Aeronautical Society Of South Africa

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A Division of the Royal Aeronautical Society

AeSSA Newsletter June 2017

A MESSAGE FROM THE PRESIDENT OF AESSA

Members of the AeSSA and all other aerospace friends –

As the year reaches mid-point, I am pleased to share our June newsletter with you.

Please join me in congratulating AeSSA Board Member, Dr Madeleine Combrinck of Flamengro, a Division of Armscor SOC Ltd, who recently graduated from the University of Pretoria. You can read about her research in the section, #AerospacePeople.

Planning for our Annual Conference in October 2015 is ongoing. It is preceded by the 8th IFAR Summit hosted by the CSIR at the CSIR International Convention Centre. Prof. Thomas Jones, CEO of S-PLANE Automation and an Extraordinary Professor at Stellenbosch University, will deliver the Alan Nurick Rotorcraft Lecture at the AeSSA Annual Conference. I encourage you to read the updates in this newsletter; visit http://aessa.org.za/Conference/index.php and follow our tweets at @AerospaceSA for updates as we post them.

Andrew Embleton's book, due for publication at the end of June 2017, is the history of Langebaanweg. Read contributor Des Barker's review of the book which is part of a trilogy by this talented historian.

The Boeremeisie featured in the AeSSA-hosted lecture by Barry Zaayman, Flight Test Engineer for VliegMasjien. A short article is included. It is good to hear about local innovation of this nature.

Our Cape Chapter has been active and I invite you to read about their activities and plans for 2017.

The Aeronautics Club of corporate sponsor Pretoria Boys High School continues to deliver an exciting programme for members of the society.

The AeSSA's annual award for 'Best 4th Year or Honours Degree Project' by a student in an African University is open for 2017. Please read about the requirements and diarise the submission date.

We encourage you to comment on or give input to the newsletter by emailing admin@aessa.org.za

Regards

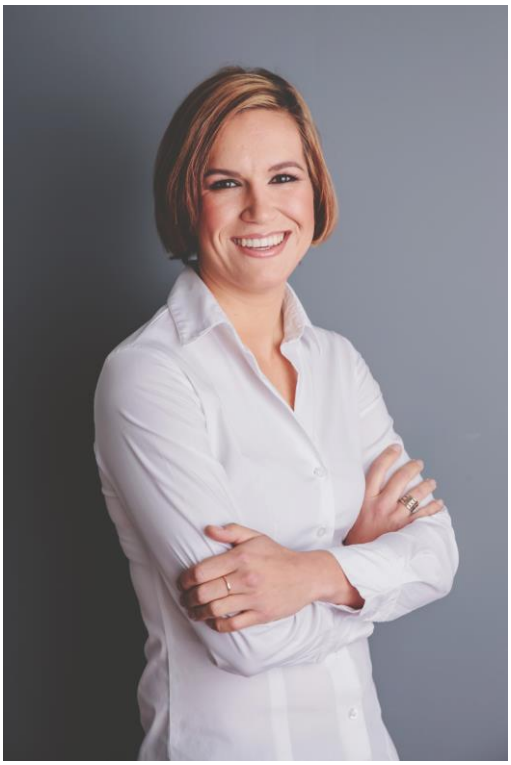
Glen Snedden

#AerospacePeople

A series of interviews with movers and shakers in the South African aerospace domain

In this newsletter, we feature Dr Madeleine Combrinck of Flamengro, a Division of Armscor SOC Ltd, who recently graduated from the University of Pretoria.

Madeleine Combrinck fulfils her childhood dream of completing a PhD



Dr Madeleine L. Combrinck, Chief Engineer at Flamengro, a Division of Armscor SOC Ltd, recently graduated from the University of Pretoria. Her PhD thesis is entitled *Boundary Layer Response to Arbitrary Accelerating Flow,* and was the culmination of years of study under supervisors Prof. Laurent N. Dala (now at Northumbria University), and Professor Igor I. Lipatov (Central Aero and Hydrodynamic Institute). Madeleine says of this milestone, “I dreamed of finishing a PhD since I was little.”

Her study aimed to develop a fundamental understanding of the boundary layer response to arbitrary motion. The boundary layer is the part of the flow close to the wing, where viscous forces distort the surrounding non-viscous flow.

Her research objectives were divided into three main activities: mathematical formulations for non-inertial bulk flow (the transfer of heat or matter by the flow of a fluid) and boundary layer equations; implementation of these formulations in a numerical solver; and simulations for various applications in arbitrary motion.

Numerical simulations were done for laminar flow on a translating plate, rotating disk and rotating cone in axial flow over a range of 70 g to 700,000 g. The boundary layer profiles, boundary layer parameters and skin friction coefficients were reported. The mechanisms that cause these responses have been identified using the developed boundary layer equations.

This work is widely applicable in external aerodynamics and improves the prediction of boundary layer behaviour for bluff bodies (cylinders and spheres) in flight.

On route to this achievement, Madeleine has served on the AeSSA Board of Directors since 2014; she is also part of the technical committee of the upcoming Annual Conference of the AeSSA.

Madeleine believes the AeSSA provides a unique platform for furthering professions in the aerospace and defence industry. Its association with the Royal Aeronautical Society provides international opportunities for collaboration and networking. The global connection also allows for benchmarking of capabilities against international standards.

She says, “The society plays an essential role in safeguarding public interest by setting and enforcing ethical norms for the professions associated with aeronautics. The interests of the professionals themselves are protected and opportunities are provided for continuous professional development.

“Current trends in the South African aerospace industry are influenced by challenges that directly influence our society. The rhino poaching crisis calls for unmanned surveillance platforms capable of

intelligent decision making. These systems will also be of use in border control programmes. International trends are largely focused on stealth technology. There is a continued drive toward environmentally friendly systems and green technologies."

Congratulations, Madeleine, on an excellent achievement!

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Announcement: AeSSA Annual Event

IFAR summit at CSIR ICC to precede AeSSA Annual Conference

The Annual Conference of the Aeronautical Society of South Africa takes place from 25 to 26 October at the CSIR International Convention Centre (ICC) in Pretoria. The theme for this year's event is '*Today's Research and Technology for Tomorrow's Aerospace'*.

Preceding and overlapping this event is the 8th International Forum for Aviation Research (IFAR) summit from 23 to 25 October 2017, hosted by the CSIR at the same venue. Delegates include representatives from all over the world. The CSIR will host an open session with the South African aerospace community during the afternoon of 24 October, with a focus on '*Empowering Aviation in Africa'*. This will be followed by a networking event.

An international IFAR delegate (to be confirmed) will deliver the plenary lecture of the AeSSA Annual Conference on 25 October.

Dr Glen Snedden, President: AESSA, says, "As the AeSSA, we are delighted to have the opportunity to engage with high-level representatives of international aeronautical and aerospace organisations. I am therefore very pleased that the open session with IFAR on 24 October has been included as part of our annual conference programme, and encourage all AeSSA delegates to plan their attendance accordingly."

Alan Nurick Rotorcraft Lecture to be delivered by Prof. Thomas Jones

The organising committee of the AeSSA Annual Conference is pleased to announce that the prestigious Alan Nurick Rotorcraft Lecture will be delivered by Prof. Thomas Jones (left), CEO of S-PLANE Automation and an Extraordinary Professor at Stellenbosch University. He was formerly Head of the Department of Electrical and Electronic Engineering at Stellenbosch University and has more than 20 years' designing and building innovative practical solutions to control challenges on aircraft and missiles of various sizes, types and configurations.

Thomas received his BEng and MScEng degrees in Electrical and Electronic Engineering from Stellenbosch University, before starting his career as a joint appointee by Stellenbosch University and the CSIR. He then relocated to the USA to manage the Charles Stark Draper & MIT Technology Development Partnership Programme whilst completing his PhD at MIT's Department of Aeronautics and Astronautics.

As professor at Stellenbosch University, Thomas led a team of 30 graduate students and academic staff specialising in aircraft and unmanned system automation research. He has helped to forge strong collaborative partnerships between academia and various international partners, including Airbus, the Charles Stark Draper Laboratory, Armscor, Denel, the CSIR and the National Aerospace Centre.

In 2008 Thomas co-founded S-Plane Automation, now employing 35 engineers and specialising in the development of high-end aircraft avionics and automation sub-systems.

Thomas is a member of the International Federation of Automatic Control (IFAC) Technical Committee on Aerospace, IFAC's Industry Committee, and an Associate-Editor of IFAC's Control Engineering Practice journal.

Web updates

All details on the AeSSA Annual Conference are posted at
http://www.aessa.org.za/Conference/index.php

Please visit regularly and follow @AerospaceSA for latest updates.

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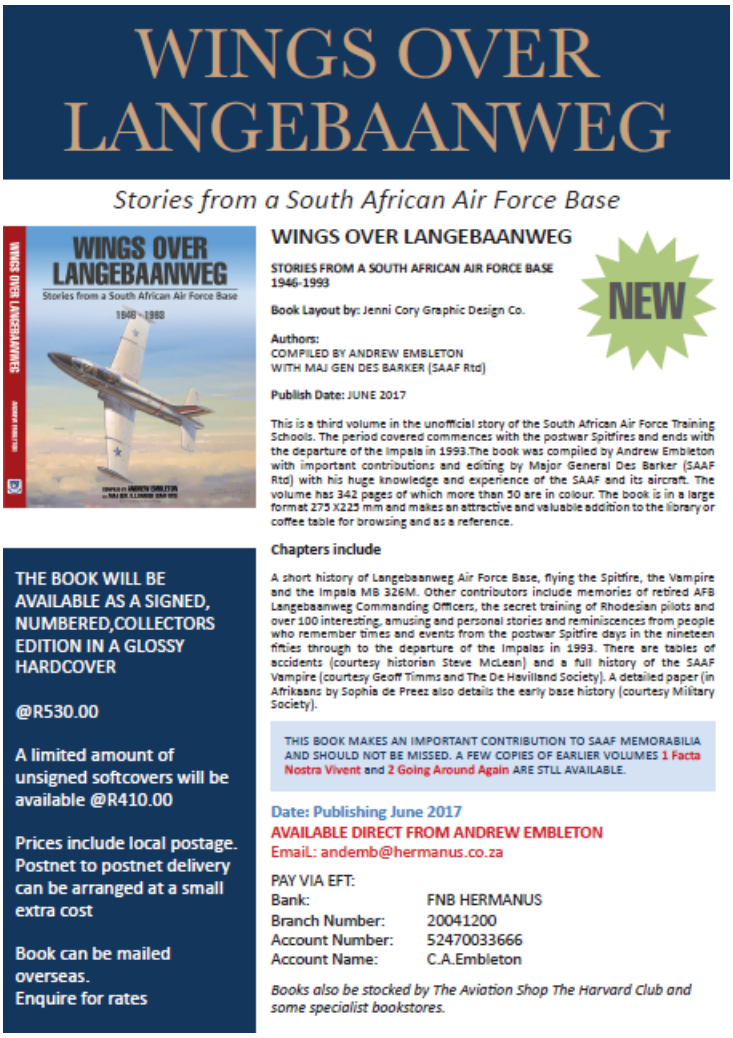
Wings over Langebaanweg: book review

Wings over Langebaanweg – Stories from a South African Air Force Base

Andrew Embleton's book, due for publication at the end of June 2017, is the history of Langebaanweg from concept design in 1942, through the Spitfire, Vampire and Impala eras until 1992 with the transfer of the Impalas from Langebaanweg.



Contributor Maj.-Gen. (ret.) Des Barker was one of more than 100 former SAAF personnel who assisted Andrew in collating this "scrapbook of memories". It contains more than 100 personal recollections and photographs by personnel stationed at Langebaanweg over the 50-year period.

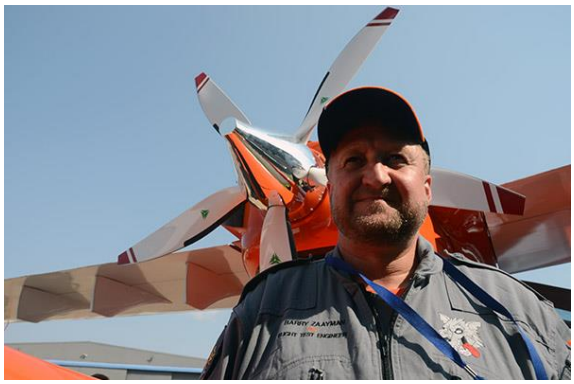
Des says, "It's amazing what personnel got up to; so are so many stories one was never aware of. The book also deals with the often voiced opinion that the Americans built Langebaanweg during WWII."

Andrew previously published two books on South African Air Force Central Flying School Dunnottar a while back, *Facta Nostra Vivent,* and *Going Around Again*; both can still be purchased via www.warbooks.co.za

Wings over Langebaanweg is the third book in the trilogy.

AeSSA lecture: Meeting the Boeremeisie

Meeting the Boeremeisie: what a treat!



Barry Zaayman with the Boeremeisie in the background. Courtesy: SABC

Barry Zaayman, Flight Test Engineer for VliegMasjien, gave a guest lecture on the Wolf Air Utility Vehicle at the CSIR on 17 May 2017 to 35 AeSSA members and aeronautics enthusiasts. Fondly known as Boeremeisie ("because you can take her anywhere!"), this robust-looking bush aircraft is in fact an innovative amphibious plane designed to land almost anywhere.

Barry focused on the feature of this aircraft that can operate from unprepared air strips as well as water bodies. It is intended as an ultra-versatile aircraft with long range and endurance, comfort and safety.

Boeremeisie is most accommodating: it offers plenty of space to pile in the gear and even has the option for one person to take a nap in the cabin as the pilot takes it on a 16-hour cruise!

Apart from its name and generous proportions, the all-composite Boeremeisie has plenty of other good South African attributes: its Adept 320T engine is made in Durban and the instruments come from a company in Paarl, Western Cape.

Designed by Wolfgang Vormbaum, Boeremeisie was taken through its testing phase last year by Chief Test Pilot James O'Connell, accompanied by Barry in his role as Flight Test Engineer.

Read more at http://bit.ly/2qXThNk

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News from the AeSSA Cape Chapter

The AeSSA's Cape Chapter is chaired by Dr René Heise. Established in 2004 by Rob Jonkers of Aerosud and Reserve SAAF Colonel Alan Nelson, the Cape Chapter aligns its objectives with those of the AeSSA and meets local requirements for its members. Alan passed the Chair's baton to René in 2017.

The Cape Chapter promotes aeronautical engineering and associated disciplines in the Western Cape by a pro-active information promotional programme, support for students at tertiary institutions, and youth development programmes. Over the years, it has delivered a range of successful programmes, one of which is the Aerotech Cadet engineering section of the Siyandiza Project in partnership with AFB Ysterplaat's youth development initiative.

In 2017, the Chapter formed a tripartite alliance with the Air Force Base Ysterplaat and Rotary Western Cape. This has delivered some promising outcomes in the form of two bursaries for engineering studies at a Western Cape University of choice as from 2018. In May 2017, 10 Cadets went glider flying at Worcester as part of technical training on gliders. A golf day has been planned for October 2017, with the proceeds going to the cadet programme.

Alan recently accompanied a group of students to the Test Flight and Development Centre, a unit of the South African Air Force at the Air Force Base Overberg.

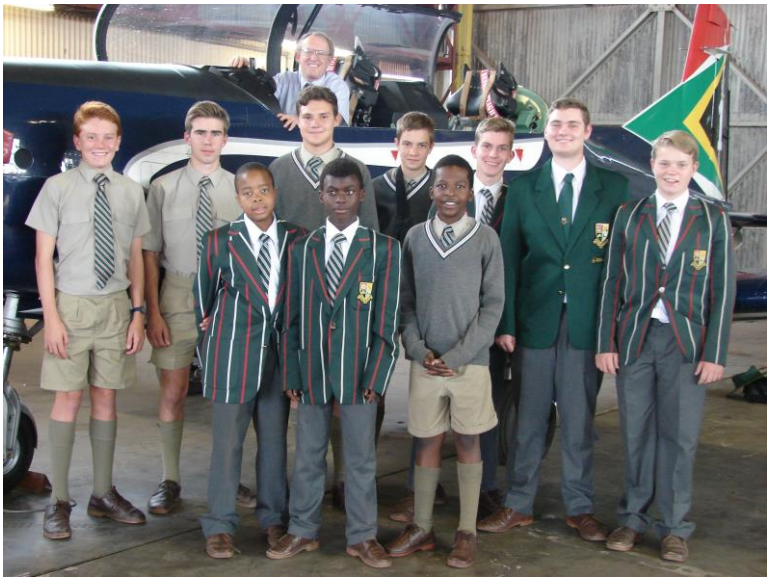
This included a trip through the telemetry labs, with videos of fast aircraft being tested through the Cape's folded mountains, seemingly missing the jagged rocks by millimetres. More videos showed bombs and fuel drop-tanks separating from wings, as ordered, but flipping back to destroy the plane, and the effects of vibration reaching a harmonic, which wrenched the wing off a plane, with fatal results. "These videos show that high tech aircraft testing in South African conditions is vital," concluded Alan.

He is proud of the students who remained "bright, irreverent and chirpy" during the visit and sees a bright future for them in South Africa. He plans to take students to see the SAAF Lynx land on an SA Navy frigate during a north-west storm.

Students accompanied by Alan Nelson visit the TFDC at Air Force Base Overberg.

News from Aeronautics Society of PBHS

PBHS's Aeronautical Society packs a full programme



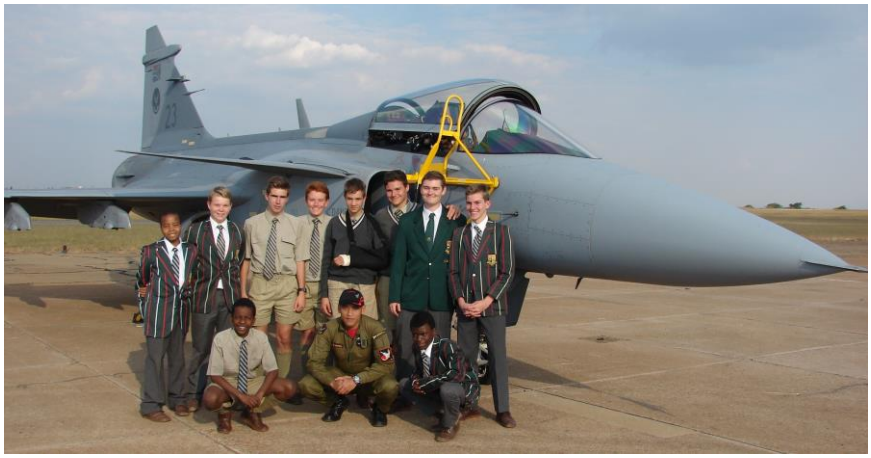
The Aeronautical Society of Pretoria Boys High School (PBHS) remains one of the most active of the non-sporting extra mural clubs at the school, with a meeting or excursion every week of the teaching term. John Illsley (left in plane, with members of the Society), Master in Charge and Second Master at PBHS, is responsible for finding the new opportunities, which, combined with annual events, have again provided for a crowded programme this year.

A visit to Aerosud provided Society members with insights into the workings of a factory producing aviation components. Apart from seeing the production techniques, the tour engendered some pride in seeing a South African company making parts for both Airbus and Boeing.

An afternoon at Wonderboom airport as guests of Loutzavia provided the opportunity for introductory flights in some of the flying school's fleet. There was also a lecture on careers in aviation and a visit to the airport's control tower.

John says, "We were privileged to have a guided tour of the Aeroplane Factory facility that manufactures kits and complete aircraft of the Sling 2 and 4 designs. After the visit to the entire production line, the morning concluded with a flight for all the boys in a Sling 4. They really did, in the space of a few hours, witness the entire process from raw materials to an airborne light aircraft!"

The excursion to Lanseria Airport was undertaken as guests of Medair for the boys to view the entire fleet of medical evacuation aircraft as well as a demonstration by the airport fire services.



At the Aviation Awareness day prior to the Swartkop Airshow, members of the Society were provided with special access and a tour that included access to one of the Silver Falcons Pilatus Astra aircraft and the chance to view a Saab Gripen fighter at close quarters. John confirms, "Needless to say, the flying display that featured both of these aircraft was the highlight of the afternoon." The boys also saw the Harvard Club collection and were given the chance to sit in the cockpit of one of these classic aircraft.

This year's President's Trophy Air Race started and ended at Springs Airfield, and a group of Society members was present at the finish line when over 60 aircraft arrived in quick succession. After they had landed, the boys were able to enjoy the rows of high performance aircraft that had participated.

The most recent event was a paper plane contest in the school hall between the Aeronautical Society and the Science Club. Fortunately, the Society won the competition!

John confirms, "In the next school term, we hope to complete the Pietenpol Aircamper project and visit an airline's flight simulators."

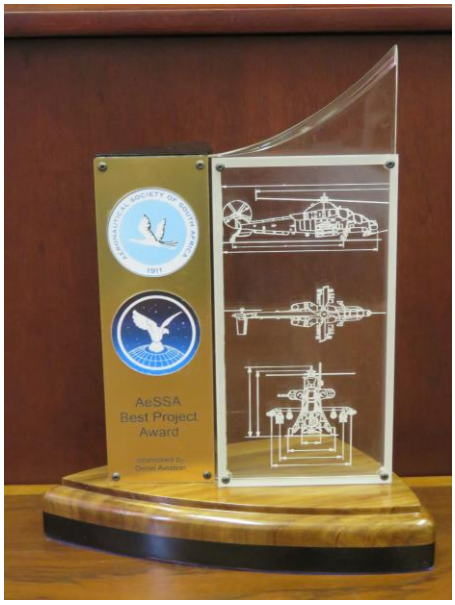
Photos courtesy of PBHS

AeSSA Annual Award

AeSSA annual award for best final year students

The annual award for 'Best 4th Year or Honours Degree Project' of the Aeronautical Society of South Africa (AeSSA) will be awarded for a second time in 2017. Students at any African university or University of Technology are eligible for this award. Submissions may be made by individuals or teams in the final year of a four-year study programme in engineering, science, commerce, law or other disciplines, and whose final year project focuses on the aerospace domain. The due date for submission is 31 October 2017.

Aerospace is one of the most significant economic multipliers, and countries with aerospace industries that are globally competitive are well positioned to benefit significantly from international trade and spillover effects. Dr Glen Snedden, President of the AeSSA, was instrumental in the conceptualisation of this new award.



The Denel Aviation floating trophy

He says, “Our intention is to recognise and reward excellence in the study of aerospace topics in a range of disciplines throughout South Africa and Africa.

“By doing so, we contribute to human capital development which is a vital factor in driving innovation for the evolving aerospace industry, which is gaining traction locally, regionally and globally.” The award comprises the Denel Aviation floating trophy and a sponsored prize of R10 000 to the winning individual or team, which will be handed over by a member of Council.

Aspiring students will be required to submit the following:
- A technical report (in English) in the format required by their university
- A hyperlink to a YouTube clip of an audio-visual presentation (in English) of the project
- Contact details of the team leader or sole author

In addition, a supervisor’s report with a short motivation (in English) supporting the submission, is required.

Glen says, “Judging of the entries will be done by a committee taken from the council of the AeSSA as well as representatives from industry and research institutions. Criteria include the quality of the YouTube presentation, the technical merit of the report and evidence of innovation or ‘out-of-the-box’ solutions to the central problem or problems encountered during the course of the project.”

The Best Engineering Final Year or Honours Degree Project award is one of a number of AeSSA awards, which include prestigious gold medal awards, engineering student awards, The Royal Aeronautical Society (London) Award, and the AeSSA Society Award.

The AeSSA was established in 1911 and is a fully-fledged Division of the Royal Aeronautical Society (RAeS). Membership ranges from highly revered aerospace professionals to enthusiastic amateurs as well as corporate membership for companies.

Submissions and enquiries: admin@aessa.org.za