

ESA'S IPR PORTFOLIO: MATCHING THE EU – JAPAN SPACE TECHNOLOGICAL NEEDS

15 MARCH 2016

VERONICA LA REGINA

AGENDA

- Introduction
- IPRs Portfolio
- IPRs Licensing Policy
- IPRs Opportunities for the Japanese market
- Q&A Session



INTRODUCTION: ESA

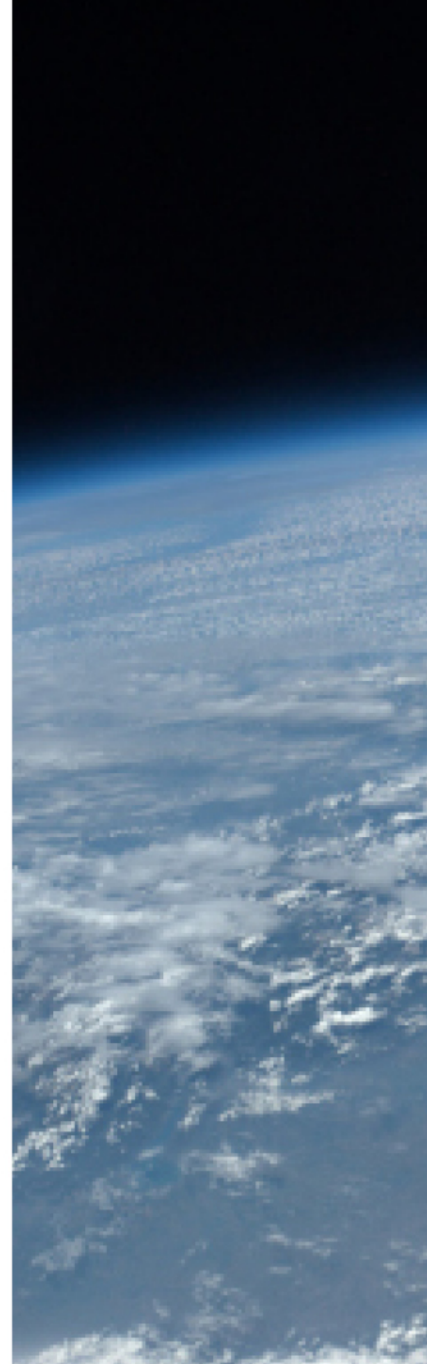
- Over 50 years of experience
- 22 Member States
- Eight sites/facilities in Europe, about 2200 staff
- 5.2 billion Euro budget (2016)
- Over 80 satellites designed, tested and operated in flight



INTRODUCTION: ESA

“To provide for and promote, for exclusively peaceful purposes, cooperation among European states in **space research** and **technology** and their **space applications**.”

Article 2 of ESA Convention

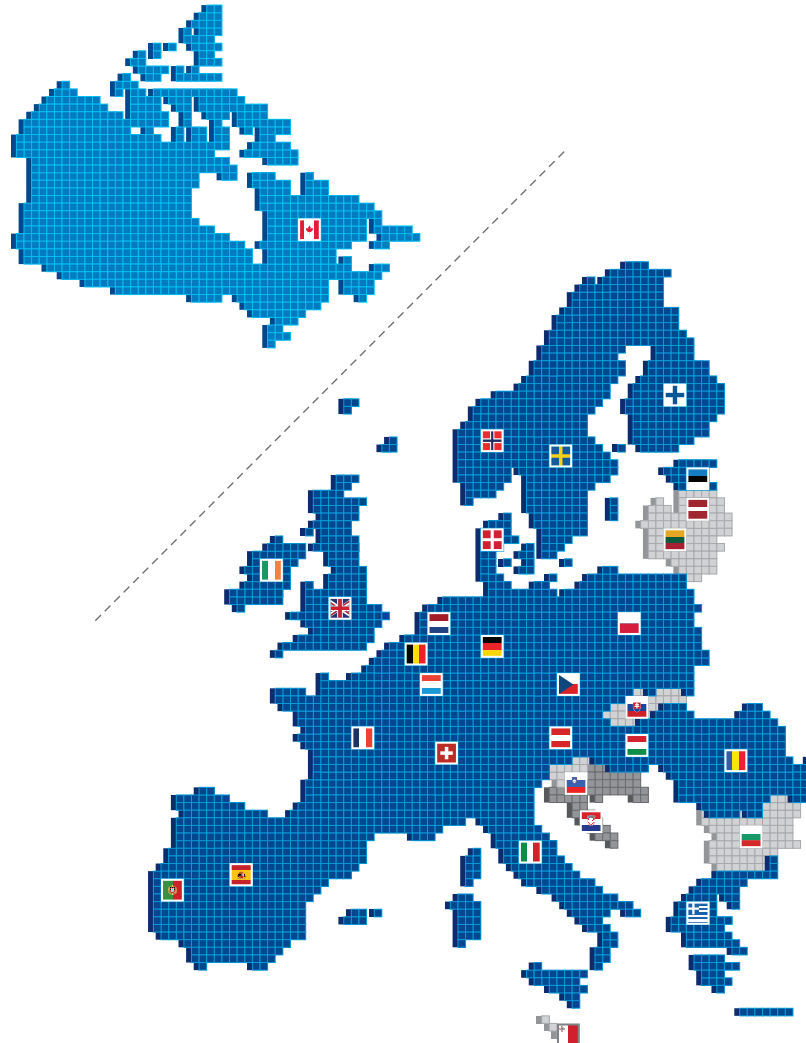


INTRODUCTION: ESA

ESA has 22 Member States: 20 states of the EU (AT, BE, CZ, DE, DK, EE, ES, FI, FR, IT, GR, HU, IE, LU, NL, PT, PL, RO, SE, UK) plus Norway and Switzerland.

7 other EU states have Cooperation Agreements with ESA: Bulgaria, Cyprus, Latvia, Lithuania, Malta, Slovakia and Slovenia. Discussions are ongoing with Croatia.

Canada takes part in some programmes under a long-standing Cooperation Agreement.



INTRODUCTION: ESA

About 85% of ESA's budget is spent on contracts with European industry.

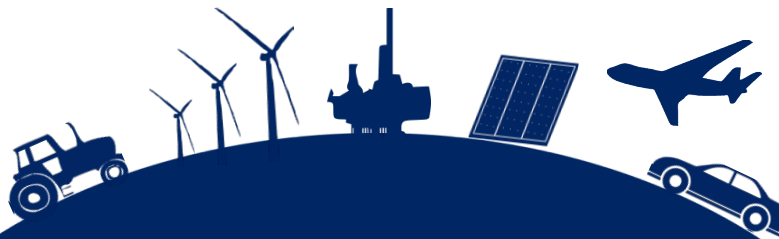
ESA's industrial policy:

- ensures that Member States get a fair return on their investment;
- improves competitiveness of European industry;
- maintains and develops space technology;
- exploits the advantages of free competitive bidding, except where incompatible with objectives of the industrial policy.

ESA SPACE SOLUTIONS







SPACE
TECHNOLOGIES



The space you need to get your business off the ground

ESA SPACE SOLUTIONS

ESA PATENT PORTFOLIO	BROKER NETWORK	BUSINESS INCUBATION	INVESTMENT SUPPORT
132 inventions covered by 411 patents	15 BROKERS 320 TRANSFERS	16 CENTRES 130 new start-ups p/y 400+ SUCCESES	Venture Capital Fund Investment Forums and training
			

WHY ESA PATENTS?



PROTECTION

Protect ESA's inventions and prevent others from blocking us



EXPLOITATION

Monopoly for use and offer licences to third parties



TRADING

Cross licence or use it as a trading mechanism

ESA IPR PORTFOLIO

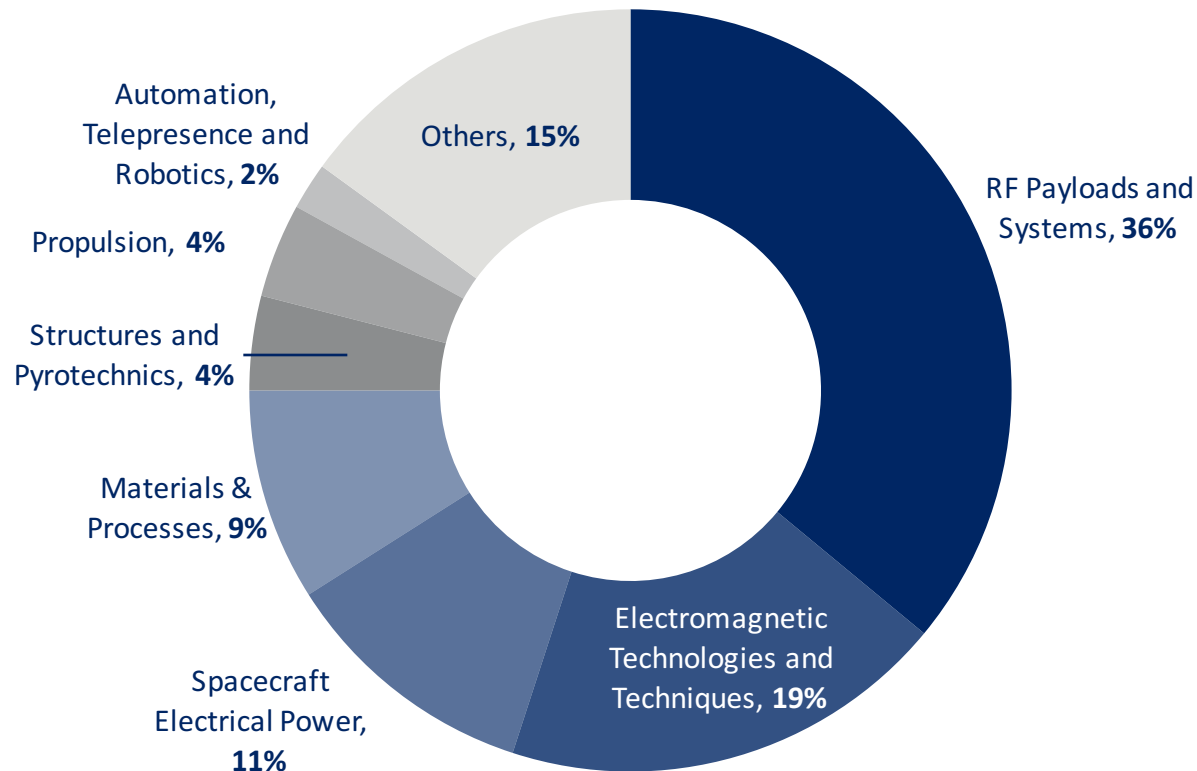
- Under ESA's staff regulations inventions by ESA **staff members** in the course of their duties are the property of ESA and should be declared to the **Director General**
- The **ESA Patent Group** studies applications from staff members to file a patent and estimates the patentability of the invention. It then assesses ESA's interest in filing for a patent. It also takes decisions on the maintenance or abandonment of the patent.



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ESA IPR PORTFOLIO

INVENTIONS BY SPACE TECHNICAL DOMAINS



ESA IPR PORTFOLIO

INVENTIONS BY APPLICATION SECTOR



31%

Information &
Communication
Technologies



7%

Materials & New
Production Technologies



17%

Aeronautics, Automotive,
Maritime and Transport



4%

Healthcare & Biotechnology



16%

Energy and Environment



4%

Industrial Production &
Robotics



10%

Security and Safety



4%

Civil Engineering



7%

Electronics


ESA IPR PORTFOLIO

- ESA IPR portfolio is available at:

[http://www.esa.int/Our Activities/Space Engineering Technology/IP for commercialisation](http://www.esa.int/Our_Activities/Space_Engineering_Technology/IP_for_commercialisation)

[→ EUROPEAN SPACE AGENCY](#) [ABOUT US](#) [OUR ACTIVITIES](#) [CONNECT WITH US](#) [FOR MEDIA](#) [FOR EDUCATORS](#) [FOR KIDS](#)

space engineering & technology



[ESA](#) [SPACE ENGINEERING & TECHNOLOGY](#) [PREPARING FOR THE FUTURE](#)

What we do

- Directorate of Technical and Quality Management (TEC)

+ Engineering

+ Cross-cutting initiatives

+ Electrical

+ Mechanical

+ Systems

+ Product Assurance

+ Standards

+ Technology


Strategy and harmonisation

- About strategy and harmonisation


+ Directorate Technology programmes

ESA > Our Activities > Space Engineering & Technology


IP FOR COMMERCIALISATION




All Space IP




Health / Biotechnology




Security / Safety




Electronics & communication technologies




Industrial production / Robotics



Energy / Environment / Transport



Materials & new production technologies



Data processing

space solutions

Space solutions

Year after year, ESA develops a vast array of innovative, highly sophisticated technologies and applications to support its space programmes and make Europe's space endeavors happen. Many of these developments result in intellectual property (IP) for top-notch technology. A lot of this IP owned by ESA also has significant commercial potential for non-space applications.

On behalf of ESA, the Technology Transfer Programme Office is tasked to market the Agency's own IP to the non-space industry in order to make sure they are exploited to their full potential.


The above lists contain full technology descriptions of such IPs, including innovation advantages and suggested market applications.

For further information, please contact:

Aude de Clercq
aude.de.clercq[at]esa.int

Related link

- Intellectual Property Rights website



Technology Transfer Programme (TTP)

ESA IPR PORTFOLIO

- ESA IPR portfolio is available at:
 - LinkedIn: ESA Space Solutions
 - Innoget: <http://esa.innoget.com/>

European Space Agency *Technology Transfer Portal*

European Space Agency's Gallery: [Log in](#)
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Corporate website

Technologies
About European Space Agency

How do I respond?
To reply now, use the green "Ask a Technology Manager" buttons located inside each technology

Contact Us

How Do I Respond?

The technologies listed below are currently available for transfer. To learn more about our technologies click on the desired technology and use the green Ask a Technology Manager button located inside each technology

Available Technologies
Found 33 technologies

New technologies delivered to your inbox

Email Alerts

POWERED BY inno

LinkedIn

Veronica, blijf op de hoogte van het laatste nieuws van KLM + Volgen

Pulse

Speed, transmission errors & bandwidth constrains. Market opp (Part I)
Mercedes Sánchez

Go Ahead, Talk About Politics at Work
Jack Walsh

Why I Haven't Worked in 30 Years
Larry Wilmore

How To Ruin A Job Interview Under Five Minutes
Liz Ryan

Is Cannabis The Next Internet?
Sarah W. Browne

Do animated characters make it too hard to Just Say No to drugs?
Lynne Everatt

Sports Authority's Bankruptcy a Reminder to Ratchet up Your Company's Robustness
Martin Reeves

When good news for the economy became good news for stocks
Anthony Scaramucci

Daily Pulse India: Now Modi Wants The EPF Tax Deferred, Google Talks To Telcos For



Mercedes Sánchez
Technology Transfer Officer at European Space Agency

Speed, transmission errors & bandwidth constrains. Market opp (Part I)

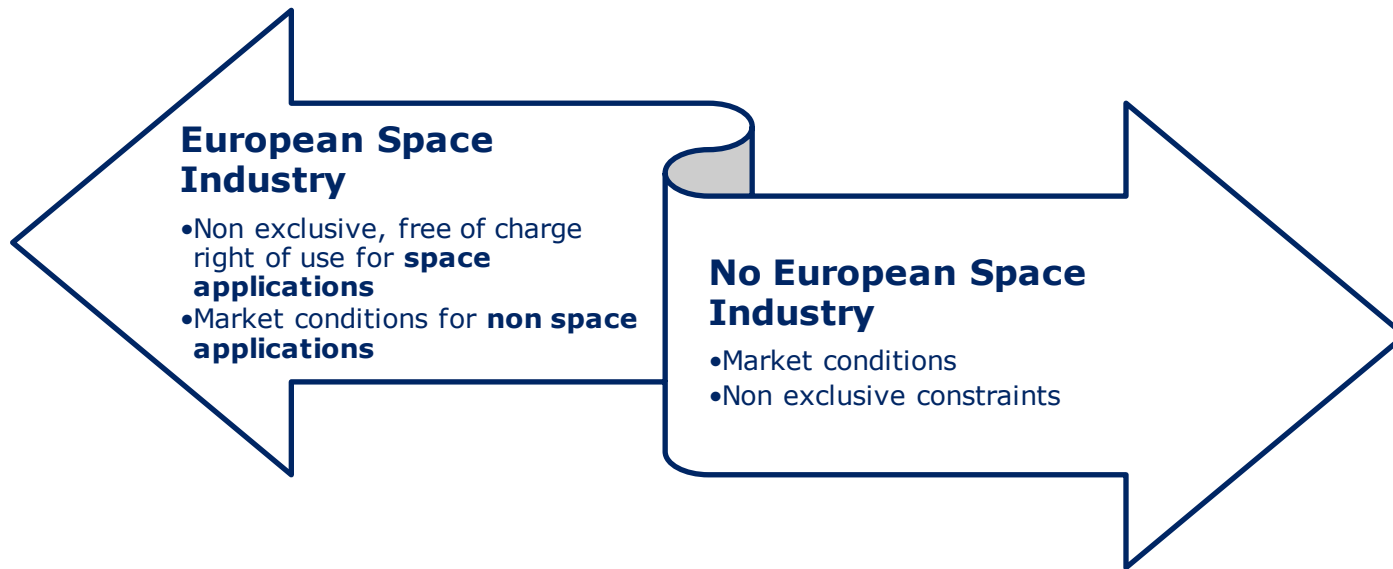
Jul 26, 2015 | 179 views | 3 Likes | 0 Comments

This **Space Solutions Capsule** provides key information of the Intellectual Property Rights developed by ESA's Division of Radio Frequency Systems, Payload and Technology around efficient solutions for the communication link of wireless networks (both terrestrial and satellite). The technology solutions included offer improvements for several terrestrial asynchronous communication applications, and the feasibility of the opportunity is analysed.

THE MARKET

The global broadcasting and cable TV market had total revenues of \$435.8bn in 2013, representing a Compound Annual Growth Rate (CAGR) of 5.7% between 2009 and 2013. In comparison, the European and Asia-Pacific markets grew with CAGRs of 2.7% and 6.5% respectively, over the same period, to reach respective values of \$108.4bn and \$101.7bn in 2013. Regarding Europe's slower growth, the

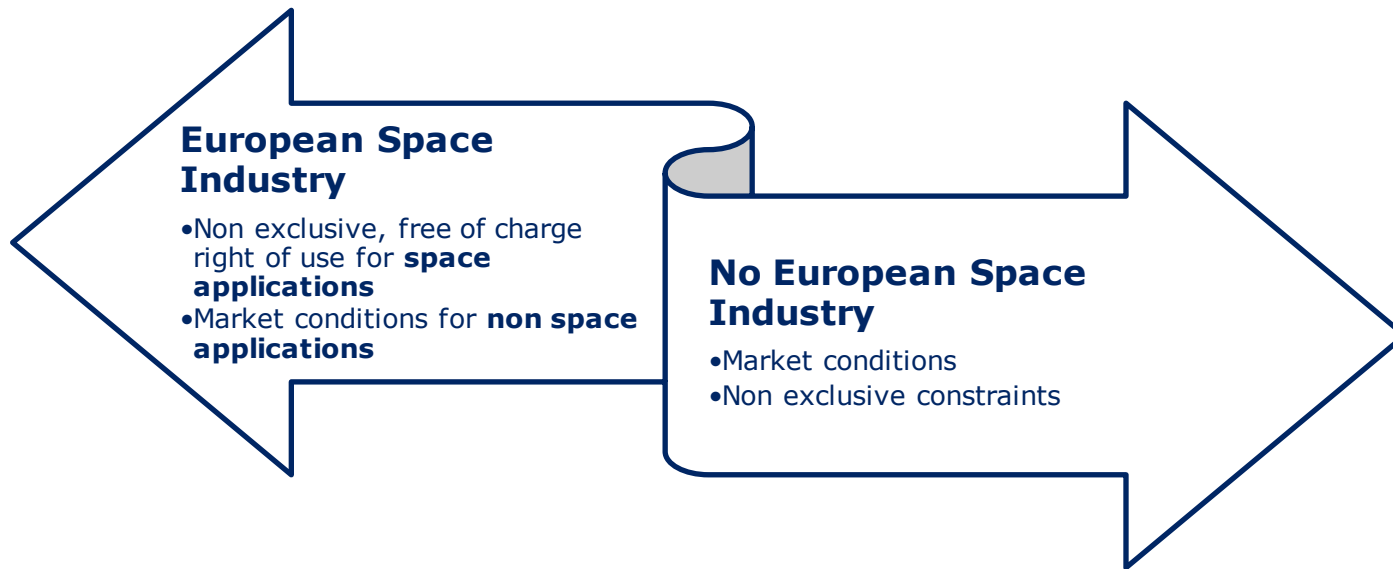
ESA IPR LICENSING



Extra- ESA Exploitation of IPRs:

- A board (*Industrial Policy Committee*), composed of representatives of ESA Member States, monitors the transfer of technology to non-Member States
- An uniform procedure enables ESA and Member States to control the circulation of information and data to third countries to guarantee consistency with ESA's own objectives.

ESA IPR LICENSING

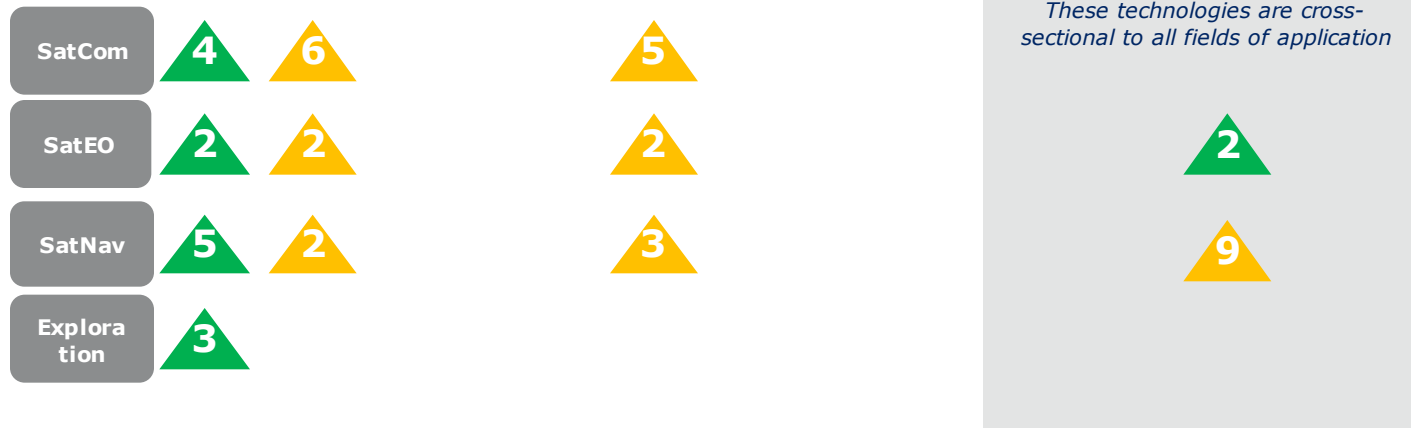


A License agreement with ESA enables you:

- To exploit the right of using the IPRs
- To fit the technology from the IPR to your purposes through the technical support of the ESA inventors
- To brand your business with



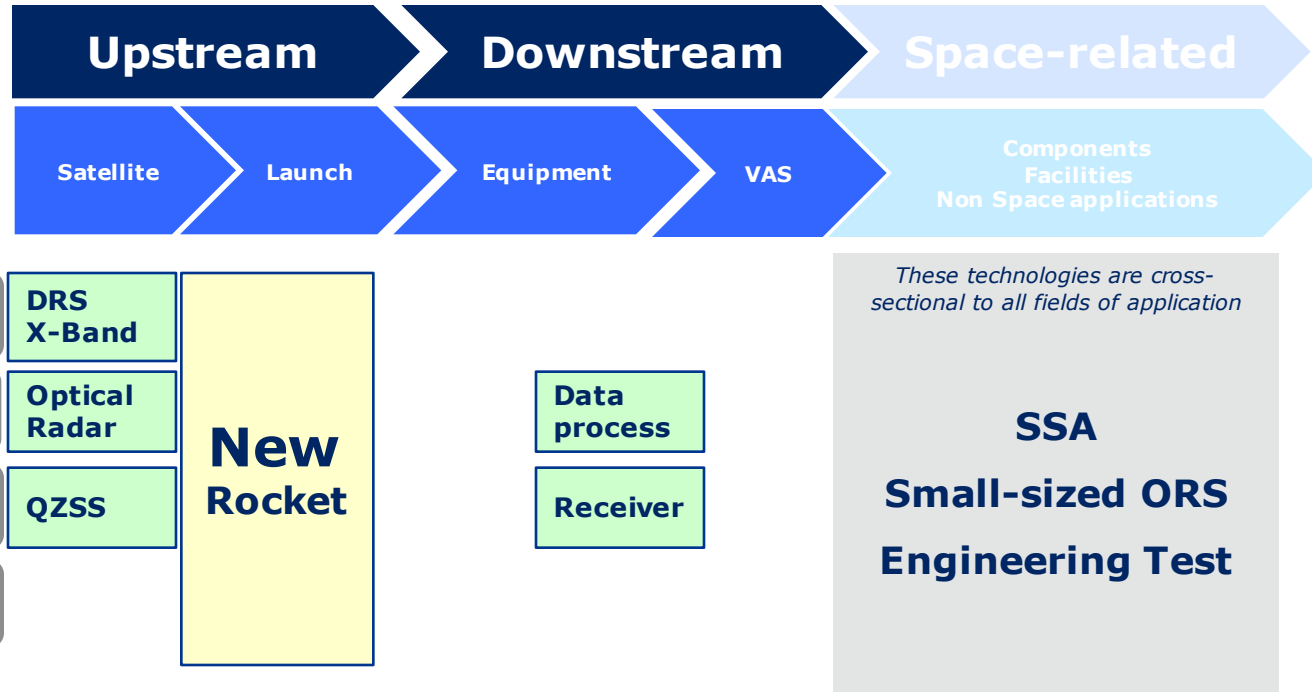
ESA IPR FOR JAPAN



Number of Patents granted in Japan
 Number of WIPO applications

- The current ESA IPR Portfolio presents almost 35 inventions with single and multiple applications

ESA IPR FOR JAPAN



- The current 10-year Japanese Space Policy Plan presents programs along the all space value chain

ASSEMBLING OF X-RAY REFLECTING GLASS FOR OPTICAL UNITS

Technology description

Method of assembling X-ray reflecting plates into an optical unit. The mirrors are shaped and **aligned nearly parallel to incoming X-Ray**. The reflection is based on the **grazing angle impact** of the photons or the high-energy particles with the reflecting surface. This technology provides a solution to the problems associated to the design and alignment required for the X-Ray reflecting surfaces.

Applications

This solution can provide advantages in those technical applications based on X-ray proton captions, such as **X-ray Medical Imaging, material quality controls, security inspection systems** and **particle telescopes**, among others. New areas of application could also include **electron microscopy** and **X-ray based crystallography**.

Added-value and benefits

- **Reduced manufacturing cost** compared to similar patents
- **Increased performance** of equipment dealing with X-ray imaging
- **Power of required X-ray sources will be reduced**, lowering costs
- Increased focus will **reduce over-radiation**.

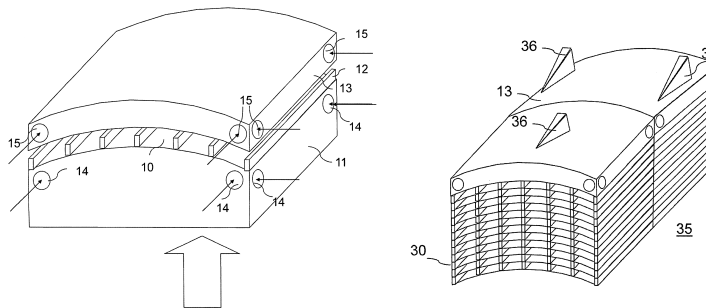
Technology readiness

The technology has been validated under laboratory conditions.

IP Status

Patents have been granted in France, Germany, Italy, United Kingdom and USA and a patent application has been filed in Japan.

[EP2348348](#); [JP2013503324](#); [US2012182634](#).



METHOD FOR DESIGNING A MODULABLE METASURFACE ANTENNA STRUCTURE

Technology description

This manufacturing method creates an **artificial electromagnetic surface (metasurface)** that can be applied to the field of reflector antennas. The metasurface has a modulated impedance tensor with sub-wavelength variations, allowing the **metasurface to adapt to the electromagnetic properties of an antenna so the antenna can work at different bandwidths**. Thanks to the properties of these meta-surfaces, the invention **allows much larger apertures at reduced size of antennas' reflectors** because the feeding elements don't need to be placed at or around the optical focus of the reflector. Moreover the invention can be implemented in a simple way and using low-cost technologies.

Applications

This technology can be of interest to **antenna reflector manufacturers** that can adopt this method in order to shape new reflectors based on metasurfaces. This solution can benefit different sectors such as **telecom services providers** (e. g. cell phone communication, electromagnetic shielding), **defense (radars)** and **medical imaging**.

Added-value and benefits

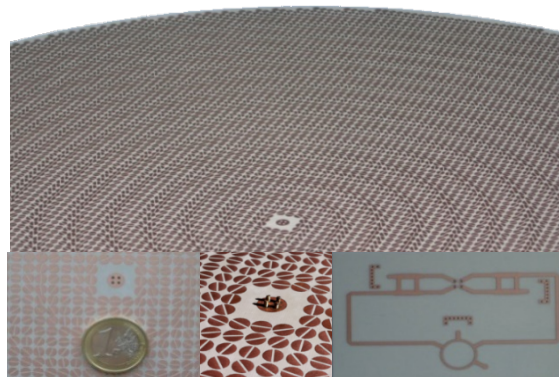
- More degrees of **freedom in the design** of antennas
- Much **larger apertures at reduced size**.
- Useful in all fields of telecommunication (terrestrial and satellite).
- Overall **cost reduction** (% depending on the application).
- Very **simple implementation** using **low-cost** technologies (eg. standard printed circuit manufacturing).
- **Improved performances**.

Technology readiness

The proof of concept has been validated.

IP Status

An International patent application has been filed



MANUFACTURING OF A CERAMIC ARTICLE FROM A METAL PREFORM PROVIDED BY 3D-PRINTING

Technology description

New method of **producing 3D ceramic lattices** for use in catalytic applications. The desired **structure is printed in metallic form** and then carry out a special 2-stage heat and oxidation treatment afterwards, that turns the metal to oxide in a controlled manner. The metal, the gas and the time-temperature profile is applied so as to **induce a metal-gas reaction resulting in at least a part of the preform transforming into a ceramic**. This provides an **affordable method to produce ceramic lattices** (or other complex articles) in comparison with other currently used methods.

Applications

Apart from the original propose for which this invention has been designed (**ionic thrusters**), the catalytic ceramic lattices obtained with this invention might also provide **benefit for different processes** such as:

- **Gas purification** by dehydration or desulfurization.
- **Crude hydro-processing**.
- Vehicle or industry **emission purification**.
- **Bad smell removal**.
- **Heat exchange applications** in order to save energy mainly in steel works and metallurgy industry.
- **Biomedical applications** (artificial ceramic-based tissues that allow oxygen supply).

Added-value and benefits

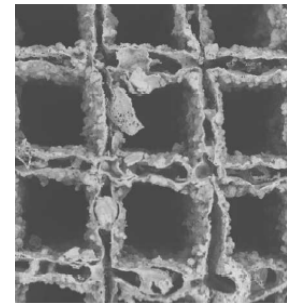
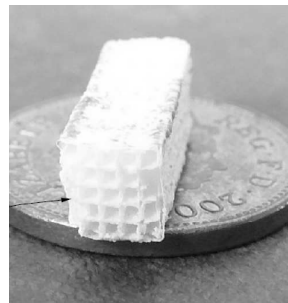
- **High cost reduction** in comparison with the current methods.
- **Full control over the spatial configuration** of the material.
- **Higher control of the inner structure** of a porous or lattice-type ceramic article (It is possible to obtain articles in which the grain size is nano-size)
- **Falling of loose powder is avoided**.

Technology readiness

A prototype has been tested under industrial resembling conditions.

IP Status

An international patent application has been filed



N X50 2mm

ADVANCED FLUIDIC FILTER

Technology description

Multi-layer mesh filter for fluids with an improved structure that maximizes the surface and **prevents particle build up**. The filter is **obtained by an additive manufacturing** process and, thanks to this, some unique features can be achieved. The main feature is that **the filter is a single piece**, which provides advantages such as avoiding weld joints, reducing the manufacturing time and avoiding spread of filter passages found in wire mesh filter elements. Furthermore, the filter is **manufactured with a Titanium alloy**, which makes it **corrosion resistant**.

Applications

This technology can benefit those applications in which a **fluid shall be filtered from pollutants or impurities** such as: **Aeronautics and automotive** (fuel impurities), **chemical industry** (High pressure liquid chromatography systems, capillary based systems), **Industrial biotechnology** (enzyme production), **thermo-nuclear plants** (cooling systems)

Added-value and benefits

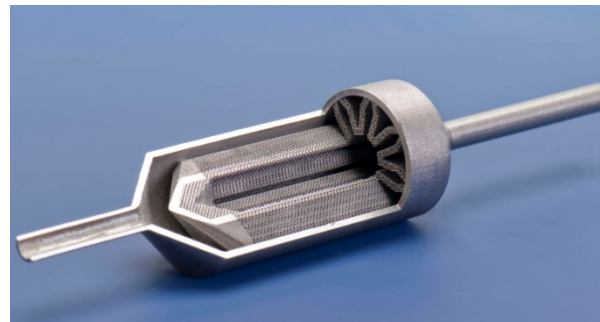
- **Single piece**
- **Reduced building time and cost**
- **High corrosion resistance**
- **Light weight**
- The structure **maximizes the filtering surface and minimizes the clogging and pressure drop**
- **Multi-layer mesh structure** (prevent the passage of long slender contaminants).

Technology readiness

A prototype has been tested under industrial resembling conditions.

IP Status

An international patent application has been filed

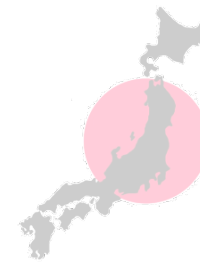


ESA IPR FOR JAPAN



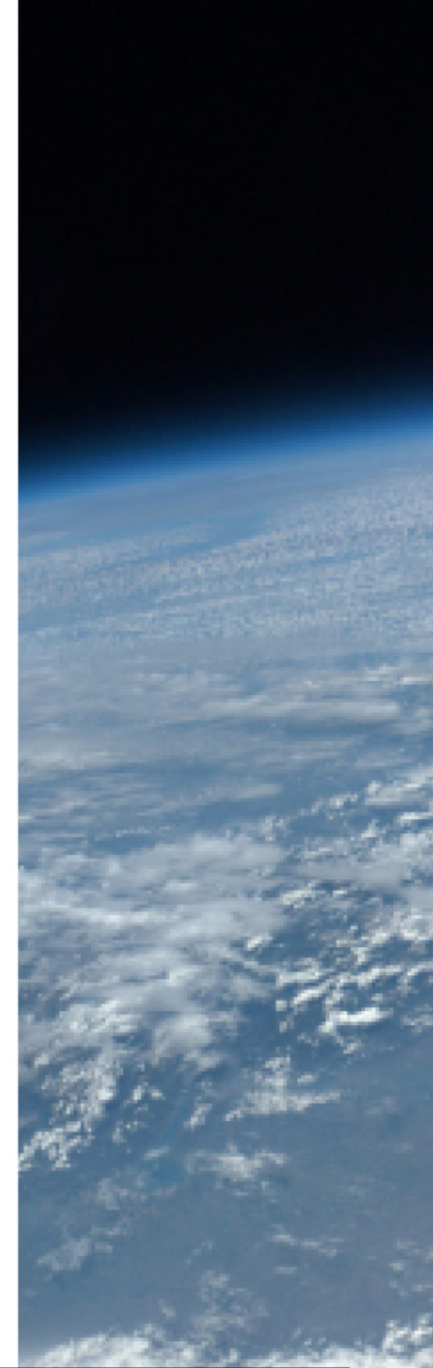
Patent	Title	Application	JP Program Need	Status	Age
JP 2003509660A	Multipath discriminator module for a navigation system	SATNAV	QZSS	Granted in JP	15 years
JP 2004561578A	Method and system for real time navigation using satellite transmitted three-carrier radio signals and ionospheric corrections	SATNAV	QZSS	Granted in JP	14 years
JP 2004546033A	Sub-millimetre wavelength camera	SATEO, Science	IGS, Exploration	Granted in JP	14 years
JP 200539799A	Optical reflector element, its method of fabrication, and an optical instrument implementing such elements	SATEO, Science	IGS, Science	Granted in JP	12 years
JP2007529383A	Electronic timepiece of the type that is a multifunctional, navigational aid watch, which is particularly suitable for space missions	SATNAV	QZSS	Granted in JP	12 years
JP 2010541700A	Active pixel sensor apparatus for use in a star tracker device	SATCOM, SATNAV, SATEO, Explorations	Upstream segment	Granted in JP	8 years
JP 2011526824A	Installation for the treatment of urea containing water, toilet, stable and method	Exploration, non Space	Exploration	Granted in JP	8 years
JP 2012525936A	Method for assembling a mirror plate stack	Exploration	Exploration	Granted in JP	7 years
US 20140354473 A1	Navigation system using spreading codes based on pseudo-random noise sequences	SATNAV	QZSS	Granted in JP	5 years

ESA IPR FOR JAPAN



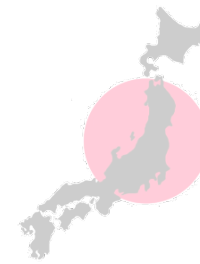
Patent	Title	Application	JP Program Need	Status	Age
JP H08116214A	A method and apparatus for generating an input signal for a parameter sensitive circuit	Cross-sectional	Cross-sectional	Granted in JP	16 years
WO 2014170710 A1	Radio-frequency high power amplifier with broadband envelope tracking by means of reversed buck converter	SATCOM	DRS	Granted in JP	3 years
WIPO					
WO 2015131930 A1	Methods for production of superconducting components	Cross-sectional	Cross-sectional	WIPO	< 2 years
WO 2015028065 A1	Manufacturing of a metal component or a metal matrix composite component involving contactless induction of high-frequency vibrations	Cross-sectional	Cross-sectional	WIPO	< 3 years
WO 2015058784 A1	Very compact tm01 mode extractor	SATCOM	DRS, Dual-use SATCOM	WIPO	< 3 years
WO 2015117680 A1	Lumped element rectangular waveguide filter	SATCOM, SATEO, Science	DRS, Dual-use SATCOM, IGS	WIPO	< 2 years
WO 2015058809 A1	Hybrid folded rectangular waveguide filter	SATCOM, SATEO, Science	DRS, IGS, Dual-use SATCOM	WIPO	< 2 years
WO 2015110155 A1	Receiving method and receiver for timing and frequency offset correction of continuous phase demodulation in satellite-based automatic identification systems	SATCOM	Maritime Awareness	WIPO	< 2 years

ESA IPR FOR JAPAN



Patent	Title	Application	JP Program Need	Status	Age
WIPO (Cont'd)					
PCT/EP2015/055807	Reconfigurable RF front end circuit for a multi-beam array fed reflector antenna	SATCOM	DRS, Dual-use SATCOM	WIPO	< 1 year
WO 2015092478 A1	Digital beam-forming network having a reduced complexity and array antenna comprising the same	SATCOM	DRS, Dual-use SATCOM	WIPO	< 2 years
WO 2015090351 A1	Method for designing a modulated meta-surface antenna structure	SATCOM and terrestrial use	Telecommunication	WIPO	< 2 years
WO 2015192872 A1	Methods for production of alloy wires and shaped alloy components from mixed metal halides	Cross-sectional	Cross-sectional	WIPO	< 2 years
WO 2015132618 A1	Imaging antenna systems with compensated optical aberrations based on unshaped surface reflectors	SATCOM, SATNAV, SATEO	DRS, Dual-use SATCOM, IGS, QZSS	WIPO	< 2 years
WO 2015081996 A1	Manufacturing of a ceramic article from a metal preform or metal matrix composite preform provided by 3d-printing or 3d-weaving	Cross-sectional	Cross-sectional	WIPO	< 3 years
WO 2015192995 A1	Joint transmitter signal processing in multi-beam satellite systems	SATCOM	DRS, Dual-use SATCOM	WIPO	< 2 years

ESA IPR FOR JAPAN



Patent	Title	Application	JP Program Need	Status	Age
WIPO (Cont'd)					
PCT/EP2014/073611	Fluidic filter	Cross-sectional	Cross-sectional	WIPO	< 2 years
WO 2015166296 A1	Wideband Reflect array Antenna for Dual Polarization Applications	SATCOM, SATEO	DRS, Dual-use SATCOM, IGS	WIPO	< 2 years
PCT/EP2014/072214	Method of manufacturing bulk metallic glass components	Manufacturing satellite and rocket components	SATCOM, SATNAV, SATEO, Rocket New	WIPO	< 2 years

- An IPR license agreement with ESA will empower your business to Japan
- ESA can be your technological partner



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Q&A SESSION

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