

Kwame Nkrumah University of Science and Technology, Kumasi

A College of Engineering Newsletter. Issue 1 Vol.6 2025

WELCOME MESSAGE

This edition brings you exciting updates on the impactful strides KEEP continues to make in engineering education, research, and industry collaboration. As part of our mission to drive industrial and digital transformation, we remain committed to producing top-tier engineers, fostering innovation, and strengthening partnerships that address real-world challenges.

In this issue, we highlight KEEP's impact at the National Tertiary Education Conference 2024 and the remarkable research of KEEP Scholar Dr. Daniel Nframah Ampong, who has developed a high-performance battery material from taro peels, an which is eco-friendly breakthrough in energy storage. We also cover the visit of the African Center of Excellence in Internet of Things (ACEIOT) team from the University of Rwanda, which explored collaborations in AI and IoT research. Additionally, we reflect on the success of PartnerAfrika Projekt's first phase, which has enhanced industry-academia linkages and provided students with hands-on sustainability training. Another major milestone is the College of Engineering's Alumni Excellence Awards & Fundraising Dinner, which raised substantial funds to support postgraduate scholarships, research, and the modernisation of engineering facilities.



Prof. Jerry John Kponyo, KEEP Project Lead

Beyond these highlights, KEEP continues to expand opportunities for student development with new research initiatives, strategic partnerships, and ongoing innovations aimed at shaping the future of engineering in Ghana and beyond. We appreciate your support and look forward to achieving even greater milestones together!

Warm Regards,

Prof. Jerry John Kponyo

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KEEP Showcases Impact at National Tertiary Education Conference 2024

The Ghana Tertiary Education Commission (GTEC) hosted the National Tertiary Education Conference 2024 at the University of Ghana, Legon, bringing together key stakeholders to discuss the future of tertiary education. It also marked the 10th anniversary of the World Bank ACE Impact Project, highlighting initiatives that have strengthened Ghana's higher education landscape.

The KNUST Engineering Education Project (KEEP) showcased its contributions to engineering research and innovation at the conference. Prof. Jerry John Kponyo shared KEEP's achievements, which included the establishment of advanced research labs, industry collaborations, and support for startups. As part of efforts to sustain its impact, KEEP recently held the KNUST College of Engineering Alumni Excellence Awards and Fundraising Dinner, bringing together alumni and stakeholders to support its long-term vision.



Prof. Jerry John Kponyo, Project Lead of the KNUST Engineering Education Project (KEEP)

Speaking at the event, Prof. Kponyo emphasized KEEP's commitment to advancing engineering education, stating, "Our goal is to position Ghana and the sub-region forefront of industrial and digital transformation. Through strategic partnerships, top-notch research, and continuous innovation, we are shaping the future of engineering education and entrepreneurship".

Click here (<u>https://keep.knust.</u> edu.gh/news/keep-showcasesimpact-national-tertiary-educationconference-2024) to read more.

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ACEIoT Team from the University of Rwanda Visits KEEP for Collaboration and Knowledge Exchange



The ACEIOT team and Keep staff during a courtesy call on the Provost of the College of Engineering

delegation from the African Center of Excellence in Internet of Things (ACEIOT) at the University of Rwanda visited the KNUST Engineering Education Project (KEEP) from January 20th to 24th, 2025, to strengthen collaboration and exchange knowledge. Led by Prof. Damien Hanyurwimfura, the team aimed to study the operations of the Responsible Artificial Intelligence Lab (RAIL) as a model for setting up a similar facility in Rwanda. During their visit, they met with KEEP Management and the Provost of the College of Engineering, Prof. Kwabena Biritwum Nyarko, who emphasized the role of engineering and technology in addressing Africa's challenges, such as poverty and job creation. Discussions focused on fostering innovation, developing joint research proposals, and supporting student-led startups in Ghana and Rwanda.



The team's tour of the RAIL Lab

The ACEIOT team toured various KEEP facilities, including the Dipper Lab, RAIL, the IoT Lab, and the Innovation

Center, where they engaged with researchers and students working on AI applications in health, education, and agriculture.



A cross-section of participants during the various presentations

Both institutions are committed to collaborate in knowledge exchange, resource-sharing, and initiatives like the Artificial Intelligence for Sustainable Development (AI4SD) Innovation Challenge, which promotes AI-driven solutions for sustainable development. The visit concluded with a strong mutual interest in deepening partnerships, and plans to implement lessons learned from KEEP in Rwanda. Prof. Hanyurwimfura expressed optimism about the collaboration's potential to drive impactful research and innovation to address Africa's pressing challenges.

Click here (<u>https://keep.knust.edu.gh/news/aceiot-</u> team-university-rwanda-visits-keep-collaboration-andknowledge-exchange) to read more.

PartnerAfrika Projekt Closes First Phase with Remarkable Success

The PartnerAfrika Projekt marked the successful completion of its first phase with a closing ceremony at KNUST on February 4, 2025. collaboration between А Unternehmer Baden-Württemberg (UBW), the Association of Ghana Industries (AGI), and KNUST, the project has provided students with sustainability-focused training and industry placements since 2022. Through structured internships, students gained hands-on experience, contributed to sustainability initiatives, and some even secured full-time employment

Stakeholders praised the initiative for strengthening academiaindustry partnerships and ensuring long-term impact. Plans are underway to institutionalise the training program and expand collaborations.

The event also recognised outstanding students and expressed gratitude to German partners for their support.



A Cohort 3 student being honoured with a certificate by the Provost



Dignitaries and participants at the event



Management of the PartnerAfrika Projekt

Click here(<u>https://keep.knust.edu.gh/news/partnerafrika-projekt-closes-first-phase-remarkable-success</u>) **to read more**

KEEP Scholar, Dr. Daniel Nframah Ampong, Develops High-Performance Batteries from Taro Peels



With support from KEEP, the research benefited from advanced testing facilities at KNUST, eliminating the need for external labs. Prof. Kwadwo Mensah-Darkwa, Research Lead of the Energy Materials Research Group and Deputy Project Lead for KEEP, highlighted how this breakthrough aligns with Ghana's push for sustainable energy solutions. Dr. Ampong emphasised that using locally available materials for energy storage can create cost-effective and eco-friendly solutions for Ghana's energy sector.

Click here (<u>https://keep.knust.edu.</u> gh/news/keep-scholar-dr-danielnframah-ampong-develops-highperformance-batteries-taro-peels) to read more

Dr. Daniel Nframah, the developer of the innovative method to produce highperformance battery materials

Dr. Daniel Nframah Ampong, a KEEP Scholar and researcher at the KNUST Center for Engineering Materials Research (KCEMR), has developed an innovative method to produce highperformance battery materials from taro peels.

This eco-friendly approach offers a sustainable alternative to conventional activated carbon production, which often involves toxic and expensive processes. His research, published in *Energy Storage*, demonstrates how biowaste can enhance energy storage technology while supporting Ghana's renewable energy goals.



The high-performance batteries developed from Taro Peels

THE RENEWABLE ENERGY LAB



The Renewable Energy Lab

The Renewable Energy Lab at the KNUST Engineering Education Project (KEEP) plays a crucial role in advancing engineering research and innovation. Established under KEEP, the lab provides postgraduate students with a dedicated space for research, study, and experimentation in renewable energy technologies. It is equipped with diverse state-of-the-art equipment, including bioenergy devices, biogas analysers, solar kits, solar simulators, and a recently acquired wind simulator. Additionally, the lab supports students from disciplines like materials engineering, providing specialised equipment for various experimental needs.



The Agrivoltaic Project site

Beyond serving as a research space for students, the Renewable Energy Lab is an annex to the Brew-Hammond Energy Centre, extending its facilities to research fellows and lecturer-student collaboration on various projects. Among the major research initiatives currently underway is an agrivoltaic project, which explores the co-location of crop production and solar energy generation on the same land. The research team is actively collecting data on the performance of this integrated system to assess its potential impact on food and energy security. In addition to its core research, the lab strategically collaborates with other research centres, including the Responsible AI Lab (RAIL), to integrate artificial intelligence into energy solutions. A notable ongoing project with GRIDCO focuses on predictive maintenance for power transmission equipment. The team is developing AI models to analyse historical data from transformers, such as temperature variations, to detect anomalies and predict potential failures before they occur. This proactive approach aims to enhance the reliability of Ghana's power grid by enabling swift interventions before critical failures happen.

The lab is also at the forefront of developing smart energy systems for buildings and research spaces. Researchers are working on IoT-enabled systems that optimise energy efficiency by remotely monitoring and controlling indoor appliances. This initiative combines electrical engineering and artificial intelligence to create intelligent energy management solutions that could be applied to homes, laboratories, and commercial buildings.



Students working in the Renewable Energy Lab

Looking ahead, the Renewable Energy Lab anticipates the arrival of additional advanced equipment to further enhance its research capabilities. Since the inception of KEEP, significant investments have been made in procuring cutting-edge devices for the lab, with many still in the pipeline for delivery. With these additions, the lab aims to expand its research scope and foster groundbreaking advancements in renewable energy.

As KEEP continues to drive innovation, the lab remains committed to shaping the future of sustainable energy solutions through research, collaboration, and technology development.

INTERVIEW WITH DR. AKWASI ADU-POKU



Dr. Akwasi Adu-Poku

r. Akwasi Adu-Poku, a KEEP scholar and Research Fellow at The Brew-Hammond Energy Centre has made remarkable contributions to renewable energy research and sustainable energy solutions. His journey began at KNUST, where his passion for clean energy was ignited during his undergraduate studies in Agricultural Engineering. Through dedication and resilience, he pursued an MPhil in Renewable Energy Technologies and later a PhD in Bioengineering, achieving the latter in record time before the age of 30. His PhD research explored bamboo's potential as a bioenergy source and its role in carbon sequestration.

Dr. Adu-Poku remains committed to advancing energy research, driving innovation, and policy development in the Global South.

Click here https://youtu.be/c2NqKwJur3Y to watch the full interview.



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COLLEGE OF ENGINEERING HOSTS ALUMNI EXCELLENCE AWARDS AND FUNDRAISING DINNER



Prof. (Mrs.) Rita Akosua Dickson, Vice-Chancellor, клиsт, gave her remarks

he College of Engineering (CoE) held its maiden Excellence Awards and Fundraising Dinner on November 8, 2024, at the Labadi Beach Hotel to honour distinguished alumni and raise funds for its Endowment Fund. The fund aims to support postgraduate scholarships, enhance engineering innovations, equip laboratories with modern technology, and recruit international visiting faculty.

In his remarks, Prof. Jerry John Kponyo highlighted the crucial role of industry, academia, and alumni in advancing KNUST's mission. Vice-Chancellor Prof. (Mrs.) Rita Akosua Dickson and Provost Prof. Kwabena Biritwum Nyarko emphasised the importance of



An overview of the esteemed guests during the memorable evening

alumni contributions in sustaining research, scholarships, and infrastructure improvements.

The event successfully raised approximately \$628,000 towards its \$1.5 million target for 2024. While acknowledging the generosity of supporters, organisers called for further contributions to fully realise the fund's objectives. The College remains committed to securing long-term support for innovation and academic excellence.

Click here (<u>https://coe.knust.edu.gh/news/news-items/</u> college-engineering-hosts-alumni-excellence-awardsand-fundraising-dinner-raise) to read more



FROM ENGINEERS TO INDUSTRY LEADERS: A CHAT WITH ING. OSEI KWADADE ASIAMPONG AND ING. MARCUS AGYEI-BOATENG



Ing. Kwadade Asiampong



Ing. Osei Kwadade Asiampong and Ing. Marcus Agyei-Boateng have transformed their engineering expertise into a thriving business, Mining Pro, specialising in process and project engineering for Ghana's mining sector. Despite initial uncertainties about job prospects, their determination led them from national service placements to building a company that is now at the forefront of mining process design and construction. Their journey is a testament to perseverance, innovation, and the willingness to take risks in pursuit of excellence.

Beyond their business success, they are committed to nurturing the next generation of engineers. Through internships, mentorship programmes, and hands-on training, they help students transition from academia to industry, ensuring they develop the skills needed to excel. Their story serves as an inspiration to young professionals looking to make an impact in engineering.

Click here (<u>https://www.youtube</u>. com/@knust-college_of_ engineering) to watch the video.

Ing. Marcus Agyei-Boateng

KEEP Info

Location: Opposite the New Faculty of Social Science Building, behind the RWESK building

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