Tshwane University of Technology
We empower people

RAPDASA
Rapid Product Development Association of South Africa

TSHWANE UNIVERSITY OF TECHNOLOGY

IS PROUD TO HOST THE

EIGHTH ANNUAL INTERNATIONAL CONFERENCE

on

TRANSPORTATION WEIGHT REDUCTION

to be held at

The Tshwane University of Technology (Soshanguve Campus)

and Kwa Maritane, Pilanesburg,

South Africa, 07-09 November 2007

Endorsed by

Global Alliance of Rapid Prototyping Associations (GARPA)

Plastics Institute of South Africa (PISA)

INTRODUCTION

The challenge facing both the automotive and aerospace industries is to reduce carbon dioxide emissions. A voluntary European Commission agreement with automotive manufacturers to reduce emissions from new cars to an average of 120 grams per kilometer by 2012 has not delivered improvements as quickly as was hoped.

Making vehicles lighter is an important way of reducing fuel consumption. Aluminium, for example, has many of the structural properties of steel, but only one third the weight. But the steel makers are not giving up without a fight. Over the past 15 years they have reduced the weight of cars by around 20-25%. They need to go further and develop new steel compositions by new metallurgical routes. It could also be possible to combine steel with other materials, including plastic polymers requiring new ideas and innovation. An acute awareness of competitive strategies is important in meeting the demands of modern tooling design, as new and old technologies are integrated to innovatively advance technology and ultimately meet different customer needs.

The 2007 *Eighth Annual International RAPDASA Conference on Transportation Weight Reduction* will provide an essential platform where key stakeholders in the sector can share, debate and strategize around both local and international technological innovations. This platform will also provide an opportunity for participants to look at ways in which to promote a competitive edge and enhance economic growth.

The conference is well aligned with the South African Government's Department of Science and Technology strategy, i.e., the National Research and Development Strategy (NRDS), that recognizes that South Africa's future competitiveness will depend on the capacity of the manufacturing sector to master advanced technology domains, to innovate and meet the precise needs of customers.

KEYNOTE SPEAKERS

We have pleasure in informing you that Prof Errol Tyobeka, Vice Chancellor of the Tshwane University of Technology, will be opening the RAPDASA 2007 Conference at Kwa Maritane on the morning of the 8th of November 2007.

Our keynote speakers are –

- **Dr Terry Wohlers, President of Wohlers Associates in the USA: *International Trends and Developments*;**
- **Prof Jasper Steyn, Director of Automotive Focus Group at the University of Pretoria: *The South African Automotive Landscape*;**
- **Prof Reimund Neugebauer, Director of the Fraunhofer Institute of Machine Tool & Forming Technology: *New Manufacturing Technologies – A Chance for Light Weight Design*.**
- **Professor Mulalo Doyoyo of Georgia Institute of Technology: *Innovation Research for Micro-assembled Lattice Material Structures*;**
- **Prof Deon de Beer, Chief Director: Technology Management, CUT will be speaking on *How Rapid Prototyping has changed (impacted on) my Job (and my life …)*;**

- Dr David Phaho, Chief Executive Officer of Tshumisano: ***The Mobilisation of the Technology Stations Program for Materials Beneficiation***; and
- Dr Andrew Taylor, Centre for Automotive Engineering on ***Trends in International Automotive Emissions Reduction***.

WORKSHOPS

7 November 2007, from 10:30 to 13:30, will be devoted to workshops that will expose participants to industry needs and give them the opportunity to share in the expertise of technology leaders. These workshops will be presented at the *Tshwane University of Technology, Soshanguve Campus*, followed by a finger lunch. Delegates will then be taken on a tour of the Institution's "FabLab".

WORKSHOP 1: ***"Advanced Solutions for machining"*** **presented by the Institute for Advanced Tooling in collaboration with Deckel Maho Gildermeister, Pfronten Germany**

WORKSHOP 2: "*Medical Product Development*" presented by the Central University of Technology, Free State

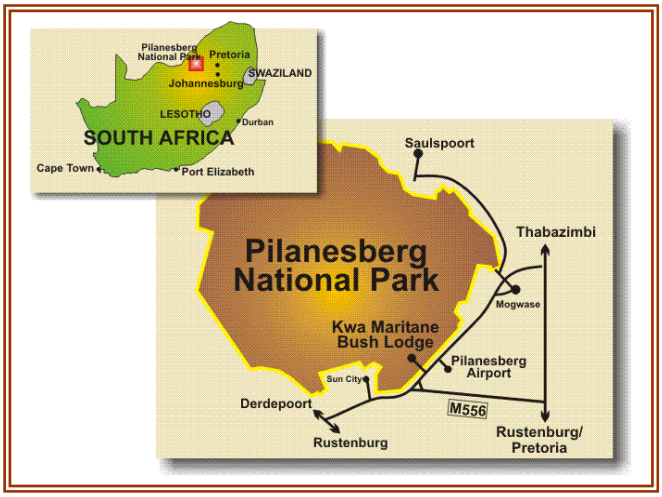
PROGRAM OF THE CONFERENCE

NB:

PROOF OF PAYMENT WILL BE REQUIRED DURING REGISTRATION

AS LIMITED ACCOMMODATION IS AVAILABLE AT KWA MARITANE, PLEASE CONFIRM YOUR BOOKINGS BEFORE FRIDAY, 26 OCTOBER 2007

LATE BOOKINGS BY PRIOR ARRANGEMENT WITH SECRETARIAT ONLY.



P R O G R A M M E

WEDNESDAY 7 NOVEMBER 2007 – SOSHANGUVE CAMPUS	
WORKSHOP 1: **Advanced Tooling and Machining Solutions** ***Old Auditorium, Soshanguve Campus*** **Institute for Advanced Tooling**	
09:00 – 10:30	REGISTRATION AND TEA/COFFEE
	ITEM / PRESENTER
10:30 - 12:30	✯ **Gauteng Government Tooling Initiative:** Nepo Kekana will open the workshop with a short presentation on **"National Tooling Initiative: Time for Action Plans and manufacturing Sector Turn-Around".**
	✯ **C4- Clam, Cusing and Conformal Cooling:** Bob Bond of The Institute for Advanced Tooling and Frank Herzog of Concept Laser will discuss recent advances made in fast cycling tooling, both from an international and a South African perspective.
	✯ **High Speed Machining:** Roy Russel and John Whitehead will discuss and demonstrate current state of the art for rapid and accurate machining of tooling components.
	✯ **Tooling:** Dimitri Dimitrov will elaborate on progress made at the Stellenbosch University of Technology Institute for Advanced Tooling.
12:30 – 13:30	**LUNCH**
13:30 – 15:30	VISIT TO FAB LAB (SOSHANGUVE)
16:00	DEPARTURE TO KWA MARITANE BUSH LODGE
17:30	**ARRIVAL AT KWA MARITANE BUSH LODGE**
WORKSHOP 2: **Medical Product Development** ***Library Training Room, Soshanguve Campus*** **Tshwane University of Technology**	
09:00 – 10:30	REGISTRATION AND TEA/COFFEE
	ITEM / PRESENTER
10:30 – 12:30	✯ **Introductory overview of Medical Applications** by Terry Wohlers (USA)
	✯ **Introduction to Tissue Engineering:** Ian Gibson (Singapore)
	✯ **CT-CAD process: Problems and Challenges** by Michéle Truscott
	✯ **Solutions through Simulation:** Neal de Beer
	✯ **Overview of recent SA successes:** Deon de Beer
12:30 – 13:30	**LUNCH**
13:30 – 15:30	VISIT TO FAB LAB (SOSHANGUVE)
16:00	DEPARTURE TO KWA MARITANE BUSH LODGE
17:30	**ARRIVAL AT KWA MARITANE BUSH LODGE**

PLEASE NOTE

1. **Wednesday morning, 7 November 2007 is strictly for delegates/visitors attending the workshops, and the bus to Kwa Maritane will only leave our Soshanguve Campus at 16:00.**

2. **Delegates/Visitors *NOT* attending the Workshops at TUT, Soshanguve, may only –**

   - ✯ **Book in at Kwa Maritane from 14:00 on 7 November 2007;**
   - ✯ **Register for the Conference from 14:00 at Kwa Maritane.**

WEDNESDAY 7 NOVEMBER 2007 – KWA MARITANE BUSH LODGE		
18:00 – 19:00	**ICE BREAKER** BOB BOND NATIONAL CHAIRMAN : RAPDASA **INFORMAL PRESENTATION** DR PRINS NEVHUTALU DEPUTY VICE CHANCELLOR: RESEARCH, INNOVATION & PARTNERSHIPS	
19:00 – 21:00	**COCKTAIL RECEPTION** **KWA MARITANE, PILANESBERG** DRESS CODE: SMART CASUAL	
THURSDAY 8 NOVEMBER 2007		
07:00 – 08:15	**BREAKFAST**	
	VISIT EXHIBITIONS	
08:15 – 08:40	**SESSION CHAIR** MR ISAAC TLHABADIRA **WELCOMING** BOB BOND NATIONAL CHAIRMAN : RAPDASA **OPENING ADDRESS** PROF ERROL TYOBEKA VICE CHANCELLOR: TSHWANE UNIVERSITY OF TECHNOLOGY	
SESSION 1 : KEY NOTE SPEAKERS **SESSION CHAIR: PROF DEON DE BEER**		
08:40 – 09:10	**DR TERRY WOHLERS** President: Wohlers Associates Inc, USA	KEYNOTE ADDRESS: International Trends and Developments
09:10 – 09:40	**PROF JASPER STEYN** Director: Automotive Focus Group, University of Pretoria	KEYNOTE ADDRESS: Accessing the global automotive supply chain with lightweight products and processes from developing countries

09:40 – 10:10	**PROF REIMUND NEUGEBAUER** Director: Fraunhofer Institute of Machine Tool and Forming Technology	KEYNOTE ADDRESS: New Manufacturing Technologies – A Chance for Light Weight Design
10:10 – 10:30	**MORNING TEA**	
SESSION 2: DIRECT MANUFACTURING SESSION CHAIR: DR OSCAR PHILANDER		
10:30 – 10:50	FREDERIK DE CLERCK, Michel Janssens	From rapid prototyping to rapid manufacturing: Rapid design through foreward engineering
10:50 – 11:10	FRANK HERZOG	Latest developments in laser cusing
11:10 – 11:40	LJ BARNARD and DJ de Beer	Scheduling laser sintering build to utilise unused time and space for rapid manufacture
11:40 – 12:00	MFVT PEREIRA, M Williams and R Bruwer	Rapid die manufacturing using direct laser metal deposition
12:00 – 12:20	MICHELE TRUSCOTT, M Jansen van Vuuren, G Booysen, DJ de Beer and LJ Barnard	Additive fabrication in the medical industry
12:20 – 12:40	C KUHN	Digital Sculpture: Technical and aesthetic considerations applicable to current input and output modes of additive fabricated sculpture
12:40 – 13:00	KESY A, Kesy Z and Kotlinski J	Dimensional deviations of machine parts produced in the laser sintering process
SESSION 3: MATERIALS SESSION CHAIR: DR IAN CAMPBELL		
10:30 – 10:50	K ABD ELGHANY	Evaluating the properties of products fabricated from low cost steel powder using selective laser micro-welding rapid prototyping technique
10:50 – 11:10	SL PITYANA, T Seleka, L Rampedi and C van Rooyen	Laser alloying of aluminium alloys with Ni and Fe based powders
11:10 – 11:40	JM BENSON, H Chikwanda	The challenges of titanium metal injection moulding
11:40 – 12:00	IAN GIBSON	Composites in RP
12:00 – 12:20	H MÖLLER and G Govender	Optimisation of the T6 heat treatment of Rheocast Alloy A356
12:20 – 12:40	P HUMPHREYS, M Sam, M Riddles and O Philander	Development of a valve for transporting abrasive slurry using direct prototyping technology
12:40 – 13:00	JAN JOOSTE and Jaco la Grange	Various applications of a robotic platform at VUT
13:00 – 14:00	**LUNCH**	
SESSION 4: STUDENT PAPERS SESSION CHAIR: MR BOB BOND		
14:00 – 14:15	COLLEN MOHAFE	Development of investment casting of magnesium-alloy
14:15 – 14:30	LEONARD SAMBO	Development of conformal cooling using laser cusing
14:30 – 14:45	SHEMANE KGARIA	Development of a market analysis model for technology advancement in the tooling industry
14:45 – 15:00	PHILIP VAN DER WALT	A design perspective on developing three-dimensional meso-lattice structures
15:00 – 15:15	Philander O, and PETERSEN, M	Influence of seamless wing morphing on aerodynamic performance

SESSION 5: STUDENT PAPERS SESSION CHAIR: MR JAN JOOSTE		
14:00 – 14:15	CLIFFORD MASHABANE	Tool Refurbishment
14:15 – 14:30	JM MAKHUBELA	Tooling SMME development for competitive global market
14:30 – 14:45	MABOGO MBAVHALELA and Graeme Oliver	The development and implementation of finite element analysis techniques in the design of press tooling
14:45 – 15:00	GL MUSEKWA	Ablation Waste Particle Separation
15:00 – 15:15	M Riddles, M SAM, P Humphreys and O Philander	Investigating the use of rapid prototyping technology for direct tooling in composite manufacturing
15:15 – 15:30	**COFFEE / TEA**	
SESSION 6: TOOLING SESION CHAIR: PROF DIMITRI DIMITROV		
15:30 – 15:50	M RIDDLES	A comparative study on the manufacturing of conformably cooled plastic injection moulds for limited production runs
15:50 – 16:10	A MOAMMER and D Dimitrov	Investigation towards the impact of conformal cooling on the performance of injection moulds for the packaging industry
SESSION 7: GENERAL SESSION CHAIR: DR MICHELE TRUSCOTT		
15:30 – 15:50	N DE BEER	Manufacturing of custom-made medical implants- a literature study of the current state of the industry
15:50 – 16:10	D LOUWRENS, C Duff and JA Botes	Product development through the industrial design initiative at TUT
16:15 – 16:45	**RAPDASA ANNUAL GENERAL MEETING**	
17:30 – 19:30	**GAME DRIVE**	
19:30 – 23:00	**BOMA DINNER** (Dress Code: Informal) PRESENTATION OF STUDENT AWARDS BY DR PRINS NEVHUTALU, DEPUTY VICE CHANCELLOR: RESEARCH, INNOVATION & PARTNERSHIPS	
FRIDAY 9 NOVEMBER 2007		
07:00 – 08:00	**BREAKFAST**	
08:00 – 13:00	**EXHIBITIONS**	
SESSION 8 : KEY NOTE SPEAKERS SESSION CHAIR: DR WILLIE DU PREEZ		
08:00 – 08:30	**PROF MULALO DOYOYO** Georgia Institute of Technology	**KEYNOTE ADDRESS:** Formulation of innovation centers in South Africa based on indigenous technologies
08:30 – 09:00	**PROF DEON DE BEER** Chief Director: Technology Management, CUT, South Africa	**KEYNOTE ADDRESS:** How Rapid Prototyping has changed (impacted on) my Job (and my life…)

09:00 – 09:30	**DR ANDREW TAYLOR** Centre for Automotive Engineering	**KEYNOTE ADDRESS:** Trends in International Automotive Emissions Reduction
09:30 – 10:00	**DR DAVID PHAHO** Chief Executive Officer: Tshumisano	**KEYNOTE ADDRESS:** Overcoming Barriers to Innovation through Technology Diffusion and Intelligence to SME's in South Africa – Challenges and Opportunities
10:00 – 10:20	**MORNING TEA**	
SESSION 9: MODELLING AND PROCESSES **SESSIION CHAIR: DR MICHELE TRUSCOTT**		
10:20 – 10:40	RI CAMPBELL, M lo Sapio and M Martorelli	Using Haptic Modelling for Spinal Implant Design
10:40 – 11:00	DAWOOD DESAI	A comparative non-linear simulation of temperature profiles induced in an exhaust manifold during cold starting
11:00 – 11:20	ZHONGJIE HUAN	Investigation of the application of laser sintering technology in heat exchanger design and manufacture
11:20 – 11:40	HERMAN VERMAAK and Gerrit Jordaan	Keeping in touch with your manufacturing process using Condition Monitoring and Intelligent Information Management
11:40 – 12:00	DROR DANAI and Omer Sagi	Expanding applications and opportunities with Polyjet™ rapid prototyping technology
12:00 – 12:20	FC AGGENBACHT	The need for a new product development process
12:20 – 13:00	JOHAN STEYN	Laser Ablation of 3D Prototypes
SESSION 10: TRANSPORTATION APPLICATIONS **SESSION CHAIR: MR EUGENE ERFORT**		
10:20 – 10:40	BOB BOND, Peter Goode, Jan Botes, Drs Andrew Taylor and Arthur Bell	Developments of proof of concept of light weight exhaust manifolds
10:40 – 11:00	NEPO WILLIAM KEKANA GPGDED, Chief Operations Officer, Economic Planning Unit, Gauteng Tooling Initiative	A perspective of the Gauteng Government's plan for the rejuvenation of the tooling industry
11:00 – 11:20	W KOHLHÖFER	Seatbelt heat treatment quality evaluation
11:20 – 11:40	JAN JOOSTE	Development of a lightweight section insulator
14:00 – 12:00	DEHAI SU and IEA Aghachi	Development of glass-reinforced composite impact beam panel for hybrid electric vehicle
12:00 – 12:20	NICHOLAS GONIWE, Dimitri Dimitrov	A method for evaluating forming geometry in order to prevent part defects during stamping process
12:20 – 13:00	D Dimitrov, B DEEZ, A SONN	Reverse engineering in industrial applications – A comparative study
13:00 – 13:40	**CLOSURE** DR PRINS NEVHUTALU Deputy Vice Chancellor: Research, Innovation & Partnerships *The Exciting Opportunities Discussed during the Conference for Future Development in a Cross Cutting Environment*	
13:00 – 14:00	**LUNCH AND DEPARTURE**	

CONFERENCE SECRETARIAT

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TECHNICAL COMMITTEE

Dr WB du Preez, CSIR (Convener)	Dr O Philander, CPUT
Prof D Dimitrov,US	Mr N de Beer, US
Prof DJ de Beer, CUT	Mr. I Tlhabadira, TUT
Dr M Truscott, CUT	Ms P Bullock, Rapid 3D

TRANSPORT

It is suggested that international and out-of-town delegates arrive on Tuesday, 6 November 2007.

We have booked, for your convenience, ten rooms at Bentley's Country Hotel just outside Pretoria and on the way to our Soshanguve Campus. Please confirm a.s.a.p. with Amanda du Preez from our Secretariat, whether you will be making use of this accommodation on the 6th. Arrangements will also be made with Bentley's to collect delegates from the airport on 6 November, but the transport will be included in the room rate.

On the morning of Wednesday, 7 November, delegates will be collected at Bentley's by bus and transported to the Workshop at Tshwane University of Technology, Soshanguve, from where the bus will depart in the afternoon to Kwa Maritane. Please make sure that you have all your belongings before leaving the hotel.

On conclusion of the conference, a bus will be available for transport back to TUT Soshanguve, arriving at approximately 16:00, and for international and out-of-town delegates back to the airport on Friday, 9 November 2007.

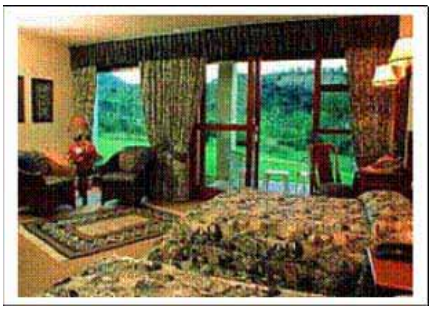
For visitors renting a car, a route map will be provided to the venues, which are reached travelling along the highway most of the way, and are relatively easy and safe routes to follow, with minimal traffic from the N4 Platinum Highway, through bushveld scenery.

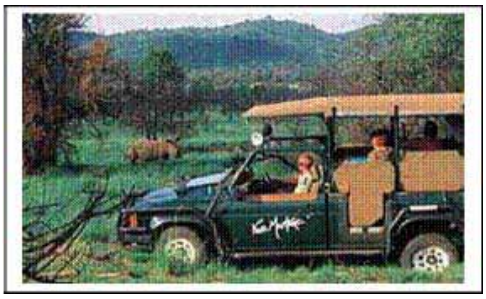
ABOUT KWA MARITANE …

Each visitor will receive, upon registration, the following:

- **A bush jacket for the game drive; and**
- **A sling bag.**

PLEASE DO NOT LEAVE THE VEHICLES ON THE GAME DRIVE AND WONDER OFF INTO THE BUSHES!!





Let your every wish be pandered to – indulge yourself with a stay in the luxury rooms of the Kwa Maritane Bush Lodge! Look out over the infinite plains adjacent to the Pilanesberg National Park – an area rich in wildlife and hosting around 365 species of birds

All rooms have individual air-conditioning, bathrooms with shower and toilet, DSTV, direct dialling phone, electric shaving plugs, coffee/tea making machines and a hair dryer.

At Kwa Maritane you can get the sense of being far away from it all and yet be minutes away from civilization.

An ancient alkaline volcano fashioned the very hills that Kwa Maritane stands on today. Hence it's name, which literally means "Place of the Rock"

WE TRUST THAT YOU WILL ENJOY YOUR STAY AT KWA MARITANE
AND THAT YOU WILL HAVE AN INFORMATIVE CONFERENCE!!

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