MORE INFORMATION ON THE AFRICA-EUROPE CoRE STELLENBOSCH UNIVERSITY IS INVOLVED IN:

1. Addressing Global and African Challenges through Methods from Artificial Intelligence, Data Science and Theoretical and Computational Thinking

This cluster will be co-led by Prof Francesco Petruccione from the School for Data Science and Computational Thinking at SU with seven ARUA core-partners listed in this section and Prof Thomas Schön from Uppsala University in Sweden. The cluster's priority area is innovation and technology.

The cluster aims to address the effective application of AI, data science and theoretical and computational thinking to tackle pressing global and African healthcare, education, agriculture, energy and infrastructure challenges. It will bring together experts from diverse fields, such as computer science, engineering, mathematics, physics and social sciences to work on complex problems and develop innovative solutions.

"Artificial Intelligence (AI) methods have become powerful tools for addressing societal challenges in almost all areas of life. This development is fuelled by improved connectivity, increased computational power and data access," says Petruccione.

"Applications of AI will play an essential role in achieving many of the Sustainable Development Goals by tackling problems in a multitude of areas, such as climate change, food security, education, public health, access to energy and clean water and in the areas in the social sciences and humanities, social justice to name a few.

"Through its work, it will also address job creation, skills training and creating new career paths aligned with the fourth and fifth industrial revolutions."

In total, the network consists of seven ARUA universities and two institutions:

University of Ghana, University of Lagos, Makerere University, University of Rwanda, University of Nairobi, Addis Ababa University, Stellenbosch University, The African Institute for Mathematical Sciences (AIMS) and the National Institute for Theoretical ad Computational Sciences (NITheCS).

The five universities from The Guild plus one international institute are as follows:

Uppsala University, University of Warwick, Tubingen University, University of Ljubljana, University of Montpelier and the Abdul Salam International Centre for Theoretical Physics (ICTP) in Trieste, Italy.

2. Genomics for Health in Africa (CoRE-GHA)

The cluster will be co-led by Prof Tulio de Oliveira, Director of the Centre for Epidemic Response and Innovation (CERI) and Prof Shahida Moosa, Head of Medical Genetics, SU & Tygerberg Hospital. The cluster's priority area is public health.

The co-leads in Europe are Prof Carmen Faso and Prof Volker Thiel from the University of Bern in Switzerland, and Prof Olaf Riess and Dr Tobias Haack from the University of Tubingen in Germany.

The CoRE-GHA will specifically focus on rare diseases and rare cancers, in addition to pandemic preparedness and infectious diseases.

According to De Oliveira and Moosa, the CoRE-GHA aims to leverage the potential of genomics to revolutionise healthcare in Africa. Genomics can provide a better understanding of rare diseases, cancer and infections and lead to more effective treatments. The overall objectives of the CoRE-GHA are to increase the capacity for genomics research in Africa and improve the diagnosis, treatment and prevention of human diseases in Africa and beyond.

In total, the network consists in total of seven ARUA universities as follows:

University of Ghana, University of Rwanda, University of Nairobi, University of Limpopo, University of KwaZulu-Nata, Rhodes University and Stellenbosch University.

The six universities from The Guild areas are as follows:

University of Glasgow, University of Groningen, University of Bonn, Radboud University, University of Tubingen and University of Bern.

3. Nature-based Solutions for Climate Change Adaptation and Mitigation

One of the newly-approved clusters by the joint assembly of The Guild and ARUA will be focused on Nature-based Solutions for Climate Change Adaptation and Mitigation, and will be coordinated by the University of Bologna together with the University of Cape Town and Stellenbosch University. The project was highly ranked in the category of Green Transition and found relevant to address both global and inter-continental challenges within the Green Transition category.

The lead team involves an interdisciplinary group led by Silvana Di Sabatino, Professor at the Department of Physics and Astronomy "Augusto Righi" of University of Bologna, together with Prof Guy Midgley, Director of the School for Climate Studies at Stellenbosch University, and Prof Mark New, Pro Vice-Chancellor for Climate Change and Director of the African Climate and Development Initiative at the University of Cape Town.

The cluster's priority area is Green Transition, but cuts across all three other priority areas.

The CoRE will advance coordinated transdisciplinary approaches to addressing climate change and biodiversity challenges that are inextricably intertwined, and therefore best addressed simultaneously, as guided by SDG priorities. The work will accelerate the development and deployment of nature-based adaptation and mitigation actions in Africa, increasingly cantered on their co-design and co-development and their role in improving mitigation-adaptation synergies. The CoE will operate by building four inter-related hubs – a climate service hub, nature-based solutions hub, adaptation and mitigation hub, and a capacity building hub. As stated by the co-leads in the proposal, "African livelihoods and development pathways are deeply dependent on the natural environment, making this the continent for which these new insights are most relevant for building climate resilience".

The partnership includes 11 partner universities, eight of which are African:

University of Cape Town, Stellenbosch University, Rhodes University, University of Ghana, University of the the Witwatersrand, University of Nairobi, Makerere University, University of Pretoria.

The three European universities are the Universities of Bologna, Göttingen and Glasgow.

These universities will establish a hub of climate services for Africa and develop an innovation centre to design nature-based solutions capable of helping us mitigate the negative effects of climate change and adapt to it. The Africa-Europe Cluster of Research Excellence will also promote the creation of doctoral networks and training activities to strengthen collaboration between European and African universities. Capacity building is a core element of the cluster's focus and they plan to work with their partners to contribute to mitigating the negative effects of climate change and training of the next generation of scientists and practitioners.

4. Renewable Energy

The CoRE is co-led by Prof Neill Goosen, the Director of the ARUA Centre of Excellence in Energy, which is hosted by Stellenbosch University, and Prof Michel de Paepe, promotor and spokesperson of the multidisciplinary research group EnerGhentIC at Ghent University in Belgium. The other founding institutions in the CoRE are the Universities of Ghana and Makerere from the ARUA network, and the Universities of Oslo and Groningen from The Guild network. Discussions are already underway to expand the CoRE in Renewable Energy to increase the impact of the CoRE's activities.

The CoRE in Renewable Energy is built on three pillars: Renewable energy technology development; equitable societal transition; and sustainable education and training. The

complexity of achieving a just and sustainable energy transition will require tackling this problem jointly, and through co-creation and equitable collaboration, this CoRE hopes to contribute significantly to tackling of one of society's biggest and most pressing needs.

The cluster consists of seven core members: four ARUA universities (Stellenbosch University as African lead and host of the ARUA CoE in Energy, and the Universities of Ghana and Makerere and the newly-added University of Lagos) and three Guild Universities(Ghent University as European lead, and the Universities of Oslo and Groningen). Following discussions amongst the VCs and DVCs, equitable partnerships, skills training and addressing energy issues within Africa and globally were seen as a key element. It is expected that the partners will work together to address these. This Renewable Energy Africa-Europe Cluster of Research Excellence was seen critical to deal with current energy challenges faced within Africa and Europe.

The cluster will be able to mobilise quickly and have a significant impact due to substantial support from the member institutions, the significant existing research infrastructure and the widespread networks of the members.

Multimorbidity Cluster of Research Excellence

SU is also a partner of the Multimorbidity Cluster of Research Excellence, led by Prof Geroge Oben Adjei, Director for Tropical Clinical Pharmacology and Therapeutics, University of Ghana and Prof Paramjit Gill, Professor of General Practice, University of Warwick, United Kingdom.

The Africa-Europe Cluster of Research Excellence in Multimorbidity aims to leverage digital technology and artificial intelligence to address the gaps in quantification, clustering, trend prediction and evaluate new interventions to improve diagnostics, safety and effectiveness of interventions for prevention, treatment and control of multimorbidity in sub-Saharan Africa.

The African universities involved in this cluster are: University of Ghana, University of Pretoria, Stellenbosch University and University of Liberia.

The Guild universities consist of the University of Warwick, King's College, UK, Aarhus University, Denmark, and includes the Copenhagen University Hospital, Rigshospitalet, Denmark.

Other partners include Last Mile Health (Liberia), University of Health and Allied Sciences (Ghana) and Princess Marie-Louise Children's Hospital, Ghana.

MORE ABOUT THE GUILD

The Guild is a network of 21 research-led universities in 16 European countries dedicated to excellence in research, education and innovation across Europe. Since 2019, it has developed a close partnership with ARUA to support sustainable partnerships between African and European universities.

MORE ABOUT ARUA

The African Research Universities Alliance (ARUA) was founded in 2016 with Stellenbosch University a founding partner.

- Also see: SU cements relationships with leading European universities