SPECIAL ISSUE: REPORT OF THE 10TH INTERNATIONAL CONFERENCE OF THE AFRICAN MATERIALS RESEARCH SOCIETY (AMRS2019)
I am pleased to welcome you to the second issue of the African Materials Research Society (AMRS) Newsletter. This issue focuses primarily on the 2019 AMRS biannual conference that was held from 10th - 13th December 2019 Arusha, Tanzania. Since my appointment as the President, my primary focus was on the preparation of the conference, including fund-raising, acquiring speakers and sponsors. The conference held at the Nelson Mandela African Institution of Sciences and Technology succeeded to gather delegates from across the globe with various themes.

I acknowledge the richness of Africa in terms of its innate materials such as minerals and plants that require expertise for their value addition. The conference aimed at marshalling experts from research, academia and related industries to discuss the improvement and long-term sustainability of African materials.

The conference was an opportunity at fostering collaboration and networking that would increase Africa’s access to state-of-the-art laboratories and expertise relevant for increasing the value of African materials. Moving forward, we anticipate increasing of innovation and establishment of industries, technologies, and job creation for Africans in Africa. The success of the conference would not have been possible without the NM-AIST management, AMRS board, sponsors and the local organizing committee who dedicated their time and resources to support the 2019 conference. I want to also thank all the delegates who participated and contributed to the conference.

I hope that the end of this conference marks the onset of more valuable and far-reaching conferences in the coming years. I am delighted to announce the new President who will take over from 2020, my esteemed colleague, Dr. Samuel Chigome. I know he will be welcomed into our community and I wish him all the best in his new role.

Asante sana and enjoy the reading.

Prof. Hulda Shaidi Swai
Chair, AMRS2019
Samuel Chigome received his PhD in Chemistry from Rhodes University, South Africa. His PhD focused on the development of electrospun nanofiber based solid phase extraction devices. Samuel has been involved in electrospinning research over the past twelve years, initially with a focus on a fundamental understanding of the electrospinning technique which progressively shifted to a focus on electrospun nanofiber-based device fabrication.

In his current role as a Senior Researcher in Nanomaterials at the Botswana Institute of Technology Research and Innovation, he leads a team of Researchers that develop materials for water filtration. Additionally, he supervises who focus on projects related to the development of materials for water filtration. Furthermore, Samuel is the Head of Secretariat of the African Materials Research Society in Botswana.

“In his current role as a Senior Researcher in Nanomaterials at the Botswana Institute of Technology Research and Innovation, he leads a team of Researchers that develop materials for water filtration.”
After all the positive hype about the 10th African MRS (AMRS) conference by the organizers in the days leading to the conference, the stage was all set for a great experience in Arusha, Tanzania at the Nelson Mandela African Institution of Science and Technology (NM-AIST) located almost between Mount Meru and Mount Kilimanjaro from the 10th to 13th December 2019. The conferences of interest held on the African continent are always a-must-go for us, and this one was no exception.

The conference kicked off well and on its first day, after the registration process which saw us curiously patient in an early morning queue in front NM-AIST’s main building, we were delighted to rekindle old friendships, start striking new ones with the many attendees who included people from all walks of life – local and international researchers, academics, students, materials developers and suppliers, civil servants, etc – and put a face to some familiar names in AMRS leadership and in our fields of research.

The conference brought together persons from different fields of materials, seven in total viz. materials for health; sustainable management and construction; water and environment mitigation technologies; nanoscience/ nanotechnology; materials for energy; computational materials science; education networking in materials science; and engineering. Almost everyone’s face was beaming with a smile, and from an African setting perspective, we were of the opinion that the organizers had managed to be good hosts. We made a side note that this experience reverberated well with the South African Sotho-Tswana government-driven political initiative of Batho Pele (People First) – kudos to the conference organizers and hosts! So what was second after People at this conference?, we silently asked, and sought to find an answer. Given that we were not slotted to present our research papers on Day 1 of the conference, we were ‘free’ to mingle with the conference attendees, organizers and hosts, and use the conference presentations programme to strategically hop from one parallel session to another – it was fun! This provided us with a unique opportunity to sample what was happening in both the Plenary and Parallel sessions.

Towards the end of the first day, we compared notes and what was starkly common was the feeling of ‘crowded loneliness’ in terms of the participation of African-based researchers both in attendance and in discussions and Keynote presentations, and the visibly low attendance of novice African-based researchers and students.

We had a myriad of questions in our minds begging for answers including ‘Why was there a so low number African-based researchers in the Plenary sessions (both Keynote presentations and Panel discussions), a trend which was replicated on the second day of the conference?’; ‘where were the African-based researchers – the well-established, the novice – why were they not in such an important gathering?’. We also questioned the degree of relevance of some of the researches being presented at the conference to the African continent at large. As a result of this, we quickly swung into action and quickly designed a short survey questionnaire to collect the views of the conference attendees, organizers and hosts on a number of issues – a response rate of 66%
(from 151 questionnaires) was achieved. A paper written based on the responses received is in the offing. In this article we share snapshots from the results and express our views in a bid to ignite fruitful discussions amongst African-based researchers and to motivate the next generation of novice African-based researchers.

The two major findings of the survey were that (i) funding is still a major milestone for research activities in Africa, and consequently, there is a high dependence of research in Africa on non-African funding, and (ii) even though African-based researchers would consider addressing local challenges as the main factor when setting their research vision and agenda, the latter two are not driven by African-based researchers mainly due to lack of funding. What was also clear from the survey was that this lack of financial independence pushes many African-based researchers to not freely express their honest ideas. As novice researchers, we are of the opinion that a change in mindset among African-based researchers is a critical nexus in addressing these challenges.

This change in mindset will involve using innovative approaches in areas of alternative funding sources, research collaborations and mentoring. We must keep on working but do things differently if we expect different outcomes. African-based researchers must not appear to be indolent! A lot of novice researchers in Africa have big and valid dreams and the role of the current cohort of established African-based researchers is to mentor and steer them in the right direction. Inasmuch as nothing can invalidate their dreams unless their lack of investment in them, the current generation of African-based researchers have a critical role to play (especially in terms if mentorship) in ensuring that they make the right investments!

When all is said and done, we must always ask ourselves the question – how do the research projects we do especially in an African context address the African society's challenges? We must continue with the quest for research relevance in Africa – this should not be misconstrued to mean research isolation which is counterproductive in today’s intricately connected world. We must work with researchers from all-over the world, but we must we must fight to rightfully have a bargaining power at the negotiations table. On the one hand, we call upon the AMRS to work towards ensuring the African-based researchers’ voices and interests are prioritized, and that AMRS is used as a platform to showcase African research in materials and also as a focal point for African-based researchers and institutions with common interests. On the other hand, we also call upon the African-based researchers to stand up, collaborate, and to explore and partake in research opportunities that will drive their research visions.

We are confident that AMRS led by the current President Dr Samuel Chigome is a realistic vessel that can help us in the materials field achieve these goals.

Even though we could not find an answer to the question we had asked ourselves at the onset of the conference – …what was second after People at this conference? – we were convinced that the overall inspirational theme of the conference “Materials for African Development” was not quite the answer! This theme is however valid and AMRS should continue to aggressively pursue it in future conferences.

To conclude, the 10th AMRS conference was fruitful and was an eye-opener on many fronts; we got to learn more about AMRS and the personal experiences of various African-based researchers from different fields. At the end of the conference, we left not only transformed in our thinking about the need to continue strengthening the African Research brand but also reinvigorated to join the few African ambassadors for change in African-based research activities. AMRS is a perfect vehicle for this! Join us and let’s keep the wheels turning to bring the much-needed change because if we don’t try, we will definitely fail. Each one of us needs to more actively involved in the activities of AMRS for it to grow. The future of the African MRS must lie with us!

Our hope is that this article not only encourages deep personal reflection among the African-based researchers and those that collaborate with them, but also inspires the novice African researchers and students, wherever they may be, to use their agency and pursue their valid dreams and visions. What this conference also confirmed is that we all have a voice that should be heard when it comes to setting and pursuing the research agenda in Africa. Thus, We also hope that this article will be a starting point for bold, objective and fruitful conversations.
# AMRS PRE-CONFERENCE WORKSHOPS

<table>
<thead>
<tr>
<th>Sunday 8th December</th>
<th>Monday 9th December</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystallography</td>
<td>Crystallography</td>
</tr>
<tr>
<td>Electrospinning</td>
<td>Electrospinning</td>
</tr>
<tr>
<td>Life Cycle Assessment</td>
<td>Life Cycle Assessment</td>
</tr>
<tr>
<td>Impact of Materials on the Society I</td>
<td>Impact of Materials on the Society II</td>
</tr>
<tr>
<td>Electrochemical Energy Technologies I</td>
<td>Electrochemical Energy Technologies II</td>
</tr>
<tr>
<td>Computational Biology and Physics</td>
<td>Computational Physics and Biology</td>
</tr>
<tr>
<td>Nanoscale Biosensors</td>
<td>Building Materials at the Human Scale</td>
</tr>
<tr>
<td></td>
<td>Electrochemical Impedance Spectroscopy</td>
</tr>
</tbody>
</table>
PRE-CONFERENCE WORKSHOPS AND PICTORIAL PARTICIPANTS OF THE PRE-CONFERENCE IN VARIOUS SESSIONS
The 10th International Conference of the African Materials Research Society (AMRS) took place at The Nelson Mandela African Institution of Science and Technology (NM-AIST), Arusha, Tanzania, from 10th-13th December 2019. The Hon. Nasha officiated the event by welcoming all participants to the conference in Arusha. In his speech, he challenged the participants to conduct research that address the challenges facing Tanzanian society and Africa in general. The guest of honor emphasized that the Tanzanian’s 5th phase Government focuses on building a middle-income economy that is based on industrial economies.

It is therefore important for researchers to focus on areas of science, technology and innovation to solve the problems that exist by developing products and services that meet the needs of the current highly competitive world of Science and Technology. The Guest of Honor was the Deputy Minister for Education, Science and Technology Hon. William Ole Nasha. Speaking during the conference Deputy Permanent Secretary of the Ministry of Education, Science and Technology, Prof. James Mdoe, urged the members of the African Materials Research Society (AMRS) to come up with solutions on how best they can utilize the available resources in Africa for African’s development. He also gave the votes of thanks to the hosts, participants and organizers of the conference. The 10th International conference aimed at creating a platform for science and research communities in Africa and from around the world to foster relationships, build knowledge and promote actions for further understanding and collaborations in fields associated with materials research and technology.

The ultimate vision is to see Africa being able to fully harness and exploit its rich natural resources greatly endowed by nature. The conference was attended by 336 participants from 39 nations across the world namely Algeria, Australia, Belgium, Benin, Botswana, Cameroon, Canada, Ethiopia, France, Germany, Ghana, Greece, India, Israel, Italy, Japan, Kenya, Lesotho, Malta, Mauritius, Morocco, Mozambique, Namibia, Nigeria, Paraguay, Poland, Russian Federation, Rwanda, Senegal, Singapore, South Africa, South Korea, Sudan, Sweden, Switzerland, Tanzania, Uganda, United States of America and Zimbabwe.

The conference was composed of 9 key note addresses; 58 posters and 273 paper presentations made by eminent researchers, scientists and speakers. These sessions included discussions, reflections, questions and answer sessions. Furthermore, the conference had several parallel sessions chaired by eminent scientists and researchers in seven breakout rooms through-which vibrant discussions, experience and knowledge sharing were widely held. There were also two panel discussions namely “The future of the work and the worker” and “The future of higher learning Institutions in Africa”. It is also worth noting that the conference had exhibition sessions throughout the conference where seven (7) exhibitors displayed various activities both for materials and for other services.
KEYNOTE SPEAKERS QUOTES

“Soft electronics for the human body has been successfully applied in neonatal intensive care in the US, and they are now planning to open manufacturing points in Africa. They have started with Kenya and Zambia. With this technology, it is easy to take care of a patient as compared to traditional methods with many wires in the skin interface.”

Prof. John A. Rogers

“Adding chemical dimension to lithograph at all scales and enabling studies in chemical signaling and cellular therapies present global opportunities for in nanotechnology such as nanotechnology for intracellular delivery.”

Prof. Paul Weiss

“African Academy of Sciences (AAS) has a mandate, vision and mission of transforming lives through research excellence. There are available funds for the researchers to apply, such as DELTAS Africa, which is funded by the UK Aid and Grand Challenges Africa with priorities such as maternal, neonatal, child health, Antimicrobial resistance, drug discovery water, hygiene and sanitation.”

Prof. Nelson Torto

“US/Africa collaborations in materials research and education was established since the 1990s. Through this program, the idea of the Nelson Mandela African Institution of Science and Technology (NMAIST) was established.”

Prof. Winston Soboyejo

There is a room for collaboration between IUMRS and AMRS. Actually IUMRS is aspiring to sponsor AMRS conferences in the future. Likewise, African participants should think about hosting IUMRS conferences one day because it has never been hosted in Africa.”

Prof. Soo Wohn Lee

“Its important to discuss the relationship between structure and function at striped phospholipid interfaces, and useful material properties that emerge from the unusual surface chemistry; these include assembly of inorganic nanocrystals and assembly of functional organic molecules.”

Prof. Shelley Claridge
Africa is richly endowed with all the energy resources to harness and store its abundant renewable such as solar and wind, yet suffers from energy poverty. Both on-grid and off-grid storage are critical. On-grid storage is necessary for balancing the grid and servicing the evening peak. Off-grid storage is most critical (e.g., solar-plus battery systems in rural Sub-Saharan Africa) if one considers that more than 70% of the 1.2 billion of Africans, 840 million people) do not have access to electricity.”

Prof. Kenneth Ozoeman

“With the NM-AIST theme, “Academia for society and industry”, “Nanofilter” has helped a significant number of people with the water crisis in Tanzania and the neighbouring countries. The invention of Nano filter is a success that provides water filtration service to individuals, institutions and schools”.

Dr. Askwar Hilonga

“While the power conversion efficiencies of perovskite solar cells have exceeded 24.2% in less than a decade of extensive research, the material still suffers from instability due to moisture and high temperatures, hindering scalability and Commercialisation”.

Prof. Mmantsae Diale
WINNERS FOR AMERICAN CHEMICAL SOCIETY (ACS) SPONSORED CONFERENCE AWARDS

ACS WINNERS 2019

<table>
<thead>
<tr>
<th>Name</th>
<th>Research Area</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sandrine Kamdoum Noukelag</td>
<td>Investigation of Structure</td>
<td>RSA</td>
</tr>
<tr>
<td>Darius Riziki Martin</td>
<td>Development of Aptamer</td>
<td>RSA</td>
</tr>
<tr>
<td>Moussa Bakayoko</td>
<td>Synthesis &amp; Characterization</td>
<td>Cote D’Ivoire/ RSA</td>
</tr>
<tr>
<td>Adama Fall</td>
<td>Synthesis &amp; Characterization</td>
<td>RSA</td>
</tr>
<tr>
<td>Bellah Oreditse Pule</td>
<td>Electrospun Hydrogel for Bio Materials</td>
<td>Botswana</td>
</tr>
</tbody>
</table>
AMRS CONFERENCE PICTORIAL
PARTICIPANTS OF THE AMRS CONFERENCE IN VARIOUS ACTIVITIES
Under the leadership of the President Prof. Hulda Shaidi Swai, the AMRS 2019 Organizing Committee decided to ensure the success of the conference by hiring a reputable and specialized Professional Congress Organizer (PCO). For this role, the Tanzanian company Green Inspirations DMC-PCO was chosen. Since November 2018, the Green Inspirations, worked tirelessly in:

- Providing a continuous advising on all organizational matters and establishing the Conference timeframe,
- Designing and creating the online registration and payment system,
- Creating the conference budget, and required sponsoring needs,
- Directing the promotional and mailing campaigns,
- Providing the Logo and Brochures designs,
- Design the exhibition plan and stands,
- Choosing and managing the best available hotels,
- Preparing and running the best choice of local tours,
- Helping with the abstract submission and management,
- Providing personalized follow up at all inquiries and requests at a timely and professional manner,
- Follow up all registrations, payments and providing regular reports to the Board,
- Manage and provide the Board with all necessary operational statistical report,
- Assist in designing the online Conference Agenda,
- Designing, providing and controlling the participants’ budgets,
- Provide onsite Management of the conference with professional staff,
- Close in time the conference by providing the Book of Abstracts and all necessary financial and statistical reports to the Board.

We believe that the services of Green Inspirations DMC-PCO greatly helped at the success of the conference and that they merit a big thank you, and our recognitions, for their important contribution and impeccable professionalism.
LUCIEN WEISS TOURISM EXPERIENCE

Africa is imbued with a vast and varied abundance of natural resources unlike anywhere else on earth. It therefore comes as no surprise that communities across the continent are working at the forefront of solving key global challenges related to climate, energy, and health. Tanzania, a trailblazer in community-spearheaded environmental preservation, has designated nearly 40% of the country for conservation. Excited to make the most of my journey there for the 2019 AMRS meeting, I extended my trip in order to see some of the country’s famed sites which include Mount Kilimanjaro, Mount Meru, Ngorongoro Crater, Serengeti National Park, Tarangire National Park as well as to experience Tanzania’s renowned hospitality and to learn about some of its cultural traditions.

After four intellectually invigorating days in Arusha at the Nelson Mandela African Institution of Science and Technology (NM-AIST), which looks out on nearby Mount Meru, we drove to Tarangire National Park in the Manyara region - guided by Paul Laizer of Loliondo, Tanzania. There, after passing a large herd of 30 elephants(!) and in view of a lioness staying cool in the shade of a nearby tree, we were amused to come across our fellow international-conference attendees Anna Krzykawska, Monika Szwed, and Piotr Cyganik of Jagiellonian University, Poland, who apparently had similar post-conference plans!

Making our way west, we were met by community leader Kisika Molin, who guided us to a reconstructed Maasai village built to educate tourists about traditional Maasai life. Upon arrival, we were received with a traditional welcome ceremony featuring the famed Maasai Adamu, sometimes referred to as the “Jumping Dance.” Here, pairs of participants, myself included, competed to jump higher than one another amidst the encouraging chants of the surrounding circle. While I may not have jumped highest this time, I will be training for the next time AMRS returns to the region! After this hearty welcome, Kisika and company demonstrated how to start a fire from the local woods and grasses, and provided a tour of an inkajijik, that is a house constructed of sticks, mud, and various locally sourced materials.

As the evening ended and night began, the animal guard changed as well. This brought an entirely different chorus of sounds to which we slept. Early the next day, we woke before sunrise to begin our descent into the legendary Ngorongoro Crater. Here, we were immediately greeted by a pride of lions, including their cubs! Over the day, we crisscrossed the crater floor, where we observed an unending ensemble of buffalo, elephants, hippopotamus, hyenas, jackals, lions, rhinoceros, warthogs, zebra, and as many species of birds.

In addition to the many wonderful memories of the trip, what continues to impress most about the AMRS meetings is the opportunity to meet and connect with scientists from across Africa and around the world, building bridges that cross borders. I look forward to returning to Tanzania as well as seeing you all at the 2021 AMRS meeting in Dakar, Senegal.
TO MY FRIENDS FROM THE AMRS2019 CONFERENCE

My experience at the AMRS2019 conference was a delight. The spirit of my scientific colleagues and the conference administrators was uniformly uplifting and welcoming. The degree to which the scientific talks described applications of materials science to address real societal needs was enlightening. But for me, as an avid eco-tourist, the AMRS2019 conference was a first-in-a-lifetime joy. I have a particular interest in bird-watching, and began by taking photos of birds from the lofty balconies of the Mandela Institute conference center during breaks in the conference schedule of talks. One day, I wandered behind our lunch tents where I found and photographed one of my favorite species - known as the Hoopoe in English (see photos) - a beautiful bird that I had previously only briefly glimpsed several years ago in Tunisia.

With so many opportunities for eco-tourism at hand, I decided to explore more of Tanzania in the vicinity of the conference, traveling first to Ngorongoro Crater for a day safari with conference colleagues. We greatly enjoyed the opportunity to observe in the wild the many large mammals and the variety of bird life, including several of the largest of the large birds, the ostrich. We broke up the long day of wildlife viewing by battling a flock of Superb Starlings who were very interested in stealing our sandwiches at lunch.

The next day, I set out on my own to Lake Manyara, famous for its bird life. After a somewhat “too exciting” ride in a small airplane, I was amazed by my first safari through the park. I spent three days on safari, including two nights in the eco-lodge listening to roaring lions. I listed more than eighty species of birds, seventy-one of which were first time personal observations, new additions to my “Bird Life List”. But the most wonderful experience was our successful excursion to find the tree-climbing lions.

One evening, there was a report of a pride of lions resting in a large tree, just a thirty minute ride from the eco-lodge. I think it was an acacia tree, but I warn you that I’m not a tree-watcher; I’m a bird-watcher and, that evening, a lion-watcher. Less than ten meters from the vehicle we found seven lions up in a tree, with another three lions lounging on the ground in the vicinity. One, in particular, was more than willing to pose for as long as the daylight lasted. That scene (see attached photo) is one of my finest memories of Lake Manyara. After a second “too exciting” ride in another small airplane, I returned to Arusha.

My final day at the “Extended AMRS2019” conference was spent on a one day safari to Arusha National Park, a smaller park that offered numerous close encounters with birds and wildlife, including several Black and White Colobus Monkeys, unusual because their four-fingered hands do not feature a thumb.

As I sit here at home in Florida, I reflect on how much the world has changed in seven short months. My experiences at the AMRS2019 in Tanzania were a first-in-a-lifetime because I am resolved to return to Africa once this terrible pandemic has passed. Until then, the warmth of the people I met at the AMRS2019 carries me forward.

With wonderful memories of a wonderful place,
Greg Boebinger (see attached photo)
POST 2019 AMRS TRIP KEVIN AND DEBRA JONES UNIVERSITY OF FLORIDA

After a wonderful AMRS meeting my wife Debra and I decided to spend 8 days on a safari going to both the Ngorongoro Valley and the Serengeti. Stephen was our guide and we traveled in the classic Land Rover set up the guides use. The best way to view wildlife and the spectacular scenery is by standing up in these vehicles.

The Ngorongoro Crater is the worlds largest volcanic intact caldera and is over 100 square miles in area. In the valley are over 1 million animals. You have the chance to drive around the valley (it takes all day to make a single loop) and the wildlife is spectacular.

From there we drove to the central part of the Serengeti. We “camped” in very nice tents (more like canvas cabins) and ate wonderful meals. Each day was a new adventure as we explored the Serengeti in all directions. The animals were simply amazing.

To hippos wrestling in the water. There was something different every day.

From Frolicking zebra’s
To cheetahs who were teaching their young to hunt (the prey got away in this case).

After the Serengeti we spent a day on a walking tour of a local village and met some wonderful people, talked for a while about growing bananas and drank banana beer (not bad). And then it was back to Arusha.

All in all it was a tremendous experience and the trip of a lifetime. What a wonderful way to cap an exciting trip to the 2019 African MRS meeting.
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Conference Proceedings

MRS Advances was the official journal for publishing proceedings for the 10th International conference of the African Materials Research Society (AMRS2019). All articles were published in Volume 5 of 2020.

Issue 26 AMRS2019:
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