

# Conference Programme

(Document version: 10 Nov 2008)

## Technical Aerospace and Unmanned Systems Conference

**17 - 19 November 2008**  
**Somerset West, South Africa**

Conference Web Page: <http://research.ee.sun.ac.za/TAUSC/>

AMD, ARMSCOR, The NACOE and Stellenbosch University are pleased to present TAUSC 2008, to be held at the Lord Charles Hotel, Somerset West, Republic of South Africa from 17 to 19 November 2008.

Since 2004, this conference has been addressing the need for a truly in-depth and international technical discussion forum on Aerospace and Unmanned Systems within the South African context. Attendees will have the opportunity to exchange technical information and understanding of future requirements, technologies and solutions both on a formal and informal basis, free from dedicated marketing. The scope of the conference includes aerospace, surface and underwater vehicle technologies. Participants will be relevant decision makers and technical staff / engineers from both industry and the operational environment. Approximately 55 presentations will be made by carefully selected persons focussing on the following areas:

<ul style="list-style-type: none"><li>-Operational Environment</li><li>-Vehicle and Systems Development</li><li>-Surface and Sub-surface Vehicle and Systems Development</li></ul>	<ul style="list-style-type: none"><li>-Sensors and Communication</li><li>-Dynamics and Control</li><li>-Systems and Safety</li><li>-Aerodynamics and Structures</li></ul>
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------

The conference takes place over course of 3 days, the last of which is a **dedicated student research presentation day**. Graduate students from various universities will present papers on their research activities. Industry representatives are invited to take part in this occasion where we showcase, prepare and guide our next generation of engineers and scientists. These presentations were very well received at TAUSC 2007.



# Programme: Day 1

Monday, 17 November

8:15 - 9:00 Arrival and registration: Tea/coffee  
9:00 - 9:20 Opening, welcoming and general remarks: **Simphiwe Hamilton**, AMD  
9:20 - 9:45 Opening address: **Maj Gen Des Barker**, CSIR DPSS

9:45 - 10:00 *Tea/coffee*

## Session 1: Operational Environment (chair: Gerrie Smit, Armscor)

10:00 - 10:20 **Ben du Toit**, Defence Institute: UAV Systems in the Context of the African Battlespace  
10:20 - 10:40 **Joe Kramer**, IMT: Unmanned Systems: An Overview of International Trends, Industry Goals and Focus Areas  
10:40 - 11:00 **Capt (SAN) Andre Katerinic**, SA Navy: An SA Navy Perspective on the Operational Requirements and Challenges for Unmanned Vehicles  
11:00 - 11:20 **Director Leonie Ras**, SA Police Service: Operational Requirements and Challenges for UAVs in the SA Police Service  
11:20 - 11:40 **Lt Col Jean Botha**, SAAF: Future UAV Requirements in the SA Air Force  
11:40 - 12:00 **Dr Jan Roodt**, CSIR DPSS: The Operational Modeling and Simulation of Unmanned Vehicles

12:00 - 12:40 *Lunch*

## Session 2: Air Vehicles and Systems Development (chair: Johan Muller, Armscor)

12:40 - 13:00 **John Monk**, CSIR: The Meraka Modular Test Bed UAV Airframe  
13:00 - 13:20 **Nicolette Louw**, Denel Dynamics: JetEye Mini UAV  
13:20 - 13:40 **Prof Thomas Jones**, Stellenbosch University: Research Aircraft Development at Stellenbosch University  
13:40 - 14:00 **Jan-Cor Roos**, Denel Dynamics: Development of the e-Juba Mini UAV  
14:00 - 14:20 **Neil Dawson**, ATE: The Development and Functionality of the Kiwit System

14:20 - 14:35 *Tea/coffee*

## Session 3: Surface and Sub-surface Vehicles and Systems Development (chair: Neels Fourie, Armscor)

14:35 - 14:55 **Jorg Schmid**, IMT: Unmanned Systems in Waterside Security - Operational Concepts and Functional Requirements  
14:55 - 15:15 **Oduetse Matsebe**, CSIR: Range/bearing Simultaneous Localisation and Mapping for an AUV  
15:15 - 15:35 **Johan Treurnicht**, Stellenbosch Univ: A Navigation Modelling and Sensor Selection Tool  
15:35 - 15:55 **Servaas Holtzhausen**, CSIR: AUV Motion Tracking Using a Kalman Filter for Sensor Fusion

16:15 - 16:30 Announcements and closure for Day 1

17:00 - 19:00 *Early Evening Cocktail function: NH Lord Charles Hotel*



# Programme: Day 2

Tuesday, 18 November

8:00 - 8:30 Arrival and registration (new arrivals): *Tea/coffee*  
8:30 - 8:40 Opening: **Neels Fourie**, Armscor

## Session 4: Sensors and Communication (chair: Lewis Mathieson, Armscor)

8:40 - 9:00 **Kiri Nicolaides**, CSIR MSM, Volumetric imaging sonar combined with fine angular resolution (Synthetic Aperture Sonar (SAS)) on an AUUV  
9:00 - 9:20 **Simon Germishuizen**, SAAB Avionics: An ESM System for UAVs  
9:20 - 9:40 **Andre le Roux**, CSIR DPSS: Radar sensing technologies for persistent surveillance  
9:40 - 10:00 **Dr. Yoann Paichard**, UCT: Compact imaging radar systems compromises  
10:00 - 10:20 TBA  
10:20 - 10:35 *Tea/coffee*

## Session 5: Dynamics and Control (chair: Simphiwe Hamilton, AMD)

10:35 - 10:55 **Dr Iain Peddle**, Stellenbosch University: Acceleration-based flight control of UAVs  
10:55 - 11:15 **Prof Chris Redelinghuys**, UCT: Modelling and experimentation in flight mechanics at UCT – A new research thrust  
11:15 - 11:35 **Tristan Martindale**, TMI Dynamics: Low fidelity aircraft models for operational effectiveness studies  
11:35 - 11:55 **Christo Koen**, ATE: Autonomous Recovery of the Vulture UAV  
11:55 - 12:15 **Kosie van den Heever**, Denel Dynamics: Development of the Seeker 400  
12:15 - 13:00 *Lunch*

## Session 6: Systems and Safety (chair: Brig Gen John Wesley, CSIR DPSS)

13:00 - 13:20 **Dr Karen Marais**, Stellenbosch University: Towards risk analysis techniques for unmanned aerial vehicles.  
13:20 - 13:40 **Anton Maneschijn**, Sterradian: Continuous airworthiness challenges in unmanned vehicles and systems  
13:40 - 14:00 **Lester Ingham**, Denel Aviation: The State of UAV regulations in South Africa  
14:00 - 14:20 **Japie Venter**, OTR: The Impact of UAV's on the environment and specifically birds of prey  
14:20 - 14:40 **Etienne Coetzee**, Airbus: Modelling and simulation within a systems engineering framework  
14:40 - 14:55 *Tea/coffee*

## Session 7: Aerodynamics and Structures (chair: Prof Chris Redelinghuys, NACoE)

14:55 - 15:15 **Dr Arnaud Malan**, CSIR: Development of fully-coupled fluid-structure-interaction modeling technology for non-linear systems  
15:15 - 15:35 **Prof. Jan Nordstrom**, Uppsala University: A hybrid methodology for unsteady compressible flows  
15:35 - 15:55 **Thivash Moodley**, TMI Dynamics: The methodology used to ensure safe separation of low drag external stores on the SAAF variant of the Saab Gripen  
15:55 - 16:15 **Prof Japie van Wyk**, University of Johannesburg: Determination of the lateral frequencies of vibration of a cantilever beam by optical-fiber Bragg Sensor  
16:15 - 16:35 **Adriaan Steenkamp**, Flamengro: Towards a preliminary design for a small gas turbine engine for UAV applications in Africa  
16:35 - 16:45 Announcements and closure for Day 2  
18:00 - 19:00 *Wine farm excursion: Cellar Tour and Wine Tasting at Eikendal Wine Estate (17h30 for 18h00)*



# Programme: Day 3

Wednesday, 19 November

(Student Showcase)

8:00 - 8:20 Arrival and registration (new arrivals); *Tea/coffee*  
8:20 - 8:30 Opening & general remarks: **Prof Thomas Jones**, Stellenbosch University

## Morning session: non-final year graduate researchers

8:30 - 8:50 **AM de Jager**, Stellenbosch University: The Development of a redundant inertial measurement unit  
8:50 - 9:10 **Prinal Naidoo**, University of the Witwatersrand: Flow features on supersonic and transonic bodies with dihedral and fillets  
9:10 - 9:30 **Lubabalo Matshoba**, Cape Peninsula University of Technology: Modeling and testing of a smart aileron servo tab  
9:30 - 9:50 **Sofia Eriksson**, Uppsala University: Well-posed and weakly coupled fluid structure interaction problems  
9:50 - 10:10 **Chris Jaquet**, Stellenbosch University: Alternative Actuation – A Study of the effectiveness of Servo Tabs

10:10 - 10:30 *Tea/coffee*

10:30 - 10:50 **Steven Kriel and Jeanne Marie Venter**, Stellenbosch University: Automatic in-air refuelling of an Airbus A330  
10:50 - 11:10 **Jordan Adams**, University of Cape Town: Development of a low cost aerodynamic test apparatus  
11:10 - 11:30 **Chris Day**, University of Cape Town: Prediction of aileron hinge moments  
11:30 - 11:50 TBA  
11:50 - 12:10 **William Norton**, University of Cape Town: Development of a parawing launching system  
12:10 - 12:30 **Velaphi Msomi**, Cape Peninsula University of Technology: Modeling and Testing of a smart aileron servo tab

12:30 - 13:10 *Lunch*

## Afternoon session: final-year graduate researchers

13:10 - 13:30 **Ulrich Spangenberg**, University of Pretoria: Model updating and damage detection on wing-like structures using laser vibrometry  
13:30 - 13:50 **Alan Sutherland**, University of the Witwatersrand: An application of LQG control in flutter suppression  
13:50 - 14:10 **Deon Blaauw**, Stellenbosch University: Control of a variable-stability aircraft  
14:10 - 14:30 **JGM Benade**, University of Johannesburg: High speed missile fin rotational actuation by smart material  
14:30 - 14:50 **Bernard Visser**, Stellenbosch University: Autonomous spot landing of a fixed-wing UAV

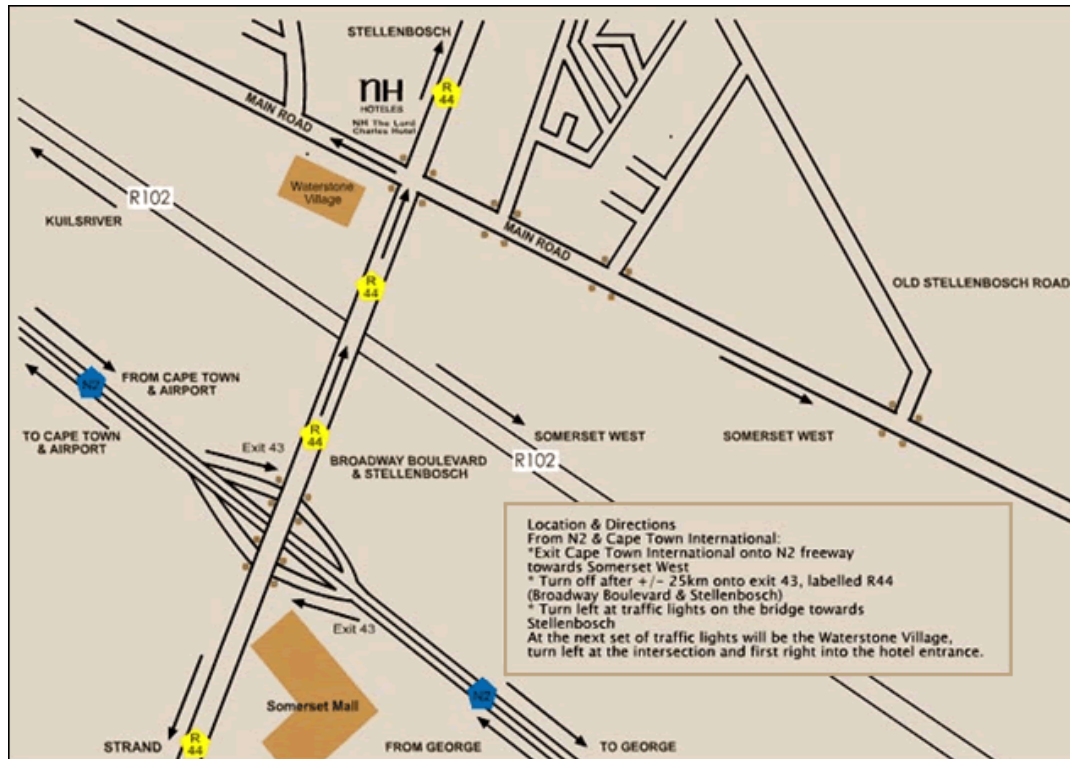
14:50 - 15:10 **Announcement: Winners of the 'TAUSC 2008 Best Student Researchers' awards**

15:10 - 15:20 Closing remarks



## Directions:

### To NH Lord Charles Hotel:



### To Eikendal Winery:

