



COSAAMI'21 PROGRAMME

Meeting link: <https://zoom.us/j/96731358215>

Monday, 18 October 2021

DAY 1		OPENING SESSION	
	<i>Session Chair:</i>	<i>Jaco van der Walt</i>	
09h00 - 09h05	Opening	Sylvester Bolokang - Chairperson, CoSAAMI 2021	
09h05 - 09h25	Welcome Address	Beeuwen Gerrys – Chief Director, Technology localisation, beneficiation and advanced manufacturing, DSI	
09h25 - 09h40	Opening Address	Jan-Rijn Zeevaart – Acting Divisional Executive, R&D, Necsa	
DAY 1		PLENARY SESSION	
	<i>Session Chair</i>	<i>Jaco van der Walt</i>	
09h45 - 10h45	Plenary	David Nicholls – Chairman of the Board, Necsa	
10h45 - 11h05	Sponsor Presentation	NMISA Presentation	
11h05- 11h30		TEA BREAK	

DAY 1	SESSION 1			
	Advanced Manufacturing	Metallic Materials	Nanomaterials	Novel Energy Materials
Session Chair	<i>Milton Makhofane</i>	<i>Ronald Machaka</i>	<i>Keneiloe Sikhwivhilu</i>	<i>Ntsoaki Mathabathe</i>
11h30 - 11h50	167. Sadiq Abiola Raji Influence of Mo on Microstructure and Hardness of Ti-Al-Si Alloy Processed by Laser Engineered Net Shaping (LENS)	241. Maje Phasha An overview of the Ferrous Materials Development Network (FMDN) in South Africa	172. Tshegofatso Phaahla The Effect of Doping with M (M = Ir AND Pt) Impurities on Ti Clusters: A Density Functional Theory Study	220. Nkgaphe Tsebesebe Empirical Forcefield Derivation and Implementation for LiMO ₂ (M: Ni, Mn, CO) Cathode Materials
11h50 - 12h10	145. Nthateng Nkhasi Reconditioning of Ti6AL4V Powder Through an Inductively Coupled Plasma for Direct Metal Laser Sintering	235. Lebedike Mampuru Comparative evaluation of wear properties of alloyed 25 wt% chromium white cast iron for milling environments	166. Ntsoaki Mphuthi Optimization of surfactant use in shear exfoliation of 2D MoS ₂ nanosheets	178. Brian Ramogayana The Effect of Niobium Doping on Major Surfaces of Lithium Manganese Oxide (LiMn ₂ O ₄): DFT Study
12h10 - 12h30	150. Mattheus Gerhardus Willemse Material characteristics of additively manufactured Ti-6AL-4V samples using the laser based direct energy deposition technique.	236. Vuyo Motsweni Effect of process control agent (PCA) on the properties of mechanically alloyed Al-Cu powders	227. Magdeline Mohlao Seabi Hydrothermal Zinc Oxide Nanoparticles as Seeds to Induce Nanoripples in Zinc Oxide Thin Films	183. Percy Ngobeni Structural and Electronic Properties of β -MnO ₂ Employing DFTB Technique
12h30-13h30	LUNCH			
DAY 1	SESSION 2			
	Advanced Manufacturing	Metallic Materials	Nanomaterials	Design & Simulation

<i>Session Chair</i>	<i>Hertzog Bissett</i>	<i>Zizo Gxowa</i>	<i>Rosinah Modiba</i>	<i>Milton Makhofane</i>
13h30 - 13h50	160. Modupeola Dada In-situ Reactive Synthesis of High Entropy Alloys by Laser Metal Deposition for Aerospace Applications	204. Rabelani Tshidavhu Microstructural analysis of as-cast NdFeB magnetic alloy	192. Khanyisile Masemola Tuning the physiochemical properties of carbon dots via heteroatom doping: Effects of the concentration of nitrogen-containing precursor.	143. Thinus van Rhijn Towards Predicting Process Parameters for Selective Laser Melting of Titanium Alloys Through the Modelling of Melt Pool Characteristics
13h50 - 14h10	173. Gaofengwe Molatlhegi The effect of laser surface re-melting on the surface roughness and micro-hardness of selective laser melting (SLM) fabricated Ti-6Al-4V samples.	237. Lesego Miya Investigating the electronic and magnetic properties of Dy, Y and La by site substitution on Nd ₂ Fe ₁₄ B permanent magnet employing the first principle approach.	165. Lindokuhle Magagula Synthesis of cellulose-based nitrogen-doped carbon quantum dots for the detection of Fe(III)	144. Themba Mashiyane Influence of operating speed on the thermo-mechanical behaviour of cylindrical roller bearing
14h10 - 14h30	202. Smith Salifu Determination of the dominant failure mechanism of P92 steam piping subjected to daily operational cycle using finite element (FE) technique	239. Christiaan Pretorius Evaluation of the HTHA-Kinetics in Welded C-0.5Mo Steels during Accelerated Laboratory Testing using High-Temperature Capsule Strain-Gauges	196. Martin Aluga Synthesis of SiO ₂ , Fe ₂ O ₃ AND Al ₂ O ₃ Nanoparticles from Lignocellulosic Bio-Pozzolans	185. Seya Watano Alex Impact of Heat and Mass Transfer on Spheroidization of Titanium Alloys
14h30 - 14h50				200. Zakhele Mathews Zondi Characteristics of the asymmetric Stockbridge damper
END OF DAY				



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Tuesday, 19 October 2021

DAY 2		KEYNOTE SESSION	
	<i>Session Chair</i>	<i>Sagren Govender</i>	
09h00-10h00	Keynote	Prof Lesley Cornish New materials for future application: Materials development and properties	
10h00-10h20		161. Nehru Pillay South African Platinum Group Metals Industry Roadmap Project Overview	

10h20 - 10h50	TEA BREAK
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DAY 2	SESSION 1			
	Advanced Manufacturing	Metallic Materials	Nanomaterials	Novel Energy Materials

<i>Session Chair</i>	<i>Sylvester Bolokang</i>	<i>Ryno van der Merwe</i>	<i>Miemie Maminza</i>	<i>Marandela Mulaudzi</i>
10h50 - 11h10	177. Andile Mazibuko The Stability of Titanium Clusters Tin (n=5,13,19) in LiCl Medium	164. Hein Moller Overview of the Precious Materials Development Network (PMDN)	211. Obakeng Nchoe Coalescence of Nano-enhanced Reverse Osmosis Membranes with Antifouling Properties	190. Refiloe Maphoto Computational Modelling Study of on the Stability of Li ₇ La ₃ Zr ₂ O ₁₂ (LLZO) Solid Electrolyte for Lithium Ion Batteries
11h10 - 11h30	187. Nthabiseng Moshokoa Microstructure and Mechanical Properties of As-Quenched Metastable Binary Ti-Mo Alloys	148. Tshenolo Phinah Leso Study of Wear Performance of Wheel and Rail Pearlitic Steels Under Dry Sliding Conditions	170. Rudzani Ratshiedana Photodegradation of Tartrazine Using Silver Doped Titanium Dioxide	152. Khomotso Maenetja Density Functional Theory Study of MnO ₂ , TiO ₂ and VO ₂
11h30 - 11h50	195. Nana Arthur Heat Treatment of Ti6Al4V Alloyed With Beta Stabilizers	153. Tshedza Sithuba The Study of the Effects of Flavanoid Derivatives as Corrosion Inhibitors for Zinc in Sulphuric Acid	240. Masaku Kgatle Degradation Mechanism of Methyl Orange Dye Using Fe/Ag/Zn Trimetallic Nanoparticles	230. Jane Negondeni Synthesizing Pt-Ni Nanoframe electrocatalysts using the solvothermal and in-house developed method for PEM fuel cells
11h50 - 12h10	248. Monnamme Tlotleng Laser micro in situ alloying of Manganese to β -Ti46.8Al1Cr0.2Si	156. Dyal Ukabhai Thermo-mechanical processing and phase analysis of titanium alloys with copper additions	243. Kgolofelo Malatjie Iron-doped cerium oxide/graphene oxide nanocomposites for the degradation of organic pollutants from wastewater	229. Nkateko Mkhabela Development of ATO as an alternative catalyst for PEM fuel cells
12h10 - 12h30	245. Kim Beyl Effect of surface preparation techniques on hybrid investment cast-additive manufactured Ti-6Al-4V components	163. Vinod Kurup Study of one-step and two-step quench and partition heat treatments on a medium carbon high silicon alloy using dilatometry		

12h30-13h30	LUNCH			
DAY 2	SESSION 2			
	Computational & Data Driven Modelling	Metallic Materials	Plasma & High Temperature Technology	
<i>Session Chair</i>	<i>Ntsoaki Mathabathe</i>	<i>Joseph Moema</i>	<i>Jaco van der Walt</i>	
13h30 – 13h50	203. Bongani Ngobe First-principles technique is employed to explore possibility of inducing martensitic transformation in ordered B2-TiRu phase by alloying with Pd	223. Absalom Mabeba Effect of Post Weld Heat Treatment of the Fatigue Strength of AISI 430	149. Rearabetswe Dire Characterisation of Spheroidised Tungsten Carbide Metco 32C Powder Using Radio Frequency Plasma	
13h50 - 14h10	159. Vilet Semakaleng Hilane Mechanical properties and thermodynamics functions of Ni-based alloys for high temperature corrosion resistance	224. Seyed Reza Jafarpour Rezaei The influence of austenitization time and temperature on the austenite grain growth in high Ti-V HSLA steels	186. Justin Mbwebwe CFD evaluation of conditions before impact of particles in plasma spraying process	
14h10 - 14h30	231. Cherise Thesner Using Site Occupation Disorder to build bulk structures of Ni _{x-1} Al _x	225. Mbavhalelo Maumela The Influence of Alloying Elements on Tensile Strength During Thermo Mechanical Control Process of Aluminum Alloy	222. Hertzog Bissett Reduction of Copper Oxide powder by an inductively coupled thermal plasma	
	END OF DAY			



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Wednesday, 20 October 2021

DAY 3		KEYNOTE SESSION			
09h00 to 10h00	Session Chair	<i>Keneiloe Sikhwivhilu</i>			
	Keynote	<p style="text-align: center;">Prof. Ronald Machaka Metal Injection Moulding at the CSIR: Lessons on Process Development and commercialization</p>			
DAY 3		SESSION 1			
		Advanced Manufacturing	Metallic Materials	Ceramic Materials	
	Session Chair	<i>Hertzog Bissett</i>	<i>Jakkie Postma</i>	<i>Zizo Gxowa</i>	
10h00 - 10h20		212. Abjesh Rath Thermal, Mechanical, and Morphological Investigation of Injection Moulded Poly (Trimethylene Terephthalate)/Graphene Oxide/F-MWCNT Hybrid Polymer Nanocomposites	228. Helena Rossouw The Influence of Al Addition on the Evolution of Microstructures and Texture During Finishing Rolling of AISI 430	180. Bathusile Nelisiwe Masina Microstructure and Mechanical Properties of Si/SiC and Al/SiC Manufactured by Laser Metal Deposition.	

10h20 - 10h40	214. Olusegun Afolabi Effect of Size Distribution and Characterization of Hollow Glass Microsphere/ Epoxy Matrix on Flexural Properties of Syntactic Foam Composites	234. Velile Charmain Mnisi First principles study of phase stability and elastic properties of $Ti_{94}MO_{6-x}Zr_x$ (where $x: 2 - 5$) for biomaterials.	154. Agnes Modiga The effect of titanomagnetite slag on the properties of glass-ceramic composites from South African fly ash	
10h40 - 11h00	221. Debasmita Mohanty Bio-based Polyurethane coating synthesized from Modified Castor Oil- Applicable in Base Coat of Automobile Paint	198. Mphamela Enos Baloyi Effect of 6.25 at.% Ta on TiPtCo Shape Memory Alloy	193. Raesibe Ledwaba Formation of Garnet-Type $Li_7La_3Zr_2O_{12}$ Nanoparticles as an Alternative Structural Stabilization Route	

11h00-11h30	TEA BREAK			
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DAY 3	SESSION 2			
	Advanced Manufacturing	Computational & Data Driven Modelling	Ceramic Materials	Materials for Extreme Environment
<i>Session Chair</i>	<i>Ronald Machaka</i>	<i>Mandy Madigoe</i>	<i>Sagren Govender</i>	<i>Sylvester Bolokang</i>
11h30 - 11h50	207. Noluntu Muchavi A shape memory alloy review: Biomedical applications	157. Vongani Chabalala Inputs to Machine Learning: Classification of Metal Oxides using Support Vector Machine and Principal Component Analysis	175. Pushetso Ramasobane In-Situ Synthesis of TIC/TI-6AL-4V Composite by Direct Metal Deposition	151. Rinae Ratshikombo Study of Corrosion Inhibition Efficiency, Mechanism and Application of Chromones as Corrosion Inhibitors on Mild Steel in Sulphuric Acid

<p>11h50 - 12h10</p>	<p>238. Alain Mwamba Tracking the railway line in-service behaviour through metallurgical, mechanical and wear property characterisation</p>	<p>168. Sadiq Abiola Raji Modelling and Simulation of the Fatigue Usage Factor of γ-TiAl Alloy Fabricated through Laser Additive Manufacturing (LAM)</p>	<p>181. Paul Lekoadi Effect of Pre-Heating on Microstructural Evolution and Hardness Properties of In-Situ TiB/Ti6Al4V Composite Produced by Laser Metal Deposition</p>	<p>201. Nomsombuluko Masia Corrosion Performance of Ti-Cu Alloys for Biomedical Applications</p>
<p>12h10 - 12h30</p>	<p>188. Tebogo Ledwaba Cluster Expansion of B2 FeCo_{1-x}V_x and Fe_{1-x}CoV_x Systems</p>	<p>174. Lebogang Motsomone Computational Modelling Studies for High Temperature Monazite Systems</p>	<p>242. Phillip Moloisi Experimental Study on Laser Additive Manufacturing of TiB₂/Ti6Al4V Composite</p>	<p>199. Mthobisi Cyprian Zulu Optimization of rotary friction welding process of titanium alloy rods</p>
<p>12h30 - 12h50</p>	<p>246. Percy Ngobeni Structural and electronic properties of β-MnO₂ employing DFTB technique.</p>			<p>158. Lindokuhle Magagula Sustainable conversion of corncob biomass waste into economic, high-performance carbon materials</p>
<p>END OF DAY</p>				

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Thursday, 21 October 2021

DAY 4	SESSION 1			
	Advanced Manufacturing	Metallic Materials	Nanomaterials	
Session Chair	Rosinah Modiba	Miemie Maminza	Lerato Raganya	
09h00 – 09h20	<p>218. Simphiwe Khanyema</p> <p>Prediction of grain growth during the austenitization of 0.7%C pearlitic rail steel billets</p>	<p>191. Mandy Madigoe</p> <p>Use of first-principles approach and thermo-calc method to identify potential low elastic modulus titanium-based alloy for biomedical applications</p>	<p>146. Sindisiwe Muthwa</p> <p>Colorimetric detection of Mn (II) using 3-(4-hydroxy-3-methoxyphenyl)-2, 3-dihydropyrazolo [3, 4-b] indole-1(4H)-carbothioamide modified gold nanoparticles: A CIEL*a*b*/Yxy colour space study</p>	
09h20 - 09h40	<p>232. Ryno van der Merwe</p> <p>Induction melting of an Al-50Cu alloy for improved homogeneity required for powder spheroidisation</p>	<p>249. Marandela Mulaudzi</p> <p>Effect of different simulated metal dusting environments on Alloys 602CA and 800</p>	<p>182. Tessia Rakgotho</p> <p>Dual application of green synthesis method of zinc oxide nanoparticles; Sorghum bicolor growth and soil sensor development</p>	

09h40 - 10h00	233. Joseph Moema Optimisation of Processing Conditions for Roll-Bonding of AA3003 AND Aa4045 for Heat Exchanger Application	219. Muhammed Salojee Effect of hot rolling parameters on recovery mechanisms in 436 (17%Cr, Nb-Mo) steel	197. Martin Aluga Nanomaterials for Soil Stabilisation in Roads Construction	
10h00 - 10h20	208. Noluntu Muchavi Heat treatment of injection moulded 17-4 PH stainless steel parts	171. Ramogohlo Diale The Effect of Co on the Transformation Temperature and Stability of Ti ₅₀ Pd ₅₀ Alloy	209. Robert Thembinkosi Khumalo Use of Attenuated Total Reflectance Fourier Transform Infrared Spectroscopy as a Tool to Determine Effect of Hot Air Drying on Yield (%) of Chitin from Crab Shells	
10h20 - 10h40		179. David Tshwane Adsorption-Desorption of F2 Diatomic Molecule on Ti (100) Surface	210. Mufaro Moyo Effects of Combined Alkali Treatment and Clay Nanoparticle Infusion on Thermo-Mechanical Response of KENAF/PLA Biocomposites	

10h40 - 11h10	TEA BREAK
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DAY 4		KEYNOTE SESSION	
11h10 – 12h10	<i>Session Chair</i>	<i>Hertzog Bissett</i>	
	Keynote	Prof. Deon de Beer Development of Additive Manufacturing Ecosystems in Africa	



DAY 4		CLOSING SESSION
12h10-13h00	Session Chair	Hertzog Bissett
	Student Presentation Awards	Sylvester Bolokang
	Sponsor video	NMISA
	Vote of thanks	Jakkie Postma
	Closing	Zizo Gxowa-Penxa (CSIR)
		END OF CONFERENCE