. Number Theory **9** (2013), no. 06, 1431–1445.
· *Eigenforms of Half-Integral Weight*, PhD thesis, University of Warwick, July 2012.
· (Joint with B. Sury) *Some vanishing sums involving binomial coefficients in the denominator*, Albanian J. Math. **2** (2008), no. 1, 27–32.

Conference Proceedings

· *$\pi/4$-Congruent number problem*, WINJ2022 Conference proceedings, October 2022.
· *Hecke Algebra of level p^2*, WINJ2021 Conference proceedings, October 2021, 69–79.

- *Hecke Algebras, New Vectors and New Spaces*, The computational and Theoretical aspects of elliptic curves, Mathematical Lectures from Peking University (2019), 69-79.
- *On distinguishing representations of different conductor*, WINJ11 Conference proceedings, October 2018, 77–81.
- *Newforms of half-integral weight*, WINJ10 Conference proceedings, October 2017, 95–104.
- *Minus space of half-integral weight forms* Proceedings of the 10th Fukuoka Symposium on Number Theory, 2016.
- *Hecke algebras, new vectors and characterization of the new spaces*, RIMS Kôkyûroku 1973, November 2015, 55–63.
- *Hecke algebras, new vectors and new spaces*, WINJ8 Proceedings, October 2015, 90–100.

Teaching

- **Lecturer** Graduate Course in Modular Forms, Fall-Winter 2022.
- **Lecturer**, Linear Algebra I/II, Calculus I/II, Tokyo Institute of Technology, Fall 2018–Current.
- **Lecturer**, Topics in Number Theory, University of Warwick, Fall 2013.

Public outreach

- **Speaker** at *Global Seminar*, Meizen High School Fukuoka as a part of *JSPS Science Dialogue Program*, October 2015.
- **Magazine Articles**:
  - Brillante 2, Office for the Promotion of Gender Equality, Kyushu University, 2016
  - JSPS Quaterly, No. 54, published by JSPS, Winter 2015

External Fundings and Awards

- **FY2018 Grant-in-Aid for Early-Career Scientists** as a Prinicipal Investigator; Project number: 18K13396, Research area: Algebra, Budget: 3,300,000 JPY, Period: 2018/04/01–2023/03/31.
- **FY2014 JSPS Postdoctoral Fellowship for Foreign Researchers** and **FY2014 Grant-in-Aid for JSPS fellows**, awarded by JSPS, under host researcher Professor Masanobu Kaneko; Project number: 14F04319, Research area: Algebra, Budget: 2,300,000 JPY, Period: 2014/04/25–2017/03/31.
- **INSPIRE Faculty award**, by Indian National Science Academy (INSA). This is a tenure-track position with research and travel grant for 5 years which I had to decline to take up the JSPS.
- **Technion Postdoctoral Fellowship**, awarded by Technion - Israel Institute of Technology for a period of 12 months which I had to decline to take up the JSPS.
- **Best Talk Award**, awarded by London Mathematical Society during Graduate Student Meeting 2011.
- **Warwick Impact Award** under Professor Samir Siksek, Research area: Number Theory, covers stipend and travel grants for the academic year 2011–2012.
- **Warwick Postgraduate Research Scholarship**, awarded by University of Warwick, covers stipend and fees for the period 2008–2011.
- **Overseas Research Students Award (ORS) and University of Nottingham Scholarship 2008**, awarded by University of Nottingham, covers stipend and tuition fees for three years. I had to decline this to join PhD program at University of Warwick.
- **Junior Research Fellowship**, awarded by Indian Statistical Institute, covers stipend and contigency grant for 2007–2008.
- **Certificate of Junior Research Fellowship in Mathematical Sciences**, awarded by the Council of Scientific and Industrial Research Fellowship Scheme of the Government of India, 2007.

· **NBHM M. Sc. Scholarship** awarded by the National Board for Higher Mathematics, Government of India for the period 2005–2007.

Recent Seminar and Conference Talks

Talks outside Japan

· September 19, 2021: **Invited speaker** at Modular forms: Conference in honour of Prof. B. Ramakrishnans 60th birthday (via Zoom).
· May 06, 2020: **Invited speaker** at International Seminar on Automorphic Forms (via Zoom).
· March 14, 2019: **Invited speaker** at International Conference on Number Theory, IISER Thiruvananthapuram.
· February 13, 2019: **Invited speaker** at Number Theory Conference, IMSc, Chennai.
· June 25, 2017: **Poster presentation** at the conference Automorphic forms on reductive groups and their covers: In honour of Solomon Friedberg", ETH Zurich.
· October 24–25, 2017: **Invited lecture series** at Department of Mathematics, POSTECH, Korea.
· April 07, 2016: **Invited speaker** at *Explicit Methods in Number Theory: Conference in Honour of John Cremona's 60th Birthday*, University of Warwick.
· December 12, 2014: **Invited speaker** at China-Indo Conference on Theoretical and Computational aspects of Elliptic curves, BICMR, Beijing.

Talks within Japan

· January, 30, 2019: **Invited speaker** at *Number Theory Mini Workshop* at Sophia University.
· July, 19, 2018: **Invited speaker** at *Number Theory Mini Workshop* at Kanazawa University.
· March 23, 2018: **Invited speaker** at *Automorphic forms/representaions on covering groups*, Okayama University.
· March 13, 2018: **Invited speaker** at *Analytic Number Theory Seminar*, RIKEN, Wako.
· February 22, 2018: Speaker at *11th Young Mathematicians Conference on Zeta Functions*, Ehime University.
· January 17, 2018: Speaker at *RIMS Workshop on Modular forms and Automorphic Representation*, RIMS Kyoto.
· May 19, 2017: **Invited speaker** at *Waseda Number Theory seminar*, Waseda University.
· February 21, 2017: **Invited speaker** at *The 10th Young Mathematicians Conference on Zeta Functions*, Nagoya University. Kyushu University.
· July 15, 2016: **Invited speaker** at *Analytic Number Theory Seminar*, Nagoya University. APU Beppu.
· May 1, 2015: **Invited speaker** at *Waseda Number Theory seminar*, Waseda University.
· February 21, 2015: **Invited speaker** at *Workshop on Computational Number Theory with Implementations 2015*, Kyushu University.
· February 3, 2015: **Invited speaker** at *RIMS Workshop on Modular forms and Automorphic Representations*, RIMS Kyoto.

Languages

· **Native**: Bengali, English, Hindi
· **Intermediate**: Japanese
· **Beginner**: German