



Research and Education Network for Uganda (RENU)

Enabling Research & Education Collaboration

Using Sensor Networks to Address Community Needs

Celestini: Uganda Announces Selected Projects, Timeline for 2021–2022 LoRaWAN Track

KAMPALA - Monday 13th September 2021

The Celestini: Uganda Program, a collaboration of the Research and Education Network for Uganda (RENU), the Marconi Society, ResilientAfrica Network (RAN), International Centre for Theoretical Physics (ICTP) and the Network Startup Resource Center (NSRC), today announced the launch of its LoRaWAN (Long-Range Wide Area Network) track.

Through **LoRaWAN: Sensor Networks Solving Local Problems**, selected graduate (Master's or PhD) students will employ this advanced sensor technology to address critical community needs. Celestini: Uganda funds each project up to \$5,000, and provides mentors, equipment, and technical support throughout the 2021–2022 academic year.

RENU, the Marconi Society, RAN, ICTP and NSRC are dedicated to growing the ecosystem of technology expertise in the country. Through projects like the LoRaWAN track, the partners collaborate to provide cutting-edge opportunities to students that will shape the future technology workforce of Uganda.

Selected Projects

The Celestini: Uganda Program solicited proposals from students across Uganda beginning May 2021. Partners from RENU, the Marconi Society, and RAN selected the top research proposals based on their innovative use of LoRaWAN technology, partnership with a community organization, and relevance of the local problem they address. From improving water systems to updating city parking management, each of the

selected projects seeks to provide solutions to community challenges using advanced technology.



Ronald Lukanga

Increasing the Use of IoT in Rural Schools as a Strategy for Monitoring and Improving Local Community Access to Safe Water, Ronald Lukanga, Makerere University



William Wasswa

An Integrated Kampala City Street Parking Management Solution for Kampala Capital City Authority (KCCA), William Wasswa, Mbarara University of Science and Technology (MUST)



Henry Mary Lutaaya

Proposed IoT LoRaWAN Based Smart Agriculture and Remote Monitoring System using the LoRa Soil Moisture Sensor, Henry Mary Lutaaya, Uganda Martyrs University (UMU)



Alexander Muhangi

Characterization of the Effect of Green Infrastructure on Urban Thermal Comfort Around Makerere Hill, Alexander Muhangi, Makerere University



Lucky Jjumba

Development of a Water Leakage Detection and Control System using Long Range Technology, Lucky Jjumba, Makerere University



Nelson Mbazira

Development of a LoRAWAN Technology Based Power Theft Monitoring and Control System, Nelson Mbazira, Makerere University

Program Outline

Starting today, participating students begin a week of introductory sessions to help them prepare and launch their projects, including meeting with the program partners and attending a workshop focused on project expectations and management. Throughout the 2021–2022 academic year, students will receive training on best practices for effectively implementing and measuring

Internet of Things (IoT)-based research projects. They will also be paired with global technology experts, who will provide mentorship and support as their projects develop.

Throughout the program, students will gain meaningful experience in applying advanced technology solutions to a real-world problem. They will develop specialized technical skills to prepare them for future professional opportunities and will establish relationships with leading technologists around the world. By the end of the program, students will give a presentation about the development and impact of their projects, including metrics on the specific outcomes of their work.

History of the Program

Celestini: Uganda is an extension of the Celestini Program, the Marconi Society's experiential learning initiative developed by its Paul Baran Young Scholars. It aims to create a strong and diverse engineering profession by pairing students with resources to gain hands-on technical experience while pursuing projects that address community needs.

Past student-led projects include using sensing technology to monitor air quality in India, addressing water waste in Colombia using Internet of Things technology and machine learning, and increasing civic engagement in Rwanda through a mobile application.

The Celestini Program operates using a partnership model, wherein a local institution collaborates with leaders in the Marconi Society's network to empower students to use new technologies to address local problems with guidance from leaders in ICT.

About Research and Education Network for Uganda (RENU)

Research and Education Network for Uganda (RENU) is a not-for-profit National Research and Education Network (NREN) that offers affordable services uniquely designed to

enable collaboration among its member institutions (research and education institutions) and their global partners. The network is a cooperatively owned and community-driven service provider that helps to facilitate research and education networking among its member institutions.

About the Marconi Society

The Marconi Society envisions a world in which everyone can create opportunity through the benefits of connectivity. The organization celebrates, inspires, and connects individuals building tomorrow's technologies in service of a digitally inclusive world.

About ResilientAfrica Network (RAN)

The ResilientAfrica Network (RAN), funded by USAID, is a research and innovation partnership of 23 universities across 16 African countries led by Makerere University. RAN strengthens and builds the resilience of African communities by identifying, nurturing and scaling cross disciplinary innovations to respond to community most pressing challenges.

About ICTP

The Abdus Salam International Centre for Theoretical Physics leads global efforts to advance scientific and technological expertise in the developing world. ICTP's more than 50 years of facilitating scientific collaboration and innovation is supported by the Italian Government, UNESCO and the IAEA.

Particular mention is made of Marco Zennaro and Ermanno Pietrosomoli of ICTP, that have greatly supported the adoption of low cost wireless technologies in the developing world over the years.

About the Network Startup Resource Center (NSRC)

The Network Startup Resource Center which is based at the University of Oregon, was

established in 1992 to provide technical assistance to organizations setting up computer networks in new areas to connect scientists engaged in collaborative research and education. For the past 25 years, the NSRC has helped develop Internet infrastructure and network operations communities in Africa, Asia/Pacific, Latin America/Caribbean, and the Middle East. The NSRC is partially funded by the International Research Network Connections (IRNC) program of the U.S. National Science Foundation and Google, with additional contributions from dozens of public and private organizations.

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