RAPDASA
RAPID PRODUCT DEVELOPMENT ASSOCIATION OF SOUTH AFRICA

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resolutioncircle

THE 4.0 OF

19TH ANNUAL CONFERENCE

Additive Manufacturing

as a key driver of the 4th industrial revolution

6 - 9 NOV 2018

PROTEA PARKTONIAN, BRAAMFONTEIN, JOHANNESBURG

PROGRAMME

PRE-CONFERENCE SEMINAR ON ADDITIVE MANUFACTURING OF TITANIUM PARTS

TUESDAY 6 NOVEMBER 2018

TIME	PROGRAMME DIRECTOR: DR KOBUS VAN DER WALT	
9:30	Registration, Tea and Coffee	
10:00	Welcoming Address: Dr Kobus van der Walt CRPM, CUT	
10:05	Opening Address: Mr Sechaba Tsubella Acting Director: Advanced Manufacturing Technologies DST	
	Theme: ADDITIVE MANUFACTURING OF TITANIUM PARTS	
	Title	**Presenter**
10:20	Progress towards qualifying additive manufacturing of Ti6Al4V for medical implants and aerospace parts	Willie du Preez, CRPM, CUT
10:40	Investigation of microstructural characteristics of heat treated high speed selective laser melting fabricated Ti6Al4V components	P Lekoadi, N Maledi, M Tlotleng, BN Masina
11:00	Evaluation of structural and geometrical integrity of Ti-6Al-4V alloy developed by LMD technique	PN Sibisi, API Popoola, NKK Arthur, SM Kubjane, AS Ngoveni, LR Kanyane
11:20	**TEA BREAK**	
11:45	Laser powder bed fusion of 55Ni-Ti shape memory alloy for biomedical applications	T Mphafudi
12:05	Investigation of in-situ alloying Grade 23 Ti with 5at.%Cu by laser based powder bed fusion for biomedical applications	E Newby, P Krakhmalev, I Yadroitsava, D Kouprianoff, I Yadroitsev
12:25	Laser powder bed fusion process defects and mechanical properties of Ti6Al4V ELI mandible implants	JA Wessels, A du Plessis, J Els, I Yadroitsava, I Yadroitsev
12:45	Discussion of the morning's presentations	All
13:00	**LUNCH BREAK**	
14:00	Design lessons for additive manufactured small radial flow Ti-6Al-4V turbines for application in organic rankine cycles	ME Cogho, GG Jacobs, JJ du Preez
14:20	Design considerations for developing an additive manufactured Ti-6AL-4V compact counter-flow heat exchanger for application in organic rankine cycles	SC Venter, GG Jacobs, JJ du Preez
14:40	Time driven activity based costing	AF van der Merwe
15:00	Innovation and commercialisation of additive manufacturing	DJ de Beer
15:20	**CLOSURE**	

Hosted by Central University of Technology, Free State. Supported by the Department of Science and Technology.

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WEDNESDAY 7 NOVEMBER 2018

TIME	DAY 1					
08:00	Registration					
09:15	Welcome and opening - Prof. Thorsten Becker (Management Committee)					
	PLENARY SESSIONS: PROTEA ROOM					
09:30	Director-General, Department of Science and Technology - Dr Phil Mjwara					
10:15	Wohlers Associates, Inc - Dr. Terry Wohlers					
11:00	**TEA BREAK**					
11:30	Vice President, Additive Manufacturing, Siemens AG, Digital Factory Division - Dr. Karsten Heuser					
12:15	Electro Optical Systems - Regional Director, Export North. EOS GmbH - Dr. Jose Greses					
13:00	**LUNCH BREAK**					
14:00	**TECHNICAL PRESENTATIONS (3 BREAKAWAY SESSIONS)**					
	VENUE: PROTEA ROOM		**VENUE: OAK ROOM**		**VENUE: MERIDIANS ROOM**	
	Session Chair: Prof Thorsten Becker		**Session Chair: David Bullock**		**Session Chair: Devon Hagedorn-Hansen**	
	Theme: Design for Additive Manufacturing		**Theme: Material/Process Development**		**Theme: AM Business Development**	
	Title	**Presenter**	**Title**	**Presenter**	**Title**	**Presenter**
14:00	Metal Body Armour: Biomimetic Engineering of Lattice Structures	Anton du Plessis	Investment Casting of Aluminium Alloy A356 Using Primecast® and PMMA Additive Manufacturing Materials for Sacrificial Patterns	Nthateng Patricia Nkhasi	Industrialise Additive Manufacturing: The Possibilities with Siemens	Henk Viljoen
14:20	Can Additive Manufacturing Help Win the Race?	Clive Henry Hands	Investigation on the Suitability of Polymers for Selective Laser Sintering Using Novel Mid-IR Lasers	Lorinda Wu	First Advanced Open Labware Workshop And Rapid Prototyping Solutions For Research Challenges In Africa	Suzanne Smith
14:40	Maxillofacial Prostheses Production Through Computer-Aided Design And Manufacturing Technologies – Review Of State Of The Art	Izél van Heerden	Feasibility of Using Lens Technology to Produce WC-Ni Alloys	Brandon Hilton Davoren	The Relationship Between Layer Height And Exposure Strategy In The Formation Of Residual Stresses In Selective Laser Melting Produced Ti6Al4V	Thorsten Becker
15:00	**TEA BREAK**					
	Session Chair: Prof Didier Nyembwe		**Session Chair: Gideon Potgieter**		**Session Chair: Andre van der Merwe**	
	Theme: Design for Additive Manufacturing		**Theme: Material/Process Development**		**Theme: Simulation and Modeling & Internet of Things**	
15:20	Conformal Cooling Channel Design for Direct Metal Laser Sintering of Maraging Steel Injection Mould Inserts	Imdadullah Adam	Analysis Of Melt Pool During The Laser Powder Bed Fusion Of Tungsten	Alfred Twala Sidambe	Machine Learning in Additive Manufacturing as Enabler for Smart Sustainable Manufacturing: A Review	Anli du Preez
15:40	Design Of A “Large” Unmanned Aerial Vehicle (UAV) Frame for Metal Additive Manufacturing (AM) on the Aeroswift Machine	Jacobus Prinsloo	Particle Emission From And Exposure To Metals During Powder Bed Fusion Additive Manufacturing Using Maraging Steel Powder	Sonette du Preez	The Development of a Ti6Al4V DMLS Topology Optimised Model for Finite Strength Analysis Evaluation of the Validity of Finite Element Strength Analysis on Topology Optimised DMLS Ti6Al4V	Jakobus Abraham van Rooyen
16:00	Comparative Study of Additively Manufactured AlSi10Mg and Maraging M300 Steel Thin Walled Structures	Karabo Moremi	Surface Contamination from Use of Metal Powders at Two Additive Manufacturing Facilities	Dr Stefan Linde	Printed RFID Tags on Paper and Flexible Substrates Towards Low-Cost Connected Sensor Systems	Suzanne Smith
16:20	**CLOSING**					
18:00	**COCKTAIL FUNCTION**					

THURSDAY 8 NOVEMBER 2018

TIME	DAY 2					
08:00	Opening and Welcome: Management Committee - Gideon Potgieter, Resolution Circle					
	PLENARY SESSIONS: PROTEA ROOM					
08:15	Vice Chancellor, University of Johannesburg - Prof T Marwala					
09:00	Loughborough University - Prof Ian Campbell					
10:00	**TEA BREAK**					
	PLENARY SESSIONS: PROTEA ROOM					
10:30	Resolution Circle (CEO) - Gideon Potgieter					
11:00	Lonmin (Platforum)					
	INDUSTRY SESSION					
	VENUE: PROTEA ROOM		**VENUE: OAK ROOM**		**VENUE: MERIDIANS ROOM**	
11:30	**National Foundry Technology Network (NFTN)**		**Voxeljet**		**GE Additive**	
12:00	**BuildVolume - Don Vermeulen**		**Materialise**		**NAPIM**	
12:30	**National Metrology Institute of South Africa (NMISA)**		**CSIR- Aeroswift**		**AMTC Simplified Manufacturing**	
13:00	**LUNCH BREAK**					
14:00	**TECHNICAL PRESENTATIONS (3 BREAKAWAY SESSIONS)**					
	VENUE: PROTEA ROOM		**VENUE: OAK ROOM**		**VENUE: MERIDIANS ROOM**	
	Session Chair: David Mauchline		**Session Chair: Ian van Zyl**		**Session Chair: Marius Vermeulen**	
	Theme: Product Development		**Theme: Material Evaluation**		**Theme: Material/Process Development**	
	Title	**Presenter**	**Title**	**Presenter**	**Title**	**Presenter**
14:00	Patient Specific Dynamic Hand Splints Produced Through Selective Laser Sintering	Allan Kinnear	Characterisation Of The Anisotropic Mechanical Properties Of Carbon Fibre Reinforced Thermoplastic Composites	Gustav Adolf Potgieter	Utilisation of Additive and Subtractive Digital Fabrication Processes in the Manufacture of Moulds for Ceramic Slip-Casting	Ashton Margarete Bullock
14:20	Evaluating the Suitability of Alumide Tooling for Injection Moulding of Different Polymers	Jacques Combrinck	Variation of Impact Toughness with Temperature of AS-Built DMLS Ti6Al4V (ELI) Specimens	Amos Mwangi Muiruri	3D Printing in the Missile Industry	Ahmed Faruk Laher
14:40	Low-temperature (aging) stress relief and phase transformation of SLM-produced Ti6Al4V	Thorsten Becker			Production of Spherical Titanium Based Powders From Powder Metallurgy Bars	Silethelwe Chikosha
15:00	**TEA BREAK**					
	Session Chair: Andre van der Merwe		**Session Chair: Pauline Bullock**		**Session Chair: Conrad Beukes**	
	Theme: Post Processing		**Theme: Material Evaluation**		**Theme: Material/Process Development**	
15:20	X-Ray Micro-CT Supporting the South African Additive Manufacturing Community	Stephan le Roux	Problems with the use of UDE of Copper Powders in 3D Printing Technology	Kinga Skrzek	Low Cost Custom Food Moulds Manufactured From 3D Printed Patterns	Martin Bolton
15:40	Tensile And High Cycle Fatigue Properties Of Annealed Ti6Al4V (ELI) Specimens Produced By Direct Metal Laser Sintering	Lerata Botsane Malefane	3D Printable Concrete Technology and Mechanics	Seung Cho	Laser Engineered Net Shaping Technology for WC-Based Materials	Emma Molobi
16:00	X-Ray and Computed Tomography as a Tool for Quality Assurance, Process Optimisation and Metrology in the Field of Additive Manufacturing	Philip Sperling	Strength Modelling of Composite Filament Fabricated Materials Using Classical Laminate Theory	Marco Delport	Selective Laser Melting of Cemented Tungsten Carbide Cutting Tools: A Review	Devon Hagedorn-Hansen
16:20	Experimental Analyses of Heat Treated Titanium Additive Manufactured Component	Amukelani Sydney Sydney Ngoveni			Spheroidisation of Titanium Metal Powder by RF Thermal Plasma Processing	Hertzog Bissett
16:40	**RAPDASA ANNUAL GENERAL MEETING**					
18:30	**Gala Dinner for 19:00**					

FRIDAY 9 NOVEMBER 2018

TIME	DAY 3					
08:00	Opening and Welcome: Management Committee - Prof Didier Nyembwe					
	PLENARY SESSIONS: PROTEA ROOM					
08:15	Coordinator of 3D Research Group, CTI Renato Archer - Dr Jorge Vicente Lopes da Silva					
09:00	Centre for Rapid Prototyping and Manufacturing - Gerrie Booysen					
09:45	**TEA BREAK**					
10:15	**INDUSTRY SESSION**					
	VENUE: PROTEA ROOM		**VENUE: OAK ROOM**		**VENUE: MERIDIANS ROOM**	
10:15	**Rapid 3D**		**New Foundry Generation Forum (NFGF)**		**Altair Engineering SA Pty Ltd**	
11:00	**TECHNICAL PRESENTATIONS (3 BREAKAWAY SESSIONS)**					
	VENUE: PROTEA ROOM		**VENUE: OAK ROOM**		**VENUE: MERIDIANS ROOM**	
	Session Chair: Marius Vermeulen		**Session Chair: Malan van Tonder**		**Session Chair: Gideon Potgieter**	
	Theme: Additive Manufacturing Business Development		**Theme: Process Monitoring**		**Theme: Material Process - Sand Moulds**	
	Title	**Presenter**	**Title**	**Presenter**	**Title**	**Presenter**
11:00	A Conceptual Framework For The Identification, Storage And Implementation Of Standards And Regulations Applicable To Additive Manufacturing	Barend Jacobus Lodewicus Duvenage	Detecting Defects During Powder Deposition In Additive Manufacturing	Adriaan Jacobus Hendriks	Fatigue crack growth rate threshold of selective laser melted Ti6Al4V titanium alloy	Thorsten Becker
11:20	Transforming Academic Research into a Business Model: an i-Corps Case Study for AM Part Verification in the Aerospace and Medical Industries	Godfrey Mills	Review Of An Active Re-Coater Monitoring System For Powder Bed Fusion Systems	Francois du Rand	Minimum Mould Thickness Design Specifications For Printed Sand Moulds	Conrad Beukes
11:40	Empirical Verification Of Pricing Algorithm For Laser Sintering Additive Manufacturing	Heinrich van der Merwe	Online Detection Of Porosity Forming Phenomena During Metal Laser Powder Bed Fusion	Dean-Paul Kouprianoff	Determining The Effect Of Three-Dimensional Printing Orientation On The Bending Strength Of Sand Moulds And Cores When Using A Voxeljet Additive Manufacturing Machine	Jacobus Johannes la Grange
12:00	Design Cycle Of AM Prismatic and Biomimetic Aerospace Components	Neil Britz	Automatic Focus Control System For High-Power Laser Additive Manufacturing	Cobus Jacobs	Sulfonic Acid Coating Of Refractory Sand For Three-Dimensional Printing Applications	Oyombo Dady
12:20			Effect Of Annealing Temperature On Microstructure And Mechanical Properties Of Direct Metal Laser Sintering Ti6Al4V Alloy For Biomedical Application	Shyline Tafadzwa Chingowo	Wireless Sensor Detection of Casting Core Shift within 3D Printed Sand Molds	Eric MacDonald
12:45	**CLOSING SESSION: PROF. THORSTEN BECKER (MANAGEMENT COMMITTEE)**					
13:00	**COLLECT VIP LUNCH PACKS**					

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