

# Materials Science and Materials Chemistry

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## Science, technology and innovation (STI) in the age of globalization – including STI in materials sciences and materials chemistry

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The talk starts with a discussion of the concept of globalization and how this affects the development of many areas of STI which pose global challenges that require to be global tackled and solved across geo-political, linguistic and cultural boundaries. It is noteworthy that these challenges need mathematical sciences for their in-depth study since mathematical sciences constitute the bedrock of all developments in STI. We thus discuss the role of mathematical sciences vis-a-vis other areas of science and technology and identify the four areas of Science and technology—basic sciences, applied sciences, classical or low technologies and high Technologies as concentric layers with diffuse boundaries with inner core of basic sciences and mathematical sciences as its innermost core such that theories from the inner core help to solve problems in applied sciences and technology while problems arising from the outer layers of technology and applied sciences provide the inner core with new structures, new concepts and new methods. We illustrate this phenomenon copiously with many examples from various technologies. Moreover, we identify the role of ICT (Information, Communication, Technology) as a unifying force for the development of STI thus turning the world into a global village. Furthermore, we observe that many developing countries are yet to produce a critical mass in any

of the areas of science and technology mentioned above.

Next we focus six of the areas for which we need to pull global resources together to achieve more rapid global development: 1) Health and Well-being, 2) Food security and nutrition; 3) Sustainable Agriculture 4) Climate Change 5) Water and Sanitation. 6) Sustainable Energy and in particular 7) Materials Sciences and Materials Chemistry which constitute the theme of the conference. We will discuss progress so far made in research and smart technologies in these areas and identify the ways forward in this age of globalization to ensure that the benefit of such research and technologies reach all corners of our world.

### Speaker Biography

Aderemi Kuku is the immediate past President of the African Academy of Sciences 2014-2017. He was the President of the African Mathematical Union during 1986-1995 and a Distinguished Professor at the National Mathematical Centre, Abuja, Nigeria. He was a Professor of Mathematics at the International Centre for theoretical Physics (ICTP), Trieste, Italy 1995-2003, and a member of the Institute of Advanced Study, Princeton, NJ, USA 2001-2004. He has over fifty years of University research and teaching experience and he is a foundation Fellow of the American Mathematical Society, Fellow of the World Academy of Sciences, European Academy of Arts Science and Humanities, Nigerian Academy of Science, and Foreign Fellow of the Mongolian Academy of Sciences.

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