



TO MAGNIFICO RETTORE OF UNIVERSITA' DEGLI STUDI DI MILANO

ID CODE __6301_____

I the undersigned asks to participate in the public selection, for qualifications and examinations, for the awarding of a type B fellowship at Dipartimento di Matematica

Scientist- in - charge: Prof. Luperi Baglini Lorenzo

[Name and surname]

CURRICULUM VITAE

PERSONAL INFORMATION

Surname	Goswami
Name	Sayan

PRESENT OCCUPATION

Appointment	Structure
01/04/2022-present	Postdoc at the Institute of Mathematical Sciences, Chennai, India

EDUCATION AND TRAINING

Degree	Course of studies	University	year of achievement of the degree
Degree	Ph.D. in Combinatorics		
Specialization	Ramsey theory		
Ph.D.	Combinatorics (Ramsey theory using ultrafilter techniques) Thesis: A study of some Ramsey theoretic configurations on commutative semigroups	University of Kalyani	2023 Award date: 07/12/2023



	Advisor: Prof. Dibyendu De		
Master	Mathematics (Algebra+Analysis+Discrete Mathematics+Probability theory)	University of Kalyani	2016
Degree of medical specialization	NA		
Degree of European specialization	NA		
Other			

REGISTRATION IN PROFESSIONAL ASSOCIATIONS

Date of registration	Association	City
01/04/2022	The Institute of Mathematical Sciences	Chennai, India

FOREIGN LANGUAGES

Languages	level of knowledge
English	Standard

AWARDS, ACKNOWLEDGEMENTS, SCHOLARSHIPS

Year	Description of award
2016	UGC NET fellowship: This is a national award, which funds for pursuing Ph.D. in any national institution in India.
2023	NBHM Postdoctoral fellowship 2023: This is a national award, which funds for carrying out postdoctoral research work in any national institution in India.

TRAINING OR RESEARCH ACTIVITY

<p>Description of activity: My research primarily focused on Ramsey-theoretic-study using methods from Ultrafilter-Techniques. In one of my recent work with Luperi Bagilini and Sourav Patra, we have studied properties of ultrafilters witnessing the exponential Schur pattern $\{x,y,x^y\}$. We found the polynomial extension of the key theorem of Di Nasso and Ragosta, which implies the existence of monochromatic, infinite exponential patterns.</p>
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PROJECT ACTIVITY

Year	Project
	NA
	NA

PATENTS

Patent
NA
NA

CONGRESSES AND SEMINARS

Date	Title	Place
February 11-12, 2023	Chennai-Tirupati Number theory conference	Chennai Mathematical Institute
March 8, 2019	Current trends in Mathematics and its applications (NSCTMA-2019)	Jadavpur University
February 21, 2019	Recent advances in Mathematics and its applications	University of Calcutta

PUBLICATIONS

Books
[title, place, publishing house, year ...]
[title, place, publishing house, year ...]
[title, place, publishing house, year ...]

Articles in reviews:
1. P. Debnath, and S. Goswami: Combined exponential patterns in multiplicative IP^* sets, New York Journal of Mathematics, 30 (2024) 38–41.
2. S. Goswami, S. K. Patra, and L. Luperi Baglini: Polynomial extension of the Stronger Central Sets Theorem, The Electronic Journal of Combinatorics, 30 (4), (2023) P4.36.
3. A. Chakraborty and S. Goswami: Polynomial extension of some symmetric partition regular structures, Bull. Sci. Math., Under second revision.
4. S. Goswami: Product of difference sets of the set of primes, Proc. Amer. Math. Soc., 151, Number 12, December 2023, Pages 5081–5086.
5. S. Goswami and J. Poddar: Central Sets Theorem along filters and some combinatorial consequences, Indagationes Mathematicae, 33(6), November 2022, 1312-1325.



6. A. Chakraborty and S. Goswami: Hales-Jewett type configurations in small sets, European Journal of Combinatorics, 104 (2022) 103539.
7. A. Chakraborty and S. Goswami: An analogue to infinity Hales-Jewett theorem, INTEGERS, arXiv:2012.03934, To appear.
8. D. De, P. Debnath and S. Goswami: Elementary characterization of essential F sets and its combinatorial consequences, Semigroup Forum, 104, pages 45–57 (2022).
9. P. Debnath and S. Goswami: Abundance of arithmetic progressions in some combinatorially rich sets by elementary means, INTEGERS, 21(2021), #A105.
10. . P. Debnath and S. Goswami: Dynamical IP \star sets in weak rings, Topology and its Applications, 303, November 2021, 107854.
11. P. Debnath and S. Goswami: Dynamical characterization of central sets along filter, Topology and its Applications 300 (2021), 107777.
12. S. Goswami: Combined zigzag structures in dynamical IP \star sets, Topology and its Applications (2021), 300 , 107752.
13. S. Goswami and S. Jana: A combinatorial viewpoint on preserving notion of largeness and an abstract Rado theorem, INTEGERS 21 (2021), #A72.
14. S. Goswami: Cartesian product of some combinatorially rich sets, INTEGERS (20)2020 #A64.
15. A. Chakraborty and S. Goswami: Richness of arithmetic progressions in commutative semigroups, INTEGERS 20(2020), #A24.
16. S. Goswami and S. Jana; Abundance of progressions in a commutative semigroup by elementary means, Semigroup forum, 101, 400–405(2020).
17. P. Debnath and S. Goswami; Applications of the Hales–Jewett theorem near zero, Semigroup forum, 101, 237–241(2020).
18. A. Chakraborty and S. Goswami; Polynomial central set theorem near zero, Semigroup forum, 102, 568–574 (2021).
Submitted articles:
1. S. Goswami, L. Luperi Baglini, and S. K. Patra: Exponential ultrafilters and patterns in Ramsey theory, arXiv:2308.02807.
2. . Bhanja and S. Goswami: An improved threshold for the number of distinct intersections of intersecting families, arXiv:2211.11341.
3. J. Bhanja and S. Goswami: A note on distinct differences in t-intersecting families, arXiv:2211.04081.

Congress proceedings
[title, structure, place, year]
[title, structure, place, year]
[title, structure, place, year]

OTHER INFORMATION

I have contributed in two papers with **Prof. Luperi Baglini Lorenzo**. The first one has been published in the



Electronic Journal of Combinatorics, where we found the polynomial extension of the stronger Central Sets Theorem. Where the second one (<https://arxiv.org/abs/2308.02807>) is a more interesting piece of work, where we investigated the exponential patterns in Ramsey theory. We have studied exponential ultrafilters and figured out, how rich they are in sense of containing exponential patterns.

Another work focuses on a problem in additive combinatorics: How large a set $(A-A)$ can be? If A has positive upper Banach density, then A . Fish proved, there exists a natural number k such that $kN \setminus \text{subset } (A-A)$. We proved a more general result, and as a result we have, there exists a natural number k such that $kN \setminus \text{subset } (P-P)$. Recently this work has been published in Proc. AMS. (<https://www.ams.org/journals/proc/2023-151-12/S0002-9939-2023-16478-3/home.html>).

Declarations given in the present curriculum must be considered released according to art. 46 and 47 of DPR n. 445/2000.

The present curriculum does not contain confidential and legal information according to art. 4, paragraph 1, points d) and e) of D.Lgs. 30.06.2003 n. 196.

Please note that CV WILL BE PUBLISHED on the University website and It is recommended that personal and sensitive data should not be included. This template is realized to satisfy the need of publication without personal and sensitive data.

Please DO NOT SIGN this form.

Place and date: __Chennai_____, _____