

WELCOME ADDRESS



Prof. Jerry John Kponyo

Welcome to the eighth edition of the KEEP Bulletin.

This edition highlights significant events and activities of the KNUST Engineering Education Project (KEEP) in the past year.

KEEP seeks to deliver high-quality postgraduate courses and conduct and disseminate applied research focused on addressing developmental challenges related to industrialisation, digital development (ICT), energy systems, renewable energy, manufacturing, and the exploration and development of the oil and gas industry.

The Government of Ghana funds the Project as part of the World

Bank's Africa Centres of Excellence for Development Impact (ACE Impact) Project hosted by the College of Engineering, KNUST.

The Agency for Quality Assurance through Accreditation of Study Programs (AQAS) has accredited five of our postgraduate programmes, namely: PhD Electrical Engineering, PhD Sustainable Engineering, MPhil Power Systems Engineering, MPhil Renewable Energy Technologies, and MSc Renewable Engineering Technologies.

Cheers!

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His Royal Majesty Otumfuo Osei Tutu II Commissions the KEEP Postgraduate Building



Unveiling of the commissioning plaque by His Royal Majesty Otumfuo Osei Tutu II

His Royal Majesty Otumfuo Osei Tutu II, Asantehene and Chancellor of KNUST, commissioned the KEEP Postgraduate Building and was assisted by Ambassador Nana Effah Apenteng, Chairman of Council, KNUST, and Prof. Mrs Rita Akosua Dickson, Vice-Chancellor, KNUST.

As part of activities of the programme, Prof. Jerry John Kponyo, Project Lead of KEEP, took the dignitaries on a tour of the KEEP building.

The KEEP building houses state-of-the-art laboratories and teaching facilities for the digital development and energy thematic areas: The Responsible Artificial Intelligence Lab (RAIL), the

Production Team

Editor-in-chief: Prof. Jerry John Kponyo **Managing Editor:** Kwadwo Nyantakyi Marfo **Content Creator:** Gifty Antoinette Hukpati **Content Editor:** Irene Otuba Nunoo **Production Editor:** Francis K. N. Nunoo

Power Systems Lab, and the Renewable Energy Lab. There are lecture halls and a postgraduate study room for independent studies.



The Project Lead explaining a point to His Royal Majesty during a tour of the RAIL Lab



The KEEP Postgraduate Building



Congratulations to the KEEP Graduating Class of 2023

Forty-one (41) students graduated at the 56th KNUST Congregation in March 2023, and twenty-eight (28) students graduated at the 57th KNUST Congregation in November 2023 at Great Hall.

The graduating class comprised individuals from different departments within the College of Science and the College of Engineering, specifically, the Department of Computer Engineering, the Department of Telecommunication Engineering, the Department of Chemical Engineering, and the Department of Materials Engineering under the College of Engineering. Additionally, there were some graduates from the Cybersecurity and Digital Forensics Department under the College of Science.



KEEP Graduates with KEEP Advisory Board Members and Management Team



KEEP Graduates with KEEP Staff

Visit of the Chancellor of Massachusetts Institute of Technology (MIT) to KNUST



The Chancellor of the Massachusetts Institute of Technology (MIT), Prof. Melissa Nobles, delivering her lecture.

Prof. Melissa Nobles, Chancellor of Massachusetts Institute of Technology (MIT), delivered a public lecture at the Great Hall KNUST on the theme, 'Students at the Heart of University Education', when she visited KNUST in July 2023.

STEM (WiSTEM), Prof. Mrs. Ibok Nsa Oduro shared their life experiences. to encourage the youth to pursue their dreams fearlessly at the programme dubbed 'Inspiring the Next Generation of Women Innovators'.



A cross-section of participants in the programme

Accomplished speakers in the persons of the MIT Chancellor, Prof. Melissa Nobles, Vice-Chancellor of KNUST, Prof. Mrs. Rita Akosua Dickson, Chief Executive Officer (CEO), Vodafone Ghana, Ing. Patricia Obo-Nai and the President, Women in



From left: Chancellor, MIT, Prof. Melissa Nobles; Vice-Chancellor, KNUST, Prof. Mrs. Rita Akosua Dickson, Vice President, SRC, Deborah Boakye, a Multimedia journalist, Emmanuel Kwasi Debrah, President, WiSTEM, Prof. Mrs. Ibok Nsa Oduro and CEO, Vodafone Ghana.

Ari Jacobovits, Managing Director of Africa Programs, MIT, visits KNUST



Ari Jacobovits (4th from left), with Prof. Mrs. Rita Akosua Dickson (5th from left), Prof. Kwabena Biritwum Nyarko (3rd from left), Prof. Jerry John Kponyo (4th from right) and KEEP staff.

The Managing Director of Africa Programs at Massachusetts Institute of Technology (MIT), Ari Jacobovits, visited KEEP and paid a courtesy call on the Vice-Chancellor, Prof. Mrs. Rita Akosua Dickson, and the Provost of the College of Engineering, Prof. Kwabena Biritwum Nyarko.

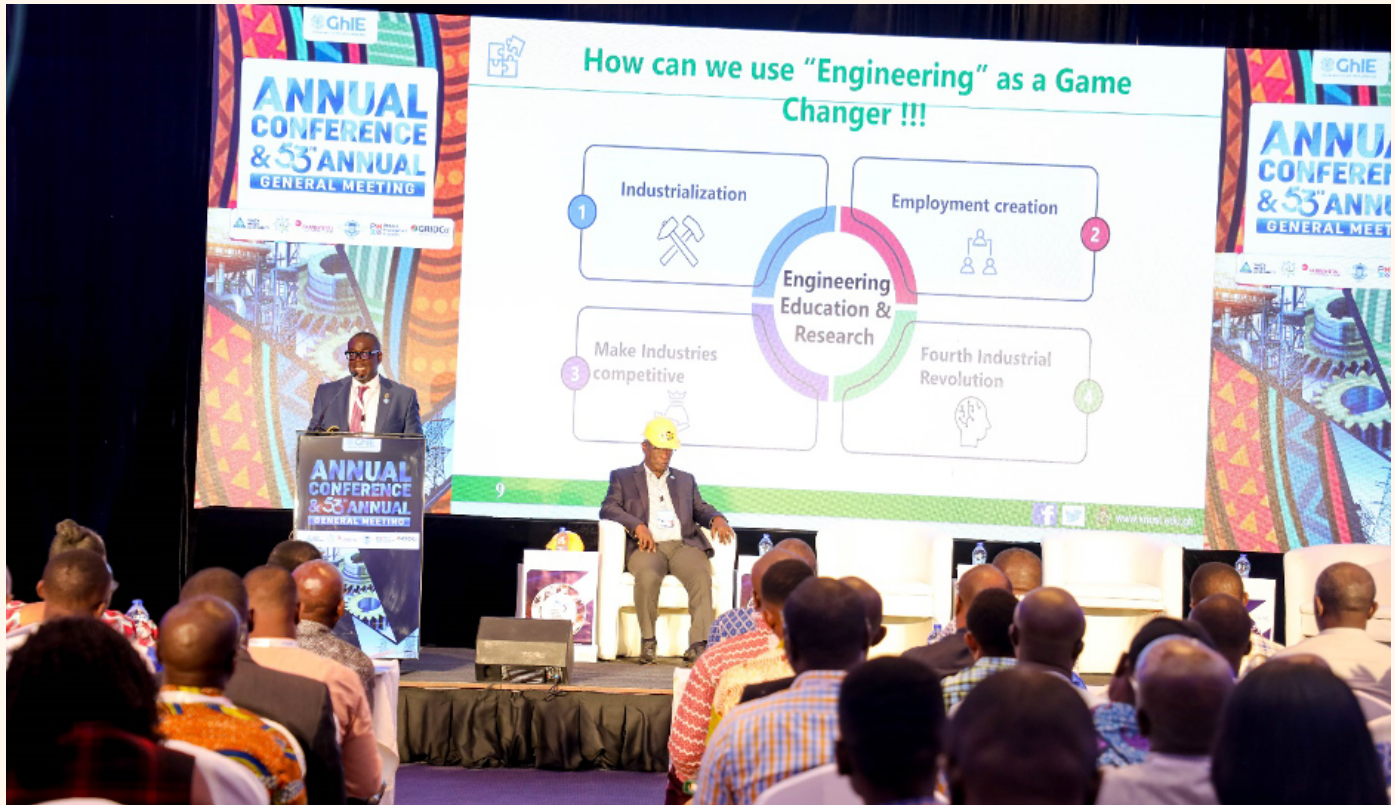
Ari Jacobovits met with the KEEP and Responsible AI Lab (RAIL) teams. Prof. Jerry John Kponyo (Project Lead for KEEP, who doubles as the Principal Investigator for RAIL), gave a presentation on the KEEP and RAIL projects. The PhD students and Research Associates of RAIL also gave presentations on their research works.



Ari Jacobovits in a meeting with the KNUST Engineering Education Project (KEEP) and the Responsible AI Lab (RAIL) team.

During the meeting Ari Jacobovits provided an overview of the MIT International Science and Technology Initiative. Both teams discussed potential areas of collaboration, particularly in the field of artificial intelligence.

Engineers Admonished to Support Engineering Education and Research for National Development at the GhIE Annual Conference 2023 at Takoradi.



Prof. Kwabena Biritwum Nyarko (standing), Provost of the College of Engineering KNUST, during a presentation at the GhIE conference.

Prof. Kwabena Biritwum Nyarko, Provost of the College of Engineering KNUST, and Ing. Asare Yeboah, Chairman of the KEEP Industrial Advisory Board, presented on the theme, *The role of Engineering Education and Research for National Development*, at the Ghana Institution of Engineering (GhIE) Annual Conference 2023 at the Best Western Plus Atlantic Hotel, Takoradi.

Prof. Nyarko introduced the KNUST College of Engineering Endowment Fund (KCEEF) as an innovative financing initiative focused on postgraduate

engineering education and research. He iterated that donating to the Fund would provide continuous funding to support postgraduate education and financially aid postgraduate students in the College of Engineering. The target is to raise GH¢50m (\$5 million) within five years. He also noted that Ghana is endowed with exceptionally brilliant and talented students. However, after their undergraduate studies, they are lured to advanced economies such as the USA, Europe, and Asia, where attractive scholarships are readily available.



Prof. Nyarko in a College of Engineering-branded helmet.



Ing. Asare Yeboah, Chairman of the Board of Trustees for KCEEF.

He added that the Endowment Fund would significantly help retain the top engineering graduates in Ghana, which would, in the long run, address some of the developmental challenges relating to manufacturing, industrialisation, energy systems, exploration, and renewable energy in the country.

He appreciated all corporate and individual contributors to the Fund and encouraged all corporate institutions, alumni year groups, and individuals to donate.

Ing. Asare Yeboah, Chairman of the Board of Trustees for the Endowment Fund, provided further details for contributors to the Fund via Momo, bank account and credit card avenues. He further admonished everyone present to donate generously.

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AND TECHNOLOGY, KUMASI

KNUST COLLEGE OF ENGINEERING ENDOWMENT FUND

Stanbic Bank Account Name:	KNUST COLLEGE OF ENGINEERING ENDOWMENT FUND	
Account Number:	904 000 824 8502 (GHC)	904 000 952 7588 (US\$)
Mobile Money	059 860 5849	Mechant ID 630380
Swift Code:	SBICGHAC	Branch KNUST

VISIT kceef.knust.edu.gh TO DONATE

To donate to the Fund, please click [here](https://kceef.knust.edu.gh/donate-to-knust-coe-endowment-fund) (<https://kceef.knust.edu.gh/donate-to-knust-coe-endowment-fund>)

KEEP Visits Some Tertiary Institutions in the United States



A cross-section of the KNUST delegation with staff of the SUNY Polytechnic Institute.

A delegation led by the Provost of the College of Engineering, Prof. Kwabena Biritwum Nyarko, embarked on a two-week visit to the United States of America in October 2023 to foster partnerships with esteemed institutions such as the SUNY Polytechnic Institute and Worcester Polytechnic Institute (WPI).

At SUNY, discussions revolved around interdisciplinary research encompassing Artificial Intelligence (AI), Manufacturing, Cyber Security, Staff and Student Mobility, Transportation, Robotics, Electrical Cars, and Mini Grids.



Worcester Polytechnic Institute with the team from KNUST

At WPI, from the KNUST delegation and officials from WPI engaged in discussions focused on the Global Development Project, Manufacturing and Materials, scholarship opportunities, and the robust collaborations between RAIL and

Artificial Intelligence Projects. They explored the potential for credit transfers between KNUST and WPI and fostered strong collaboration between the innovation centres of both institutions.



Alumni of the CoE, the Alumni Connect in Worcester, alongside Prof. Johnson Asumadu, Chairman of the KEEP ISAB (second from the left front row)

In his address, Prof. Johnson Asumadu, Chairman of the KEEP International Scientific Advisory Board (ISAB), noted that alumni are an integral part of the University and should support activities of the University. He said the quality of KNUST students is due to the education provided, and KNUST students always prove themselves wherever they go.

The team also had a similar meeting with the alumni in Virginia on 26th October 2023 and extended an invitation to all alumni in Virginia to take an active interest in their University and partake in engagements when called on.





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To donate to the Fund, please click **here** (<https://kceef.knust.edu.gh/donate-to-knust-coe-endowment-fund>)

KEEP Visits Some Tertiary Institutions and Industry Partners in the United Kingdom (UK)



Meeting at the University of Cambridge with Dai Morgan (third person on the left-hand side), in charge of MPhil Sustainable Development, University of Cambridge

A team led by Prof. Jerry John Kponyo, Project Lead, KNUST Engineering Education Project (KEEP), visited the United Kingdom. They visited prestigious institutions like the Foreign Commonwealth and Development Office (FCDO), the Royal Academy of Engineering, the University of Oxford, and the University of Cambridge.

Interactions and discussions with the institutions visited sparked considerable interest in Artificial Intelligence (AI) and Quantum Computing and also explored how Ghana could leverage the strategy initiated by the Former UK Foreign Secretary to its advantage in relation to Science, Technology, and Innovation.



The KNUST Team with a Staff members of the Royal Academy of Engineering

KEEP Advisory Board pays a Courtesy call on the Vice-Chancellor, KNUST



KEEP Management and Advisory Board Members with the Vice-Chancellor, KNUST (middle)

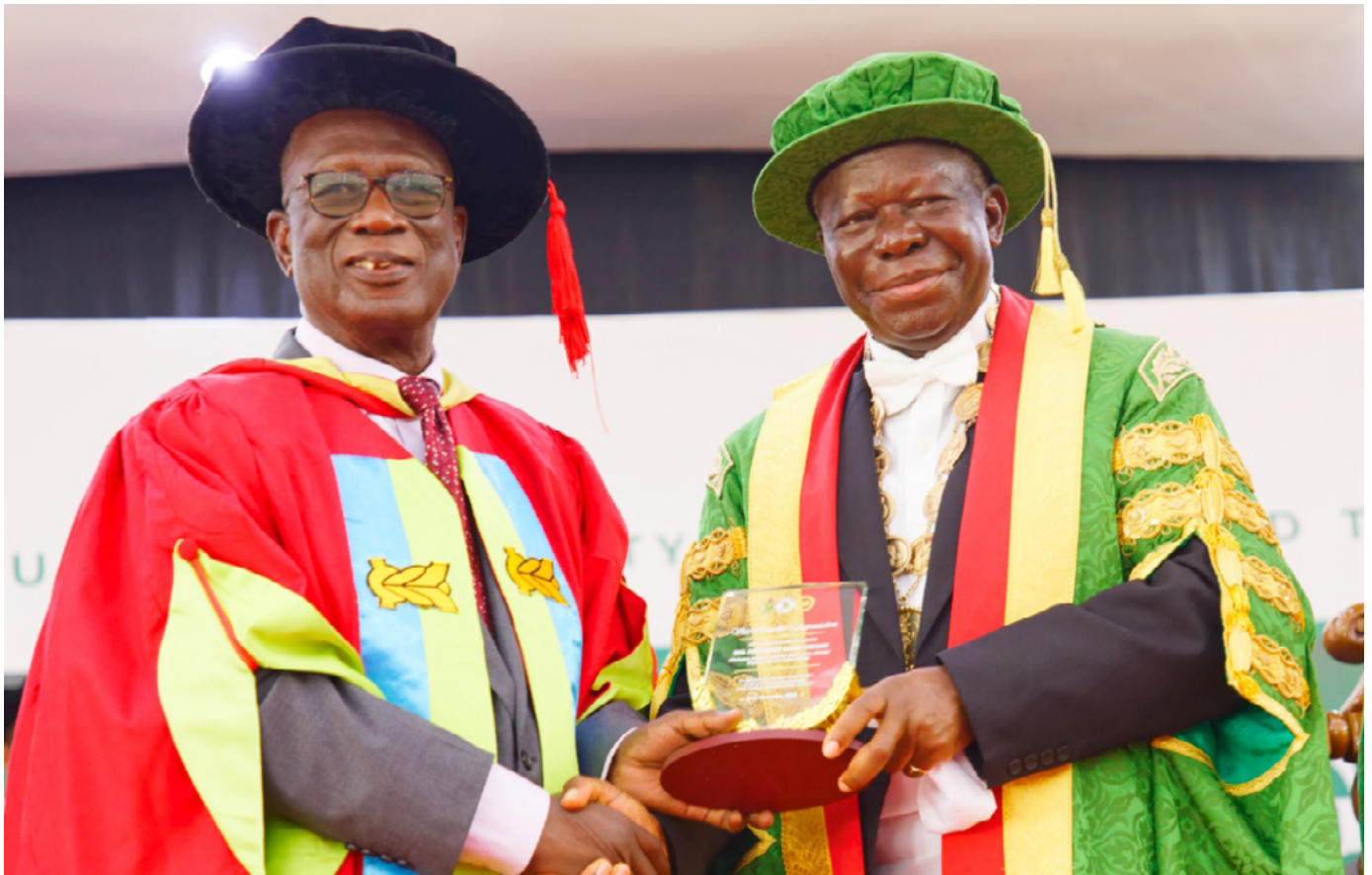
As part of KEEP's first joint meeting of its Scientific and Industrial Advisory Boards in November 2023, a courtesy call was paid to the Vice-Chancellor, Prof. Rita Akosua Dickson, KNUST. Prof. Jerry John Kponyo announced that KEEP, (an African Centre of Excellence (ACE) Impact Project in the College of Engineering), is one of the best ACEs among all the 53 Impact Projects, with a Disbursement Linked Result of 96% as per performance statistics reported by the World Bank at the 10th ACE Regional Workshop in Abidjan, Ivory Coast. The KEEP Advisory Board members visited to discuss the progress of the Project's implementation.

Following the courtesy call, the team held their first joint in-person meeting at the KEEP Board Room. In his opening remarks, Prof. Johnson Asumadu, Chairman of ISAB, said the advisory board is glad to meet in-person and will continue to guide and advise the project team. He expressed the team's commitment to encouraging the College to forge on with its commendable efforts for both current success and future achievements. He added that there are about 85,000 ideas in students' minds, which must be tapped into and utilised for the benefit of the College and University.



An in-person meeting at KEEP between staff members and the KEEP Advisory board members.

KNUST Honours KEEP Advisory Board Members



Ing. Frederick Asare-Yeboah received a plaque from His Excellency Otumfuo Osei Tutu II for his outstanding service to KEEP

The Vice-Chancellor, KNUST, Prof. Rita Akosua Dickson, honoured and recognised the esteemed KNUST Engineering Education Project (KEEP) Advisory Board Members for their outstanding service and immense contributions towards the College of Engineering. They were given plaques as a token of appreciation during the KNUST 57th Special Congregation.

The KEEP Advisory Board Members honoured were Ing. Frederick Asare-Yeboah, Ing. William Amuna, Nana Joe Mensah, Dr. Kwaku Aning, Ing. Mrs. Patricia Obo-Nai, Dr. Ben K.D. Asante, Ing. Mrs. Nana Akua Brenyah Boateng, Prof. Johnson Asumadu, Prof. Muiyiwa Sam Adaramola, Prof. Joseph

Yaw Yeboah, Dr. Victor Atiemo-Obeng, Dr. Joseph Odartey Cruickshank, Dr. Richard Okine and Dr. Chux Daniels.

At this same special congregation, Ing. Frederick Asare-Yeboah and Ing. William Amuna, both KEEP Advisory Board members, were conferred with Honorary Degrees, DSc. Honoris Causa

for their outstanding services to KNUST, Ghana and West Africa.



KEEP Advisory Board Members and Management Team



Prof. Joseph Yaw Yeboah

Spotlight on Prof. Joseph Yaw Yeboah

Prof. Joseph Yaw Yeboah is a Massachusetts Institute of Technology (MIT) trained Professor of Chemical and Biomedical Engineering and a Member of the KEEP International Scientific Advisory Board.

Prof. Yeboah is the first black man to earn four degrees in four years—a Bachelor's in Chemistry, Chemical Engineering, Management, and a Master's in Chemical Engineering Practice from MIT. His research interests are electro-catalysis/heterogeneous catalysis, combustion and emission control, oilfield scale formation, coal and biomass conversion processes, petroleum and natural gas production and processing, energy, materials, and the environment.

Initially, he had intended to enrol at Ghana's premier Engineering University, the Kwame Nkrumah University of Science and Technology (KNUST), to pursue chemical engineering upon completing his secondary school education at Ghana Secondary Technical School (GSTS). However, during Lower 6, he discovered that one of his classmates had gained admission to the Rochester Institute of Technology and was set to depart for the United States at the end of Lower 6.

At this point, he and his classmates who considered themselves academically at par with Frank, became aware of the possibility of pursuing a university education in the United States. This information gave him the confidence that he could after GSTS, attend one of the world's premier

engineering schools, leading him to apply to the Massachusetts Institute of Technology (MIT).

In the course of his application, he needed some financial assistance to cover the cost of registering for the Scholastic Aptitude Test (SAT). To secure this support, he utilised the resources available at the GSTS library to gather the addresses of numerous University professors in the US specialising in Chemistry, Chemical Engineering, and related fields of interest. Writing them letters, he earnestly appealed to them to help him fund his SAT registration to make it possible for him to take the exams in Ghana. Eventually, someone generously covered the expenses, enabling him to complete his SAT, and he later gained admission to MIT in 1971. To this day, he remains unaware of the individual behind this act of kindness preventing him from showing his gratitude. He expressed that the compassionate act of kindness from this anonymous individual instilled in him the value and importance of being kind, generous, and charitable.



Responding to how he acquired four degrees in four years, he said it was not a deliberate decision to achieve four degrees in four years.

He had a passion for chemical engineering because of his desire for a profession that combined his strong interest in chemistry, maths,

and physics. He was particularly interested in chemistry and took extra chemistry courses in addition to his chemical engineering courses each semester. So, while he felt good about his background in the sciences, he also felt a big void in areas such as economics and management.

He realised that MIT departments had no restrictions on who took which classes, so he decided to broaden his scope by also taking some management and economics courses each term. The Chemical Engineering Department at MIT has a unique master's degree programme in Chemical Engineering Practice. It allowed students who met academic requirements to apply for graduate status in their junior year. Students accepted into the program earned graduate status while undergraduates, enabling them to take graduate-level courses, and he took advantage of that. He spent one semester working at one of the department's practice school centres stationed at a selected industrial company. He had the chance to work in groups of 3-5 on practical industrial problems facing the company, and the group had to present their results, conclusions, and recommendations within one month. He did that as part of his master's degree and completed the requirements for his bachelor's in Chemical Engineering and Master's in Chemical Engineering Practice.

Towards the end of his undergraduate year, he realised that he only needed a few additional courses to take in chemistry and management to meet the degree requirements for those majors. He completed those courses to meet the bachelor's degree requirements

in chemistry and management in addition to his chemical engineering degree and master's in Chemical Engineering Practice. That explains the four degrees in four years

As a graduate student in his fourth year, he took the qualifying exams in Chemical Engineering for a PhD. He did exceptionally well that they could not refuse him, and the professors allowed him to continue with his PhD. In the Chemical Engineering Department. After his PhD. at MIT in 1979, he worked with General Electric Corporate Research and Development Centre for five years doing research and development. His PhD. was in energy and fossil fuels, but working in General Electric, he worked with plastics and silicones. He realised he was too much of an academician to be stuck in the industry. He then decided to go into academia, where he could change his research focus and explore other fields.

He also worked in Saudi Arabia at the King Fahd University of Petroleum and Minerals (KFUPM), where he helped establish their research centre on petroleum and natural gas at the Research Institute and taught in the Chemical Engineering Department. He left KFUPM and joined Clark Atlanta University (CAU) in Atlanta, where he helped develop a new engineering programme and served as the Technical Director of the Research Centre for Science. He left Clark Atlanta to become the Head of the Department of Energy and Mineral Engineering at the Pennsylvania State University. After a while he left Pennsylvania State to become the Dean of Engineering at Florida State University (FSU) and Florida

Agricultural and Mechanical University (FAMU). These two universities have a unique joint College of Engineering, the FAMU-FSU College of Engineering, in Tallahassee, Florida. He admitted that being the Dean of engineering of a joint college between two universities was tough because of the different cultures, philosophies, and policies. After a while, it was too stressful for him, so he stepped down as the Dean but remained on the faculty as a chemical and biomedical engineering professor engaged in teaching and research.

He mentioned that he has two more years to retire. And he will spend the rest of his years visiting Ghana and other places.

He shared that he had had a wonderful experience visiting KNUST and the College of Engineering.



For Women in Science

unesco

FONDATION
L'ORÉAL

Rahimat Oyiza Yakubu, A KEEP Scholar, Awarded at L'Oreal-UNESCO for Women in Science Programme

Rahimat Oyiza Yakubu, a KNUST Engineering Education Project (KEEP) Scholar and a graduating PhD student in Sustainable Energy Technologies from the Department of Mechanical Engineering, KNUST, was awarded one of the 30 most promising females in STEM by the President of Botswana.

UNESCO and the Fondation L'Oréal seek to recognise women researchers who, through their work, have contributed to

overcoming today's global challenges. The L'Oreal – UNESCO for Women in Science Programme helps empower women scientists to achieve scientific excellence and participate equally in solving the great challenges facing humanity.

According to Rahimat, she is excited and grateful for the leadership and management training coupled with the € 10,000 support to attend and participate in international conferences.

The programme also connects awardees with journalists and podcast creators to give their research findings visibility and recognition.

Rahimat's research interests are Renewable Energy Technologies, Energy Policy, and Power System analysis. Her research at the PhD level focused on modelling and technical assessment of bifacial solar photovoltaic systems in low latitude regions using West Africa as a case study.



West Africa Awardees at the programme

KEEP HANGS OUT WITH JOSHUA ATTA ALABI, A KEEP SCHOLAR.



KEEP: Tell us about yourself

JOSHUA: I am a dedicated and highly motivated MPhil Materials Engineering student from Kwame Nkrumah University of Science and Technology, Ghana, with a strong academic background and a passion for sustainable materials. In my academic journey, I have led innovative research teams, focusing on developing biodegradable sanitary pads from plantain waste and producing commercial-grade graphene from biomass. At the same time, I have strongly engaged in community projects and received several

recognitions at scientific conferences, including an award from the Vice-Chancellor for my work. As a research enthusiast, I am deeply committed to contributing to a greener, more sustainable future in materials engineering.

KEEP: Tell us about your postgraduate studies.

JOSHUA: In pursuit of my postgraduate studies, I was driven by a deep passion for expanding my knowledge and skills in Materials Engineering after serving as a Teaching and Research Assistant in my department, Materials

Engineering. This educational journey is not just a personal ambition but a deliberate choice to contribute meaningfully to my field. I aim to delve deeper into sustainable and nanomaterials, as I believe these areas hold immense potential for innovative solutions. Additionally, I am eager to engage in collaborative research, participate in academic forums, and take advantage of the cutting-edge resources that come my way to build myself to the possible best version I can attain. I am particularly inspired by the innovative works being done at KEEP and how KEEP makes it possible for people like myself to have polished experience and guidance under the supervision of great lecturers in the department. I want to emphasise that the Department of Materials and KEEP have a common mission and vision which align perfectly with my academic interests. I am committed to leveraging this opportunity to not only enhance my expertise but also to contribute to the academic community and address real-world challenges actively. I am confident that my enthusiasm for continuous learning, coupled with my dedication to making a positive impact, will make me a valuable asset to this Institution and the world at large.

KEEP: Is there any other project you are working on?

JOSHUA: Yes, in fact I am dedicated to a groundbreaking research project on the production of high-quality commercial-grade graphene from shea nut shell wastes. This

Project combines my passion for sustainable materials and advanced technology. I am devoted to exploring innovative methods to extract graphene efficiently, aiming to contribute to the advancements in renewable energy, electronics, and various other industries. However, while this Project consumes the majority of my research efforts, I am always open to collaborating on related initiatives within the realm of materials science and sustainable technology. I firmly believe that interdisciplinary cooperation can lead to transformative discoveries, and I am enthusiastic about exploring such opportunities in the future.

KEEP: How has the postgraduate journey been so far?

JOSHUA: My postgraduate journey has been incredibly enriching and transformative. It's been a period of deep exploration and rigorous academic challenges, all of which have contributed significantly to my growth, both personally and professionally. Engaging with cutting-edge research, collaborating with esteemed professors, and working on innovative projects, such as my research on the production of biodegradable absorbent cores from plantain fibres to curb the high cost of sanitary pads and also reduce the amount of microplastic waste in the environment, has allowed me to apply theoretical knowledge into practical solutions. The diverse perspectives of my peers and mentors have broadened my horizons, enhancing my critical thinking and problem-solving skills. Furthermore, the opportunity to contribute to meaningful research initiatives has not only deepened my

passion for materials science but also reinforced my commitment to sustainable technology. Overall, my postgraduate journey has been a fulfilling and rewarding experience, motivating me to continue pushing boundaries in the field of scientific research.

KEEP: How has KEEP impacted your journey?

JOSHUA: KEEP is profoundly shaping my academic journey by providing me with invaluable support and resources. With KEEP, I am pursuing my education with financial stability, allowing me to focus wholeheartedly on my studies and research. The mentorship and guidance I receive from KEEP have been instrumental in my personal and professional growth. They have not only eased my financial burden but also instilled in me a sense of responsibility to give back to my community. Their support has not only opened doors for my education but has also fuelled my determination to make a meaningful impact in the world. I am deeply grateful for the opportunities and encouragement KEEP has provided, which have been pivotal in shaping my journey toward academic excellence and social responsibility.

KEEP: Are there Any Mentors You Would Like to Appreciate?

JOSHUA: I am immensely grateful for the mentorship I have received from a distinguished group of professionals. Dr. Emmanuel Arthur's guidance has been invaluable, providing me with insights that have significantly influenced my research approach. Dr. Kwadwo Mensah-Darkwa's expertise has enlightened my

understanding of advanced materials, enriching my academic pursuits of sustainable materials for energy production and storage. Dr. Emmanuel Gikunoo's mentorship has been instrumental in honing my research skills and fostering an environment of intellectual curiosity. Dr. Eric Asare's unwavering support has bolstered my confidence, encouraging me to explore innovative solutions in my field. Dr. Frank Agyemang's encouragement and constructive feedback have been pivotal in my growth as a researcher. Dr. Mizpah Rockson's mentorship has been transformative, inspiring me to pursue excellence in both academia and community service. I express my deepest gratitude to these mentors, whose wisdom and mentorship have been instrumental in shaping my academic and professional journey.

KEEP: Any final words?

JOSHUA: I am deeply passionate about my field and committed to making a meaningful impact. I am driven by a desire to innovate, contribute to scientific knowledge, and address pressing societal challenges. With a strong foundation in materials engineering and a relentless pursuit of excellence, I am enthusiastic about the opportunities that lie ahead. I am dedicated to my academic and research endeavours and deeply invested in giving back to my community and fostering positive change. I am excited about the prospect of further learning and collaborating with experts in the field, and I am ready to embark on new challenges with enthusiasm and determination.

Congratulations **Mark Korang Yeboah**

Mark Korang Yeboah is a graduating MPhil Bioengineering Student at the Department of Agricultural and Biosystems Engineering, KNUST, and a KEEP Scholar. He won the Graduate Assistant of the Year 2023 award at the 30th Anniversary Dinner and Awards Night of the Graduate Students' Association of Ghana.

During his tenure as a graduate assistant, he assisted undergraduates with thermodynamics and postgraduates with computer optimisation through tutorials. His research interest is to uncover the promising insight that lies at the convergence of biotechnology and artificial intelligence. His dream is to be a lecturer and a researcher to make contributions to his field and society.



INNOVATION CORNER

A Smart IoT-Based Energy Conservation Device: The "DUO"



The "DUO"

Faisal Ihunnang Nurideen and Stephen Nimako Effah, both third-year Telecommunication Engineering and Automobile Engineering students at the KNUST College of Engineering have innovated a smart IoT-based energy conservation device named the "DUO".

This device efficiently conserves energy by automatically powering off electrical gadgets like light bulbs, fans, air conditioners, and other electronics when no human presence is detected in a room for a specified duration. The fully automated device receives functionality updates remotely, making it a dynamic and responsive system. The system's efficiency is deeply rooted in the advanced AI algorithm for human detection.

The system' encompassing a webcam, sensors, a motor, and a Raspberry Pi4, is designed for

diverse environments, including classrooms, homes, and offices.

The DUO device saves energy by preventing electronic devices from being left on for extended periods. It showcases versatility in applications, ranging from head counts to smart home

controls, security enhancement, safety, and anomaly detection. Its seamless integration into various settings underscores its potential as a multifaceted tool for convenience, energy efficiency, and safety.



Faisal Ihunnang Nurideen (left) and Stephen Nimako Effah (right)

The students who created the device were supervised by Prof. Francis Kemausuor, Dean of the Faculty of Mechanical and Chemical Engineering and the Renewable Energy Thematic

Lead of the KNUST Engineering Education Project, and Mr Akwasi Adu-Poku, a PhD Bioengineering candidate. The Brew Hammond Energy Centre and the KNUST Engineering Education Project funded the materials for the "DUO."

Alumni Interactions



Ing. Barrister Kwaku Boadu, an alumnus of the CoE, visited the College and presented his published book.



Ing. Dr. Riverson speaks at the first Alumni Connect.



Ing. Barrister Kwaku Boadu Esq. (third person on the left) together with his wife and some representatives of the CoE Alumni.

Learn more:

<https://keep.knust.edu.gh/news/engineer-turned-lawyer-still-engineering>



C.E.O of Vester Oil Mills Ltd., Ing. Kwasi Nyamekye speaks at the first Alumni Connect



A cross-section of participants at the first CoE Alumni Connect held in June 2022.



Alumni panel members at the Alumni Connect.

Learn more:

<https://coe.knust.edu.gh/news/news-items/college-engineering-knust-organizes-alumni-meet>



Robert Kwasi Kummapley PE. (Second person on the left) an Alumnus of the CoE with his family (the women in the middle) visited the Provost of the CoE, Prof. Kwabena Biritwum Nyarko (First person on the left) and Prof. Samuel I.K. Appadu (First person on the right).

Learn more:

<https://coe.knust.edu.gh/news/news-items/robert-k-kumapley-and-family-visit-college-engineering-knust>



Interaction with an Alumnus at the 52nd GhIE conference.



CoE Alumni from Ghana and Germany at ICERA conference, Lancaster, Kumasi.



Interactions between Alumni at the 52nd GhIE conference.



CoE Alumni from Ghana and Germany at ICERA conference, Lancaster, Kumasi.



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College of Engineering alumni

HOME Coming

Anticipate


KEEP Info

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


Contact: (+233)501384810 / (+233)202340149


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To make any enquiries about KEEP, you can send a mail to keep@knust.edu.gh

Contact the Project Manager for KEEP on **0502519057**