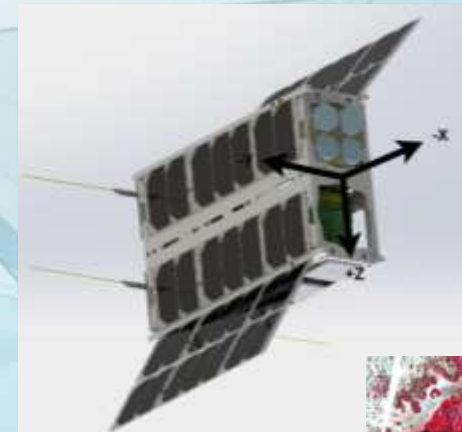


# USING THE AGRISENSE CONSTELLATION AS A TOOL FOR SUSTAINABLE SPACE PROGRAMMES

August 2023

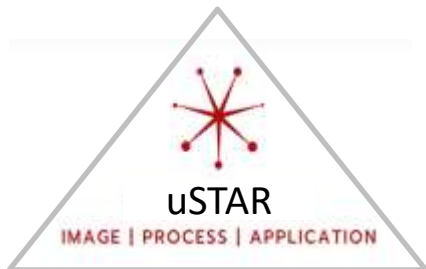
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# SCS SPACE FOCUS AREAS

## CONSTELLATIONS AND MISSIONS PARTNER



## ENGINEERING SERVICES

**Procurement Management (Level 5 to Level 8)**

**Program Management**

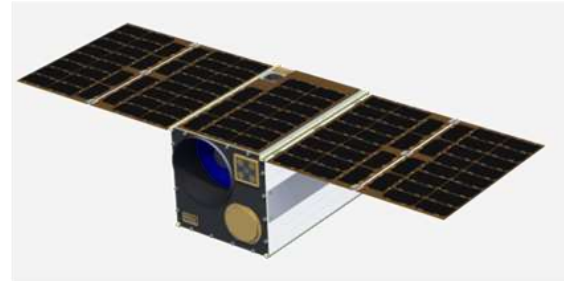
**Space System Engineering**

**Product Assurance**

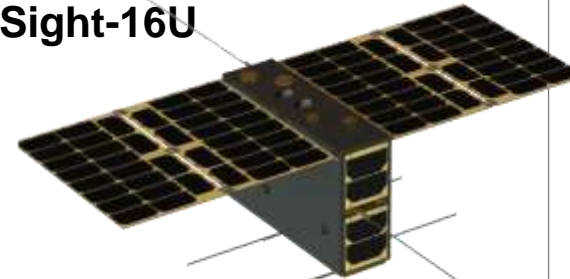
**Technology Management**



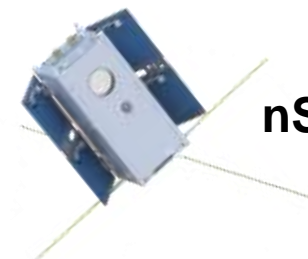
## NANO SATELLITES



**NSight-16U**



**nSight-6U**



**nSight-1**

## HANDS ON TRAINING

**Mission Analysis and Design**

**Space System Engineering**

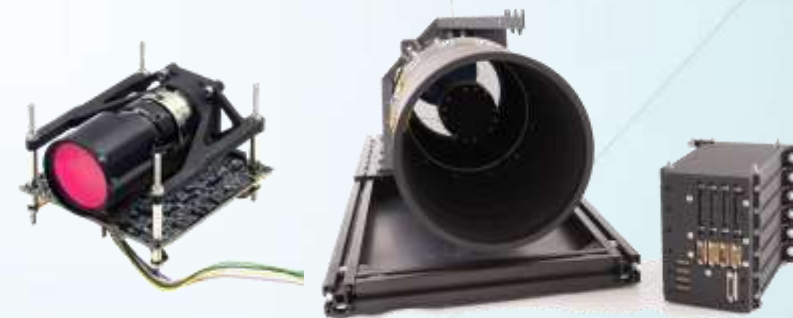
**Theory and Practice designing and building 2U, 3U and 6U satellites**

**Establish own space engineering laboratory**





***Four Satellites (100-400kg)  
designed, built and launched  
successfully with a satellite  
engineering training client***



1999

2008

2013

2018

2009

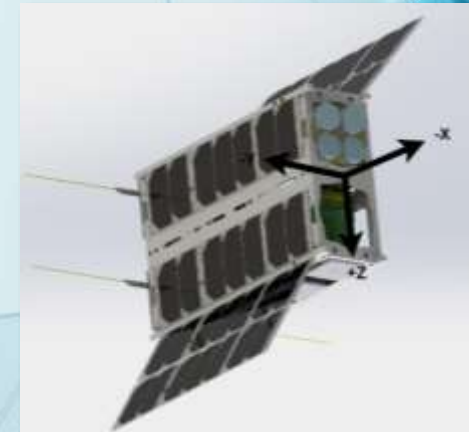
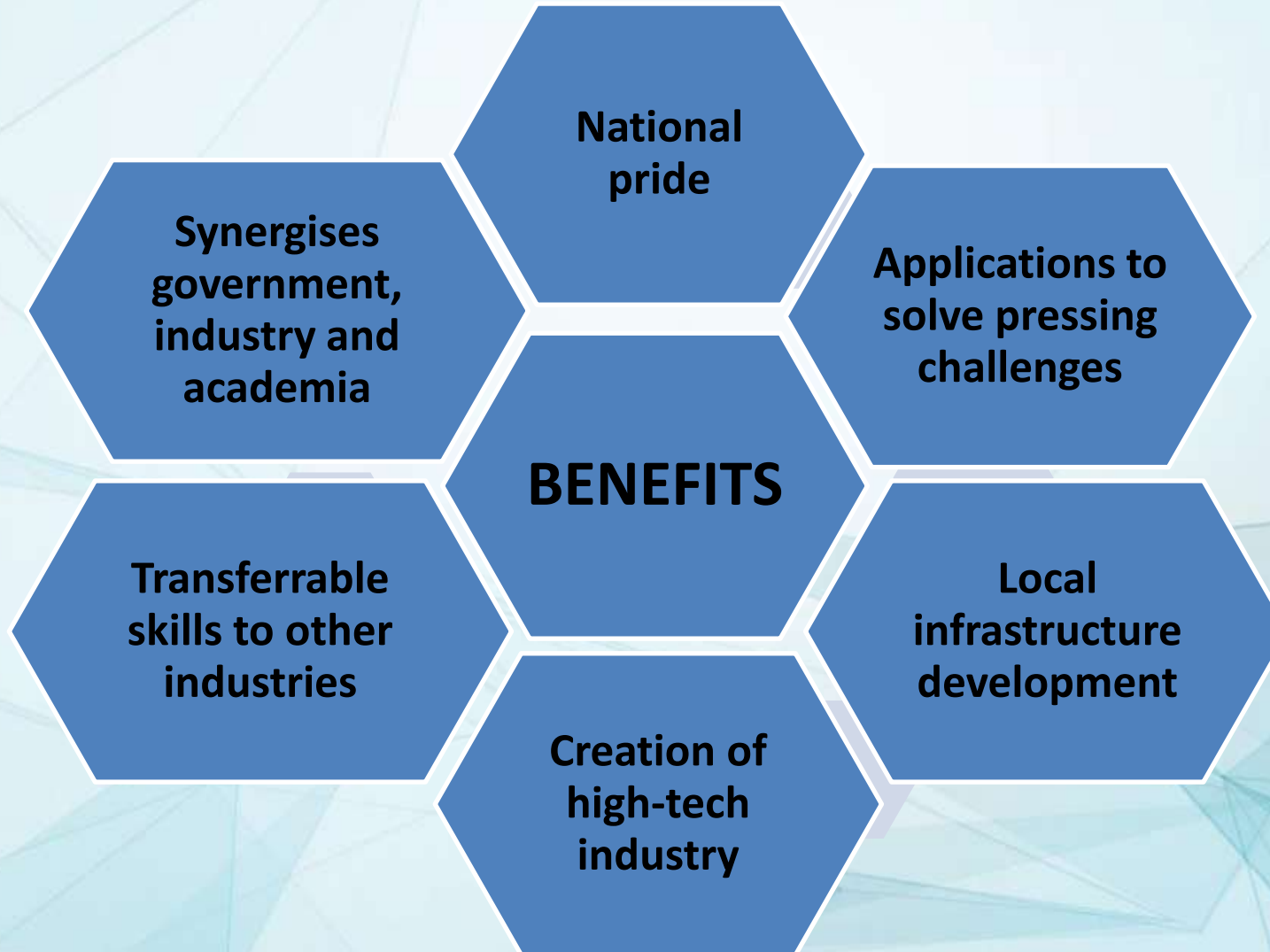
2016

2017

2019



- The country's socio-economic development blueprint encourages us to create a better life for all citizens in an inclusive society.
- Address national challenges.
- South Africa needs to sharpen its innovative edge and continue contributing to local and global innovation and technological advancement.
- Drive economic growth and employment.
- **Space technologies are well situated to address some of our societal challenges.**



# SA Satellites Path

SunSat	Sumbandila	New Dawn	ZACub-1	Kondore-E	InSight-1	ZA-Aerosat	ZACube-2	EOSat-1	MDSat
1999	2009	2011	2013	2013	2017	2017	2018	20**	2022
University	Space Agency	Private	University	Military	Private	University	University	Space Agency	University

It is **very hard to achieve a sustainable space engineering program**

Challenges include:

- Unsupportive political decisions

- Unfavourable agreement structures

- Expensive programme structures

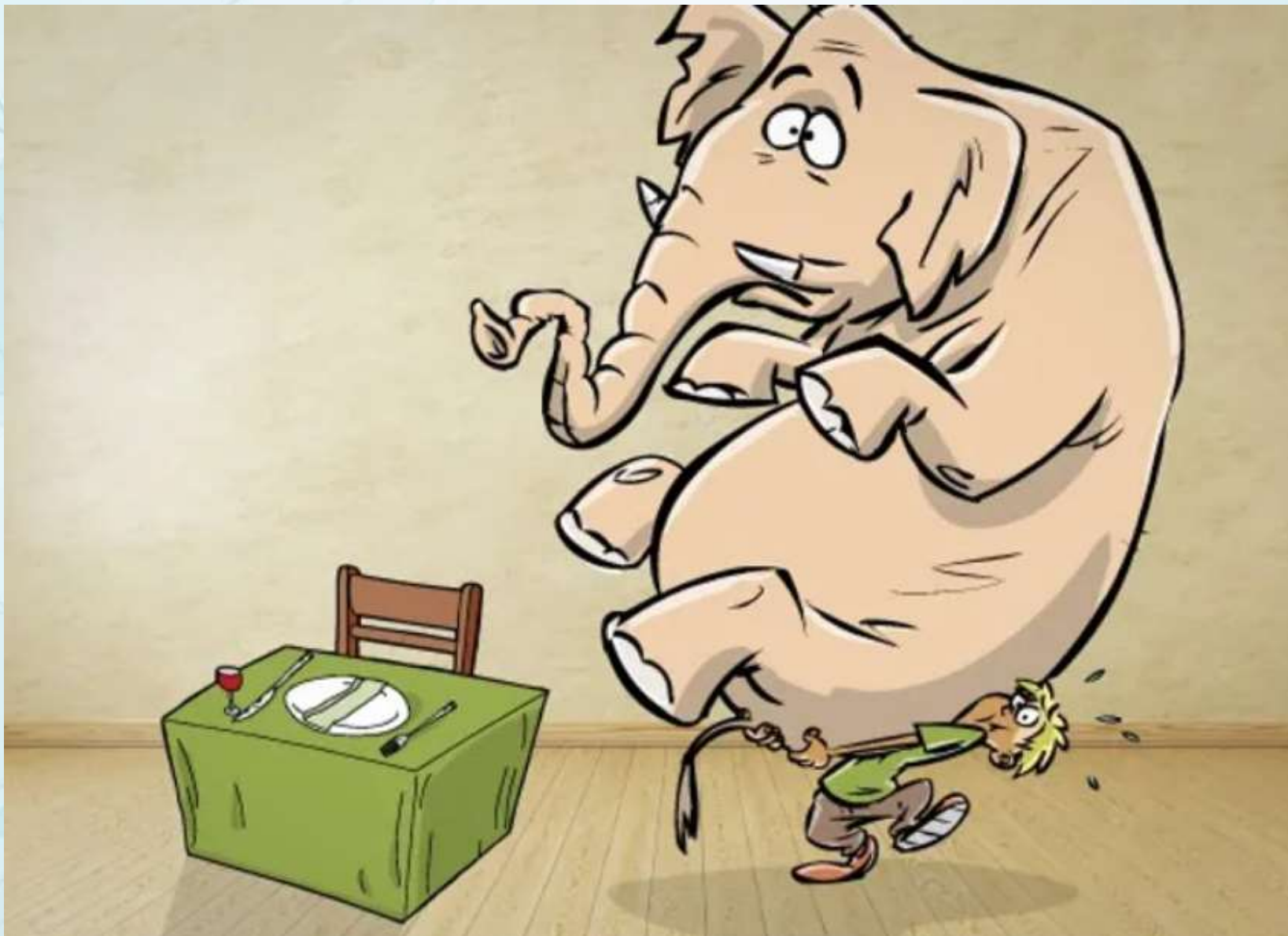
- No real use of satellites after launch

- No plan for follow-up satellite launches to ensure continuity

- Inadequate training of local space engineering team

- Loss of skilled personnel

# Let's get eating!





# Sustainability Elements

					
<p>Infrastructure</p>	<p>Human capital</p>	<p>Effective utilization</p>	<p>Collaboration (Internal)</p>	<p>Collaboration (external)</p>	<p>Continuity</p>

“Longevity”

# Example Project- nSight



- A 3-year project in partnership with the DTIC
- The nSight-1 2U CubeSat launched and deployed in 2017
- As part of the QB50 constellation, it carried the FIPEX science payload to collect information about atmospheric oxygen in the lower thermosphere
- The Gecko camera on nSight-1 provides 31m GSD, 64km swath RGB Bayer images



					
<p><b>Infrastructure</b></p>	<p><b>Human capital</b></p>	<p><b>Effective utilization</b></p>	<p><b>Collaboration (Internal)</b></p>	<p><b>Collaboration (external)</b></p>	<p><b>Continuity</b></p>
<p>nSight satellites</p>	<p>2 PhD 9 M. Eng 2 B. Tech 3 Interns</p>	<p>None</p>	<p>Massive</p>	<p>International</p>	<p>Minimal (3 years)</p>

# nSight Collaboration Partners



# Outputs - Commercialisation

**Tegu EO Payload  
2018 (PakTES-1A) &  
2019 FTM  
24kg**



**Gecko EO Payload  
2017 - 5+ Payloads  
0.5kg**



**Data Processor  
2018 (NCLE)  
1.5kg**

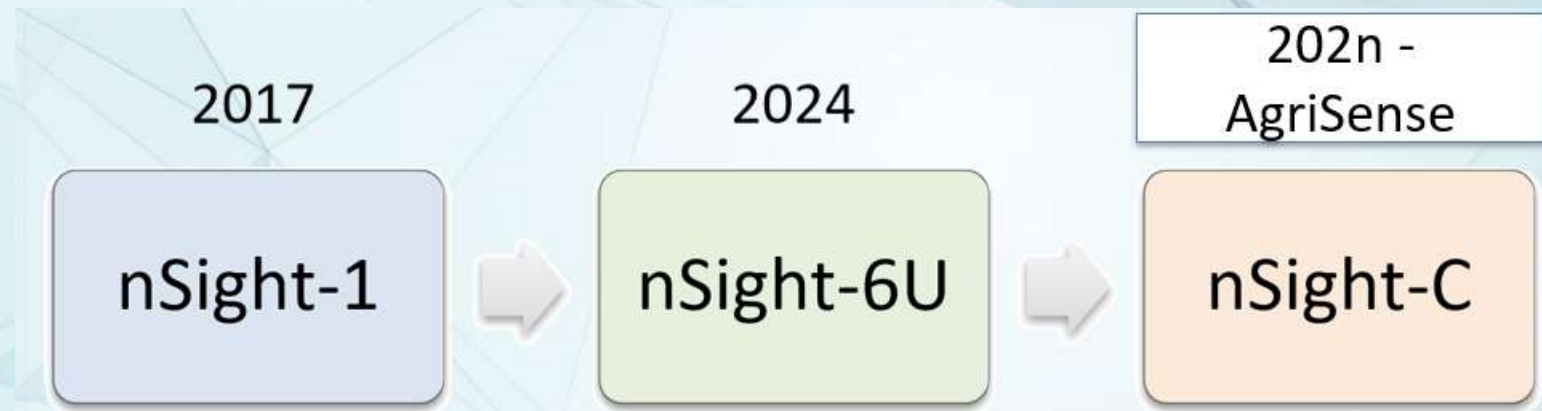


**Chameleon EO Payload  
2020  
3 kg**

Infrastructure	Human capital	Effective utilization	Collaboration (internal)	Collaboration (external)	Continuity
<ul style="list-style-type: none"> <li>• Both upstream and downstream</li> <li>• Maintain existing infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>• Power in numbers</li> <li>• Theoretical training</li> <li>• Hands-on training</li> </ul>	<ul style="list-style-type: none"> <li>• Research user requirements</li> <li>• Ensure a strong user base</li> </ul>	<ul style="list-style-type: none"> <li>• Inclusive of different sectors</li> <li>• Stimulate industry growth</li> </ul>	<ul style="list-style-type: none"> <li>• African countries</li> <li>• A basis for industry stimulation and growth</li> </ul>	<ul style="list-style-type: none"> <li>• Repeatability focus</li> <li>• Constellation</li> </ul>

# Introducing Agrisense

- According to the World Bank, agriculture accounts for about 15% of Africa's GDP and employs over 60% of the continent's population.
- Space technologies can support farmers, agronomists, food manufacturers and agricultural policy makers through spatial data for monitoring soil, floods and droughts, pests and diseases, crop development and livestock management and providing early warning signals.
- Use the nSight technology and experience to build an agricultural constellation.





**Infrastructure**

**Human capital**

**Effective utilization**

**Collaboration (Internal)**

**Collaboration (external)**

**Continuity**

Satellites,  
Ground stations,  
Space labs,  
etc

Various fields

Agricultural focus

Repeat or exceed nSight success

African countries and International

Constellation



# Let's Get Eating!

