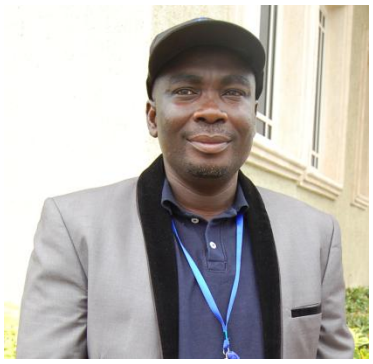
WELCOME ADDRESS



Prof. A. Lateef
Head, Nanotechnology Research Group (*NANO*$^{+}$), LAUTECH, Ogbomoso

On behalf of LAUTECH Nanotechnology Research Group (*NANO*$^{+}$), I humbly welcome you to this gathering, the 2nd workshop/conference on nanotechnology to be organized by our fledging research group. The research group was formed on September 4, 2014 by some young scholars who showed interests at pursuing researches in nanoscience and nanotechnology in this University.

Nanoscience and nanotechnology is a multidisciplinary research field that seeks to create, manipulate, study, and apply materials at nanoscale (10^{-9} m) in different areas. These materials can be living or non-living. Nanomaterials are so exceptional and fascinating in the sense that their creation always leads to acquisition of new range of properties and improved activities compared to their bulk forms. While nanoscience actually stemmed from physical fields of Physics and Materials Science; its study and applications traverse diverse fields of study including Chemistry, Engineering, Life Sciences, Biomedicine, Pharmacy, Agriculture, Mathematics and Computing, Economics among others. Its adoption has led to production of novel materials, and rendering of specialized services, with the projection that by 2020, about 2 million workers in the US would have nanotechnology-related jobs, and the US market value of products using nanotechnology would be $1 trillion, or 5 % of the GDP.

This technology has lots of applications in agriculture, medicine, renewable energy, national security, engineering, consumer products, and sustainable environment amongst others. Nigeria, as a country can tap in to these benefits. In her bid to diversify the nation's economy, and also to build a knowledge-based economy, the Nigerian government through the Federal Ministry of Science and Technology has recently recognized the importance of nanotechnology by setting up the National Steering Committee on Nanotechnology Policy in Nigeria. The committee was

inaugurated by the Hon. Minister of Science and Technology, Dr. Ogbonnaya Onu on February 26, 2018 in Abuja.

Since the formation of *NANO*$^{+}$, its strength has grown from five to eleven, with members drawn from diverse disciplines of Physics, Microbiology, Biochemistry, Botany, Zoology, and Mechanical Engineering, which are structured into three clusters of Biological/Biomedical, Chemical/Physical, and Engineering/Technology. The group has also enabled formation of a charter at Osun State University, Osogbo, and collaborates with researchers from sister Universities. The major focus of *NANO*$^{+}$ is to engage in activities that would promote nanotechnology research in Nigeria. We have vigorously pursued this lofty objective through sensitization, training of students and colleagues, publications and organization of workshop and conferences. Till date, we have had forty-seven (47) scientific meetings to discuss research activities on nanotechnology.

Specifically, we have trained several undergraduates in the art of nanoscience and nanotechnology, and at least five M.Tech scholars have been produced in this field. A number of master and doctoral candidates are carrying out investigations on nanotechnology under supervision of our members in the Departments of Pure and Applied Physics, Pure and Applied Biology, Biochemistry, and Mechanical Engineering. Between 2015 and now, members have published thirty research articles in reputable journals under Elsevier, Springer, Taylor and Francis, IEEE (UK), IET (UK) and DeGryuter. Despite the challenges in the University, the group successfully organized her maiden national workshop on nanotechnology on 21-24 August, 2017, which drew participants from several Universities and research institutes in Nigeria. I'm glad to inform you that participants from at least five Universities who attended the workshop would present outcomes of their research activities at this conference. We have consciously decided to retain workshop as a component of our activities; targeting postgraduate students and early career researchers.

We are not unmindful of the challenges that can face research activities in a cutting-edge discipline such as nanotechnology in a country like Nigeria, but we have decided to forge ahead. We have enjoyed robust partnership from our collaborators in South Africa and Saudi Arabia through the advanced imaging of our samples. However, we have exercised our expertise in generating new and novel concepts, biomimetic synthesis, basic characterization and novel applications. We have improved mechanical properties of paints, and shelf-lives of agricultural produce using nanotechnology. Antimicrobial, antioxidant, dye degradation, desulphurization,

anticoagulant, thrombolytic, plant-growth promoting, cytotoxicity, solar energy-harnessing, larvicidal and anti-deterioration activities of wide range of nanoparticles, with potential applications in agriculture, environment, energy, and healthcare have been established in our various investigations. Indeed, we are grateful to distinguished Prof. E.B. Gueguim-Kana, Ms. L.S. Beukes and Dr. S.H. Abbas for the rewarding collaborations.

Our dream of positioning LAUTECH as a centre of excellence in nanoscience and nanotechnology in Nigeria could be easily achieved if research activities in this area enjoy good funding. We appeal to the University to seek a special intervention from TETFund to equip the Central University Research Laboratory with advanced equipment that include FTIR, XRD, AFM, SEM, TEM, particle size analyzer, fluorescent microscope, TGA amongst others. I also call on technocrats, industrialists, funding agencies and government to support the group for innovative research in nanotechnology for the benefit of the nation and humanity at large. It is equally pertinent for me to add my voice to the agitation for adequate and sustainable funding of the University system in Nigeria, without which development would continue to elude the nation. More specifically, our research group appeals to the governments of owner states of Oyo and Osun to dedicate more funds to LAUTECH for the realization of the lofty idea of the founding fathers of the University. It is instructive to say that the University cannot survive on IGR, and as such, an adequate and sustainable funding plan should be put in place and implemented to ensure growth and development of unarguably the best state University in Nigeria.

In this conference, we shall have the opportunity to listen to seasoned researchers and administrators on different aspects of nanotechnology. The theme of the conference, '*Nanotechnology for sustainable development: prospects for Africa'* was chosen, for us to reflect on how nanotechnology can be harnessed to solve myriads of problems that confront the inhabitants of the continent of Africa. It would also explore possibilities of adding value to quality of life on the continent through creation of new range of products and services to develop knowledge-based economies. Participants at the conference would listen to speakers from different fields; ranging from Agriculture, Computing and Mathematics, Life Sciences, Physical Sciences, Engineering, Pharmacy and Economics on how nanotechnology can be impactful on our nation and Africa in general. More than seventy papers would be presented at this top-notch conference.

On behalf of the Nanotechnology Research Group, I express deep gratitude to the management of LAUTECH, under the able leadership of our amiable Vice-Chancellor, Prof. A.S. Gbadegesin for various supports for the group. As an individual, I won't forget that it was under his tenure as Vice-Chancellor of this great University that I became Reader, Professor, Acting Head of Department of Science Laboratory Technology, Head of Department of Pure and Applied Biology, elected representative of Senate on LAUTECH Governing Council, and most recently, Chairman of the Management Committee of the Central University Research Laboratory. Thank you, Sir for your love.

I also appreciate all Deans and Provost, our senior Professors, colleagues, collaborators, students, well-wishers, captains of industries, sponsors and friends for their various forms of words of encouragement and support that have assisted us to attain the present status. Finally, I most sincerely thank our *NANO*$^{+}$ family; spouses and children for their unrelenting support, love and care.

Mr. Vice-Chancellor, Provost and Deans, distinguished Professors, members of academia, invited guests, participants, students, friends, well-wishers and gentlemen of the press, it is my pleasure to warmly welcome you to LAUTECH NANO 2018, and I wish you all the best during the conference and beyond.

Thank you and God bless.

Prof. A.T. Oladipo

Dean, Faculty of Pure and Applied Sciences, LAUTECH, Ogbomoso

Research is an indispensable aspect of academic which deals with careful and excellent study of an area of knowledge or subject with a view to discovering new facts or information about it. Nanotechnology Research Group ($NANO^{+}$) at LAUTECH, Ogbomoso was established by scholars in various related science and engineering disciplines to join hands together to research into nanomaterials and nanoparticles. Since the formation of this research group, quality research outcomes have been published in reputable journals, and the group had collaborated with scientists from different Universities in Nigeria and other countries.

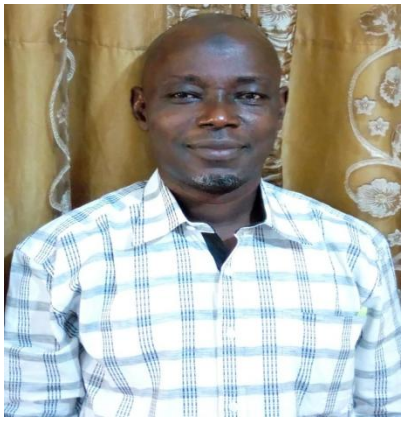
Nanotechnology research group has been a source of inspiration for young scientists and scholars, as it offers research assistance to different research groups and students. Many students have benefited from this assistance and young scholars have been trained through the activities of $NANO^{+}$. Despite the challenges that faced the University, the group successfully organized the maiden national workshop on nanotechnology during August 21-24, 2017, which drew participants from different Universities and research institutes. The event established the leadership of the group in biomimetic nanotechnology in Nigeria.

The field of nanotechnology is all encompassing and its vast application in all facets of human endeavours has thrown a challenge at all academics irrespective of the field of specialization. Even as a mathematician, I'm aware of the importance of modeling in nanotechnology, as well as computational nanotechnology. It is therefore my pleasure that a research group that is deeply rooted in the Faculty of Pure and Applied Sciences of the University is championing the course of nanotechnology drive in this country. Certainly, the future is bright.

I have no doubt that the Nanotechnology Research Group will break new grounds in sciences and technology through its various research activities at different fora. I look forward to the time that Nanotechnology Research Group would plan training workshop and seminars for the undergraduate and graduate students of LAUTECH and other Universities.

On behalf of the staff and students of the Faculty of Pure and Applied Sciences, I welcome you all to the second edition of the Nanotechnology Research group's Workshop/conference on

nanotechnology. I wish you a successful deliberation and fruitful outcomes of the Workshop/conference. Thank you and God bless.

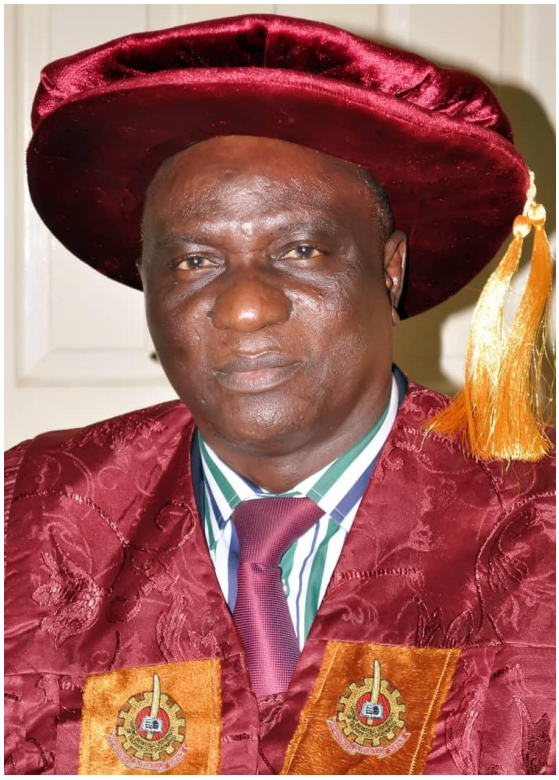


Prof. K.A. Adebiyi
Dean, Faculty of Engineering and Technology; Chairman Committee of Provost and Deans, LAUTECH, Ogbomoso

I wish to congratulate *NANO*$^{+}$ for organizing this workshop/conference. I'm abreast of your research efforts towards positioning LAUTECH, and by extension Nigeria, on the path of progress via applications of nanotechnology. I salute your doggedness to pursue this field despite limited resources and supports.

As an individual, I will continue to offer my unalloyed support. While your research activities are helping to solve some of our germane problems, I challenge you to also consider applying nanotechnology to solve problems that are bedeviling Africa (and Nigeria in particular) such as environmental pollution, terrorism/security, food storage/preservation, drug abuse, global warming, and desertification among others. These challenges continue to stare us in the face, and if they are allowed to skyrocket, generations yet unborn will blame us for our action or inaction. I am confident you have what it takes to delve into the challenges. Finally, I congratulate the invited guests and lecturers, and urge all participants to make utmost benefit of this conference.

Best of luck to *NANO*$^{+}$.



Prof. A.S. Gbadegesin

Vice-Chancellor, LAUTECH, Ogbomoso

I am greatly elated to welcome you to LAUTECH NANO 2018 Workshop/Conference with the theme '**Nanotechnology for sustainable development: prospects for Africa**'. Today is another epoch making event in the life of the University community coming from the stable of our own LAUTECH Nanotechnology Research Group (*NANO*$^{+}$). I am particularly delighted to see that our scholars are full of energy and strengths, and are fully determined to take this relatively new frontier of knowledge at cutting-edge to doorsteps of scientists in this part of the world and beyond. The successful organization of this programme after the research group maiden workshop held last year is an indication that our University is back fully on ground despite funding challenges. Without doubt, this research group has greatly promoted the image of the University and I encourage members to continue in the same vein.

Since inception, nanotechnology as a multidisciplinary subject has been unifying cord for scientists in material sciences, physical sciences, agriculture, engineering, life sciences and medicine. It is a technology that design, create and manipulate molecules or substances on nanoscale with attendant alterations in physical, chemical, biological, optical, electrical and magnetic properties. Manifestation of novelty by the molecules or substances whose properties have changed subsequently lead to their exploitation to deliver goods and services. Being an all encompassing technology, its applications is wide and expansive, traversing effective control of vectors of diseases, solar panel technology, bioimaging, electronics and sensor technology, pollution control, water treatment technology, drug delivery and disease control, food and feed technology, agriculture, biomedicals and textile. No wonder that the call for abstracts has attracted scientists from different fields and institutions to participate in this year workshop and conference.

Nanotechnology is full of promises for developing nations of the world as it has that potential of providing solutions to arrays of problems besetting the inhabitants of these nations, of which Nigeria is not exceptional. Furthermore, the fact that nanotechnology can be explored to bring about sustainable development has given a very strong leverage to the acceptability of this technology. This later point must have seriously influenced the coinage of the theme for this year workshop/conference. I am therefore greatly elated seeing LAUTECH as a pacesetter by having a dynamic and formidable research group at the forefront of this thought-provoking technology.

The Nanotechnology Research Group ($NANO^{+}$) is based in LAUTECH with its headquarter presently in the Department of Pure and Applied Biology. The vision of this group is to be a leading research group in Nigeria with focus of providing high quality research, training programmes and research findings in the area of nanotechnology. The target of the research group to be at the center of discovery and innovation in the field of science and technology with a view to create opportunity and prosperity that will enhance quality of life is gradually taking shape and will start yielding dividends soonest. The research group ably led by Prof. A. Lateef has continued to engage in high quality research and applied innovations, which has resulted in the training of excellent manpower by training undergraduate and postgraduate students, with publication of thirty (30) research articles in reputable journals in a pace of about four years. The resultant effects of which are expected to facilitate collaborations with industries in not far future. I have to say here without mincing words that substantial parts of most of these investigations were carried out using the facilities in the University with the aspects of the advanced microscopy done in the laboratories of the group's collaborators based in South Africa and the kingdom of Saudi Arabia. Therefore, organization of this workshop/conference is a step further in the pursuit of the lofty goal and aspiration of the group.

Ladies and gentlemen, I have that strong believe that the crop of scientists behind promotion of nanotechnology as frontier of knowledge have the wherewithal to take the University and our dear country to greater heights in knowledge dissemination and advancement of humanity. Therefore, the University shall continue to play its own part by investing in the provision of equipment that will spur cutting-edge and translational research for the benefit of all. I wish to congratulate the organizers and the participants in this groundbreaking event and encourage all to tap on the knowledge offered by this occasion for successful exploitation for human development. It is therefore with all enthusiasm that I formally declare this conference open to the glory of God and service to humanity.