

UNISEC Southern Africa Region Activities



Members

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UCT

Angola NOSA

NMU

BIUST

By

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Smita Francis – Namibia PoC (Virtual)



November 2023

UNISEC-SAR Members

Founding

- Stellenbosch University (SU)
- Namibian University of Science and Technology (NUST)
- Cape Peninsula University of Technology (CPUT)
- Angola (Angolan National Office for Space Affairs)



Joined

- University of Cape Town (UCT)
- Nelson Mandela University (NMU) - 2022
- **NEW - Botswana International University of Science & Technology (BIUST) - 2023**



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UNISEC-SAR History

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- Local Chapter UNISEC-SAR founded as one of 12 original UNISEC-Global members at 2nd Global Meeting in 2014
- Founding members: NUST (Namibia), NOSA (Angola), SU (South Africa), CPUT (South Africa)
- UNIGLO Meetings – All
- CLTP
 - 3 – Smita Francis – Namibia
 - 4 – Zolana Joao – Angola
 - 6 – Ivandro Rodrigues – Angola
 - 11 – Arno Barnard – South Africa
 - 12 – Rut Shiwambi – Namibia
- HeptaSat
 - UN Workshop – SU 2017
 - SU 2023

UNISEC-SAR History

- Student teams in:
 - MIC1 – Semi finalists
 - MIC2 – First prize, Cat2 (CPUT), Student prize (SU)
 - MIC3 – IAA Award (SU), Finalist (CPUT)
 - DDC1 – Finalist (SU), Finalist (UCT)
 - DDC2 – Finalist (SU)
 - MIC5 – Finalist (SU)
 - MIC8 – Finalist (SU)

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CPUT - SA



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BIUST

- Pan African University Institute for Space Sciences (PAUSS) based at CPUT
- Offers MEng in Satellite Systems and Applications (Course Work + Thesis)
- Offers MEng (Research) and DEng (Research) in Electrical Engineering
- Research Focus on Marine Protection Services and Governance.
- Research Activity – Environment/SAI/Satellite: Top Surface Sea Plastic Waste Detection Using Satellite Images and AI Tools.

CPUT - SA

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BIUST

- CPUT adopts an integrated, multi-disciplinary approach in 4 niche areas: Industrialization of Space, ICT for Space, Space segment, Space Applications, and Space Science.
- CPUT graduates are contributing immensely to the development of SA Space Industry and serve in many South African space companies.

- New CPUT contact:

- Prof Inno Davidson

- Director

- French-South African Institute of Technology

- Africa Space Innovation Centre



NMU - SA

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BIUST

- 16 Years working in Radiation effects mitigation
- Focus on space based FPGA systems
- First Heavy-Ion based testing of Mitigation schemes in Dec 2023

NELSON MANDELA
UNIVERSITY

Mechatronics

SU - SA



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BIUST

- 30+ Years of satellite development
- Offers MEng (Research), PhD in Satellite systems
- Research Focus on Satellite hardware, Control Systems, Radiation effects testing
- Graduates are satellite engineers in most South African space companies



SU - SA

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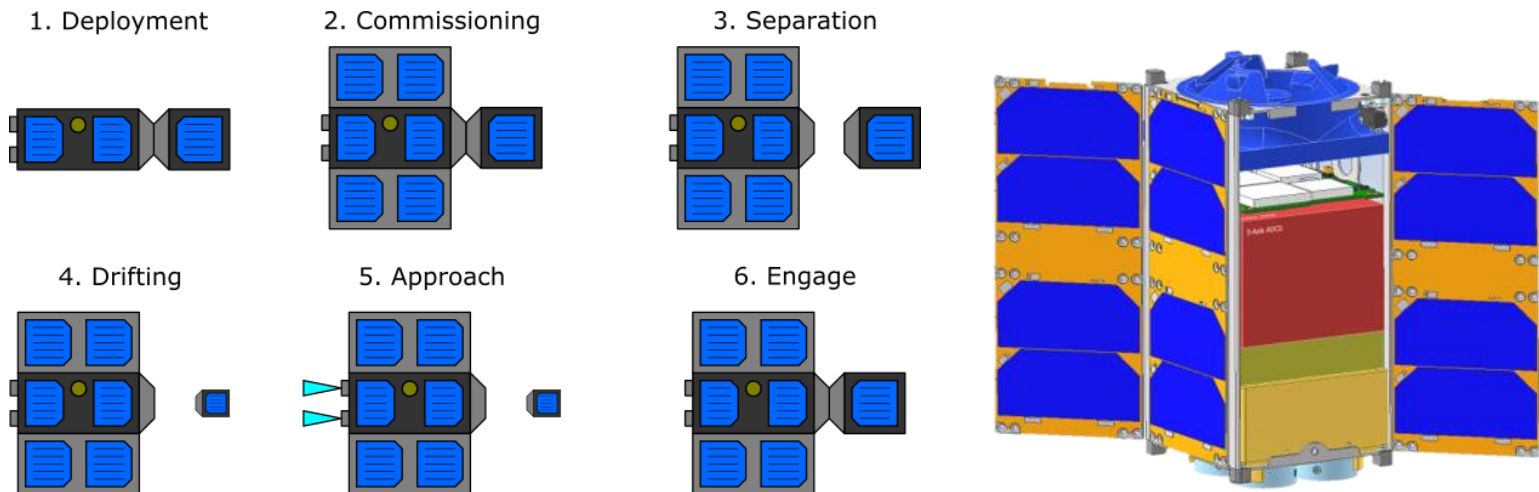
UCT

Angola NOSA

NMU

BIUST

- Current conceptual mission = DockSat
- 2021 - 2nd place in the IAF-CSA Space Universities CubeSat Challenge
- 2021 - Presented at the 12th European CubeSat
- 2023 - Paper at IEEE Aerospace
- Demonstrate the in-orbit undocking and docking of satellites
- Require propulsion, accurate attitude control, pose estimation, custom docking mechanism
- Generates Masters and PhD projects



SU - SA

- June 2023 – First **PocketQube** projects start!
- 5 undergraduate students developed
 - Communication system
 - Electrical power system
 - Magnetic control board
 - Momentum wheel control
 - Attitude control

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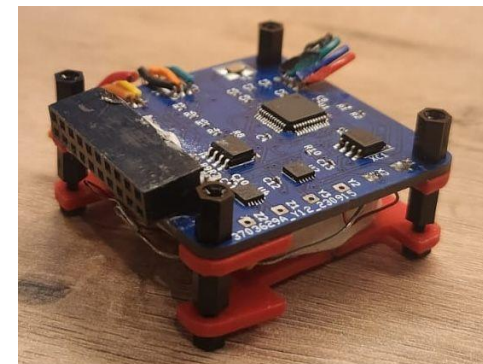
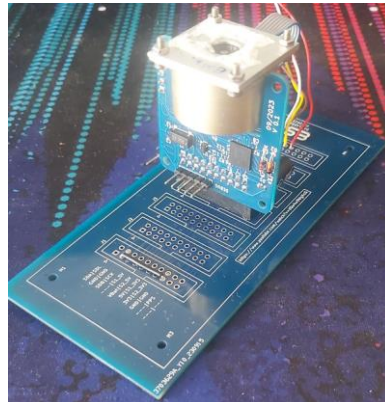
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SU - SA



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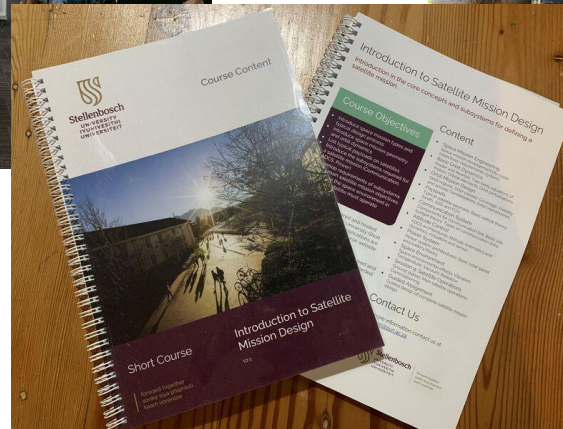
UCT

Angola NOSA

NMU

BIUST

- Developed and hosting short courses
- Focuses on satellite mission design
- Contract experts from industry to assist in presenting topics
- In the past two years we have trained 60 local satellite engineering professionals



Recent UNISEC-Global Activity

- Participant at CLTP12: Aug 21 - Sep 1, 2023



- Host of HEPTA-Sat training: Oct 30 – Nov 1, 2023



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Thank you

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UNISEC-SAR POCs



Willem Jordaan
South Africa



Arno Barnard
South Africa



Smita Francis
Namibia



Zolana Joao
Angola