**TUESDAY 23 OCTOBER 2018**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
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<tbody>
<tr>
<td>12:00 - 16:00</td>
<td>WELCOME &amp; REGISTRATION</td>
</tr>
<tr>
<td>14:00 - 16:00</td>
<td>Registration</td>
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<tr>
<td>14:00</td>
<td>REFRESHMENTS</td>
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<tr>
<td>17:30 for 18:00</td>
<td>Welcome cocktail cruise along the Vaal River</td>
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<td></td>
<td>Mr Martin Sanne, Executive Director, CSIR, MSM</td>
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**DAY 1**

**WELCOME**

8:00 - 9:00 Registration

9:00 - 9:05 Conference Opening – Heron

Dr Robert Tshikhudo, Competence Area Manager, CSIR, MSM

9:05 - 9:25 Welcome Address: Dr Thulani Dlamini, Chief Executive Officer, CSIR

9:25 - 9:45 Opening Address: Mr Imraan Patel, Deputy Director-General, DST

**PLENARY SESSION**

9:45 - 10:30

Prof M Neil James: Professor of Mechanical Engineering, University of Plymouth

Fracture-safe and fatigue-reliable design

**SESSION 1**

Venue: Heron

Chairperson: C Machio

POWDER METALLURGY

11:00 - 11:20 Densification behavior of spark plasma sintered duplex stainless steel reinforced with TiN nanoparticles

S R Oke

PM7

11:20 - 11:40 Development and characterization of nanocrystalline cobalt powder prepared via high energy ball milling process

A L Rominiyi

PM2

11:40 - 12:00 Ball milling and tubular mixing performance of Ti6Al4V-ZrO2 bio-composite

T V Mukhudwana

PM11

12:00 - 12:20 Spark plasma sintered Ti6Al4V-ZrO2 bio-composites: optimization of ball milling and tubular mixing of powders and their subsequent sintering parameters

N Moshokoa

PM8

12:20 - 12:40 Determination of roll compaction parameters required for high green density, defect free Ti-6Al-4V strips

N S Muchavi

PM1

12:40 - 13:00 A comparative study of oxygen pick-up of TiH2DH powder during press and sinter and loose sintering processing

T M Motsai

PM4

LUNCH SERVED AROUND THE SWIMMING POOL
<table>
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<tr>
<th>TIME</th>
<th>SESSION 2</th>
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| 14:00 - 14:30 | KEYNOTE 1: Heron Mr Muzi Manzi, CEO AFSA  
An overview of the South African Aluminium industry, towards 2030 and beyond |
| 14:30 - 14:50 | Effect of putrefied quenching oil on the transformation behaviour of railway spring steel  
G Mukwevho  
HT2 |
| 14:50 - 15:10 | The direct observation of surface martensite formation upon cooling to temperatures close to ambient in a heat treated AISI 301 stainless steel  
T W Mukarati  
HT1 |
| 15:10 - 15:30 | The influence of full and partial austenitization temperatures on the quench and partition heat treatment process for an advanced high strength steel  
V Kurup  
HT4 |
| 15:30 - 15:50 | Use of computed tomography to analyse metal injection moulded parts  
K Jakata  
PM12 |

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<tr>
<th>DAY 1</th>
<th>AFTERNOON REFRESHMENTS AND POSTER SESSION</th>
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| 15:50 | Mechanism study of Fe- and Ni-based alloys under metal dusting environment – F M L Mulaudzi  
FM1 |
|       | Mass loss comparison behavior of 316L SS and 316L SS weld alloyed with ruthenium – V Motsweni  
FM2 |
|       | Case study on the manufacturing of Zircalloy-4 components – P Steyn  
NM1 |
|       | Low temperature synthesis of Zr/C via magnesiothermic reduction – M Mastoroudes  
NM2 |
|       | Analytical approach towards measuring the progress in homogenization during sintering of Ti-6Al-4V – V Churu  
LM1 |
|       | Corrosion behaviour of Ti-34Nb-25Zr alloy fabricated by Spark Plasma Sintering – M R Mahundla  
LM3 |
|       | The corrosion behaviour of metal injection moulded commercially pure titanium – N Nyakane  
LM4 |
|       | The effect of Fe addition on the electrochemical behavior of Ti-34Nb-25Zr base alloy for orthopaedic device application fabricated by SPS – M K Nemavhola  
LM5 |
|       | Evaluation of the rheological properties and spray drying behaviour of a Ti6Al4V based aqueous slurry – N Mguni  
LM8 |
|       | Phase change analysis of commercially pure titanium using simultaneous thermal analyser – L Fikeni  
LM9 |

18:30 FREE EVENING BUFFET DINNER SERVED IN THE RESTAURANT
**THURSDAY 25 OCTOBER 2018**

**KEYNOTE SESSION**

<table>
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<tr>
<th>Time</th>
<th>Session 1</th>
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| **9:00 - 9:30** | Keynote 2: Heron  
*Dr Gabriel Nothnagel, NECSA*
Material requirements of nuclear reactors and related technologies |

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<tr>
<th>Time</th>
<th>Session 2</th>
<th>AdvanCed Materials: Modelling</th>
<th>Composites</th>
</tr>
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</table>
| **9:40 - 10:00** | Mechanical properties and stability of TiPdM (M= Ru, Co, Cu, Zr and Hf) for high temperature applications  
*M P Mashamaite* | Smart Materials: Modelling | COMPOSITES |
| **10:00 - 10:20** | Computational study of binary titanium-based potential shape memory alloys  
*M E Baloyi* | SM1 | Metal matrix composite laser metal deposition for ballistic application  
*A Botes* | CM1 |
| **10:20 - 10:40** | First principles study of structural, thermodynamic, elastic, and electronic properties of TiPdRu shape memory alloys.  
*R G Diale* | SM2 | Effect of milling parameters on the dispersion characteristics of multi-walled carbon nanotubes in transition metal oxides  
*S S Lephuthing* | CM2 |
| **10:40 - 11:00** | Thermodynamic stability of doped FeAl-X (X = Pd, Ag, Pt and Ru) systems  
*C S Mkchonto* | MG3 | Structural integrity and dispersion characteristics of carbon nanotubes in titanium-based alloy  
*A M Okoro* | CM4 |

**SESSION 2**

<table>
<thead>
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<th>Time</th>
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<tr>
<td><strong>11:00 - 11:20</strong></td>
<td>Morning Refreshments</td>
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| **11:40 - 12:00** | The effect of selective laser melting build orientation on the mechanical properties of AlSi10Mg parts  
*B J Mfusi* | AdvanCed Manufacturing: Additive Manufacturing, Welding  
*MG5* |
| **12:00 - 12:20** | Development and Process Verification of a Linear Friction Welding Platform for Small Axis-Symmetrical Ti6Al4V Components  
*N T A Mohlala* | MG4 | Numerical simulation of plastic deformation and mechanical response of strip rolled aluminium alloys  
*G J Jansen van Rensburg* |
| **12:20 - 12:40** | Development of a welding platform and tool for the study of weld and process parameters, during continuous friction stir welding of AA6082-T6 sheets  
*P P Chimakhti* | AM2 | Finite-element analysis of the effect of sheath-gas composition in an inductively-coupled plasma  
*N J M Grobler* |
| **12:40 - 13:00** | Process optimization of rotary friction welding of Ti-6Al-4V alloy rods  
*M C Zulu* | AM3 | Interatomic potential parameters for Li-CI-Ti interaction  
*A F Mazibuko* |
| **13:00 – 14:00** | Lunch Served Around the Swimming Pool |

**Day 2**

23 – 26 October 2018

RiverSide Sun, Vanderbijlpark

www.cosaami2018.co.za
### DAY 2 | THURSDAY 25 OCTOBER 2018

#### KEYNOTE SESSION

**14:00 - 14:30**

**KEYNOTE 3:** Heron  
*Dr Romain Vert, Tekna Plasma, Europe*

Spherical powders manufacturing by Induction Coupled Plasma technology

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#### SESSION 3

**Venue:** Heron  
**Chairperson:** H Bisset  
**Venue:** Bishop  
**Chairperson:** N Mathe

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<tr>
<th>TIME</th>
<th>MATERIALS FOR EXTREME ENVIRONMENT</th>
<th>ADVANCED MANUFACTURING: MACHINING, CASTING</th>
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</table>
| 14:40 - 15:00 | Synthesis and Characterization of Tantalum Oxide Deposited by Metal-Organic Chemical Vapour Deposition (MOCVD)  
*S O Jeje* | On machinability of titanium grade 4 under minimum quantity lubrication assisted high speed machining  
*K Gupta* |
| 15:00 - 15:20 | Batch adsorption study of uranium on various ion exchange resins as an alternative method to solvent extraction  
*J S Gama* | A study of the machinability of Ti-6Al-4V compacted powders  
*C Machio* |
| 15:20 - 15:40 | Concentration of rare earth elements from monazite by selective precipitation  
*S M Xaba* | Manufacturing of high added value titanium components.  
*A South African perspective*  
*D Dimitrov* |
| 15:40 - 16:00 | Phase analyses of the Co-Fe-Pd ternary alloys  
*K Dyal Ukabhai* | Characterization of A356 investment cast component produced using controlled liquid metal cooling technique  
*T F Sishuba* |

#### AFTERNOON REFRESHMENTS AND POSTER SESSION

**Venue:** Reception  
**Chairperson:** K Sikhwivhilu

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<tr>
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| 16:00 | The design and implementation of analytical quality assurance and monitoring programmes in the CSIR TiCOC analytical laboratories –  
*T Madzivhandila*  
Effect of Powder Synthesis Methods on the Properties of Spark Plasma Sintered Ti6Al4V/ZrO2 Composites –  
*M L Raganya*  
Production of titanium-based products through metal injection moulding using CSIR ‘custom binder’ –  
*M Seerane*  
Review of vacuum and inert gas sintering of titanium powder compacts –  
*A Govender*  
An analysis of discrete element method techniques used in simulating direct powder rolling –  
*P Sinclair*  
Novel engineered nanocomposite membranes for advanced oxidative catalytic mineralization of organic pollutants in river water –  
*M Kgatle*  
Exploring the effect of insulating moulds on the mechanical performance of an ambient cure epoxy resin –  
*D Woods*  
HF/HCl Molecule Adsorption on Titanium (110) and (100) Surfaces: Density Functional Theory –  
*D Tshwane*  
First principle investigation of structural, electronic and elastic properties of NiTi shape memory alloy –  
*D Klenam*  
Spheroidisation and densification of irregular shape particles of Fe-Mo powder –  
*V Motsweni* |

**19:00**

**AWARDS DINNER: AROUND THE WORLD – THE ISLAND**
### FRIDAY 26 OCTOBER 2018

#### DAY 3

**KEYNOTE SESSION**

**KEYNOTE 4:** Heron  
*Mr Llanley Simpson, Director: Mining and Minerals Beneficiation, DST*  
Education for the Fourth Industrial Revolution

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| 9:00 - 9:30 | **TITANIUM**<br>SJ Oosthuizen  
**SMART MATERIALS**<br>R Modiba |
| 9:40 - 10:00 | Development status of the CSIR-Ti Process<br>*K Mutombo*<br>**TM2**<br>Computational modelling of Ti50Pd50-XVx potential shape memory alloys<br>*R Modiba*<br>**SM3** |
| 10:00 - 10:20 | Research and development of Ti and Ti alloys: Past, present and future<br>*K Mutombo*<br>**TM1**<br>The effect of vanadium on structure and martensitic transformation temperature of TiP alloy<br>*S Chikosha*<br>**AD1** |
| 10:20 - 10:40 | The effect of specimen geometry on tensile properties of titanium alloy metal sheet<br>*M S Masete*<br>**MT1**<br>Non-destructive characterisation of materials and components using neutron and x-ray diffraction methods<br>*A M Venter*<br>**MT2** |
| 10:40 - 11:00 | MORNING REFRESHMENTS |

**KEYNOTE SESSION**

**KEYNOTE 5:** Heron  
*Mrs Nontombi Marule, Director: Innovation and Technology, Department of Trade and Industry*  
The incentives and support instruments for technology development and commercialisation

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<tr>
<td>11:40 - 12:00</td>
<td><strong>POLYMER COMPOSITES</strong>&lt;br&gt;<em>K Gupta</em>&lt;br&gt;<strong>PC1</strong>&lt;br&gt;Evaluation of machining performance of pineapple filler based reinforced polymer composites using abrasive water jet machining process&lt;br&gt;<em>M J J Monareng</em>&lt;br&gt;<strong>PM3</strong>&lt;br&gt;Effect of milling speed on the formation of Ti-6Al-4V via mechanical alloying</td>
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<tr>
<td>12:00 - 12:20</td>
<td><strong>POWDER METALLURGY</strong>&lt;br&gt;<em>W M R Matshe</em>&lt;br&gt;<strong>PC2</strong>&lt;br&gt;Synthesis of a Novel Amphiphilic Nano-Chitosan Material&lt;br&gt;Spherical Ti6Al4V powder by thermal RF plasma&lt;br&gt;<em>M M Makhofane</em>&lt;br&gt;<strong>PM10</strong></td>
</tr>
<tr>
<td>12:20 - 13:00</td>
<td><strong>ZHULAMIN</strong>&lt;br&gt;<em>Z Cele</em>&lt;br&gt;<strong>PC3</strong>&lt;br&gt;Synthesis, characterization and antimicrobial activities of quaternary chitosan-based materials&lt;br&gt;Effect of ball milling parameters on the dispersion of carbon nanotubes within aluminium powders&lt;br&gt;<em>Z L Madala</em>&lt;br&gt;<strong>PM13</strong></td>
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<td>13:00 – 14:00</td>
<td>LUNCH SERVED IN THE RESTAURANT</td>
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