The University of Fiji
(An Entity of Arya Pratinidhi Sabha of Fiji)

# Department of Science Newsletter

Issue 2 | July 2025

## From the HOD

It is with great pride that I extend my warmest greetings to all readers of the second issue of the Department of Science Newsletter for 2025. This publication highlights the dynamism, dedication, and forward momentum of a department that continues to excel in teaching, research, and community engagement.

The Department of Science offers a diverse suite of academic programmes spanning from Biology, Chemistry, Physics, Environmental Sciences, Agricultural Engineering, Renewable Energy, and the Earth and Planetary Science streams. These disciplines are critical to addressing some of the most pressing global challenges, and our curriculum is designed to prepare students for impactful careers in science, sustainability, and innovation.

This past semester of 2025 has seen remarkable developments, ranging from international research collaborations and student field visits to impactful community initiatives such as the Earth Day Clean-Up and the World Water Day, and the World Meteorological Day colloquiums. These activities reflect our commitment to fostering scientific inquiry that is locally relevant and globally significant.

We are pleased to welcome new academic and technical staff, whose expertise will undoubtedly enrich our academic community. Looking ahead, we remain committed to expanding our research footprint, enhancing student learning experiences, and strengthening partnerships both within Fiji and the Region and globally. The recent engagement with the KTH Royal Institute of Technology, Sweden, and our involvement in the Transforming Energy Access-Learning Partnership (TEA-LP) project exemplify our strategic vision to align education with sustainable development goals.

Thank you for your continued support and interest in the work of the Department of Science. Together, let us continue to advance scientific excellence at the University of Fiji.

Assoc. Prof. Ramendra Prasad

Head of Science Department,

School of Science and Technology,

The University of Fiji.

## Welcome

Congratulations to our HOD, Associate Professor Ramen on his appointment to the role from Senior Lecturer, the first to attain this rank within UniFiji's Department of Science.

We welcome Dr. Kunal Dayal as Associate Professor in Science at UniFiji. Originally from Ba, Assoc. Prof. Dayal brings over 15 years of experience across the petroleum sector, academia, and research. He holds a Ph.D. from the University of Auckland and a Master's degree from Uppsala University, with BSc from USP. His research focuses on atmospheric and meteorological physics, wind energy, and the use of the Weather Research and Forecasting model. Assoc. Prof. Dayal is also available for Master's and Ph.D. supervision and is keen on collaborative research opportunities.

We also welcome our Adjunct Professor Pradeep Deo. Dr. Deo brings extensive expertise in agricultural biotechnology, plant biology, and genetics. He holds a Ph.D. from USP and has taught plant tissue culture and transformation at the undergraduate level. His outstanding academic achievements were recognized with the QUT Vice-Chancellor's Performance Award in 2017. We look forward to the valuable insights he will provide to our students and department.

Pleased to welcome Ms. Shinal Shania as our new Laboratory Technician for undergraduate science. She holds a BSc in Biology and Chemistry and a GDT. Ms. Shinal brings valuable experience from her time at Fiji Water and will support lab work in Chemistry, Biology, and Physics. We're excited to have her on board.

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Delighted to have Ms. Ayesha Kirti Reddy join us as a Teaching Assistant in the Department and as part of the Office of the Vice-Chancellor team. Ms. Ayesha made UniFiji history as the first student to earn straight A+ grades in every unit and is the latest recipient of the Vice Chancellor's Award for Outstanding Excellence. She completed her BSc in Mathematics & Physics with a GDT and credits her success to disciplined time-management and strong family support. We look forward to the energy and dedication she will bring to her new roles.

## Farewell

The department bid farewell to Ms. Zahidah Afrin Nisa for her valuable contributions during her time with us as a Lecturer. With her background in Marine Science and Environmental Management she brought unique insights and expertise to our team. We wish her all the very best in her future endeavors.

We bid a warm farewell to Mr. Peni Nabutu, our outgoing Laboratory Technician. We sincerely thank him for his dedicated service and the support he has provided to our staff and students. His reliability and friendly presence in the labs will be truly missed. We wish him all the very best in his future endeavors and hope he stays connected with the UniFiji family.

## Alumni Corner


Ms. Ashleen Ashna Prasad, a Biology and Chemistry teacher at Penang Sangam High School in Rakiraki, blends academic excellence with a passion for making science meaningful. She holds a BSc in Biology and Chemistry with a GDT, equipping her with practical teaching skills. A gold medalist in Biology, Ms. Prasad attributes her academic success to perseverance and a deep sense of curiosity. Her interests in nature photography, wildlife observation, and environmental reading bring real-world relevance to her lessons. She emphasizes active learning and time management, encouraging students to understand concepts rather than memorization. Reflecting on her experiences, she highlights how hands-on and virtual labs helped build confidence and inquiry skills. She advocates for more outdoor learning to deepen scientific understanding and spark lasting student interest.

## Student Testimonial

Esther Ravai's (20230431) journey into Environment Science at UniFiji began without a clear plan, but with an open mind and interest in science. Initially unsure of what to pursue after high school, she chose Environment Science simply to explore something different and over time, it grew into a genuine passion. She is particularly drawn to topics in public health, biology, and environment science, where she explores the intricate connections between human health and ecosystems. Balancing classes,

travel, and campus life can be challenging, but Esther relies on a positive mindset and her faith in God to stay grounded. She hopes to see more field specific internship opportunities at UniFiji for science students. Esther believes that practical experience is essential for bridging classroom learning with real world environmental challenges.

## Events

**Field visit to Juncao Technology Centre in Legalega**

In March, 74 Plant Biology students and 4 staff from the Department of Science visited the Legalega Research Station and Juncao Technology Centre. The visit provided valuable insights into agricultural research and sustainable farming practices.

**Field visit: Punjas and Sugar Research Institute, Lautoka**

In April, Science students toured the Punjas Biscuit Factory in Lautoka, where they learned about biscuit production, quality control, and food technology. They also visited the Sugar Research Institute, gaining firsthand insights into sugarcane breeding research and innovation.

**Earth Day Clean-Up campaign success**

We extend our heartfelt thanks to all the students and staff who participated in this year's Earth Day Clean-Up Campaign. Your enthusiasm and commitment played a vital role in making the event a meaningful and impactful success. By coming together to clean and green our campus, we not only improved our surroundings but also raised awareness about the importance of environmental responsibility. Well done, team!

**World Water Day & World Meteorological Day**

The department successfully hosted a virtual colloquium on 21st March 2025 to commemorate World Water Day and World Meteorological Day. Dr. Anshuka Nand from Auckland University of Technology presented her research on using artificial intelligence and Agent-Based Models to understand disaster preparedness in Fiji's Ba River catchment area. Her work emphasized the importance of effective Early Warning Systems and community engagement in mitigating flood risks. The session was well attended and sparked discussion

on the integration of science, technology, and local knowledge in disaster resilience.


**Muaira Methodist College Guest Speaker**

Ms. Azekah Swamy served as Chief Guest at Muaira Methodist College's Climate Change Awareness Week in April. She delivered an inspiring address on the importance of environmental stewardship and youth engagement in climate action. Her participation highlighted the UniFiji's commitment to community outreach and climate education.

**Regional Conference on Advancing Ocean Learning**

Ms. Kelera Railoa presented at the Regional Conference on Advancing Ocean Learning, held at USP's Laucala Campus from April 14–16. Her presentation focused on integrating ocean literacy into education and highlighted UniFiji's efforts in promoting marine awareness and sustainability in the Pacific.

**GHG Inventory & NDC Tracking Training**

Our HOD, Assoc. Prof. Ramen joined key participants at the GHG Inventory & NDC Tracking Training for Fiji's Energy Sector Stakeholders, held at Novotel, Nadi from 22–25 April. The training focused on building national capacity in greenhouse gas data management and monitoring progress towards Fiji's climate commitments

**KTH Royal Institute of Technology collaboration**

In May, Ebba Centerlind and Jessica Ye from KTH Royal Institute of Technology, Sweden, successfully completed their thesis fieldwork in Fiji on solar mini-grid business models, supervised by Assoc. Prof. Anders Malmquist (KTH) and our HOD, Assoc. Prof. Ramen. Their work supports rural electrification. A new MoU between SoST and KTH has also been signed, opening doors for future collaborations in maths, chemistry, and physics.

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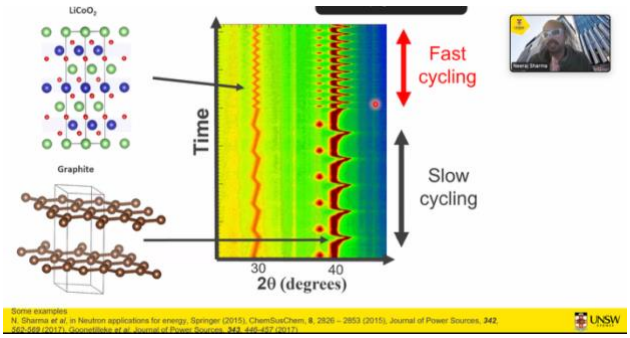
**TEA-LP Project sponsored gift**

The Department gifted tea mugs to the Student Academic Services team, sponsored by the UK Aid-funded Transforming Energy Access – Learning Partnership (TEA-LP) project. This gesture recognizes SAS's outstanding dedication in supporting students and staff during this flagship initiative. TEA-LP is a global consortium of 23 universities working to build sustainable energy expertise and deliver master's-level curricula aligned with SDG 7 targets. We're proud to integrate their support into this impactful collaboration.

**Faraday Institution Battery Network Webinar 4**




In June, the Battery Network Webinar 4 featured Dr. Neeraj Sharma, a Fiji-born scientist and prominent member of the Australian Battery Society and the University of New South Wales (UNSW Sydney). Prof. Sharma delivered a presentation on the latest breakthroughs in crystal chemistry and their practical applications in advancing commercial sodium-ion battery technologies. His talk highlighted the growing importance of alternative energy storage solutions to enhance energy access and sustainability, particularly in the Global South. Representing Fiji in the Faraday Institution's Battery Ambassador program, Dr. Vodo and Ms. Azekah attended the webinar further strengthening the country's engagement in global energy research.

**Upcoming**

14 July: Semester 2 begins

31 July: Senate meeting

1 September: Mid Semester Break Begins

5 September: Mid Semester Break Ends

8 September: Prophet Mohammed's Birthday

9 September: Semester 2 Resumes

10 October: Fiji Day

## Spotlight: Plastic Waste Solutions

Global plastic production surged from 1.7M tonnes (1950) to 370M tonnes (2020). Traditional disposal fails, driving innovation in recycling technologies. 70% of plastic waste is non-PET. Scalable solutions are urgent to curb pollution.

- **Chemical processes**: Pyrolysis, hydrolysis break plastics into fuels (gasoline, diesel) or chemicals.
- **Biological methods**: Microbes (bacteria/fungi) use enzymes (cutinase, lipase) to degrade plastics.
- Works best on PET (ester bonds) but struggles with PE/PP (stable C-C chains).
- Non-PET plastics (PE, PP, PS) resist biodegradation; need energy-intensive breakdown which is a challenge.
- Chemical recycling costs more but yields valuable byproducts.
- Combine chemical/biological approaches. Engineer better enzymes/catalysts for non-PET plastics.

**Ref**: Liu, Z.; Chang, S.H.; Mailhot, G. "Emerging Biochemical Conversion for Plastic Waste Management: A Review." Molecules (2025): 30, 1255.

## Papers

Diykh, M., Ali, M., Labban, A. H., Prasad, R., Jamei, M., Abdulla, S., & Farooque, A. A. (2025). Designing empirical fourier decomposition reinforced with multiscale increment entropy and deep learning to forecast dry bulb air temperature. Results in Engineering, 26, 104597.

Singh, P., Linnér, B. O., & Singh, A. A. (2025). Marine spatial planning and ocean governance in Small Island Developing States. Regional Environmental Change, 25(3), 91.

Li, S., Addey, C. I., Roman, R., Hayashida, H., Jiang, C., Hu, C., ... & Luo, T. (2025). Early career ocean professionals declaration on Ocean Negative Carbon Emissions for our ocean and future. The Innovation.

Singh, D., Aretaake, R., & Railoa, K. (2025). Traditional ecological knowledge in Kiribati: Elders' insights on indigenous fishing practices. Folk, Knowledge, Place. Advance online publication.

To suggest a story or other content please email sekovev@unifiji.ac.fj