

CSIR in aerospace: An engine for future industrial growth

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Overview



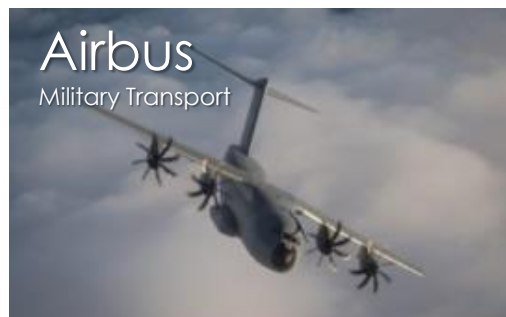
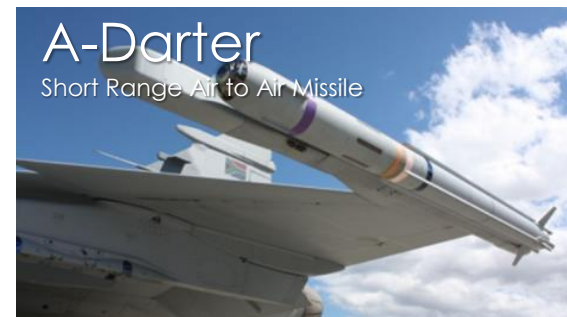
- A brief summary of past and current activities in South African aerospace
- Overview of CSIR capabilities in aerospace
- Opportunities for industry impact



A brief summary of previous and current activities in SA aerospace



A brief summary of previous and current activities in SA aerospace



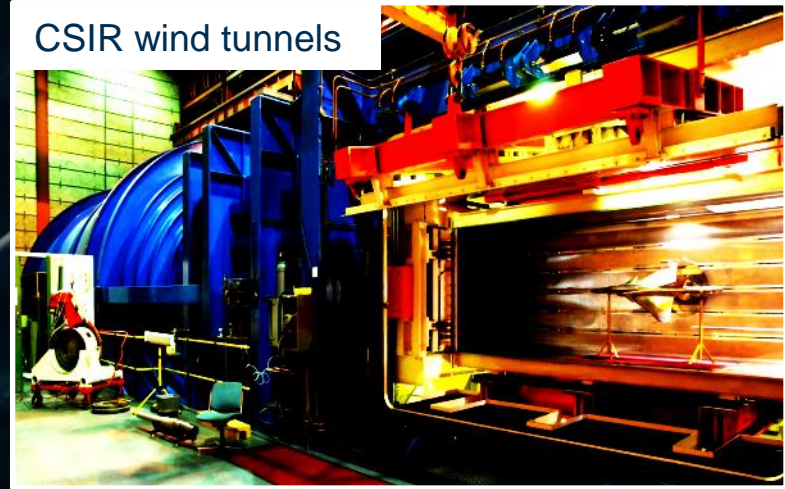
A brief summary of previous and current activities in SA aerospace: Guided weapons



Test flight centre



CSIR wind tunnels



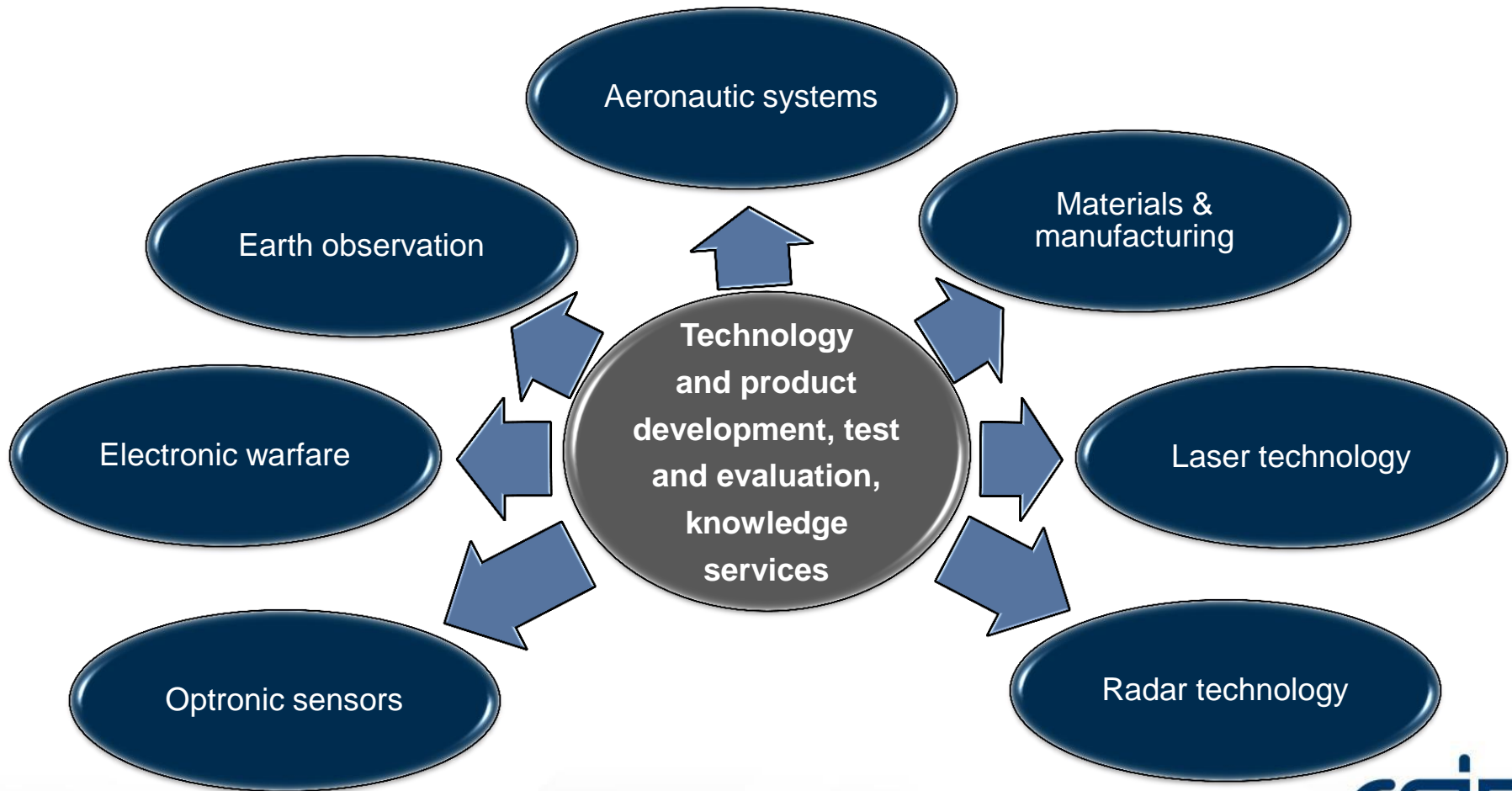
Alkantpan ballistics range



Overberg test range



Overview of CSIR capabilities in aerospace



Infrastructure for world-class research, development and innovation



INDUSTRY



Titanium pilot plant



Laser laboratory



Biocomposites research facility



Nanomaterials laboratories



Biomanufacturing industry development centre



Biorefinery and forest product laboratory

Infrastructure for world-class research, development and innovation



INDUSTRY



Suite of wind tunnels



Mobile intelligent autonomous systems laboratory



Nano upscale facility

DEFENCE & SECURITY



Radar, electro-optical facility



Concept development and experimentation centre



Detonics, ballistics and explosives laboratory

Materials and manufacturing



- Industry vision
- Manufacturing more complex, larger assemblies for the large OEMs
- Currently manufacturing for global OEMs at tier 1 and tier 2
- Need to develop advanced capabilities for complexity and value add
- Need to improve efficiencies and automation to drive down cost and time
- Locally developed regional aircraft

Materials and manufacturing



- Thermoset processes
- Carbon fibre reinforced thermoplastics
- New cellular core technologies
- Natural fibre composites
- Out of autoclave technologies
- High pressure fluid cell technologies
- Industrialisation of additive manufacturing
- Non-destructive testing technologies
- Optimisation of current processes
- Improved planning, internal logistics
- Automation
- Digital manufacturing etc.

Materials and manufacturing



- Advanced Metals Initiative including titanium alloy powder production for aerospace manufacturing
- Laser additive manufacturing: World's largest and fastest additive manufacturing system – Department of Science and Technology (DST), CSIR and Aerosud
- Biocomposites for aerospace
- Non destructive testing R&D Centre
- Aerospace Industry Support Initiative by the Department of Trade and Industry **(the dti)**



Aeronautics systems



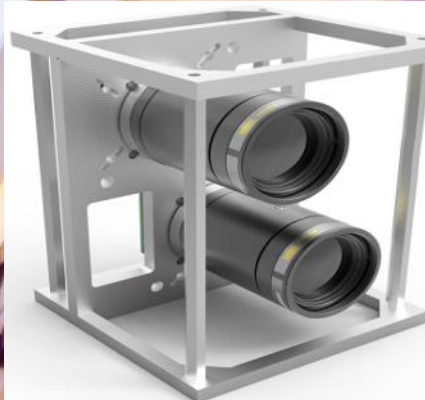
- Aerodynamic simulation, testing & evaluation
- Airborne systems development
- Weapons Integration
- Unmanned aerial systems
- Propulsion systems
- Technologies for next-generation missile development

Optronic sensor systems



SUNSAT launched in 1999

- CSIR developed electro-optic imager



Optical payload for forest fire detection

- Novel sensor concept
- VNIR band
- Low-cost , high-quality detections
- Veld fire K-line constellation

Platform self-protection

- Infra Red Detection
- Infra Red Suppression
- Infra Red Counter-measures

Paardefontein site in 2014

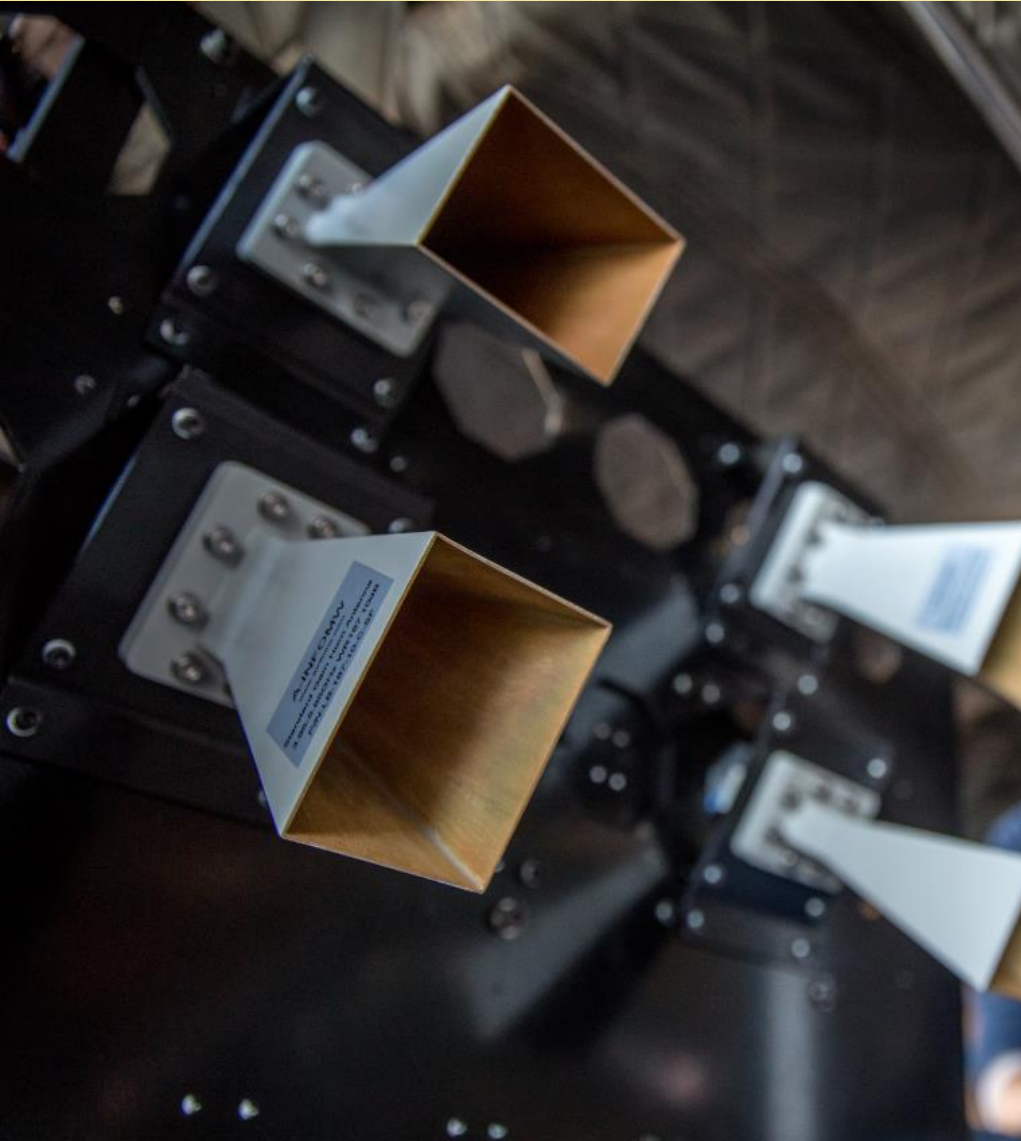
- DST funded facility used for calibration and satellite Cal-Val capability



Sumbandila SAT launched in 2009

- Sensors calibration
- Pre-launch, on-orbit, vicarious

Radar sensors and T&E



- Oldest capability in the CSIR
- Strong test and evaluation and electronics hardware development capabilities
- SAR sensor development for airborne systems applicable to unmanned systems and satellites

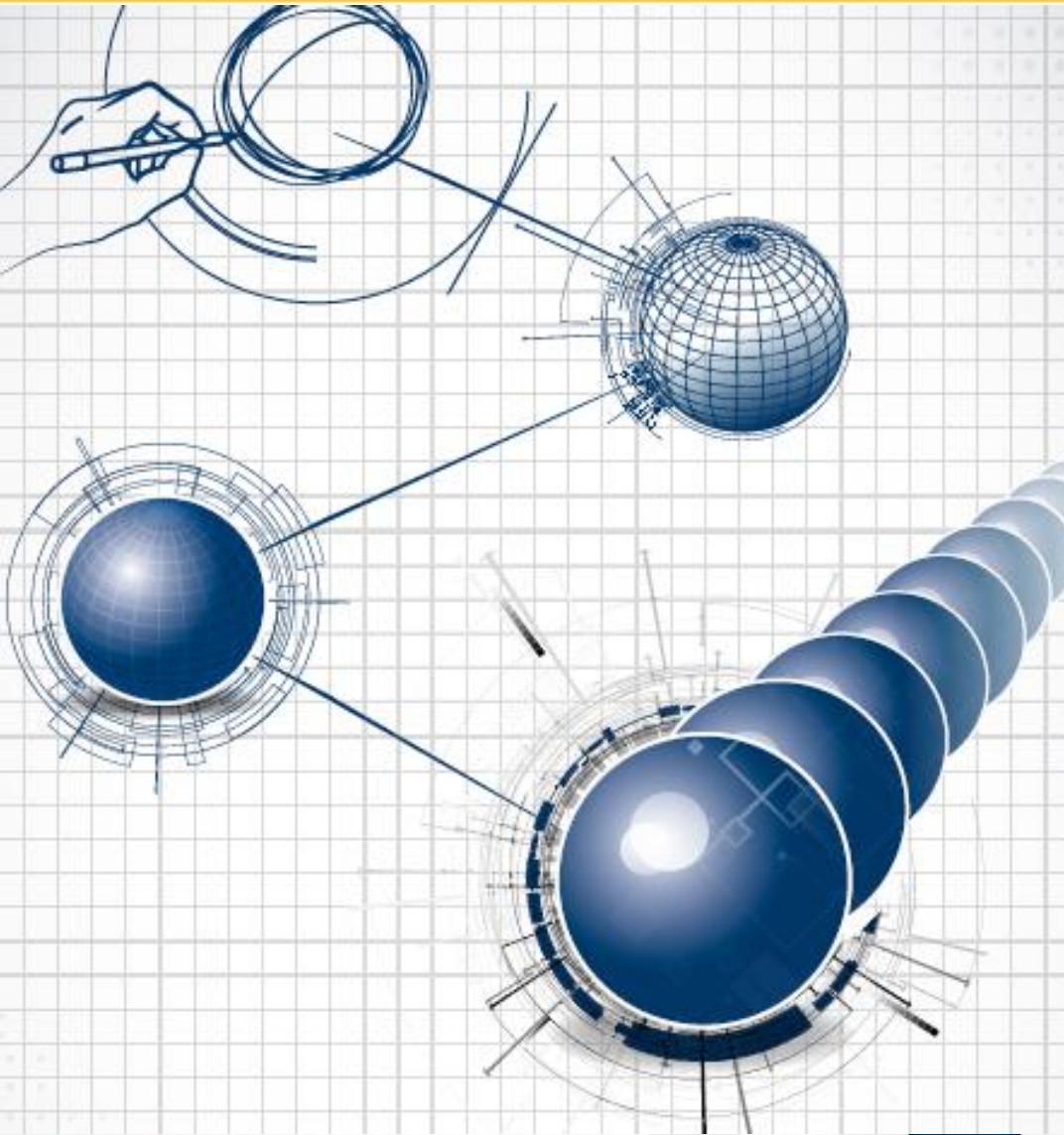
Radar and electronic warfare



- Radar and electronic warfare testing and evaluation pod
- High fidelity, laboratory based testing and evaluation hardware into an airborne system
- Enables: Training of radar and electronic warfare system operators, “Red Air” airborne exercises and electronic warfare test and evaluation
- Complex, niche system in short time scales
- Multidisciplinary programme with experts in:
 - radar and EW
 - mechanical design
 - aerodynamic design
 - power electronics
 - aircraft stores integration
 - turbomachinery
 - aerodynamic testing
 - flight test to develop the system



Other initiatives hosted at the CSIR



- Hosting of the dti's Aerospace Industry Support Initiative
- Creating sustainable small, medium and micro enterprises through enterprise development
- Product lifecycle management platform for product development, facilitating concurrent, multi-disciplinary engineering



Thank you

CSIR
our future through science