



November 2023

## POSITION STATEMENT

# Technological Innovations for Discovering Solutions to the World's Greatest Challenges

## PREAMBLE

Emerging technologies such as nanomaterials, bioengineering and artificial intelligence are already transforming our personal and professional lives, changing how we interact with each other and with our (fragile) natural world. Responding appropriately to these transformations calls for international partnerships and collective action to harness potential, but also to assess risk and mitigate potential harms. Indeed, it is our collective responsibility as a global community of researchers to build a shared vision for a sustainable future, which will use emerging technologies responsibly and effectively. In particular, early-career researchers (ECRs) play a pivotal role in spearheading solutions and ensuring that emerging technologies' impacts are well reflected and effectively managed.

In June 2023, the Global Young Academy (GYA) and the Rwanda Young Academy of Sciences (RYAS) jointly held an International Conference for Young Scientists in Kigali, Rwanda, on the theme "Technological Innovations for discovering Solutions to the World's Greatest Current Challenges". This event brought together approximately 150 researchers from over 50 countries. As a result of panel discussions, the following joint recommendations emerged for scientists, scholars, and science organisations.

## HARNESSING TECHNOLOGY AND INNOVATION

- Following lessons learned from the COVID-19 pandemic and in preparation for future global pandemics, vaccine equity should be at the forefront of global health and social justice dialogues. Scientists and scholars can play a crucial role in sharing information about evidence-based health research in their national contexts. ECRs in particular have a vivid awareness of the global

context and should push for investments in technology and leveraging of digital health solutions in low and middle-income countries to foster local vaccine production and promote global health equity.

- (National) Young Academies have the potential to foster constructive dialogues between science and society, and to shape the future of research in their local contexts. Collaboration is essential for innovation, and young academies foster cross-disciplinary and international communication; thus, it is crucial to support and strengthen existing and nascent Young Academies.
- Innovation processes should encourage citizen science and inclusion of local voices, to ensure sustainable progress. Active community involvement in design and execution stages of research and technology can increase relevance to local contexts and challenges.
- Education about the potential benefits and risks associated with emerging technologies is needed, especially for youth. The next generation of scientists and scholars needs to develop skills to critically analyse data with diligence and responsibly interact with emerging technologies.
- We must recognize youth in all world regions as an immense resource, a source of skills and innovation for the future of science. Involving youth in finding solutions to achieve the United Nations Sustainable Development Goals (SDGs) requires embracing an open mindset and believing in young people's abilities. Youth are not only knowledge recipients, but active solution creators and implementers.

## THE ROLE OF EARLY-CAREER RESEARCHERS

In the context of solving grand challenges with emerging technologies and innovation, the unique role of ECRs involves:

- Pioneering interdisciplinary research and innovation: spearheading initiatives that intersect multiple academic disciplines and seek multidimensional solutions.
- Championing responsible research and innovation: advocating for sustainable and responsible research practices that prioritise societal interests and wellbeing.
- Embracing ethical conduct: Especially channeled through Young Academies, ECRs are incentivized to maintain a strong commitment to ethical and equitable conduct in research and professional interactions.
- Advocating for Open Science: ECRs actively support global Open Science, promoting transparency, accessibility, and collaboration in various stages of scientific research and dissemination.

- Engaging in science communication and public discourse: ECRs play a significant role in translating complex scientific concepts into understandable narratives for the public, fostering an informed societal discourse.
- Providing evidence for policy: Leveraging their expertise, ECRs can influence policy-making processes, driving the creation of informed policies.
- Cultivating leadership skills: The future needs ECRs who can lead research teams, direct innovative projects, and inspire the next generation of researchers.
- Promoting international collaborations: Addressing global issues requires fostering a global approach to solving shared challenges.

In summary, ECRs have an important role to play regarding the employment of emerging technologies and global solutions to the world's most significant challenges. By working together and forming reliable partnerships, ECRs can shape a future that is equitable, sustainable, and resilient.

## ABOUT THE GYA

The vision of the GYA is *science for all; science for the future*, and its mission is to give a voice to young scientists and researchers around the world. The GYA, founded in 2010, is an independent science academy of 200 outstanding early- to mid-career researchers from six continents who are selected from across disciplines based on their academic excellence and commitment to engage with society. GYA members serve five-year terms, and the GYA presently counts members and alumni from 101 countries. The GYA administrative Office is publicly funded and hosted at the German National Academy of Sciences Leopoldina. The wide array of GYA activities are supported by a range of international public and private funders.

## ABOUT RYAS

The Rwanda Young Academy of Science (RYAS) is a dynamic platform that brings together exceptional early- to mid-career Rwandan researchers, whether based within the country or abroad. Founded in 2018 and officially registered in 2021, RYAS is hosted by the ICTP-East African Institute for Fundamental Research (EAIFR) at the University of Rwanda's College of Science and Technology. RYAS is committed to promoting scientific excellence and societal engagement, providing young scientists with a voice and a platform to shape the future of science in Rwanda and beyond. By fostering interdisciplinary collaborations, advancing research and innovation, and actively contributing to addressing national and global challenges, RYAS hopes to play a pivotal role in driving scientific progress and making a positive impact on society.