



DIRECTO

A LAS ESTRELLAS

FUERZA AÉREA DE CHILE





NATIONAL SPACE PROGRAM

*“A ROADMAP FOR **AUTONOMOUS** TECHNOLOGICAL
DEVELOPMENT”*



NATIONAL SPACE PROGRAM



Pilars

1

National Satellite System

SNSAT

- **National Space Center**
- EO Satellites, AIS, ADS-B, S&F.
- Data Centers y HPC
- Geoportal – Mobile App

3

Regional National Satellite System

SNSAT – CER

- Antofagasta Space Center (COMM SAT)
- Magallanes Space Center (RADAR SAT)
- Regional Educational Space Program
- Data Science Labs and workshops.

2

National Satellite Communications System

SNSAT – COM

- GEO Communications Satellites
- MEO/LEO Communications Satellites
- Ground Segment

4

Educational Satellite System

SNSAT – EDU

- Educational Space Program (scholarship, technical, professional, undergraduated and graduated)
- Data Science Labs and workshops (CANSAT).



NATIONAL SATELLITE SYSTEM





NATIONAL SATELLITE SYSTEM Elements

SUBSYSTEM 1 (SS1) GEOSPACIAL INFORMATION



5 DATA CENTER
2 HPC / 8 PTB

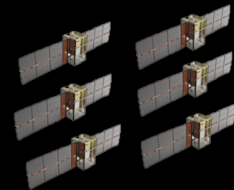


-MISSION CONTROL CENTER
-GIS CENTER



-IMAGES SERVICE
-GEOPORTAL
-MOBILE APP
-TECHNICAL APLICATIONS

SUBSYSTEM 2 (SS2) NATONAL SPACE DEVELOPMENT



DEVELOPMENT,
ASSEMBLY, INTEGRATION
AND TESTING
(AIT) OF 7 MICRO-
SATELLITES OF 23 KGS.
(SNSAT)



DESIGN AND
DEVELOPMENT OF A
NATIONAL PAYLOAD

AIT LABORATORY IMPLEMENTATION

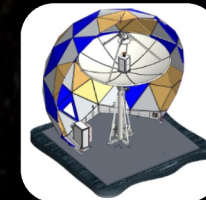


SUBSYSTEM 3 (SS3) SATELLITE NATIONAL SYSTEM

NATIONAL CONSTELLATION: 2 SATELLITES
OF ≈ 200 kgs



GROUND SEGMENT WITH 03 STATIONS IN
CHILE.



ANTOFAGASTA /



BAPU /



PTA. ARENAS

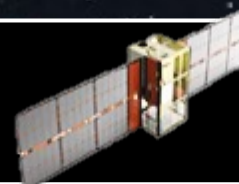


NATIONAL SATELLITE SYSTEM

Capabilities



SNSAT CAPABILITES



SAT ID	PL1	PL2	PL3	PL4
SNSAT 1	EO (HS)	COMM	ISL	GLOBALSTAR
SNSAT 2	AIS	ADS-B	ISL	COMM
SNSAT 3	EO (MS & PAN)	COMM	GPS	GLOBALSTAR
SNSAT 4	AIS	ADS-B	SSA	COMM
SNSAT 5	EO (HS)	COMM	ISL	GLOBALSTAR
SNSAT 6	EO (MS & PAN)	COMM	ISL	GLOBALSTAR
SNSAT 7	SIGINT	NAT. PL	NAT. PL/COMM	GLOBALSTAR

Mission

- Scientific & EO
- Remote Sensing
- Space Situational Awareness
- Search & Rescue
- Communications



NATIONAL SATELLITE SYSTEM

Capabilities



ECHO 1&2 CAPABILITES

ECHO 1&2 PL1 (Optical Telescope)



Parameter	Value
Optical Configuration	Reflective Telescope
Focal Length	3430 mm
Nominal MTF	109 lp/mm
Field of View (FoV)	$\pm 0.4^\circ$ -> 48mm on focal plane
Pointing Mode	Nadir and Off-Nadir Imaging
Maximum Off-Nadir Angle	30°
Ground Sampling Distance (GSD)*	~0,74 m
Image Acquisition Modes	Strip Imaging, Spot Imaging, Video Imaging
Geolocation Capability	Precision Geolocation
Primary Output	High-Resolution Electro-Optical Imagery

* Estimated GSD based on the current optical design parameters.

Applications

- Border Monitoring, Maritime Surveillance, Disaster Management, Environmental Monitoring, Cartography and Infrastructure Monitoring

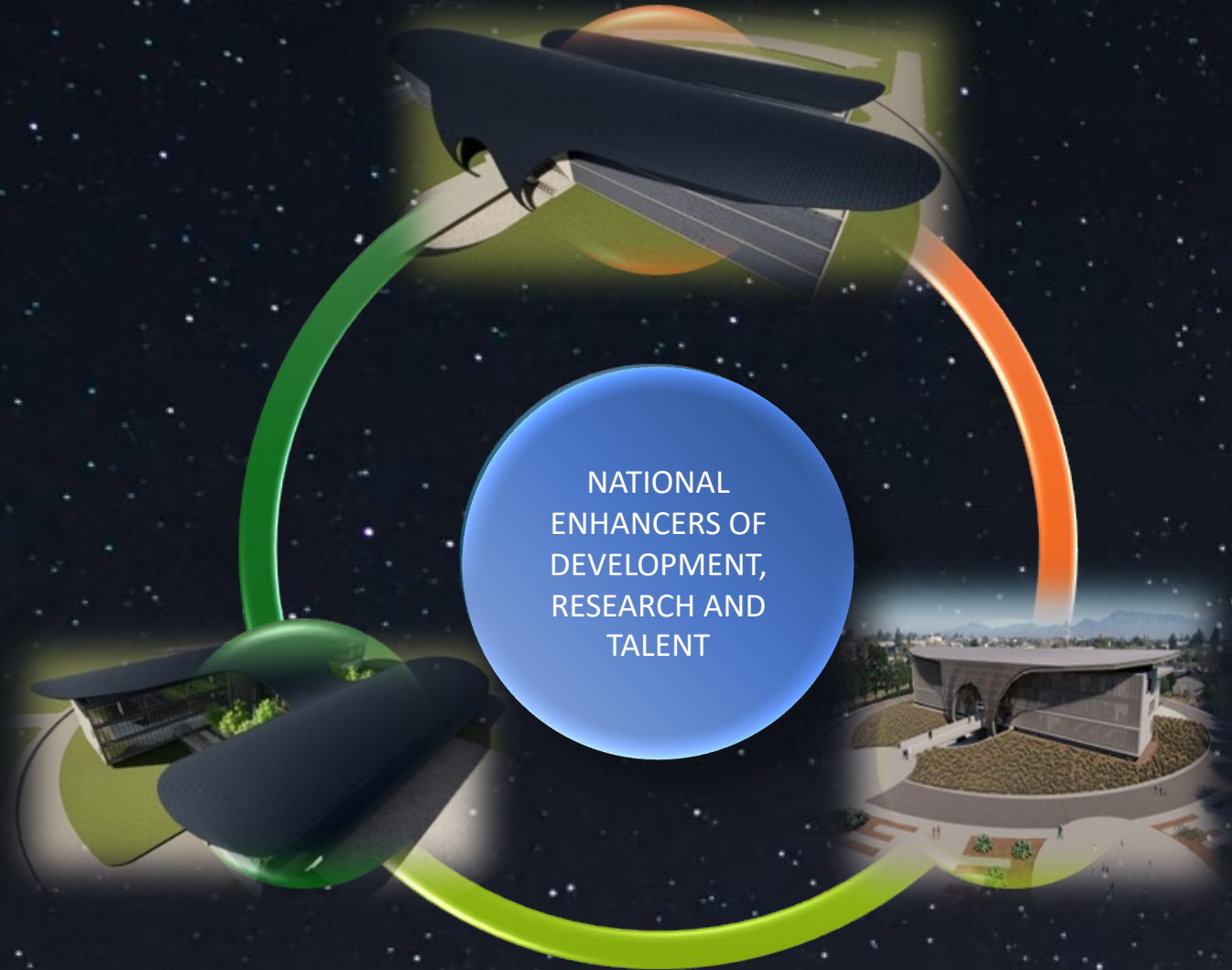


NATIONAL SATELLITE SYSTEM Planning





SPACE REGIONAL CENTERS



Antofagasta



Santiago



Punta Arenas







THE NATIONAL SPACE
CENTER IS THE **FIRST
NATIONAL HUB** FOR THE
DEVELOPMENT OF SPACE
TECHNOLOGY AND
KNOWLEDGE,
STRENGTHENING THE
COUNTRY'S
TECHNOLOGICAL
**AUTONOMY AND
SOVEREIGNTY**



CONSTRUCTION PROCESS



24-05-24



28-06-24



26-07-24



30-08-24



27-09-24



25-10-24



29-11-24



19-12-24



10-01-25



24-02-25



24-04-25



NATIONAL SPACE CENTER



TECHNOLOGICAL SPACE DEVELOPMENT

MISSION **CONTROL** CENTER

DATA SCIENCE

RESEARCH, INNOVATION & ENTREPRENEURSHIP

5.800 m²

SPACE TECHNOLOGY DEVELOPMENT



ASSEMBLY-INTEGRATION-TESTING

- ❑ CLEAN ROOM 400 m² – ISO 7
- ❑ TVAC – SHAKER - EMC

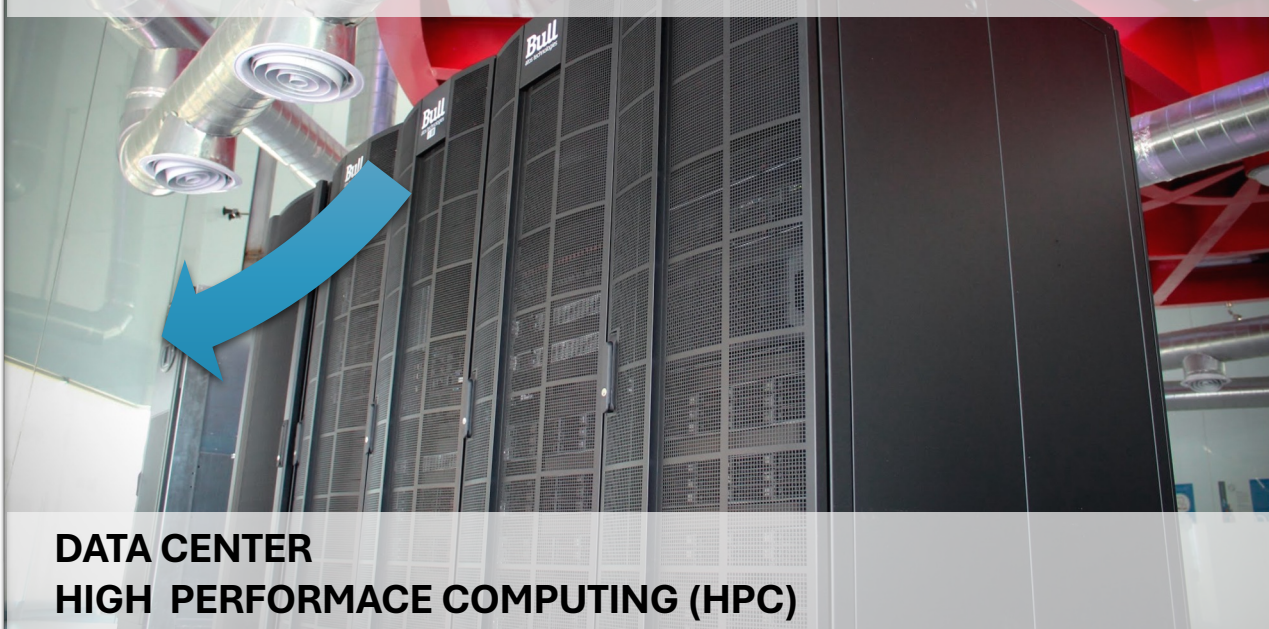
MISSION CONTROL CENTER



RESEARCH, INNOVATION & ENTREPRENEURSHIP



DATA SCIENCE



DATA CENTER
HIGH PERFORMANCE COMPUTING (HPC)

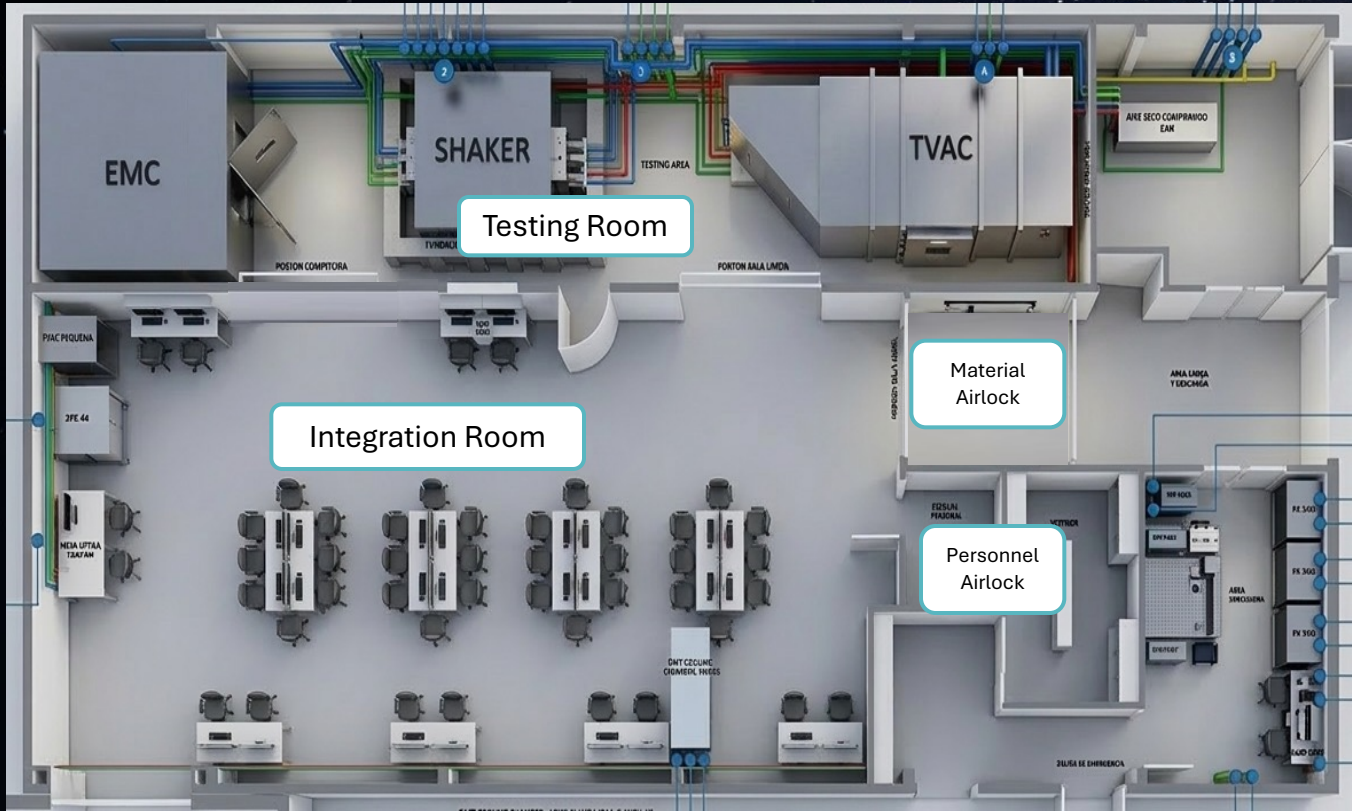
The image shows a cleanroom environment where two technicians, wearing white protective suits, hoods, and blue gloves, are examining a cylindrical metallic component. The component has a series of vertical fins or cooling channels. In the background, two other people in white lab coats are visible, and a red fire extinguisher is mounted on the wall. In the foreground, on a dark table, there are other electronic or mechanical components, including a small white probe-like device and a complex assembly of wires and metal parts. A banner with the text "SPACE TECHNOLOGY DEVELOPMENT" is overlaid on the image.

SPACE TECHNOLOGY DEVELOPMENT

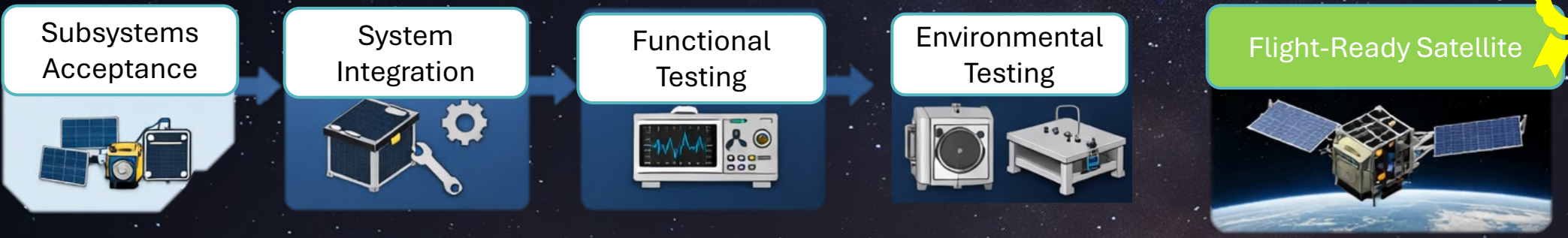


SPACE TECHNOLOGY DEVELOPMENT

CLEAN ROOM



SPECIFICATIONS	PARAMETER
Clean Room Clasification	ISO 7 (14644)
Temperature	18°C – 22°C
Relative Humidity	40% – 60%
Non Viable Particles per m³ ($\geq 0,5 \mu\text{m}$)	352.000
Non Viable Particles per m³ ($\geq 5 \mu\text{m}$)	2.930
N° of air renovations (renov./hour)	≥ 30
Integration Room Pressure (Bar)	1,01335 (1,00001 atm)
Testing Room Pressure(Bar)	1,01325 (1 atm)
Personnel and Materials Airlock Pressure (Bar)	1,01320 (0,9998 atm)

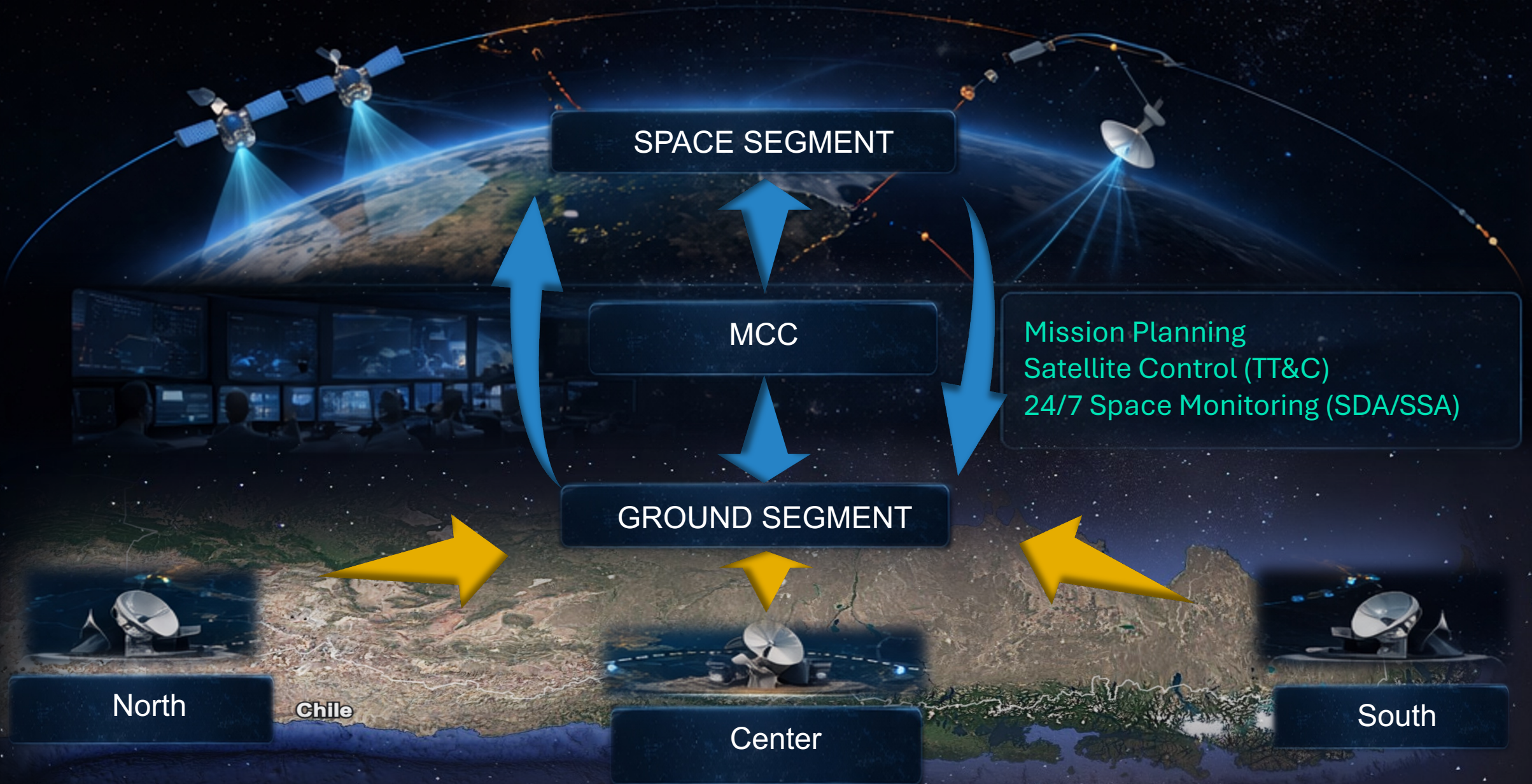


MISSION CONTROL CENTER





MISSION CONTROL CENTER

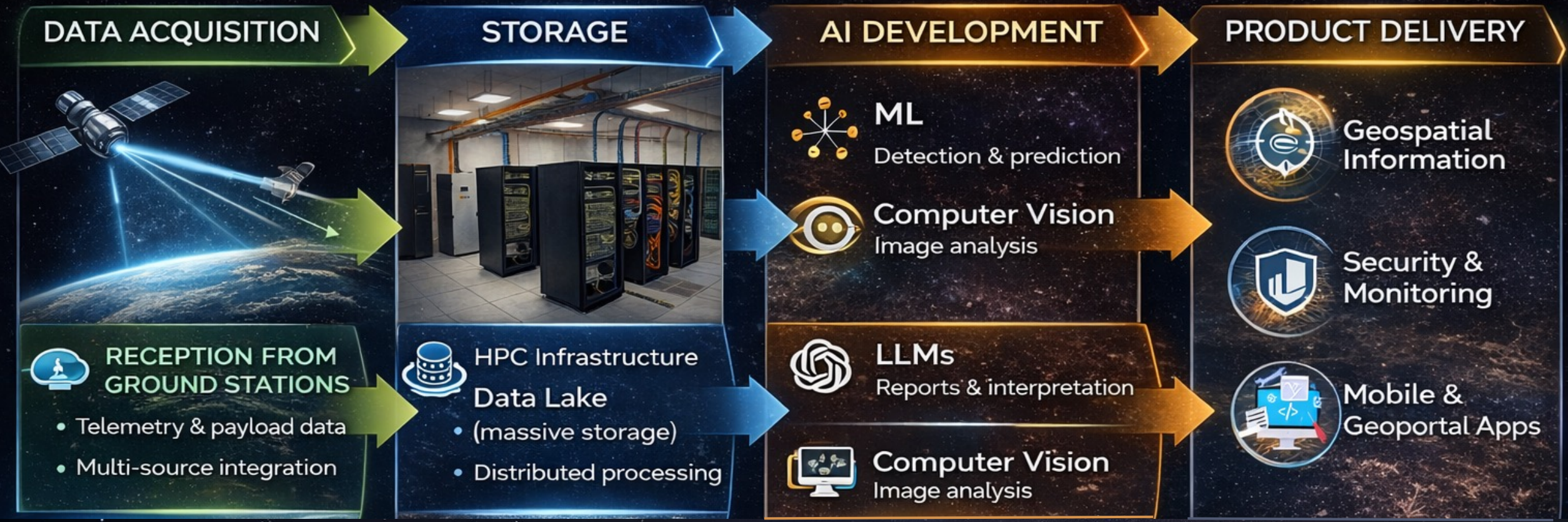




DATA SCIENCE



DATA SCIENCE



DATA LAKE

- Massive data storage (5PB)
- Multi-source Integration
- High Availability and Scalability



HPC - ADVANCE COMPUTING

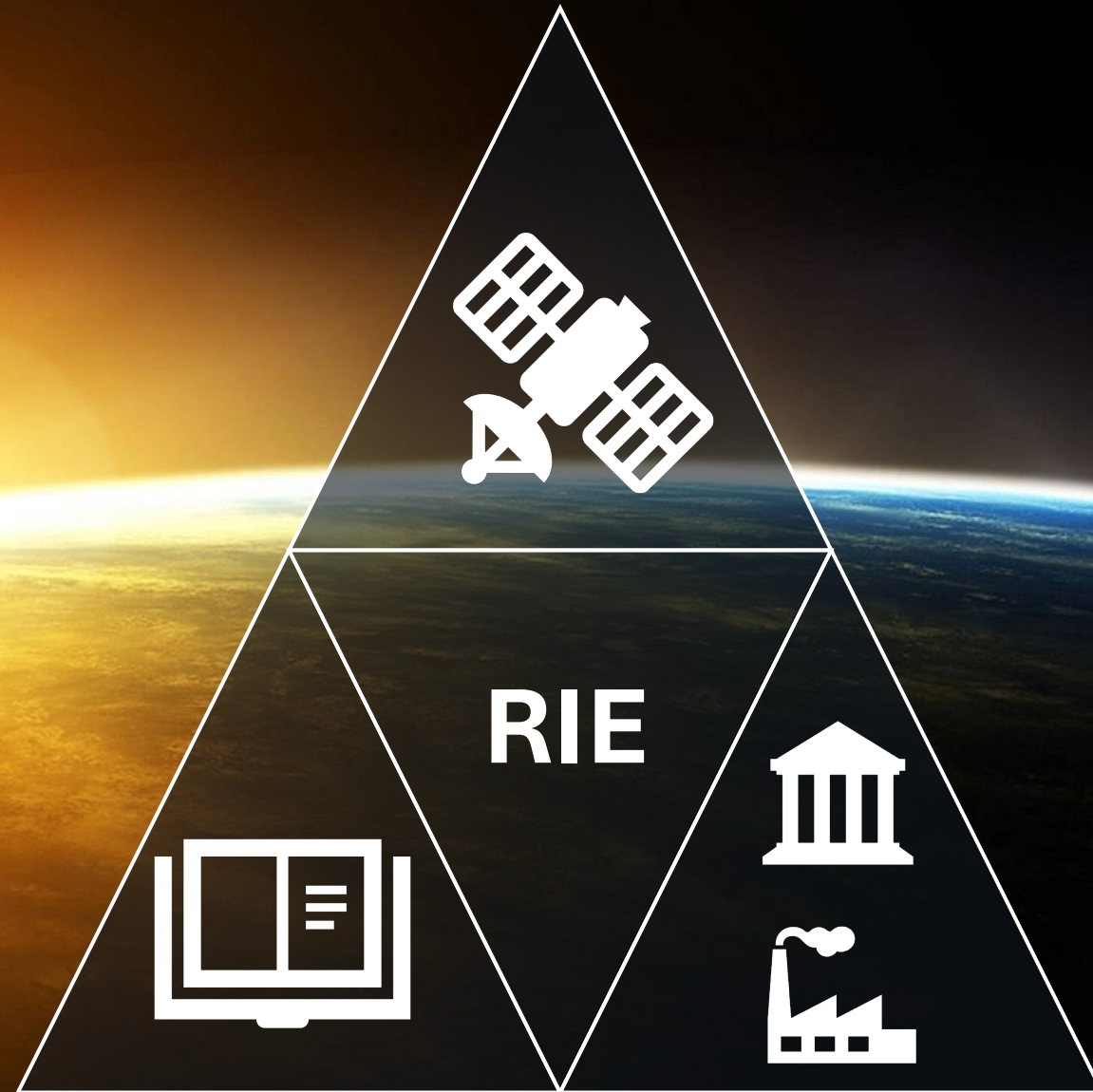
- Data Processing (+2600 processor cores)
- 18.8 TB RAM for Big Data
- Dedicated GPU for AI (Deep Learning)
- Infrastructure for massive processing



RESEARCH, INNOVATION & ENTREPRENEURSHIP

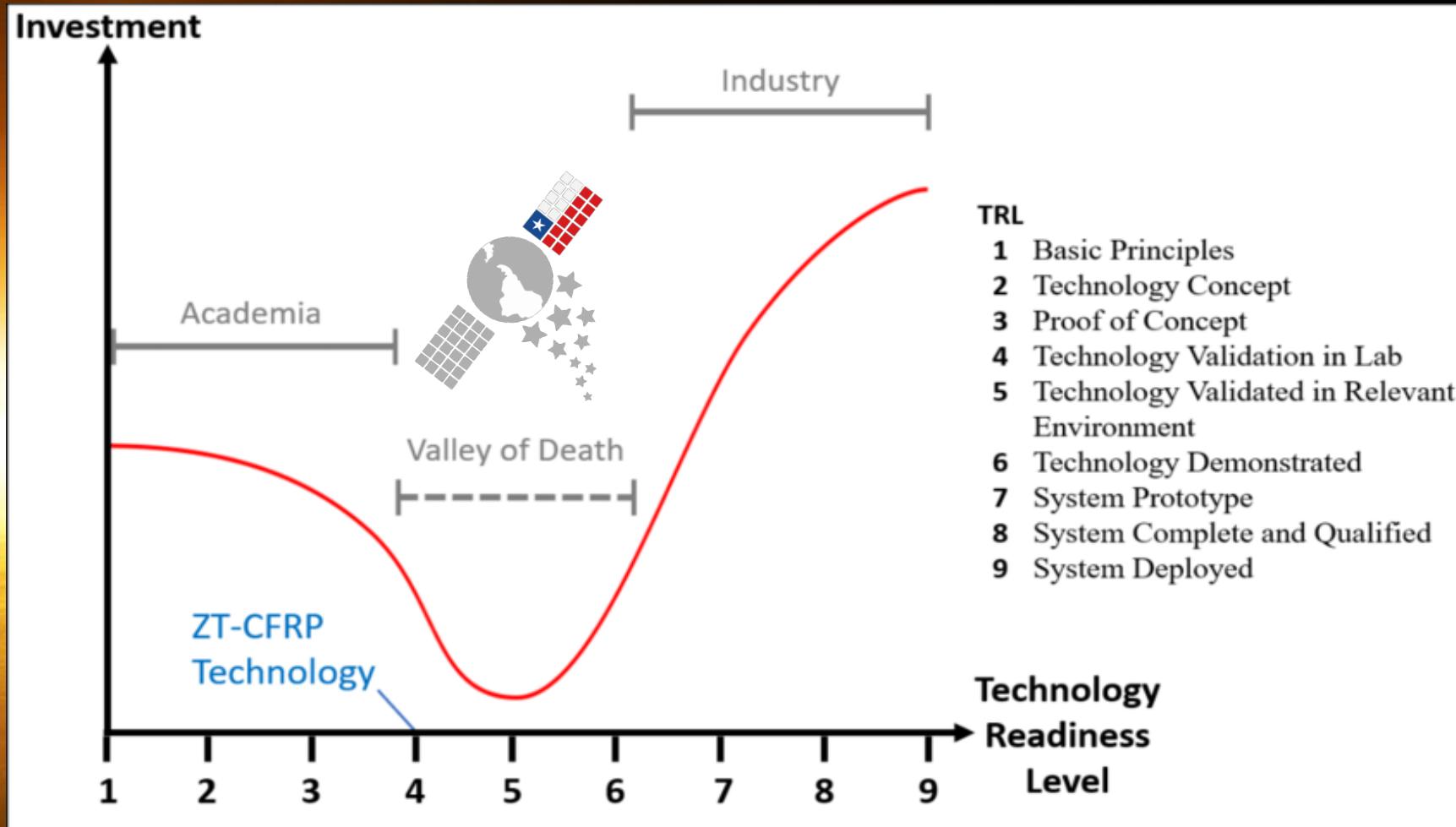


RESEARCH, INNOVATION & ENTREPRENEURSHIP





RESEARCH, INNOVATION & ENTREPRENEURSHIP





NATIONAL SPACE CENTER



“STRATEGIC OPORTUNITY”





NATIONAL SPACE SYSTEM

**A BRIDGE BETWEEN DEFENSE,
SCIENCE, INDUSTRY AND
NATIONAL DEVELOPMENT**



DIRECTO

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FUERZA AÉREA DE CHILE

