

# THARANG

RESEARCH

INNOVATION

SOCIETAL IMPACT

## Amrita University Hosts South Asia UNESCO Chairs Round Table 2026

Dr. Maneesha V. Ramesh, Pro Vice Chancellor of Amrita Vishwa Vidyapeetham and Director of the Amrita Center for Wireless Networks and Applications (Amrita WNA), participated in the South Asia UNESCO Chairs Round Table 2026, hosted by Amrita Vishwa Vidyapeetham at its Amritapuri Campus on 13-14 May 2026. Organized in collaboration with the UNESCO Regional Office for South Asia, the Round Table brought together UNESCO Chair holders, academic leaders, and policymakers. The meeting was led by Mr. Tim Curtis, Director of the UNESCO Regional Office for South Asia, Mr. Jaco Du Toit, UNESCO Representative to Nepal, and Ms. Susan (Sue) Vize, UNESCO Representative to Bangladesh. During the event, Dr. Maneesha shared the achievements and future vision of Amrita's UNESCO Chair, highlighting the Live-in-Labs® methodology and its role in fostering sustainable development, community engagement, and international research collaborations.



# EVENTS & ACTIVITIES

## Experiential Learning for Sustainable Innovation & Development



Dr. Maneesha V. Ramesh, Pro Vice Chancellor of Amrita Vishwa Vidyapeetham, Director of the Amrita Center for Wireless Networks and Applications (Amrita WNA), and UNESCO Chair on Experiential Learning for Sustainable Innovation & Development, participated in the South Asia UNESCO Chairs Round Table 2026, held at Amrita Vishwa Vidyapeetham, Amritapuri Campus, on 13–14 May 2026. Organized in collaboration with the UNESCO Regional Office for South Asia, the Round Table convened UNESCO Chair holders and academic leaders from across the region to strengthen knowledge networks and foster collaborative initiatives aligned with UNESCO's 2026–2027 priorities. During the meeting, Dr. Maneesha presented

the progress and achievements of the UNESCO Chair on Experiential Learning for Sustainable Innovation & Development, highlighting the transformative impact of the Live-in-Labs® methodology in addressing real-world societal challenges through community-engaged, interdisciplinary research. She shared the Chair's strategic roadmap for 2026–2027, emphasizing sustainable innovation, rural development, international partnerships, and experiential education as key drivers for achieving the Sustainable Development Goals (SDGs). Dr. Maneesha's participation reaffirmed Amrita University's leadership in advancing experiential learning, sustainable innovation, and globally connected research that creates meaningful societal impact.

## NIOT Scientists Visit Amrita's Green Hydrogen Laboratory



Scientists from the National Institute of Ocean Technology (NIOT), Ministry of Earth Sciences (MoES) visited the Green Hydrogen Laboratory at Amrita Vishwa Vidyapeetham to review the progress of the research project titled "Green Hydrogen Production and Storage from Sea Water using Liquid Metal Alloy Paste for Deep Ocean Research."

During the visit, the research team presented the complete experimental workflow, demonstrated the operation of the laboratory instruments, and showcased the key outcomes achieved under the project. The visiting scientists appreciated the innovative research and commended the team's efforts in advancing sustainable hydrogen technologies for deep-ocean applications.

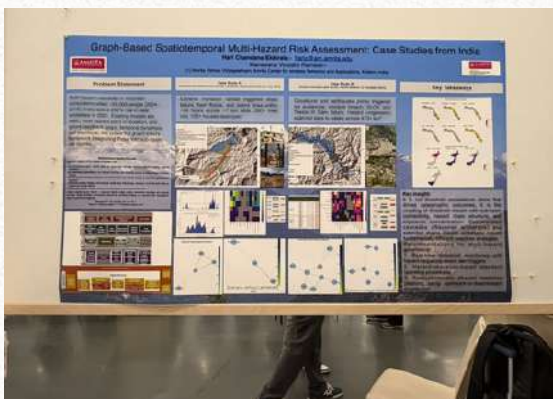
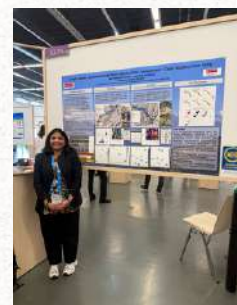
The NIOT experts encouraged the team to submit a new research proposal for future collaborative work, along with the project's final report and presentation. Their valuable feedback and encouragement reaffirm the significance of the project in supporting India's clean energy and ocean research initiatives.

## Published Q1 Journals

1. Kumar, Sangeeth, and Maneesha Vinodini Ramesh. "A case study on digital twin-enabled IoT communication architecture for landslide monitoring." *Information and Software Technology* (2026): 108131.
2. Anagha, V. S., Alka Singh, and Frédéric Frappart. "Shoreline and Salinity Shifts Along the Chennai Coast: Environmental and Ecological Implications." *Environmental Challenges* (2026): 101514.
3. Sanjeevi, G., Uma Gopalakrishnan, Rahul Krishnan Pathinarupothi, C. J. Arya, Kaustuv M. Talukdar, Subramania Iyer, and Srisairam Achuthan. "SPARNet: A Framework for Airway Invasion Tracking from Fluoroscopic Videos of Dysphagia Patients." *IEEE Journal of Biomedical and Health Informatics* (2026)
4. Pradeesh, N., G. Gopakumar, Rahul Krishnan Pathinarupothi, and Shivsubramani Krishnamoorthy. "Outcome-Based Knowledge Tracing with Affinity Mapping and Memory Augmented Outcome Impact." *International Journal of Artificial Intelligence in Education* (2026): 100006.

# EVENTS & ACTIVITIES

## EGU 2026 : Amrita WNA Team Presents Research on Landslide



A team from the Amrita Center for Wireless Networks and Applications (Amrita WNA), including Dr. Maneesha V. Ramesh, Pro Vice Chancellor and Director, Dr. Aadityan Sreedhara, Nitin Kumar M, and Dr. Harichandana Ekkirala, represented Amrita Vishwa Vidyapeetham at the prestigious European Geosciences Union (EGU) General Assembly 2026 held in Vienna, Austria, presenting pioneering research on landslide monitoring, risk assessment, and early warning systems.

Dr. Maneesha V. Ramesh presented Amrita's operational AI-IoT enabled landslide early warning framework, highlighting over two decades of research integrating hydro-geophysical sensing, wireless sensor networks, artificial intelligence, and community-based disaster resilience into actionable risk intelligence for vulnerable mountain regions.

Dr. Aadityan Sreedhara presented a hybrid modelling approach combining Distributed Lag Nonlinear Models with Newmark's coseismic displacement analysis to investigate earthquake-rainfall induced landslides,



demonstrating the critical role of antecedent rainfall in landslide triggering using the 2011 Sikkim earthquake as a case study.

Nitin Kumar M showcased an integrated analysis of inclinometer, DGPS, and rainfall observations from Chandmari, Sikkim, providing valuable insights into groundwater-driven slope instability and strengthening operational landslide monitoring and early warning capabilities.

Dr. Harichandana Ekkirala presented a graph-based spatiotemporal multi-hazard risk assessment framework, demonstrating cascading hazard interactions through case studies from the North Sikkim GLOF and Wayanad landslides, advancing dynamic risk assessment and anticipatory early warning for complex mountain environments.

## Talk on Resource-Efficient IoT and AI-Based Monitoring

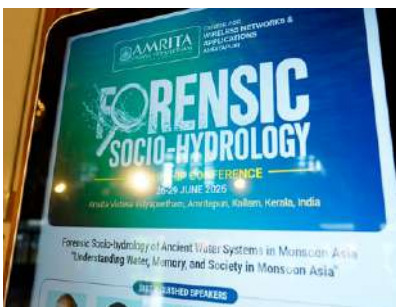


The Amrita Center for Wireless Networks and Applications organized an invited talk on "Resource-Efficient IoT and AI-Based Event Monitoring Strategies: Concepts, Energy Consumption Reduction Approaches, and Key Research Directions" by Dr. M. Sabarimalai Manikandan, Associate Professor, Department of Electrical Engineering, Indian Institute of Technology Palakkad.



The session explored emerging research in energy-efficient Edge AI systems, intelligent signal processing, compressed sensing, lightweight deep learning architectures, and sustainable IoT-based monitoring solutions. Dr. Manikandan also highlighted real-world applications, innovative approaches for reducing energy consumption, and future research opportunities in intelligent sensing and control systems. The talk provided valuable insights to researchers and students, fostering discussions on developing sustainable, AI-driven technologies for next-generation IoT applications.

# Amrita WNA Conducted Forensic Socio-hydrology Conference



The Amrita Center for Wireless Networks and Applications (Amrita WNA) organized the International Conference on "Forensic Socio-Hydrology of Ancient Water Systems in Monsoon Asia: Understanding Water, Memory, and Society in Monsoon Asia" at Amrita Vishwa Vidyapeetham, Amritapuri Campus. The three-day conference brought together leading researchers, historians, architects, hydrologists, and environmental scientists from around the world to explore the interconnections between ancient water systems, social memory, and modern hydrology. The conference featured technical sessions on traditional water management systems, stepwells, cascade tanks, governance, infrastructure co-design, data-model integration, and sustainable water practices. Distinguished speakers from the USA, Japan, Sri Lanka, the Netherlands, India, and Sweden shared their expertise and insights on advancing interdisciplinary research in socio-hydrology. The event also included case studies, field-based discussions, and workshops that highlighted the relevance of traditional knowledge in addressing contemporary water challenges. The conference reaffirmed Amrita WNA's commitment to promoting collaborative research and developing sustainable, community-centered solutions for water resource management and environmental resilience.

## Dr. Aiswarya on WAMS 2026



Dr. Aiswarya s., Assistant Professor represented the Amrita Center for Wireless Networks and Applications (Amrita WNA) as an IEEE AP-S Committee on Promoting Equality (COPE) Invited Speaker at the 5th IEEE Wireless, Antenna, and Microwave Symposium (WAMS 2026), held at B. V. Raju Institute of Technology (BVRIT), Hyderabad, from 10–13 June 2026. She delivered an invited talk titled "Electromagnetic Wave Interaction with Biological Tissues: Implications for Sensing and Diagnostics," highlighting recent advancements in biomedical electromagnetics, non-invasive sensing technologies, and their applications in healthcare diagnostics. The presentation also showcased ongoing research at the Amritatarang – Advanced RF & Microwave Research Lab of Amrita Vishwa Vidyapeetham. The symposium provided an excellent platform for engaging with students, researchers, and faculty members from diverse institutions, fostering discussions on emerging research opportunities at the intersection of electromagnetics, sensing technologies, and healthcare. Events such as WAMS serve as invaluable platforms for knowledge sharing, fostering interdisciplinary collaborations, and inspiring the next generation of engineers and researchers to address real-world challenges through innovation.

## Co- authored Q1 Journals

5. Nair, Hema Sadasivan, Onattu Damodaran Jayakumar, and Sreedha Sambhudevan. "Doping strategies in FeTi-based Intermetallics: Pathways to advanced solid-state hydrogen storage." International Journal of Hydrogen Energy 241 (2026): 155550.

6. Hema, S., D. Anagha, S. Gayathri, Radhika Sreenath, P. Aiswarya, O. D. Jayakumar, and Sreedha Sambhudevan. "Smart hydrogels under light: Emerging paths in biomedical sensing." MRS Bulletin (2026): 1-24.

7. Reshma, A. S., Krishna Nandan, Hari Chandana Ekkirala, Vineeth Ajith, Amritanand Sudheer, Ramesh Guntha, and Maneesha Vinodini Ramesh. "Unravelling water sustainability: a decentralised, data-driven model for water governance." Scientific Reports 16, no. 1 (2026): 11150.

8. Chandran, Greeshma U., S. Hema, A. R. Ajitha, O. D. Jayakumar, Balakrishnan Shankar, Arunima Regunadhan, and Sreedha Sambhudevan. "Natural bioactive polyphenols as ultraviolet barriers in biodegradable packaging." In Polymer-Based Nanostructured Barrier Materials, pp. 559-596. Elsevier, 2026.

# PEOPLE SPOTLIGHT

## Jayakrishnan V. M. Awarded Ph.D. for Research on Metamaterial-Enhanced Antenna Systems

Dr. Jayakrishnan V. M. on the successful completion of his Ph.D. titled "Design and Development of Metamaterial-Enhanced Microstrip Antennas Integrated with a Monopulse Comparator," under the guidance of Dr. Dhanesh G. Kurup. His research addresses the growing demand for high-precision antenna systems for Uncrewed Aerial Vehicle (UAV) applications, including surveillance, disaster management, and defense. The work focused on developing compact, lightweight, and high-performance metamaterial-enhanced microstrip antenna systems integrated with a monopulse comparator to enable accurate UAV tracking, improved signal quality, and reliable wireless communication. This significant achievement contributes to advancing next-generation antenna technologies for intelligent sensing and aerospace applications.



## Dr. Hemalatha T Elevated as IEEE Senior Member

The Amrita Center for Wireless Networks and Applications (Amrita WNA) proudly congratulates Dr. Hemalatha T, Assistant Professor, on her elevation to the prestigious IEEE Senior Member grade. This distinguished recognition acknowledges her sustained professional excellence, significant technical contributions, and over 15 years of dedicated research and teaching in the fields of AI-based disaster resilience, multihazard research, and landslide early warning systems.



Her research integrates artificial intelligence, remote sensing, and wireless sensor networks to develop advanced decision-support tools for hazard-prone regions. In addition to her research accomplishments, Dr. Hemalatha serves as the Secretariat Co-Chair of the 7th World Landslide Forum (WLF-7), contributing to global initiatives in disaster risk reduction. Her elevation to IEEE Senior Member reflects her outstanding contributions to engineering and technology and brings pride to the Amrita WNA community.

### INTERSHIP



Mohan C. P., M.Tech –  
Wireless Networks &  
Applications



Aswin K, M.Tech –  
Wireless Networks &  
Applications



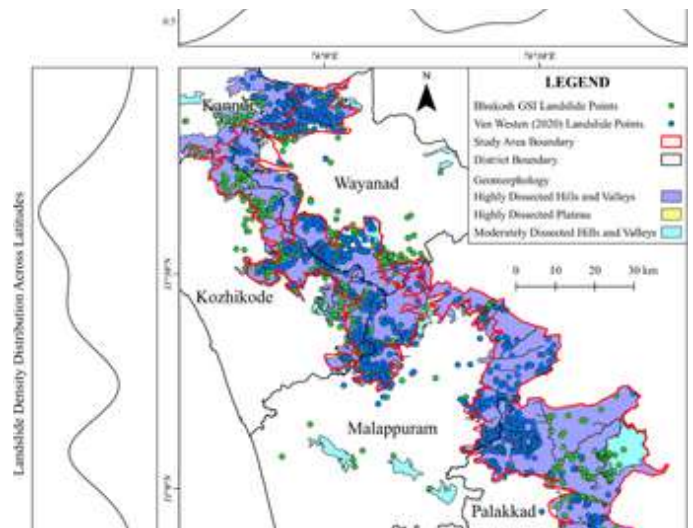
**BOSCH**

## AI-Based Landslide Detection in the Western Ghats



Our M.Tech student, Abhilash Sreekumar, under the guidance of Dr. Hemalatha T. and Dr. Maneesha V. Ramesh, and in collaboration with international co-author Dr. Sansar Raj Meena, conducted a study on landslide detection in the Western Ghats of Kerala using Deep Learning and Explainable Artificial Intelligence (XAI). The research aims to improve the identification and mapping of landslides using satellite imagery and AI-based techniques.

By analyzing images captured before and after landslide events, the study enhances the accuracy of landslide detection in a region where reliable landslide inventories are limited. The use of Explainable AI also helps in understanding how the model identifies landslide-prone areas, making the results more transparent and trustworthy. The study contributes towards developing efficient tools for disaster risk reduction and environmental management in Kerala.



## Digital Twin-Enabled IoT Communication for Landslide Monitoring

Dr. Sangeeth Kumar and Dr. Maneesha V. Ramesh conducted a case study on a digital twin-enabled IoT communication architecture for landslide monitoring in Munnar, Kerala. The study addresses the challenge of maintaining reliable communication between remote landslide monitoring sensors and cloud-based data systems under changing weather conditions. The researchers developed a Multi-Criteria Network Digital Twin (MNDT), a virtual representation of the landslide monitoring network that continuously tracks communication performance and weather parameters such as rainfall, temperature, and humidity. By combining real-time network data with intelligent learning techniques, the system predicts the most suitable communication network for transmitting sensor data at any given time.



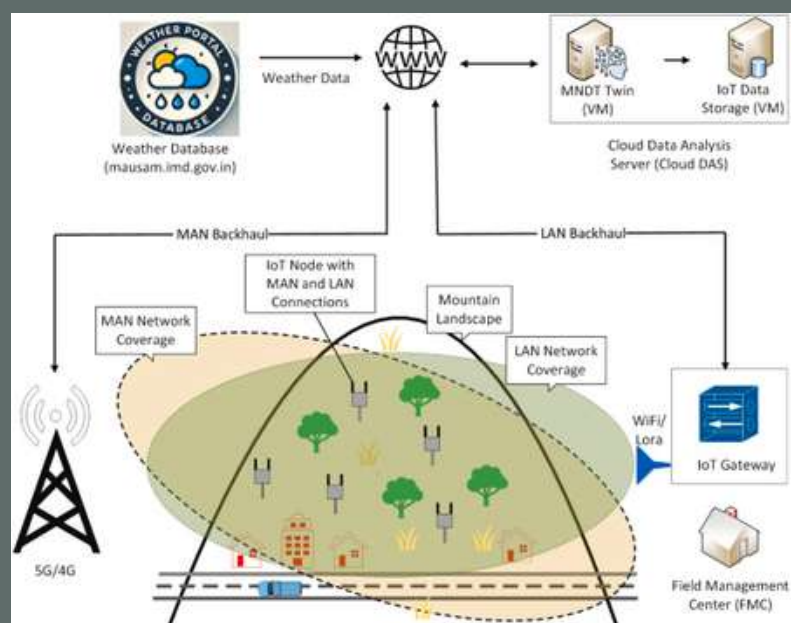
# A Study Explores the Impact of Shoreline Change and Seawater Intrusion

Anagha, a researcher at Amrita WNA, under the guidance of Dr. Alka Singh and in collaboration with Dr. Frédéric Frappart from INRAE France conducted a comprehensive study investigating the long-term impacts of shoreline dynamics and seawater intrusion along the Chennai coast. The research assessed an 86 km coastal stretch from 1990 to 2024 using advanced geospatial techniques, hydrochemical analysis, and satellite observations. The findings revealed that extensive shoreline erosion, driven by both natural processes and anthropogenic activities such as port development has

significantly accelerated seawater intrusion into coastal aquifers. The study further highlighted the combined influence of sea-level rise, groundwater abstraction, and climate variability on groundwater salinity. Importantly, the research also identified a strong association between increasing coastal erosion and declining Olive Ridley turtle hatching success, emphasizing the urgent need for integrated coastal management strategies to protect fragile ecosystems and ensure sustainable groundwater resources.



Based on these predictions, the system intelligently selects the most suitable network for data transmission. Experimental results demonstrated significant improvements in packet delivery performance compared to conventional learning-based approaches. The study highlights the potential of digital twin technology to enhance the reliability and resilience of weather-sensitive landslide monitoring systems.



# ACADEMIC ACTIVITY

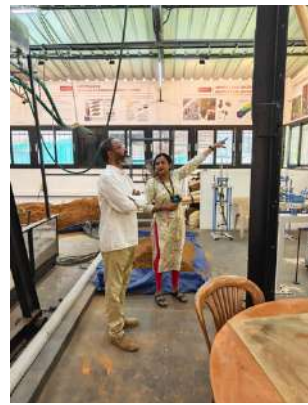
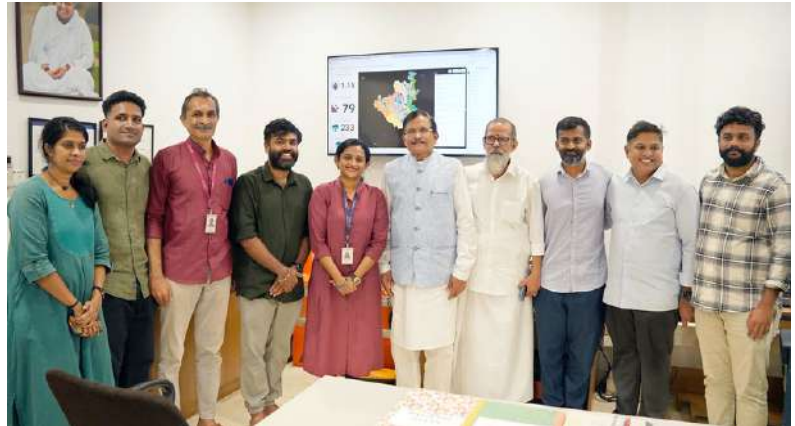
## M.Tech Geo-Informatics Students Conduct Tsunami Resilience Field Study



M.Tech Geo-Informatics students from Amrita Vishwa Vidyapeetham participated in a three-day field study at Andhakaranazhy, Alappuzha, from 1–3 July 2026. Organised by the Amrita Center for Wireless Networks & Applications (Amrita WNA), the programme offered students valuable field-based learning on coastal resilience, disaster preparedness and community vulnerability more than two decades after the 2004 Indian Ocean tsunami. Working alongside faculty members and researchers, the students conducted household surveys, community discussions, transect walks, GPS-based documentation and Participatory Rural Appraisal (PRA) exercises. They identified evacuation routes, safe shelters, hazard-prone locations, critical infrastructure, water sources and livelihood resources across the study area. A key outcome of the programme was the preparation of Participatory Resource Maps, where students consolidated their field observations into detailed community maps before presenting and validating their findings for GIS integration.

The field study provided students with practical experience in geospatial data collection, participatory mapping and spatial analysis while strengthening their understanding of community-centred disaster risk reduction. By integrating geospatial technologies with local knowledge, the programme demonstrated how young geospatial professionals can contribute to evidence-based planning for resilient and sustainable coastal communities.

# LAB VISIT

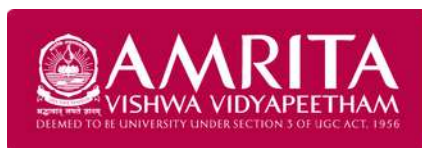




Times Higher Education  
**Sustainability  
Impact Ratings 2026**



**RANKED 37<sup>TH</sup>  
IN THE WORLD**



**CENTER FOR  
WIRELESS NETWORKS  
& APPLICATIONS**

**Amrita Center for wireless Networks & Application  
Amrita Vishwa Vidyapeetham  
Amritapuri campus, Clappana P.O.,  
Kollam, Kerala, India**



[amrita.edu/awna](http://amrita.edu/awna)



[researchheadawna@am.amrita.edu](mailto:researchheadawna@am.amrita.edu)