

# Taking aeronautics to new heights

**Aerospace or aeronautics is a field in which qualified graduates can play an important role in increasing the global competitiveness of the industry. By engaging in applied research at postgraduate level under the guidance of skilled professionals with industry experience, a new generation of aeronautical engineers will ensure that South Africa is recognised as a leader in this highly specialised field.**

The University of Pretoria is the only tertiary institution in South Africa to offer a postgraduate qualification in aeronautical engineering. Until now, research in this field has been very limited, with most of the applied research in the country being conducted by institutions such as the Council for Scientific and Industrial Research (CSIR), specifically its Aeronautic Systems Research Group. Industry specialists are also found in but a few niche aerospace and defence organisations, such as Denel Aerostructures, Paramount Advanced Technologies (PAT) and Incomar Aerospace and Defence Systems (IADS).

Qualified aeronautical engineers, however, remain in short supply, especially graduates with a thorough understanding of the industry in which they are to forge a career for themselves. In an effort to address this challenge, the University of Pretoria has collaborated with the CSIR to establish a Chair in Aeronautics in the Department of Mechanical and Aeronautical Engineering. This Chair will not only enable more research to be conducted in this field, but will ensure that the aeronautical engineers that are delivered to the industry are equipped to deal with the challenges they will face.

This Chair was established in an effort to assure industry partners that

aeronautical engineers who have graduated with a postgraduate qualification in mechanical and aeronautical engineering from the University of Pretoria are suitably qualified for the specialised aerospace and defence industry. It will also increase the University's capacity in this field, and ensure that academic programmes and research projects are designed to meet industry needs.

The inaugural Chairholder is Prof Laurent Dala, Research and Development Leader of the CSIR's Aeronautic Systems Research Group. Prof Dala has more than 25 years' experience in aeronautical/aerospace engineering, having worked at research centres and universities in France, Russia and England, as well as in industry (Airbus, CargoLifter and Ratier Figeac). He specialises in aerodynamics, flight dynamics, aeroelasticity, aeroacoustics and multi-design optimisation, and was involved in the undergraduate programme in aeronautical engineering at the University of the Witwatersrand.

According to Prof Dala, the Chair will develop and enhance applied research and create a strong synergy between the aerospace industry and academia. The Chair will strengthen research collaboration between the University and the CSIR, which will be beneficial to



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new research projects, as valuable knowledge can be exchanged. It will also provide a platform for developing more scholars in this discipline.

In addition to research, the Chair will contribute to the development of postgraduate study programmes in the Department. "We anticipate that academic programmes will evolve with industry," says Prof Dala. In collaboration with Prof Josua Meyer, Head of the Department of Mechanical and Aeronautical Engineering, Prof Dala is collaborating with industry role-players to develop the Department's first master's degree in aeronautical engineering – and also the first such degree in South Africa. It will be presented from the 2016 academic year.



→ Prof Laurent Dala, Chairholder of the CSIR-UP Chair in Aeronautics.

Topics to be covered include aeroelasticity, avionics, advanced aerodynamics, aircraft structure, aircraft propulsion, missile aerodynamics and design, flight dynamics, unmanned air system technology and experimental methods.

Lectures will be presented by specialists from the CSIR, PAT, Denel Aerostructures and IADS, who will also supervise students' research projects.

With the launch of this research chair, together with the postgraduate study programme, the Department of Mechanical and Aeronautical Engineering looks forward to becoming part of an exciting new chapter in South African aeronautics, and hopes to maintain its close links with industry in support of teaching and research excellence. ➔

## International Council of the Aeronautical Sciences Congress

Prof Laurent Dala, Chairholder of the CSIR-UP Chair in Aeronautics, and Dr Bennie Broughton of Incomar Aerospace and Defence Systems (IADS) had the privilege of having two of the master's students in mechanical and aeronautical engineering that they had supervised present papers at the 29<sup>th</sup> Congress of the International Council of the Aeronautical Sciences (ICAS) that took place in St Petersburg, Russia, from 7 to 12 September 2014.

Some 867 participants from 43 countries attended the congress, and more than 550 papers were published in the proceedings document. Guests of honour at the official opening ceremony included Mr Vladimir Kargopol'tsev, Director of the United Aircraft Corporation, and Dr Andrey Maximov, Chairman of the St Petersburg Government Committee for Science and Higher Education. Delegates were also treated to a special video message from the crew of the International Space Station.

Several prizes were awarded at a gala banquet at the end of conference. The South African students made ICAS history when Prof Dala's student, Marius-Corné Meijer (who had received his degree from the University of the Witwatersrand), received first prize for the best student paper, while Dr Broughton's student, Elizna Miles (who had received her degree from the University of Pretoria), was awarded the runner-up prize. Not only was this the first time that both the winner and runner-up of this competition hailed from the same country, but they were the only master's degree students to compete against an international field of PhD candidates.

Meijer's paper outlined the development of a zero-order aeroelastic prediction method for plate-like structures in supersonic flows, while Miles's paper presented an overview of the work conducted as part of the design of a control system for a miniature unmanned aerial vehicle (UAV) with a rhomboid wing configuration. ➔