Aganit

Department of Mathematics, BITS-Pilani, Hyderabad Campus
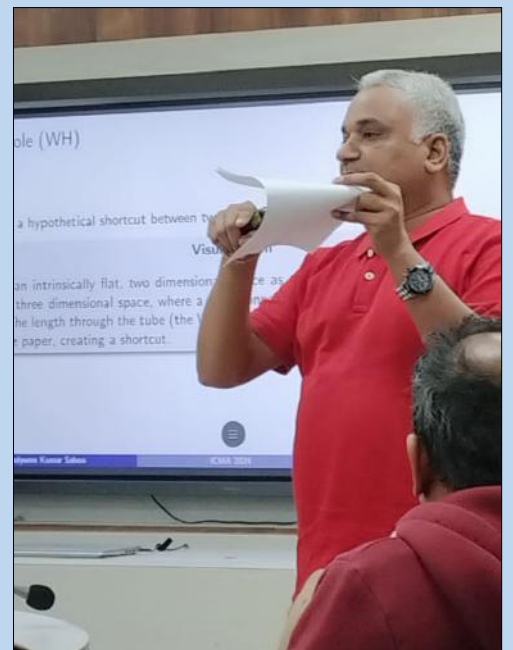
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National Conference on the Recent Developments in Mathematics (NCRDMS 2024) at University of Hyderabad during 12th-14th February 2024

Prof. P.K. Sahoo delivered a talk titled "Wormholes: Science or science fiction"

Prof. B. Mishra delivered a talk titled "Accelerating cosmological models in teleparallel gravity with Gauss-Bonnet term"

Dr. Santanu Koley delivered a talk titled "Intergal equation techniques and boundary element method-structural integral for wave-structure interaction problems"

Dr. K. Bhargav Kumar delivered a talk titled "A Study of nonlinear renewal equations with diffusion

Prof. P.K. Sahoo

delivered a talk at International Conference on Mathematics and Applications' held at Mata Sundri College for Women (University of Delhi), Delhi during 10th - 12th January, 2024.

Prof. Sharan Gopal

delivered an Invited talk at International Conference on Mathematics for Data Science and Dynamics - 2024 at Rajagiri School of Eng. & Tech., Kerala during 1st - 3rd February 2024.
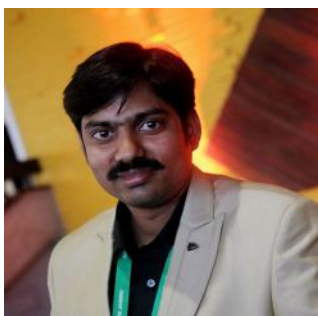
Prof. Manish Kumar

delivered an invited talk on "Fractional Fourier Transforms and its Applications" in the workshop on "Applied and Computational Complex Analysis" organized by the Department of Mathematics, IIT Hyderabad on 21st February, 2024.

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Prof. Sumit Kumar Vishwakarma delivered invited talks

at **Tokyo University of Science** on 11ᵗʰ January 2024,

titled "*A cell-centered Implicit Finite difference scheme to model seismic wave propagation in 2D and 3D acoustic media*"

&

at **Workshop on Waves and Vibrations** held at **Tokyo University of Technology** on 17ᵗʰ January 2024,

titled "*Dispersive constraints of Anti-plane Shear waves in a strain-gradient LOH model under in-flexible boundary plane and initial pressure*"

Ph.D. AWARDED

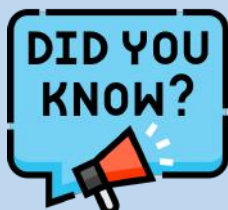|	
Scholar:	**Mr. Agrawal Amarkumar Shyamsunder**
Ph.D. thesis:	"*Bouncing Scenario and Cosmic Dynamics in Modified Theories of Gravity*"
Supervisor:	**Prof. Bivudutta Mishra**
Final Viva-voce:	6ᵗʰ February, 2024

DID YOU KNOW?

- There are exactly 10!(factorial) seconds in six weeks.

- There is a rational between any two irrational numbers and an irrational between any two rational numbers, still the cardinality of the irrationals is way larger than the rationals.

National Conference on the Recent Developments in Mathematics (NCRDMS-2024)
at University of Hyderabad during 12th - 14th February 2024

Paper presentations at NCRDMS-2024

Ruddarraju Amrutha presented a paper titled "Normality theorem for elementary symplectic groups"


Sangeeta Dhawan presented a paper titled "Hadamard fractional calculus on Nabla time scales"

Attendees at NCRDMS-2024

Anshid Aboobacker, A Gurucharan, Karthik Tathe, Suman Prabha Yadav, Sunil Rampuria

International Conference on Mathematics for Data Science & Dynamics (ICMDD) at Rajagiri School of Engineering & Technology (Autonomous), Cochin, Kerala during 1st - 3rd February 2024
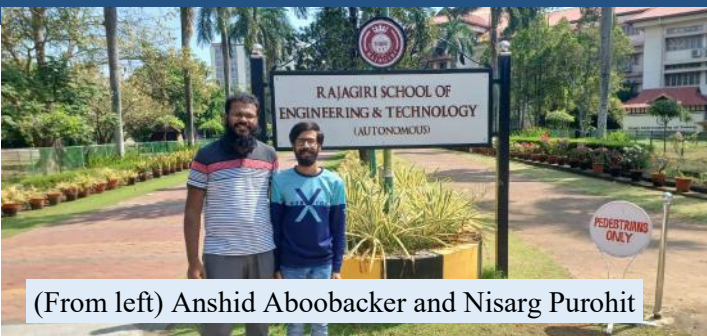
(From left) Anshid Aboobacker and Nisarg Purohit

Anshid Aboobacker presented a paper on "k-type chaos of Z^d actions" and **Nisarg Purohit** presented a paper on "Lipschitz shadowing property for topological spaces".

Latest Advances in Computational Applied Mathematics (LACAM) at IISER Thiruvananthapuram during 21st-24th February 2024

(From left) Mayuri Verma and Shivangi Joshi

Mayuri Verma presented a paper titled "Optimal control of weights in weighted least squares kinetic upwind method"

Shivangi Joshi presented a paper titled "A nonconforming least-squares spectral element method for Stokes problems with discontinuous viscosity and singular forces"

CONFERENCES AND WORKSHOPS

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International Conference on Emerging Frontiers in Nonlinear Complex Systems, Computational Intelligence and their Applications at Vellore Institute of Technology, Chennai during 7th - 9th February 2024

At this online conference,

Kailash Swami presented a paper on "Scattering of Water Waves by Thick Porous Breakwater in the Presence of Ocean Current""

Santanu Kumar Dash presented a paper on "Iterative boundary element method for modeling an inverted T-type porous barrier in presence of ocean currents

Subhendu Paul presented a paper on "Effect of Ocean Current on Interaction of Water Waves with Perforated Barrier Placed Over Undulated Seabed"

Fourth International Conference on Advances in Electrical, Computing, Communications and Sustainable Technologies (ICAECT 2024) at Shri Shankaracharya Technical Campus, Bhilai during 11th - 12th January 2024

Vipin V presented a paper on "Power Generation Prediction and Optimization of Parameters of Piezoelectric Wave Energy Converter Devices" at this online conference.

Novel Materials and Technologies for Energy and Environmental Applications (NMTEA) at BITS Pilani, Hyderabad Campus during 17th-18th February 2024

Amya Ranjan Ray presented a paper titled "Performance of Piezo-beam structure energy harvester with flow-induced vibration: mathematical modeling and simulation" at this international conference
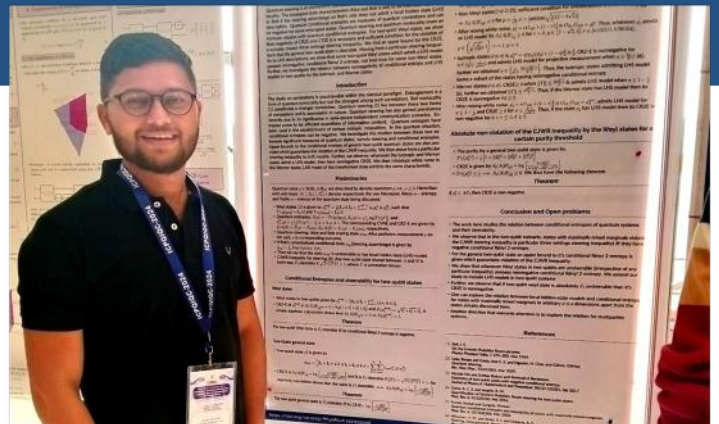
International Conference on Photonics, Quantum Information, and Quantum Communication (ICPQIQC 2024) during 29th January - 2nd February 2024 at S N Bose National Centre for Basic Sciences, Kolkata
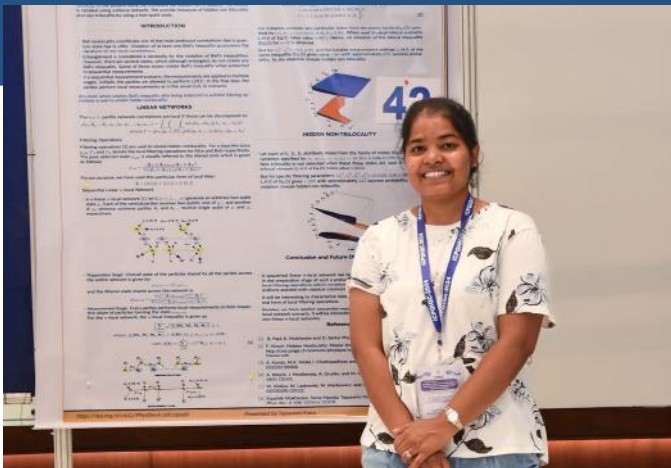
Tapaswini Patro presented a poster titled "Hidden non-n-locality in linear networks"

Komal Kumar presented a poster titled "Quantum conditional entropies and steerability of states with maximally mixed marginals "

◆**A. S. Agrawal,** S. Chakraborty, **B. Mishra**, J. Dutta and W. Khyllep. *"Global phase space analysis for a class of single scalar field bouncing solutions in general relativity"* The European Physical Journal C, vol. 84, p.56, Jan. 2024. *

◆**D. S. Rana, R. Solanki** and **P.K. Sahoo**. *"Phase-space analysis of the viscous fluid cosmological models in the coincident f(Q) gravity"* Physics of the Dark Universe, vol. 43, 101421, Feb. 2024.*

◆N. Kumar and **F. P. Barbhuiya**. *"Transient behavior of a discrete time renewal population growth model subject to geometric catastrophes "* Journal of Industrial and Management Optimization, Jan. 2024.

◆N.S. Kavya, G. Mustafa, V. Venkatesha and **P.K. Sahoo**. *"Exploring wormhole solutions in curvature-matter coupling gravity supported by noncommutative geometry and conformal symmetry"* The Chinese Journal of Physics, vol. 87, p. 751-765, Feb. 2024.

◆R. Dutta, S. Das, N. Bhengra, **S. K. Vishwakarma** and S. K. Das. *"Nonlocal effect on shear wave propagation in a fiber-reinforced poroelastic layered structure subjected to interfacial impulsive disturbance"* Soil Dynamics and Earthquake Engineering, vol. 176, 108307, Jan. 2024. *

◆**S.A. Kadam**, S. V. Lohakare and **B. Mishra**. *"Dynamical complexity in teleparallel Gauss-Bonnet gravity"* Annals of Physics, vol. 460, 169563, Jan. 2024. *

◆**S. S. Mishra, A. Kolhatkar** and **P.K. Sahoo**. *"Big Bang Nucleosynthesis constraints on f(T,𝒯) Gravity"* Physics Letters B, vol. 848, 138391, Jan. 2024.*

◆V. Venkatesha, C. C. Chalavadi, N. S. Kavya and **P.K. Sahoo**. *"Wormhole Geometry and Three-Dimensional Embedding in Extended Symmetric Teleparallel Gravity"* New Astronomy, vol. 105, 102090, Jan. 2024.

* indicates Q1 journal

KNOW A MATHEMATICIAN

Paul Erdős
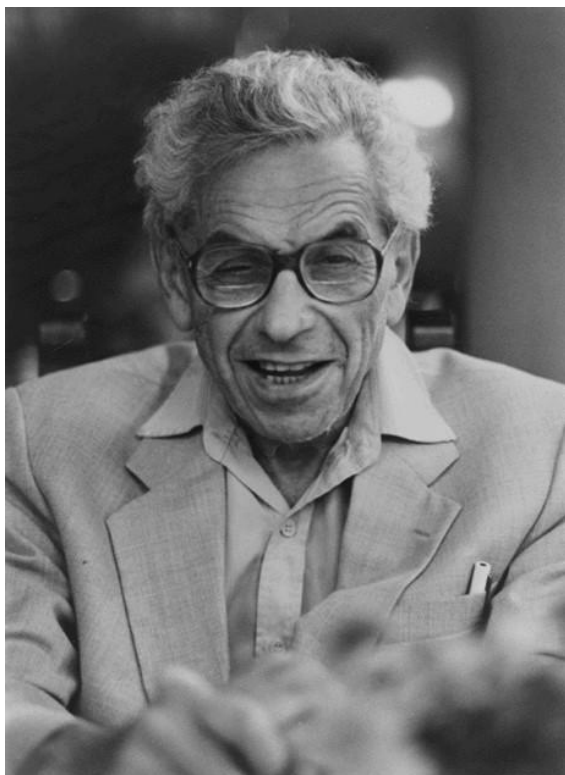
Paul Erdős, the Hungarian-born Jewish mathematician, led a life deeply intertwined with mathematics. Born in Budapest in 1913, his early passion for math was nurtured by his father. Despite facing anti-Semitism, he earned a scholarship to the University of Budapest at just 17. By 20, Erdős had completed his undergraduate studies and offered an elementary proof of Chebyshev's theorem, earning both his PhD and B.Sc. that same year. He made significant contributions to number theory, combinatorics, and graph theory, solving numerous conjectures and problems in these fields. Erdős's legacy extends beyond his own work; he was known for nurturing young mathematicians like Terence Tao, providing recommendations that shaped their careers. With an astonishing collaboration with around 500 mathematicians and over 1500 published papers, his eccentric lifestyle, characterized by a suitcase and a nomadic existence, saw him living with colleagues around the world, dedicating nearly all his waking hours to mathematics. His profound impact on the mathematical community is still felt today, with scholars proudly citing their Erdős number as a mark of academic collaboration

Read more about him in the book The Man Who Loved Only Numbers: The Story of Paul Erdős and the Search for Mathematical Truth by Paul Hoffman .

It is not enough to be in the right place at the right time. You should also have an open mind at the right time.

A twenty-year journey in Mathematics with Dr. Kota

Dr. Kota Venkata Ratnam is a respected mathematician and educator with a career spanning over two decades. His journey is adorned with academic achievements, including degrees in M.Sc, M.Tech, and Ph.D., each milestone a testament to his unwavering dedication to the field.

As an Associate Professor at the prestigious Birla Institute of Technology & Science in Hyderabad, Dr. Kota displays a passion for bringing mathematics to life within his classroom. With a range of captivating topics such as Advanced Calculus and Neural Networks, he ensures that the learning experience for his students is not only enriching but also accessible. Through his engaging teaching methods, he transforms abstract theories into tangible concepts, sparking curiosity and igniting a love for the subject.

Beyond the confines of traditional teaching, Dr. Kota plays a pivotal role in the academic machinery. His involvement in essential tasks such as planning schedules and coordinating BITSAT underscores his commitment to the smooth functioning of educational processes. Moreover, his scholarly pursuits extend into the realm of research, where he delves into captivating areas such as Dynamic Optimization, Mathematical Modeling, and Neural Networks. Driven by intellectual curiosity, his endeavors have culminated in the publication of 15 articles, each contributing to the ever-evolving landscape of mathematics.

Dr. Kota's impact is not confined to the academic sphere alone; it extends into the lives of his students. As a mentor, he is currently guiding Sushil Pathak on his doctoral journey, providing invaluable support and direction. Additionally, under his meticulous supervision, Mrs. Gopishetty Shirisha and Mrs. P. Lalitha have successfully completed their Ph.D., marking significant milestones in their academic pursuits. This further exemplifies his commitment to nurturing the next generation of scholars.

Moreover, Dr. Kota's influence transcends the boundaries of the classroom. He generously shares his expertise

Prof. Kota Venkata Ratnam

with professionals in the corporate world, offering courses on practical subjects such as Probability and Statistics. His approachable demeanor and dedication to making mathematics enjoyable have earned him a reputation as not just a great teacher, but also a positive influence within broader educational circles. Through his efforts, he bridges the gap between theory and application, equipping his students with the tools they need to succeed in diverse fields.

In essence, Dr. Kota Venkata Ratnam embodies the essence of a passionate educator and a dedicated mathematician. His impactful contributions to academia, coupled with his unwavering commitment to student success, serve as a beacon of inspiration for all. Whether within the classroom or beyond, his influence continues to shape the minds of future mathematicians and professionals, leaving an indelible mark on the world of education. You can see his profile here.

Exploring Interdisciplinary Frontiers with Dr. Praveen Kumar

Prof. P.T.V Praveen Kumar

Dr. P.T.V Praveen Kumar, an Associate Professor at BITS PILANI, Hyderabad Campus since 2009, is a dedicated researcher with a strong focus on interdisciplinary studies. His journey in academia began with a Ph.D. from Sri Krishnadevaraya University, Anantapur, Andhra Pradesh, where he studied "Critical Comparisons of Various Networks with Respect to Different Performance Measures" in the field of Statistics. This early work laid the foundation for his future endeavors in research.

Over the years, Dr. Praveen Kumar has actively collaborated with different departments, showcasing his versatility and commitment to exploring varied domains. One significant collaboration was with the Department of Biology, where he contributed to research on Autism Spectrum Disorder (ASD). This neurological disorder, particularly affecting children, poses unique challenges, especially in the Indian context. Dr. Praveen Kumar's research in this area aimed to identify the risk factors associated with ASD, providing valuable insights into the disorder's prevalence and potential mitigation strategies.

In his role as a mentor, Dr. Praveen Kumar has guided several Ph.D. students, each focusing on distinct yet impactful research areas. His initial guidance to a student in Time Series analysis addressed the risks inherent in Motor insurance claims. This work showcased his practical approach to statistical analysis, offering solutions to real-world challenges.

Currently, Dr. Praveen Kumar is supervising a Ph.D. student working on Generative AI, an area gaining significant traction due to its potential applications across various fields. This research combines the power of Generative AI with statistical techniques to tackle issues in the education sector. By leveraging Generative AI's ability to create new data from existing datasets, coupled with statistical rigor, the aim is to develop innovative solutions for educational challenges. This forward-thinking research not only demonstrates Dr. Praveen Kumar's adaptability to emerging technologies but also his commitment to advancing education through interdisciplinary approaches.

Beyond his Ph.D. students, Dr. Praveen Kumar actively engages in delivering Work-Integrated Learning Program (WILP) courses. These courses cater to working professionals, highlighting his dedication to both traditional on-campus education and meeting the needs of a broader audience. By imparting his knowledge and expertise through these programs, Dr. Praveen Kumar contributes to bridging the gap between academia and industry, ensuring that professionals receive relevant and up-to-date training.

Dr. P.T.V Praveen Kumar's career exemplifies a blend of rigorous statistical analysis, interdisciplinary collaboration, and a forward-looking approach to research. From his early work on network performance measures to his current exploration of Generative AI in education, he continues to push boundaries and contribute valuable insights to various fields. His commitment to mentoring students and delivering industry-relevant courses underscores his dedication to both academic excellence and practical applications, making him a valuable asset to BITS PILANI, Hyderabad Campus, and the broader research community. You can see his profile here.

Dr. Pratishtha Shukla
ID Number: 2011B4A3634H
Research Scientist, Computational Science Engineering at Oak Ridge National Laboratory, Tennessee, USA

She specializes in modeling and simulating cyber-physical systems, particularly the power grid, emphasizing optimization and control. Her expertise spans optimization, control, power systems, computing, probability, statistics, game theory, and mathematical modeling, complemented by communication and networking knowledge. With dual degrees in EEE and MSc, she pursued a PhD at North Carolina State University, later joining Oak Ridge National Laboratory (ORNL) as a Postdoctoral Research Associate. Currently, she serves as a Staff Scientist at ORNL, leveraging her Mathematics and EEE background to tackle significant challenges for the US Department of Energy (DoE). Graduating from BITS Pilani Hyderabad Campus in 2016 with a B.E. in EEE and MSc. Mathematics, her Master's Thesis focused on "Coalitional Formation Approach in Game-Theoretic Modeling Applied to Cognitive Radios," supervised by Prof. Dipak Satpathi.

Graduating in 2017 with a B.E. in Computer Science (Gold medalist) and M.Sc. in Mathematics from BITS Pilani Hyderabad campus, he delves into programming languages, particularly program verification and synthesis. By reducing the cognitive burden in automated verification, he strives to empower programmers to verify their code. He employs data-driven logic learning techniques to replace expert assistance in software verification. With numerous publications, awards, services, and industry experience, he pursues his Ph.D. in Computer Science under the guidance of Dr.Madhusudan Parthasarathy. His research seeks to streamline automated software verification by learning logical expressions from data, bridging programming languages, formal methods, and symbolic machine learning. Simultaneously, he embraces teaching, aspiring to cultivate an equitable and inclusive classroom environment where students' performance is solely influenced by effort and mastery of the subject matter.

Adithya Murali
ID Number: 2012B4A70498H
Ph.D scholar at Illinois Urban– Campaign, USA.

Ahana Ghosh
ID Number: 2014B4A70525H
Ph.D scholar at Max Planck Institute of Software Systems

Ms. Ahana Ghosh earned her B.Tech. in Computer Science and M.Sc. in Mathematics from BITS Pilani Hyderabad Campus, in 2019. Drawing upon her mathematical background, she embarked on research in Artificial Intelligence (AI). Currently a doctoral candidate in the Machine Learning group at the Max Planck Institute for Software Systems, her focus is on AI-driven systems to revolutionize education, particularly in computer science. Notable projects include blockspython.com, offering personalized learning tools. For Ahana, this fusion of mathematics, AI, and education isn't just professional but also deeply personal. Her capacity to integrate these disciplines enables her to make meaningful contributions while pursuing her passions. Dedicated to pushing boundaries in this intersection, she aims to unlock new learning avenues and empower individuals from diverse backgrounds, fostering a more equitable society. Ahana is committed to advancing knowledge and enriching educational experiences through her interdisciplinary work.

Dr. Kottala Panduranga

Asst. Professor, Dept. of Mathematics
School of Advanced Sciences, VIT-AP,
Andhra Pradesh

Driven by an interest in coastal hydrodynamics and integral equations, his research journey has been marked by significant contributions. He is the author of seven papers published in esteemed SCI journals, shedding light on crucial aspects of his field. His findings have garnered attention at both national and international conferences, emphasizing the relevance and impact of his work within the academic community. In addition to his scholarly pursuits, he served as an assistant professor at Vignan's Foundation for Science, Technology & Research (Deemed to be University), Guntur, for more than a year, and at Chaitanya Bharathi Institute of Technology (CIBT), Hyderabad, for nine months before moving to his present position. His commitment to research excellence was recognized with the esteemed award for the best oral/poster presentation at NCASM-2020, sponsored by the American Institute of Physics (AIP).

PhD Thesis: Mathematical Techniques for Water Wave Interaction with Porous and Flexible Structures

Supervisor: Prof. Santanu Koley/Prof. Dipak K Satpathi

Year of Conferral : 2022

Dr. G Shirisha

Associate Professor, Dept. of Mathematics,
Stanley College of Engineering and Technology for Women,
Hyderabad, Telangana

Her areas of research expertise are mathematical modelling, neural networks, dynamical systems, and biological models. She focused on the dynamical behaviour of the delay neural network model. Investigated how various delays affected the dynamic behaviour of both autonomous and non-autonomous cooperative and supportive neural network systems. Discretized the system and applied predictive dynamic techniques to get the desired output by restricting the inputs. Identified the real-time applications of the models studied. Presently working on infectious disease models. She also has a total teaching and administrative experience of 15 years. She possesses a deep understanding of pedagogy and has honed her skills in effectively conveying complex concepts to students. This expertise would also indicate her dedication to education and mentoring, which can complement her research work by fostering the development of future scientists and researchers in the field.

PhD Thesis: Qualitative Study of Influence of Transmission and Intra-Connection Propagation Delays on a Cooperative and Supportive Neural Network.

Supervisors: Prof. K. Venkata Ratnam

Year of Conferral : 2022

BITS Pilani
Hyderabad Campus
Department of Mathematics

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Contact us: maths.bphc.newsletter@gmail.com