

INTRODUCING

THALES ALENIA SPACE



SPACE FOR LIFE



IF YOU TAKE AWAY ONLY ONE MESSAGE...

WE BELIEVE IN SPACE AS HUMANKIND'S
NEW HORIZON TO BUILD A BETTER, SUSTAINABLE
LIFE ON EARTH.



**SPACE
FOR
LIFE ///**

**SPACE TO
CONNECT**

**SPACE TO
SECURE
& DEFEND**

**SPACE TO
OBSERVE
& PROTECT**

**SPACE TO
EXPLORE**

**SPACE TO
TRAVEL
& NAVIGATE**

**AT A
GLANCE
///**

**WORLDWIDE
LEADERSHIP**



**WHAT
MAKES US
DIFFERENT**





WORLDWIDE LEADERSHIP

Date : 26/03/2019

Ref : xxxxx

Ref Modèle : 83230347-DOC-TAS-FR-005

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THALES ALENIA SPACE INTERNAL

ThalesAlenia
Space
a Thales / Leonardo company

A FEW NUMBERS

JOINT VENTURE



THALES (67%)
LEONARDO (33%)

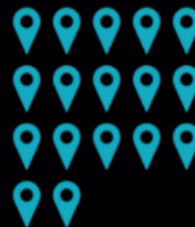
SALES 2.6
BN€
IN 2017

A FEW NUMBERS

MORE THAN
8,000 EMPLOYEES

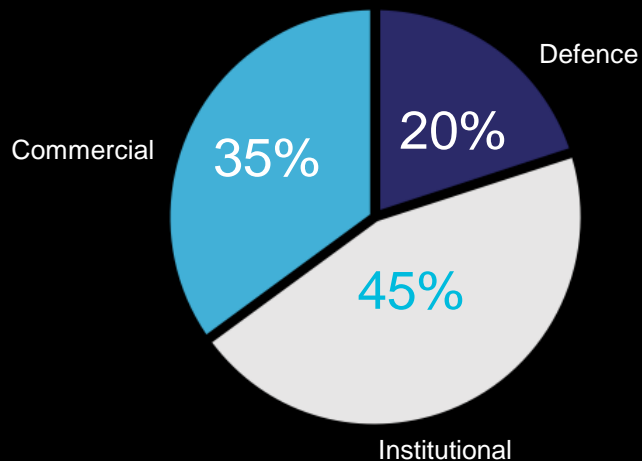


17 SITES
WORLDWIDE

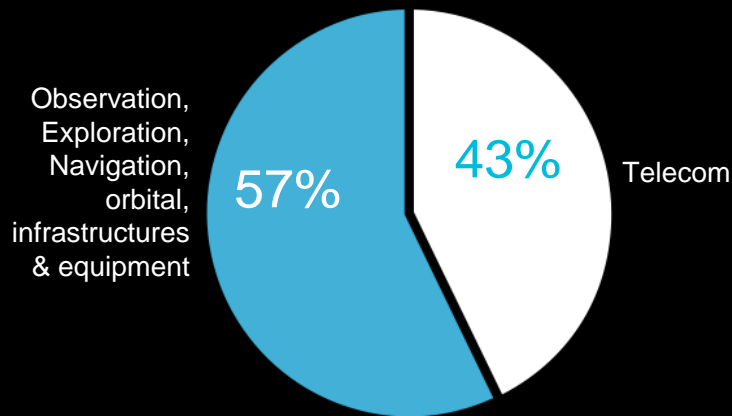


A FEW NUMBERS

BREAKDOWN
PER MARKET*



BREAKDOWN
PER ACTIVITIES*



A SELECTION OF CUSTOMERS

AS OF DECEMBER 2018

SCIENCE & EXPLORATION

ASI: ITALIAN SPACE AGENCY — CNES: FRENCH SPACE AGENCY — ESA: EUROPEAN SPACE AGENCY — ESTEC: EUROPEAN SPACE RESEARCH & TECHNOLOGY CENTRE — NASA — RUSSIAN FEDERAL SPACE AGENCY — UK SPACE AGENCY

OBSERVATION, METEOROLOGY & ENVIRONMENTAL MONITORING

CNES — ESTEC — EUMETSAT: EUROPEAN ORGANISATION FOR THE EXPLOITATION OF METEOROLOGICAL SATELLITES — ESA — EUROPEAN UNION — FRENCH GOVERNMENT — ITALIAN GOVERNMENT — NPO LAVOCHKIN — SOUTH KOREA — EUROPEAN COMMISSION

TELECOM OPERATORS

ARABSAT — AVANTI COMMUNICATIONS — EUTELSAT — HISPASAT — INDOSAT INDONESIA — INMARSAT — ISS-RESHETNEV — KOREA TELECOM — MINISTRY OF INFORMATION BANGLADESH — MINISTRY OF TRANSPORTATION & TELECOMMUNICATIONS OF TURKMENISTAN — PT TELKOM INDONESIA — RSCC: RUSSIAN SATELLITE COMMUNICATION CORPORATION — SES GLOBAL — TELEBRAS — YAHSAT

SATELLITE CONSTELLATION OPERATORS

GLOBALSTAR — IRIDIUM — LEOSAT — O3B — TELESAT

MILITARY SATELLITE COMMUNICATIONS

BRAZIL — FRANCE — GERMANY — ITALY — KOREA

NAVIGATION

CLS — EUROPEAN GLOBAL NAVIGATION SATELLITE SYSTEMS AGENCY — ESA — EUROPEAN UNION — KOREA AEROSPACE RESEARCH INSTITUTE (KARI)

SATELLITE INTEGRATORS

AIRBUS DEFENSE & SPACE — BALL AEROSPACE & TECHNOLOGIES — MAXAR — MITSUBISHI

WHAT MAKES US DIFFERENT?



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THALES ALENIA SPACE INTERNAL

OUR TASTE FOR PERFORMANCE

We have been delivering **high-quality technologies** to some of the world's most demanding customers for decades — a sure sign of **our culture of commitment, partnership and responsiveness.**



OUR DIGITAL TRANSFORMATION

Digitalization is allowing us to make **smarter** and **more flexible** satellites.

Our customers benefit from the new solutions emerging from our **agile and empowered teams**.



OUR PARTNERSHIP APPROACH

CUSTOMERS & SUPPLIERS

Success for complex projects such as ours can only be achieved by collaborating all along the value chain.

NEW SPACE

Our work in the “New Space” paradigm

We are already working with new partners on smaller, competitively-priced satellites that enable a wide variety of applications for Earth Observation, Telecoms and the Internet of Things.



• OUR ATTRACTIVENESS AS AN EMPLOYER

We're hunting for solutions to the constantly-changing challenges of Telecoms, space, Navigation, Earth Observation, defense and science – and **it's the thrill of that hunt that allows us to attract the best people.**





SPACE TO CONNECT

TOP MANUFACTURER OF TELECOMMUNICATIONS SATELLITES

WORLD LEADER IN SATELLITE CONSTELLATIONS

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THANKS TO OUR PLATFORMS AND PAYLOADS, YOU CAN...

- Stay connected from anywhere on Earth
- Surf the web during your flight
- Bridge the digital divide
- Grow your business with digital payloads

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STAY CONNECTED FROM ANYWHERE ON EARTH

/// “Constellations” of communication satellites provide truly global connectivity

TODAY

125+ satellites built for three different constellations: Globalstar 2, O3b and Iridium® NEXT.

TOMORROW

We're already working to meet new challenges.



STAY CONNECTED FROM ANYWHERE ON EARTH



Zoom in on some success stories

Iridium® NEXT, the most sophisticated telecommunications system ever! >

We replaced the original Iridium constellation with a new one, satellite by satellite, without interrupting service for 1 million subscribers!



< The high performance O3b constellation

We built a total of 20 satellites for the O3b constellation, with which SES Networks supplies broadband services to its customers.



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STAY CONNECTED DURING YOUR FLIGHT

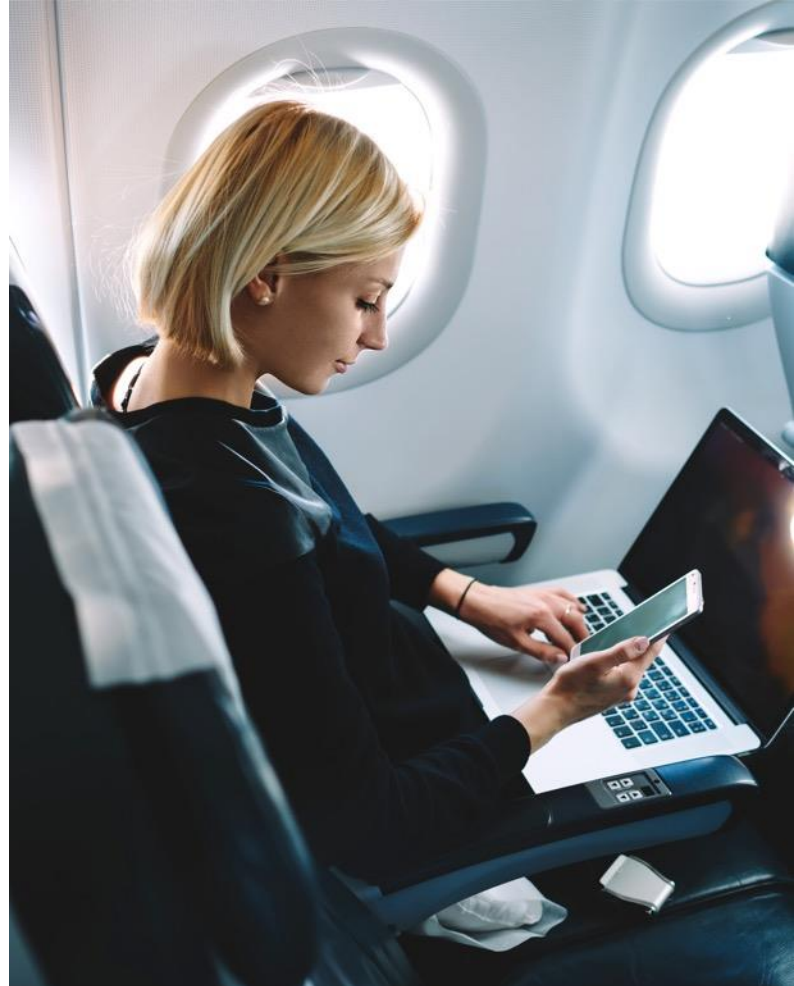
/// Satellites can let airlines offer in-flight voice calls and Wi-Fi to passengers

TODAY

Our Very High Throughput Satellite (VHTS) solutions offer capacity, digital agility, flexibility and competitiveness.

TOMORROW

We will build the Global Xpress (GX) satellite for Immarsat.



BRIDGE THE DIGITAL DIVIDE

/// Satellites can reach out from space to fill gaps in coverage and connectivity

TODAY

The Bangabandhu Satellite-1 we built connects businesses & schools across Bangladesh to the internet.

TOMORROW

High-performance KONNECT VHTS will allow Eutelsat to bring the Internet to underserved parts of Europe.



FLEXIBLE SOLUTIONS FOR TELECOM OPERATORS

/// Satellites can help respond to an operator's evolving needs during a telecommunications mission

Our all-electric Spacebus NEO platform will host digital payloads up to 25W. The lower the weight of the platform, the bigger the payload it can carry.

Spacebus NEO all-electric platform is the ideal solution to host powerful VHTS payloads bringing a lot of flexibility.





SPACE TO SECURE AND DEFEND

DEFENSE TELECOMMUNICATIONS SATELLITES

VERY HIGH RESOLUTION OPTICAL OR RADAR INSTRUMENTS

GROUND CONTROL SYSTEMS

TESTING & INTEGRATION CENTERS



COUNTRIES AROUND THE WORLD COUNT ON OUR SOLUTIONS TO ENABLE...

- SURVEILLANCE & OBSERVATION FOR FIELD INTELLIGENCE
- SECURED COMMUNICATIONS FOR ARMED FORCES

SURVEILLANCE AND OBSERVATION FOR FIELD INTELLIGENCE

/// Satellites can see what is happening in areas of
interest and zones of engagement

TODAY

Our satellites gather intelligence, plan & prepare operations, prevent trafficking, assess damage after earthquakes or flooding, protect critical infrastructures...

TOMORROW

Based on our expertise in terms of optical and radar technologies, we are now working on brand new Earth Observation products including high revisit solutions.



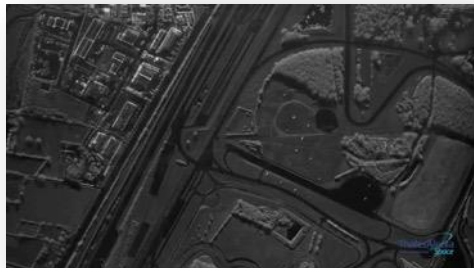
SURVEILLANCE AND OBSERVATION FOR FIELD INTELLIGENCE



Zoom in on some success stories

COSMO-SkyMed: global standard in spaceborne radar tech >

By keeping watch day and night, no matter the weather conditions, COSMO-SkyMed helps Italy protect its citizens and ensure public safety.



< GÖKTÜRK-1 satellite: remarkable image quantity & quality

Turkey's Earth Observation satellite has a high-resolution optical sensor and an onboard digital imaging storage system, linked to an integration center in Ankara.



Pleiades, Helios & CSO: 30 years of keeping the watch

We are the exclusive supplier of all Very High Resolution optical instruments for these French intelligence satellites.



SECURED COMMUNICATIONS FOR ARMED FORCES

/// Satellites systems can help securely transmit orders and receive situation reports

TODAY

We are world leader in helping armed forces ensure that no one can monitor or scramble their exchanges.

TOMORROW

With the battlefield now including cyberspace, we are working on cutting-edge solutions to protect against cyber-threats of all kinds.



SECURED COMMUNICATIONS FOR ARMED FORCES



Zoom in on some success stories

Supporting Syracuse with the French Ministry of Defense for more than 12 years >

French forces stationed in France or deployed overseas to HAVE access best-in-class military satellite telecommunications services.



Sicral 2 one example of a successfull French/Italian collaboration on space programs

< We also built Athena-Fidus, the French-Italian dual broadband satellite.





SPACE TO OBSERVE & PROTECT

A COMPREHENSIVE LINE OF EARTH OBSERVATION SATELLITE SOLUTIONS,
INCLUDING RADAR AND HIGH/VERY-HIGH RESOLUTION OPTICAL PAYLOADS

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THIS ALLOWS EXPERTS TO...

- STUDY EARTH'S OCEANS & SURFACE WATER
- STUDY EARTH'S CONTINENTS & ISLANDS
- FORECAST THE WEATHER
- UNDERSTAND CLIMATE CHANGE

EARTH'S OCEANS & SURFACE WATER

/// Satellites can advance scientific knowledge while enabling sustainable development

TODAY

Our satellites, radars, altimeters and other optical instruments enable oceanographic and hydrological missions run by space agencies around the world.

TOMORROW

We are working on a new satellite which will be able to measure how lakes, rivers, reservoirs and oceans are changing over time.



EARTH'S OCEANS & SURFACE WATER



Zoom in on some success stories

SWOT, the oceanographic satellite from the French (CNES) and American (NASA) space agencies >

SWOT will collect detailed measurements on Earth's lakes, rivers, reservoirs and oceans, to improve ocean circulation models, enhance weather and climate predictions, and aid in freshwater management.



< Jason-2 and -3 and Sentinel-1 and -3

These satellites, all built by Thales Alenia Space, kept a friendly eye on the skippers of the 2016-2017 Vendée Globe.



EARTH'S CONTINENTS & ISLANDS

/// Satellites help mapmakers, urban developers, farmers, geologists, ecologists, government agencies and more

TODAY

Our Earth Observation satellites are contributing to a better understanding of the mountain ranges, deep canyons, flat plains and dense forests of the planet Earth.

TOMORROW

Satellites will be used to prevent deforestation, monitor crop yields, count trees in forests, plan roads, estimate reserves of mined natural resources and more.



EARTH'S OCEANS & SURFACE WATER



Zoom in on some success stories

We are developing the antenna feed array on the European Space Agency's Biomass spacecraft >

Its missions: quantify and generate maps of biomass in the world's forests and measure annual changes, in order to understand the role forests play in the carbon cycle.



< We are prime contractor for COSMO-SkyMed

This constellation is providing data that will enable experts to monitor deforestation in the Brazilian Amazon. Its radar sensors operate in all weather conditions, making it the ideal solution for the cloudy, rainy Amazon territory.



FORECASTING THE WEATHER

/// Will you need sun cream or an umbrella? We help provide the answer in Europe

TODAY

Thales Alenia Space has built all Meteosat European weather satellites since 1977. We are the world leader in geostationary meteorology.

TOMORROW

European meteorology is becoming more accurate: from 30 minutes between images in the 1980s to 15 minutes today, and in the near future, an image every 10 minutes with MTG.



UNDERSTANDING CLIMATE CHANGE

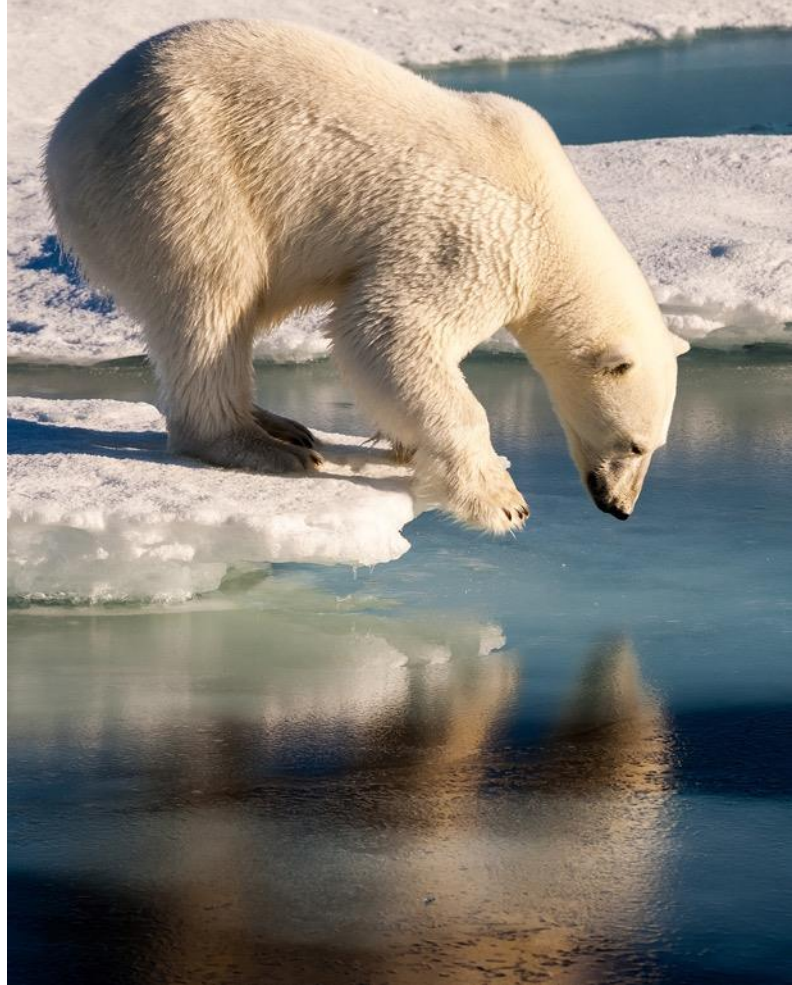
/// The data and images needed to understand and mitigate the impacts of climate change

TODAY

Our satellite-based instruments record temperatures, and changes in sea levels, log facts about precipitation and droughts, and offer concrete visuals of melting continental and maritime ice.

TOMORROW

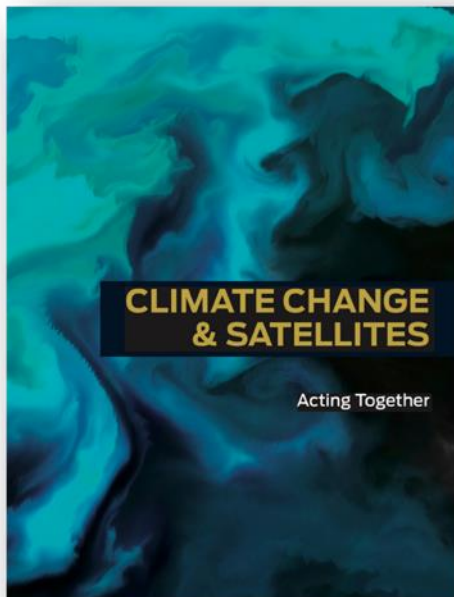
Future solutions will provide even more detailed information and more accurate images, allowing experts to work better and with more confidence.



UNDERSTANDING CLIMATE CHANGE



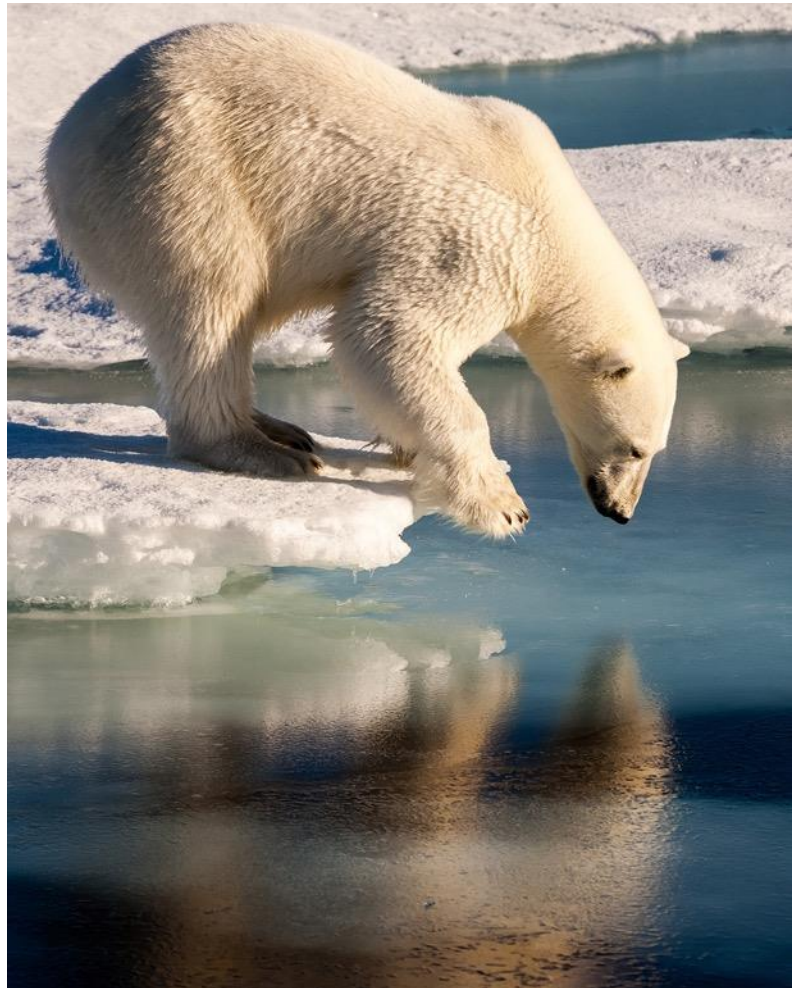
Zoom in on a success story



Satellites for a better understanding of Climate Change

Thales Alenia Space is prime contractor for the Sentinel-1 and -3 families (4 satellites each); in charge of the image ground segment for Sentinel-2; and constructor of the imaging spectrometer carried by Sentinel-5P as well as the Poseidon-4 radar altimeter for the Jason-CS/Sentinel-6 mission.

< [Read Climate Change & Satellites: Acting Together](#) a book published by Sud[s] Concepts for Thales Alenia Space





SPACE TO TRAVEL & NAVIGATE

A PIONEER IN EUROPEAN SATELLITE NAVIGATION, WE STILL LEAD THE WAY
WITH OUR INNOVATIVE SOLUTIONS FOR RELIABLE LOCALIZATION AND
ENHANCED SAFETY

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IN EUROPE AND ASIA TODAY, WE ARE...

- Enabling location & map services
- Ensuring the safety of travelers
- Providing accuracy & reliability
- Enabling the Internet of Things

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THALES ALENIA SPACE INTERNAL

ENABLING LOCATION & MAP SERVICES

/// Satellite systems provide the information for online maps and navigation apps

TODAY

We developed the EGNOS satellite system, used today to improve the performance of global navigation satellite systems (such as GPS) in Europe.

TOMORROW

We are leading the development and deployment of the next version of the ground-based Galileo Mission Segment and Security Facility.



ENSURING THE SAFETY OF TRAVELERS

/// Satellite systems provide “safety of life” navigation services to aviation, maritime and land-based users

TODAY

EGNOS is essential for applications where extreme accuracy and reliability are critical – such as landing airplanes or navigating ships through narrow channels.

TOMORROW

We will supply KARI, the South Korean space agency, with KASS, their own version of EGNOS, which will provide Safety of Life and other services.



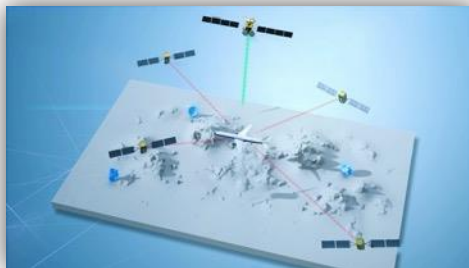
ENSURING THE SAFETY OF TRAVELERS



Zoom in on some success stories

EGNOS: helping manage the growth of global air traffic >

EGNOS Safety of Life services make aircraft landings safer and faster, helps improve the overall safety of air travel and contributes to reducing delays, diversions and flight cancellations



< COSPAS-SARSAT: search & rescue missions from space

We provided our breakthrough MEOLUT NEXT technology to this satellite-aided, intergovernmental search & rescue initiative.



PROVIDING ACCURACY & RELIABILITY

/// An excellent ground infrastructure for Galileo ensures the reliability of information sent from space

TODAY

Sensor stations, control centers, mission uplink stations and telemetry, tracking & command stations: we are prime contractor for the Galileo Mission Segment and the Galileo Security Facility.

TOMORROW

We will develop new versions for Galileo, while maintaining the already-deployed operational versions.



ENABLING THE INTERNET OF THINGS

/// Satellites can capture and retransmit data from anywhere on the globe

TODAY

Connecting an IoT device to the internet today is usually done via Bluetooth or Wi-Fi — both rather low-range options. **We think there's a better solution.**

TOMORROW

KINEIS, a 20-nanosatellite constellation built by Thales Alenia Space as prime contractor on behalf of CLS, will link millions of objects to the Internet by 2030.





SPACE TO EXPLORE

SPACE AGENCIES AROUND THE WORLD RELY ON THALES ALENIA SPACE'S
EXPERTISE TO EXPLORE OUR SOLAR SYSTEM AND OUR GALAXY



WE ARE PART OF PROJECTS DEVOTED TO...

- Exploring our solar system
- Understanding our universe
- Living & working off Earth
- In-orbit services

• SATURN

/// After 20 years, the amazing adventure of Cassini-Huygens is now finished

TODAY

Cassini-Huygens was one of the most complex and successful missions in the history of space exploration. Its main antenna, which we designed and built, transmitted data and images until the very end.

TOMORROW

The antenna currently on its way to Mercury with the BepiColombo mission was inspired by the one that worked so well for so many years aboard Cassini.



MARS

/// Is there life on Mars? This existential question about our neighbor may soon be answered

TODAY

The Trace Gas Orbiter of ExoMars 2016 is now “sniffing” the Martian atmosphere for evidence of recent biological activity on the planet below.

TOMORROW

ExoMars 2020 will dig a record-breaking 2 meters below the surface of Mars and then analyze the soil samples in its own ultra-sophisticated mini-lab.



MERCURY

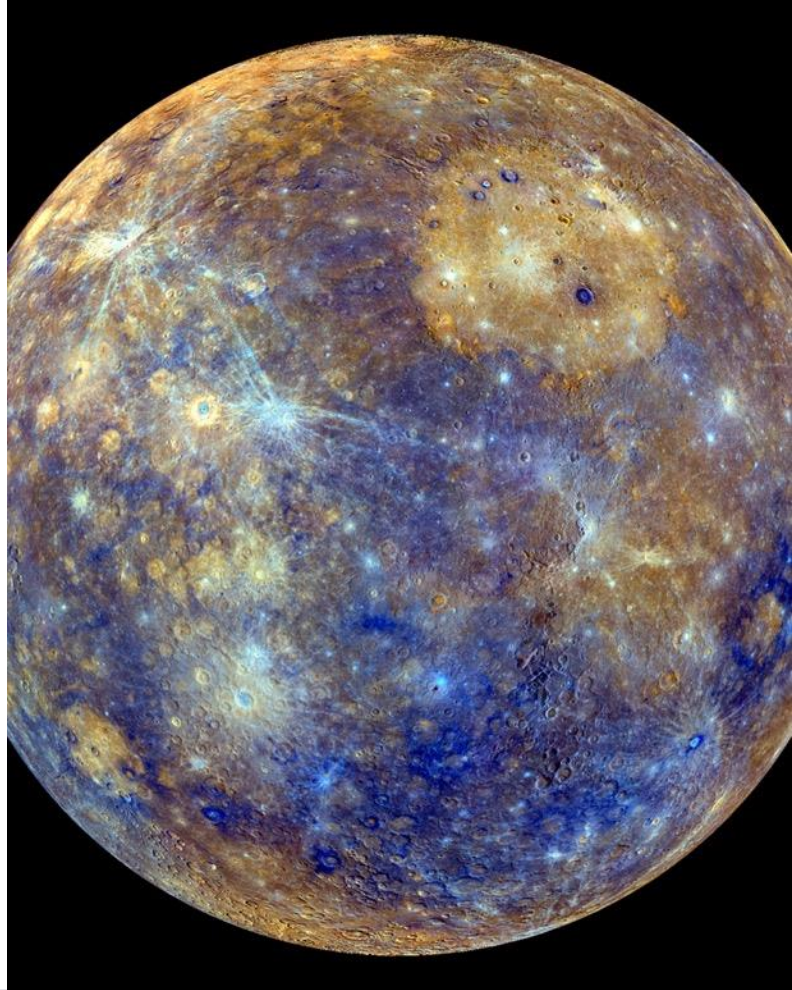
/// Launched in October 2018, BepiColombo is now on its seven-year journey to Mercury

TODAY

We led the team that supplied telecom, thermal control & electrical distribution systems, oversaw spacecraft testing, provided transponders, onboard computers, mass memory and more.

TOMORROW

BepiColombo is expected to provide scientists with data and observations about in about 2025, adding to the knowledge we have from NASA's Mariner 10 (1970s) and Messenger (2010-2015) missions.

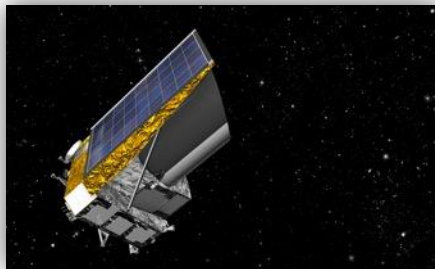


UNDERSTANDING OUR UNIVERSE



WHAT ARE THE ORIGINS OF OUR UNIVERSE?

We built 25 of the ALMA radio telescope's 64 huge parabolic antennas.



WHAT IS DARK MATTER?

We are prime contractor for Euclid's satellite, which will add to our understanding of dark matter & dark energy.



WHERE DO COMETS COME FROM?

We were a leading partner in Rosetta-Philae, the first mission to rendezvous with a comet.



HOW WAS OUR UNIVERSE FORMED?

We were prime contractor for both the Herschel and the Planck space observatories.

THE INTERNATIONAL SPACE STATION

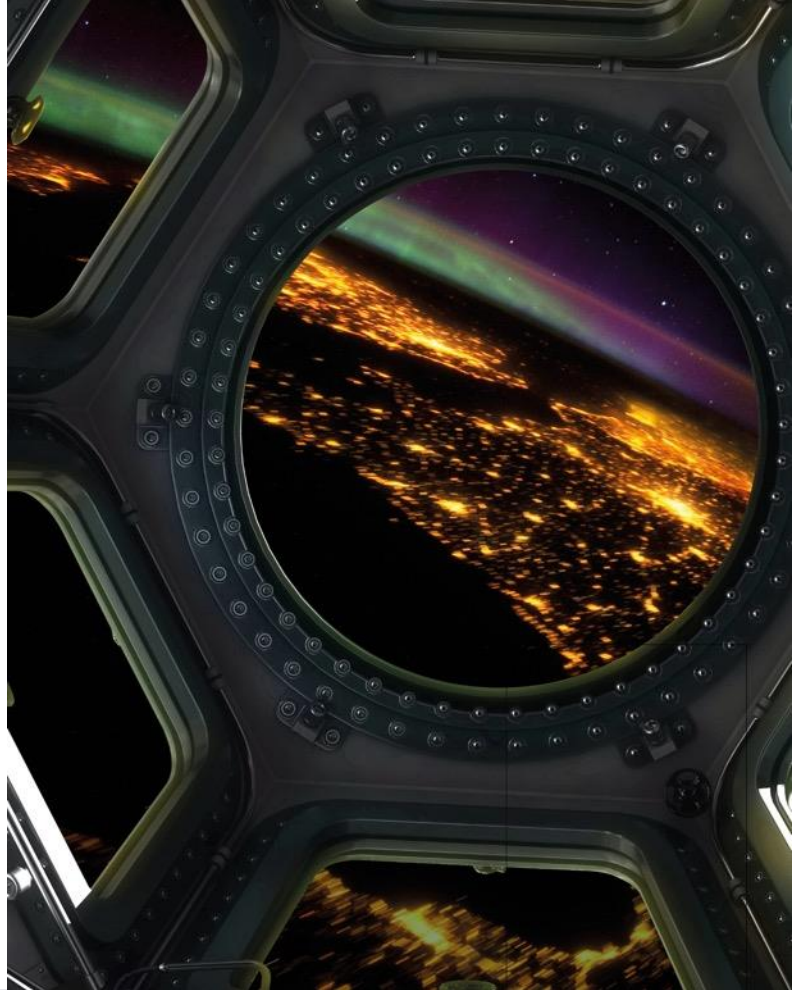
/// A state-of-the-art home/office and world-class laboratory for astronauts and scientists

TODAY

We have provided half of the International Space Station's pressurized volume.

TOMORROW

We also make the pressurized cargo modules for the Cygnus resupply vessels which deliver food, water, spare parts and space experiments to the ISS.



• ZOOM IN ON A SUCCESS STORIES



Zoom in on some success stories

ALTEC >

The Thales Alenia Space/Italian Space Agency center of excellence, provides engineering and logistics services to the ISS!



< Rover Operations Control Center (ROCC)

A drilling test facility and a platform for simulating Martian gravity; ROCC will also receive and analyze data received from ExoMars via the ESA's Mission Operations Centre.



OUR CLOSE BOND WITH ASTRONAUTS



ESA astronaut Thomas Pesquet: scientist and space photographer

During his 196 days in space, Thomas Pesquet took more than 2,000 photos. Although we are fans of all astronauts, we confess to having extra-fond feelings for Thomas because he was an intern at Thales Alenia Space in 2001.



ESA veteran astronaut Paolo Nespoli testing our spacesuit prototype

Paolo Nespoli has been to the ISS three times and performed hundreds of scientific experiments in space; including tests of PERSEO, a vest we designed to protect astronauts against cosmic radiation.



ESA astronaut Tim Peake at the propulsion integration centre in belfast

Tim Peake was with us in Belfast (UK) in October 2016 for the opening ceremonies of the Propulsion Integration Centre. Thales Alenia Space has a dedicated clean room at the Thales plant there.

REUSABLE SPACECRAFTS

/// Space Rider: an affordable, independent & reusable cargo transportation spacecraft

TODAY

Space Rider will soon provide ESA with affordable, routine access to space: it's an unmanned spacecraft that can transport payloads into Low Earth Orbit and then safely reenter Earth's atmosphere and land.

TOMORROW

Space Rider paves the way to reusable stages, point-to-point flights, spaceplanes and even space tourism.



• A SPACE STATION IN LUNAR ORBIT

/// The Lunar Orbital Platform-Gateway will orbit the moon as a comms hub, science lab, short-stay habitat & equipment storage zone

TODAY

LOP-G will be a test-base for the environmental systems that will be needed to keep astronauts alive on long voyages to deep space.

TOMORROW

It could also be a launch point for future missions to the moon, to Mars or to rendezvous with asteroids.



HUMAN SPACEFLIGHTS

/// Ready to boldly go: we're working with NASA on human spaceflights to the moon, Mars and deep space

TODAY

NASA has chosen us as one of the major partners who will provide solutions for propulsion, life support systems, habitation concepts, small satellites & more.

TOMORROW

The project, called NextSTEP, is built around public-private partnerships and puts value on a gradual build-up of capabilities & fiscally responsible spending.



IN-ORBIT SERVICES

/// A new type of vehicle to make space more sustainable
and to provide enhanced satellite services

TODAY

Satellites in orbit cannot currently be refueled, maintained or upgraded, so their capabilities are static and their service life is limited.

TOMORROW

In-orbit space servicers will change everything, bringing a range of new possibilities: life extension, maintenance, debris clean-up, base-building...



THANK YOU
FOR YOUR ATTENTION

