BIRBAL SAHNI INSTITUTE OF PALAEOSCIENCES, LUCKNOW

BSIP/RDCC/New Prj.25-29/2025-26/RD-07 **Date: 23.06.2025**

List of Thrust Areas and Problem Statements approved by Chairman, Research Advisory Council and Chairman Governing Body for the FY April 2025 – March 2029

Thrust Area	**Problem Statements**	**Personnel**
Thrust Area 1: **Early Life and Environment: Evidence from Indian Precambrian Basins** **Coordinator:** Dr. Veeru Kant Singh, Scientist 'E' **Co-Coordinator:** Dr. Santosh K. Pandey, Scientist 'D'	**Problem Statement 1:** *How did early life and oxygenic photosynthesis contribute to the development of banded iron formations (BIF)*	Dr. Arif Husain Ansari Dr. Yogmaya Shukla,
	Problem Statement 2: *How and when did the eukaryotes evolve and what was the pivotal role of associated environment in Proterozoic Era.*	Dr. Veeru Kant Singh, Dr. Santosh Kumar Pandey, Dr. Arif Husain Ansari, Dr. Yogmaya Shukla, Dr. Arvind K Singh
	Problem Statement 3 *How evolution of the Earth's surface environment lead to the photosynthetic oxygenation of the ocean-atmosphere system on the Earth?*	Dr Arvind Kumar Singh, Dr. Gurumurthy GP Dr. Adrita Choudhari Dr. Sabyasachi Mandal
	Problem statement 4: *Exploring magnetic studies to confirm the meteorite impact origin for the India's oldest potential impact craters.*	Dr. Mohammad Arif
Thrust Area 2: **Biostratigraphy, climatic and biotic events, basin correlation and unconventional hydrocarbon plays in the Palaeozoic and Mesozoic sequences** **Coordinator:** Dr Srikanta Murthy, Scientist E **Co-Coordinator:** Dr. Anju Saxena, Scientist E	**Problem Statement 1:** *Resolving Stratigraphic Disparities and Tectonic Histories in the NW Tethyan Himalaya: Insights of early Palaeozoic (Cambrian-Ordovician/Early Silurian) with integrating Kinnaurthe Kumaon-Garhwal Region*	Dr. Ranveer Singh Negi
	Problem Statement 2: *Proposal of a revised palynostratigraphic zonation scheme and chemostratigraphy for the Indian late PaleozoicGondwana sequence for insights into age, climate and tectonic processes*	Dr. Pauline Sabina K Dr. Gurumurthy G.P

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	Problem Statement 3: *Unravelling Plant ecosystem dynamics, their forcing mechanisms and comprehend marine incursions in continental Gondwana sequences.*	Dr. Srikanta Murthy Dr. Anju Saxena Dr. Suresh K. Pillai Dr. Deepa Agnihotri Dr. Neha Aggarwal Dr. Neelam Das
	Problem Statement 4: *Assess and delineate the events of biotic crisis- recovery and subsequent radiation of biota across the major boundary events and establish/revise the bio- and event stratigraphic framework across the continental and marine Palaeozoic and Mesozoic sequences*	Dr. Srikanta Murthy Dr. Anju Saxena Dr. K Pauline Sabina Dr. Suresh K. Pillai Dr. Deepa Agnihotri Dr. Neha Aggarwal Dr. Abha Singh Dr. Neelam Das
	Problem Statement 5: *Unconventional plays in the Indian sedimentary basin*	Dr. Neha Aggarwal Dr. Divya Kumari Mishra
	Problem Statement 6: *Evidence for burning of Gondwana*	Dr. Srikanta Murthy Dr. Anju Saxena Dr. S Suresh K Pillai Dr. Deepa Agnihotri Dr. Neha Aggarwal Dr. Divya Mishra
Thrust Area 3: **Biotic turnover(s) and palaeoenvironmental change(s) during the end Cretaceous and Cenozoic interval in India.** **Coordinator:** Dr Hukam Singh, Scientist E **Co-Coordinator:** Dr. Poonam Verma, Scientist E	**Problem Statement 1:** *Geodynamic and biotic evolution of the Indian Plate during the Late Cretaceous and Early Paleogene*	Dr. Mohammad Arif Dr. Shreya Mishra Dr. Adrita Choudhuri Dr. Prem Raj Uddandam Dr. Arvind Kumar Singh Dr. Vivesh Vir Kapur
	Problem statement 2: *Assessment of Paleogene-Neogene carbonate and lignite-bearing deposits of India pertaining to biotic and palaeoenvironmental transitions across various climatic events and a notion on the future energy security*	Dr. Poonam Verma Dr. Runcie Paul Mathews Dr. Suman Sarkar
	Problem Statement 3: *Reconstructing past climates, ecological shifts, and biodiversity patterns from the Late Cretaceous to Neogene Period.*	Dr. Hukam Singh Dr. Poonam Verma Dr. Gaurav Srivastava Dr. Anumeha Shukla Dr. Vivesh Vir Kapur Dr. Ansuya Bhandari Dr. Prem Raj Uddandam

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Thrust Area 4: **Ocean and Polar Paleoclimatic Reconstruction during Quaternary** **Coordinator:** Dr. Srinivas Bikkina, Scientist F **Co-Coordinator:** Dr. Pawan Govil, Scientist E	**Problem Statement 1:** *Late Quaternary Palaeoceanography reconstruction from the Eastern Indian Ocean.*	Dr. Pawan Govil Dr. Abhijit Mazumder Dr. Manoj M.C.
	Problem Statement 2: *The Role of the Southern Ocean in Quaternary Climate Dynamics: Deep-Water and Sea-Ice Variability*	Dr. Sunil Kumar Shukla Dr. Manoj M.C.
	Problem Statement 3: *Quaternary monsoon variability from the northern Indian Ocean*	Dr. Prem Raj Uddandam
	Problem Statement 4: *High latitude (Arctic and Antarctic) and High-altitude (Himalaya) palaeoclimate reconstruction during the late Quaternary using multiproxy data.*	Dr. Pawan Govil Dr. Vartika Singh Dr. Abhijit Mazumder
	Problem Statement 5: *Trace terrestrial input of organic matter (w. focus on soot and other fire-originated compounds) in sediments – a multiproxy approach*	Dr. Srinivas Bikkina Dr. Manoj M.C.
Thrust Area 5: **Coastal dynamics, sea-level changes and monsoonal variability along Indian coastline** **Coordinator:** Dr. Biswajeet Thakur, Scientist E **Co-Coordinator:** Dr. Shilpa Pandey, Scientist E	**Problem Statement 1:** *Coastal dynamics and monsoonal climate change during the Holocene in the west coast of India*	Dr. Biswajeet Thakur Dr. Md. Firoze Quamar Dr. Niteshkumar Khonde
	Problem Statement 2: *Mangroves development and dynamics during Holocene: Climatic implications and impact on human settlements*	Dr Shilpa Pandey
	Problem Statement 3: *(PS-3) Studying plant ecological interactions for scenario development, forecasting and projecting the landcover changes along the Indian coastline*	Dr. Jyoti Srivastava

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	Problem Statement 4: *How adaptive resilient our coastal social-ecological systems are? A study from Tamil Nadu coast.*	Dr. P. Morthekai Dr. Nitesh Khonde
	Problem Statement 5: *Tropical Peatland and Palaeoclimate: Lessons from Past and Present for Future Carbon Dynamics*	Dr Shilpa Pandey
Thrust Area 6 **Holocene Vegetation Reconstruction, Climate Change, Extreme Events and Anthropogenic impact in the Himalayan Region** **Coordinator:** Dr. Ratan Kar, Scientist F **Co-Coordinator:** Dr. Sadhan Kumar Basumatary, Scientist E	**Problem Statement 1:** *Palynological studies from the higher and Trans Himalaya: implications for Holocene climate change and anthropogenic activities*	Dr. Ratan Kar Dr. Parminder Singh Ranhotra
	Problem Statement 2: *Biotic and Abiotic assessment to deduce the Late Quaternary Climate and anthropogenic impact in Eastern Himalayan foothills (Indo-Burma region)*	Dr. S.K. Basumatary Dr. Swati Tripathi Dr. Ratan Kar
	Problem Statement 3: *Spatio-temporal climate reconstruction and ecological changes in the Himalayan region using tree-rings: intrinsic teleconnections and societal impacts*	Dr. Santosh Kumar Shah Dr. Krishna Gopal Misra, Dr. Parminder Singh Ranhotra
	Problem Statement 4: *Investigating the Evolution of High Mountain Glacial Landscapes and modeling the potential risks of glacial lake outburst floods (GLOFs).*	Dr. Sheikh Nawaz Ali
	Problem Statement 5: *What is the role of climate/tectonics and hydrometeorology on lake/paleolake formation in the high-altitude regions of northwestern Trans-Himalayas and associated natural hazards?*	Prof. Mahesh G. Thakkar (Seismology; Director), Dr. Anupam Sharma (Geochemistry) Dr. P. Morthekai (Dating-Modelling) Dr. Gurumurthy G.P (Geochemistry) Dr. Sabyasachi Mandal (Sedimentology) Dr. Mayank Shekhar (Natural Hazards-Modelling)

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	Problem Statement 6 *Tracing Temperate Peatland dynamics during Holocene-Anthropocene*	Dr. Shilpa Pandey
Thrust Area 7: **Human-environment relationship and peopling in prehistoric and historic India** **Coordinator:** Dr. Anil K. Pokharia, Scientist F **Co-Coordinator:** Dr. Sadhan Kumar Basumatary, Scientist E	**Problem Statement 1:** *Understanding agricultural diversitcoy and human - monsoon relationship in semi-arid to sub-humid tropics during mid-late Holocene: Combining Archaeobotanical and Archaeological data*	Dr. Anil K. Pokharia
	Problem Statement 2: *Understanding the past population dynamics, demographic changes, adaptation and resilience using state-of-the-art ancient genomics, stable isotope analysis and modern day human population genomics data.*	Dr. Niraj Rai
	Problem Statement 3: *Reconstructing domestication history and co-evolution of human- animals over different time periods in the Indian subcontinent.*	Dr. Niraj
	Problem Statement 4: *To test the impact of dispersals and population-genetic structure on the historical formation of the different endogamous groups resulting in accumulations of the recessive mutations; and how various ethnic groups have developed susceptibility / resistance against different environmental pressures over tens of thousands of years of evolution.*	Dr. Niraj Rai
	Problem Statement 5: *Reconstructing Holocene Vegetation Pattern, Indian Monsoon Dynamics And Ancient Indian Culture: Insights From Indian Subcontinent*	Dr. Anjali Trivedi
	Problem Statement 6: *Animal-Plant Interaction: special emphasis on the dietary pattern and conservation*	Dr. Sadhan Kumar Basumatary Prof. Mahesh G. Thakkar, Director

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Thrust Area 8 **Quaternary Monsoon/Climate Reconstruction through high-resolution multi-proxy studies of lacustrine archives along the East-West Corridor in India (Project Acronym: QLDP-Phase 2)** **Coordinator:** Dr. Anupam Sharma, Scientist G **Co-Coordinator:** Dr. Binita Phartiyal, Scientist F	**Problem Statement 1:** *Palaeoclimate Reconstruction & ISM Variability*	Dr. Srinivas Bikina Dr. Biswajeet Thakur Dr. Anjali Trivedi Dr. Kamlesh Kumar Dr. Shailesh Agrawal Dr. Md. Firoz Quamar Dr. Jyoti Srivastava Dr. S.N. Ali Dr. Swati Tripathi Dr. Manoj MC Dr. Prasanna K Dr. Trina Bose Dr. Anurag Kumar Dr. Mayank Shekhar
	Problem Statement 2: *Vegetation dynamics and contemporary climate change*	
	Problem Statement 3: *Long-term assessment of monsoon season precipitation and streamflow based on tree-rings from Central India and expanding the multi-species tree-ring network to understand monsoon variability and growth dynamics across Central and Western India*	
	Problem Statement 4: *Environmental Baseline Monitoring and Integration*	
	Problem Statement 5: *Species Distribution Modelling (SDM)*	
	Problem Statement 6: *Integrating modern biogeochemical processes for Enhanced paleoclimate reconstructions*	
	Problem Statement 7: *Climate Modelling*	
Thrust Area 9: **Investigating the Signatures of Life and Habitable Environments: Astrobiological and Astrochemical Perspectives** **Coordinator:** Prof. M.G. Thakkar, Director **Co-Coordinator:** Dr. Anupam Sharma, Scientist G		Dr. Kamlesh Kumar Dr. Sunil Kumar Shukla Dr. APS Chaddha
Thrust Area 10: **Laboratory Enhancements and Technological Developments** **Coordinator:** Dr Anupam Sharma, Scientist G **Co-Coordinator:** Dr. Srinivas Bikkina, Scientist F	**Problem Statement 1:** *Protocol development (R&D) for new proxy parameters, upgradation and functioning of BSIP instrumentation facilities*	Dr. Anupam Sharma Dr. Srinivas Bikkina
	Problem Statement 2: *Developing new Quaternary dating methods*	Dr. P. Morthekai

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	Problem Statement 3: *Laboratory Stimulation of Petroleum Formation from Immature Sedimentary Basins: Insight from Hydrous Pyrolysis*	Dr. Neha Aggarwal Dr. Divya K. Mishra
	Problem Statement 4: *Liquid Nitrogen plant for usage in C14 Lab, Cathodoluminescence Lab and Clumped isotope lab*	Dr. Prasanna K
	Problem Statement 5: *Enhancing the in-house capability for conventional Radiocarbon measurement*	Dr. Srinivas Bikkina Mr. Sanjay K S Gahlaud
	Problem Statement 6: *Improving pollen identification and classification using flow cytometry and deep learning neural networks*	Dr. Jyoti Srivastava
	Problem Statement 7: *Laser Ablation-Multicollector-Inductively Coupled Plasma-Mass-Spectrometer (LA-MC-ICPMS) facility for radiogenic and non-traditional isotope research at BSIP.*	Dr. Gurumurthy G.P. Dr. Anupam Sharma Dr. Pawan Govil Dr. Niteshkumar K
Thrust Area 11: **Specific Project under CPGG and Media** **CPGG Coordinator:** Dr. Shilpa Pandey, Scientist E	**Geoheritage Conservation and Promotion for Sustainable Geotourism Development**	Prof. M.G. Thakkar, Director Dr Vivesh Vir Kapur Dr Nimish Kapoor Dr Sanjai K Singh
Media Co-Coordinator: Dr. Nimish Kapoor, Scientist B	**Science Communication for Public Engagement & Partnership (SCoPE 2025 – 2029): BSIP's Lab to Land Initiative for Vision Viksit Bharat 2047** **Activity 1:** *Palaeoscience Today, Quarterly newsletter cum magazine*	Dr Kamlesh Kumar Dr Swati Tripathi Dr M. Firoze Quamar Dr Jyoti Srivastava Dr Prem Raj Uddandam Dr Ranveer Singh Negi Dr Suman Sarkar Dr Syed Rashid Ali
	Activity 2: *Accessible Science to all: Popular Science Books / Booklets on Palaeosciences*	Dr Kamlesh Kumar Dr Swati Tripathi Dr M. Firoze Quamar Dr Jyoti Srivastava Dr Prem Raj Uddandam Dr Mayank Shekhar Dr Ranveer Singh Negi Dr Suman Sarkar Dr Sanjay Kumar Singh Dr Syed Rashid Ali

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	Activity 3: *Audio Podcast Series - Unbound Palaeoscience*	Dr Jyoti Srivastava Dr Ranveer Singh Negi
	Activity 4: *Prithvi - Palaeosciences Research and Interventions through Visual Initiatives the Palaeoscience Film Festival of India* *Annual event of BSIP to promote and inculcate science communicators and science filmmakers in the area of Palaeosciences, Geology, Botany, Climate & Earth Sciences, Geo Heritage and Geo Tourism*	Dr Kamlesh Kumar Dr Swati Tripathi Dr Anurag Kumar Dr Prem Raj Uddandam Dr Mayank Shekhar Dr Ranveer Singh Negi Dr Sanjay Kumar Singh Dr A P S Chaddha
	Activity 5: *India's Fossil Legacy: A Timeless Journey* *Production of Short Films on BSIP's research in labs and ground-breaking discoveries at geo-heritage sites and fossil-rich areas*	Dr M. Firoze Quamar Dr Anurag Kumar Dr Prem Raj Uddandam Dr Ranveer Singh Negi Dr Suman Sarkar Dr Sanjay Kumar Singh
	Activity 6: *News & Views: A Science Blog: A dedicated space on the BSIP website for weekly updates on news, features and expert interviews*	Dr Jyoti Srivastava Dr Mayank Shekhar Dr Ranveer Singh Negi Dr A P S Chaddha
	Activity 7: *Science Communication for Public Engagement (ScoPE) Workshops for Scientists and Scholars*	Dr Jyoti Srivastava Dr Mayank Shekhar Dr Ranveer Singh Negi Dr A P S Chaddha

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	Activity 8: *Palaeosciences Horizons: Exploring Incredible India:* *A Science Outreach Programme featuring workshops on Palaeosciences, Mega and Micro Fossils, Amber led by BSIP Scientists for research scholars, students and journalists* *An initiative to explore and understand India's geoscientific heritage, inspiring public interest and academic engagement in the fascinating world of palaeosciences.*	Dr Jyoti Srivastava Dr Anurag Kumar Dr Mayank Shekhar Dr Ranveer Singh Negi Dr Sanjay Kumar Singh
	Activity 9: *Artful Science Communication to Popularize Impactful Research (ASPIRE)* *Popular Science Article & Short Video Competition for Research Scholars (Annual Activity)*	

This is issued with the approval of Director.

(Anupam Sharma)

Convener, RDCC

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