ISNNAM 2020

2020 INTERNATIONAL SYMPOSIUM ON NANOSTRUCTURED, NANOENGINEERED AND ADVANCED MATERIALS

6th & 7th AUGUST 2020

VIRTUAL CONFERENCE

SYMPOSIUM ORGANIZERS

UNIVERSITY OF JOHANNESBURG

Centre for Nanomechanics and Tribocorrosion

Tshwane University of Technology
We empower people

Institute for NanoEngineering Research

Symposium sponsors

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Title: The 2020 International Symposium on Nanostructured, Nanoengineered, and Advanced Materials (ISNNAM 2020)

Date: 6th and 7th August 2020
Venue: Virtual Conference

Backdrop:

Over the past decades, the incessant modification of material's properties for the development of advanced materials has spurred technological and industrial advancements in various scientific and engineering fields. Since advanced and nanostructured materials are highly desirable for various applications across the globe, there is a need for the increase in awareness about the prospects and application of nanotechnology in developing innovative and advanced materials.

The 2020 International Symposium on Nanostructured, Nanoengineered, and Advanced Materials (ISNNAM 2020) was co-organized by the Centre for Nanomechanics and Tribocorrosion, University of Johannesburg and the Institute for Nanoengineering Research, Tshwane University of Technology, Pretoria, South Africa. Owing to the global COVID 19 challenges, the symposium was conducted virtually to create awareness on nanostructured and advanced materials with a focus on development on science, engineering and innovations in the areas of nanotechnology and advanced materials. It also covered various research areas in nanoscience, nanoengineering, advanced materials and nano-innovations dealing with the processing, fabrication, analyses and testing of nanostructured, nanoengineered and advanced materials as well as nano-devices and nano-systems.

The 2020 International Symposium on Nanostructured, Nanoengineered, and Advanced Materials (ISNNAM 2020) was scheduled for the 30 April to 03 May 2020. Articles were received from authors from about 12 countries which were subjected to rigorous peer review process. About 80 % of the articles were accepted and published in Materials Today: Proceedings. Due to COVID-19 global pandemic, the accepted papers were presented as online on the 6th and 7th August 2020.

The two (2) days exclusive virtual conference featured presentations/discussions from academic and industrial researchers from institutions in South Africa, USA, France, Canada, India, Nigeria, Ethiopia, Ghana, Namibia, Botswana among others in materials science and engineering. The first day of the symposium commenced with an opening speech by the conference chair (Prof Peter Olubambi), keynote speeches and subsequently, plenary sessions which was graced by over 150 participants from different part of the globe. While the second day of the symposium basically featured plenary sessions and presentation on integrated computational materials modeling which had over 148 participants.

The ISNNAM 2020 Sessions featured speeches, presentations and discussions on the following areas in materials science and engineering

SYMPOSIUM TOPICS/SESSIONS

- ✓ Integrated Computational Materials Modelling
- ✓ Nanotechnology & 4th Industrial revolution
- ✓ Biomaterials, nanomedicine and health

- ✓ Nanomaterials synthesis and characterisation
- ✓ Nanofabrication and Near-Net-Shaping
- ✓ Innovations in advanced materials processing
- ✓ Nanobiotechnology and nanofood
- ✓ Nanotechnology in energy and electrochemical Technologies
- ✓ Nanostructured alloys and ceramics technologies
- ✓ Nanotechnology in water and waste management
- ✓ Advances in polymer nanotechnologies

KEYNOTE/PLENARY SPEAKERS

Prof Estournes
Universite Toulouse III, France

Prof Maphanga
Council for Scientific and Industrial Research, South Africa

Prof Ray
CSIR, Pretoria, South Africa

Prof Olevsky
San Diego State University, USA

Prof Daramola
University of Pretoria, South Africa

Dr Diatta
Ziguinchor University, Senegal

Prof Chauke
University of Limpopo, South Africa

Prof Doo-Arhin
University of Ghana, Ghana

Dr Ukpong
University of KwaZulu-Natal, South Africa

SUBMISSIONS & PUBLICATION

- Manuscript template was downloaded from the symposium website at: www.isnnam.org/paper-submission
- Authors submitted their articles through Materials Today: Proceedings website located at: http://ees.elsevier.com/MATPR/default.asp

- Authors were advised to select “ISNNAM 2020” when they reach the “Article Type” step in the submission process.

- Submitted paper were subjected to double blinded peer review. Accepted papers were published in Materials Today: Proceedings (Elsevier) [Scopus Indexed]. www.journals.elsevier.com/materials-today-proceedings

ISNNAM 2020
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PRESENTATION SCHEDULE FOR ISNNAM 2020

DAY 1 (THURSDAY, 06 AUGUST 2020)

OPENING CEREMONY

08:00 – 08:30	Arrival, Familiarization and Networking
08:30 – 08:40	Introduction and Welcome by Prof Peter Olubambi (Symposium Chair, University of Johannesburg)
08:40 – 08:50	Symposium Opening address by Prof. Daniel Mashao (Executive Dean, Faculty of Engineering and the Built Environment University of Johannesburg
08:50 – 09:40	Symposium Plenary Talk address by Prof. Ray Suprakas (Manager; Centre for Nanostructures and Advanced Materials, DSI-CSIR Nanotechnology Innovation Centre, Council for Scientific and Industrial Research, Pretoria)
09:40 – 09:55	Vote of Thanks by Prof Rotimi Sadiku (Symposium Co-Chair, Tshwane University of Technology, Pretoria)

SYMPOSIUM SESSION 1

KEYNOTE ADDRESS: 09:50 – 10:20

Topic: Multifaceted nature of carbon nanotubes as a nanomaterial

Speaker: Prof Michael Daramola (Head; Department of Chemical Engineering, University of Pretoria)

Session Chair: Prof Anthony Andrews (Kwame Nkrumah University of Science and Technology)

Time	Article Title	Authors	Affiliation
10.20- 10:40	Photoactive and Self-cleaning Properties of Copper Oxide Thin Film Non-Enzymatic Glucose Biosensor	**A.O. Inyang;** M Chowdhury	Cape Peninsula University of Technology, Cape Town, South Africa
10:40 - 11:00	Zinc Oxide Nanoparticle in Lithium Triborate Microparticle System: Visibility for Application in Dosimetry	O.S.Ajayi; S.S.Oluyamo; **C.U.Ofiwe**; C.A.Aborisade	**Federal University of Technology, Akure, Nigeria;** Obafemi Awolowo University, Nigeria
11:00 - 11:20	Thermomechanical response of kenaf/PLA biocomposites to clay nanoparticles infusion	**M Moyo;** Krishnan Kanny**;** T.P.Mohan	**Durban University of Technology, Durban, South Africa;** Malawi University of Science and Technology, Malawi
11:20 - 11:40	Purification of petroleum products contaminated water using modified rice husk ash filters	J.O. Madu; **F.V. Adams**; B.O. Agboola; B.D.Ikotun; V.Joseph	**American University of Nigeria;** University of South Africa
11:40 – 12:00	On the development of sustainable and durable concrete	**S.A. Alabi;** Jeffrey Mahachi	**University of Johannesburg, South Africa**

SYMPOSIUM SESSION 2
KEYNOTE ADDRESS: 12:10 – 12:40
Topic: Photocatalytic Degradation of Rhodamine Dyes using Zinc Oxide Nanoparticles
Speaker: Prof David Dodoo-Arhin: (Department of Materials Science and Engineering, University of Ghana)
Session Chair: Prof Ritwik Basu (Bhartiya Skill Development University (BSDU), Rajasthan, India)

Time	Article Title	Authors	Affiliation
12.40- 13:00	Electrical and mechanical properties of polypropylene/epoxy blend-graphite/carbon black composite for proton exchange membrane fuel cell bipolar plate	**O.A. Alo;** I.O. Otunniyi; HCvZ Pienaar; E.R. Sadiku	**Vaal University of Technology, Vanderbijlpark South Africa;** Tshwane University of Technology, Pretoria, South Africa
13:00 - 13:20	Experimental investigation of thermal and physical properties of nanocomposites for power cable insulations"	C.A.Uwa; **B.Abe;** A.F.Nnachi; E.R.Sadiku; T.Jamiru	**Tshwane University of Technology, Pretoria, South Africa**
13:20 - 13:40	Phase stability of TiPd1-xRux and Ti1-xPdRux shape memory alloys	**R.G.Diale;** R.Modiba; P.E.Ngoepe; H.R.Chauke	**University of Limpopo, South Africa** Council for Scientific Industrial Research Pretoria, SOUTH AFRICA
13:40 - 14:00	Dry Sliding Wear Behavior of Binary Powder Laser Cladded Ti-6Al-4V Using SiC and Al	**U.O.Okoli;** I.O.Otunniyi; I.D.Adebiyi	**Vaal University of Technology, Vanderbijlpark South Africa**
14: 00 – 14:20	Development of a Model for the Optimization of Energy Consumption during the Milling Operation of Titanium Alloy (Ti6Al4V)	**I.Tlhabadira;** I.A.Daniyan; L.Masu; K.Mpofu	**Tshwane University of Technology, Pretoria South Africa;** Vaal University of Technology, Vanderbijlpark, South Africa
14: 20 – 14:40	Surface Characteristics of Nano Powder Mixed Micro-Wire Electrical Discharge Machining on Inconel Alloy	**P.Sivaprakasam;** P.Hariharan	**Addis Ababa Science and Technology University, Ethiopia.** College of Engineering Guindy, Anna University, Chennai, India

DISCUSSIONS ON FUTURE DIRECTIONS FOR ISNNAM (14:40 – 15:10)

SYMPOSIUM SESSION 3

Session Chair: Prof Kenneth Alaneme (Federal University of Technology, Akure, NIGERIA)

Time	Article Title	Authors	Affiliation
15.15- 15:35	Development of low-cost titanium alloys: a chronicle of challenges and opportunities	**Michael O.Bodunrin** Lesley H.Chown Joseph A.Omotoyinbo	**University of the Witwatersrand, South Africa;** Federal University of Technology, Akure, Nigeria
15:35 - 15:55	Process Design and Optimization for the Milling Operation of Aluminum Alloy (AA6063 T6)	**I.A.Daniyan;** I.Tlhabadira**;** K.Mpofu; A.O.Adeodu	**Tshwane University of Technology, South Africa;** Afe Babalola University Ado Ekiti, Nigeria
15:55 - 16:15	An electron backscattered diffraction (EBSD) approach to study the role of microstructure on the mechanical behavior of welded joints in aluminum metal matrix composites	P.K.Jayashree; **R. Basu**; S.S. Sharma	Manipal Institute of Technology, Karnataka, India; **Bhartiya Skill Development University (BSDU), Rajasthan, India**
16:15 - 16:35	Microstructural evaluation of NiAl-CNTs composites fabricated by spark plasma sintering	**M.A. Awotunde;** P.A. Olubambi**;** D. Chen	**University of Johannesburg, South Africa** Ryerson University, Canada
16: 35 – 16:55	Development and Micrograph Analysis of Beta-SiAlONs Produced by Spark Plasma Sintering	**L.J. Letwaba;** I. Tlhabadira, I.A. Daniyan; M Seerane; ER Sadiku; L. Masu	**Tshwane University of Technology, Pretoria South Africa;** Council for Scientific Industrial Research Pretoria, South Africa; Vaal University of Technology, Vanderbijlpark, South Africa
16:55– 17:15	Microstructural and Nanomechanical studies on Spark Plasma Sintered 48Ti-48Al-2Cr-2Nb alloy	**M.R. Mphahlele;** P.A. Olubambi; E.A Olevsky	**Durban University of Technology, Durban, South Africa;** University of Johannesburg, South Africa; San Diego State University, USA

SYMPOSIUM PLENARY TALK 2 (17:20 – 18:20)

Topic: Advanced Manufacturing of New Materials via Combined 3D-Printing and Spark Plasma Sintering

Speaker: Eugene A. Olevsky (Dean and Distinguished Professor, College of Engineering, San Diego State University)

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DAY 2 (FRIDAY, 07 AUGUST 2020)

SYMPOSIUM SPECIAL LECTURE SERIES ON INTEGRATED COMPUTATIONAL MATERIALS MODELLING

Session Chair: Prof Ronald Machaka (Council for Scientific and Industrial Research, Pretoria)

08:30 – 09:00 Arrival, Familiarization and Networking

Time	Article Title	Speaker	Affiliation
09.00- 10:00	Computational modelling as value add to materials research	Prof Rapela Maphanga	Council for Scientific and Industrial Research, Pretoria, South Africa
10:00 - 11:00	Computational thermodynamics: a useful tool for alloy development	Dr Ukpong Magnus	University of KwaZulu-Natal, South Africa
11:00 - 12:00	Computational design and modelling of Titanium based alloys	Prof Hasani Chauke	University of Limpopo, South Africa
12:00 - 13:00	Numerical modelling and finite element simulation of thermal-electric phenomena in spark plasma sintering of ceramics	Prof Joseph Diatta	University of Ziguinchor, Senegal
13:00 - 14:00	Spark plasma sintering: from controlling the microstructures to the development of complex shapes	Prof Claude Estournes	Université Toulouse III Paul Sabatier, France

CLOSING FORMALITIES: 14:00 – 14:15