



Agenzia Spaziale Italiana



2019

INTERNATIONAL
SPACE FORUM
AT MINISTERIAL LEVEL
THE MEDITERRANEAN CHAPTER

SPACE EDUCATION, COOPERATION AND SCIENTIFIC KNOWLEDGE

KEYNOTE SPEECH

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*...some key-words about the
space science aspects...*



*Studies of the heavens and observations
of astronomical phenomena go back to
archaic time and cross the centuries ...*



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of astronomical phenomena go back to
archaic time and cross the centuries ...*

IV Century B.C. : Ancient Cities of Mesopotamia, Egypt and Greece

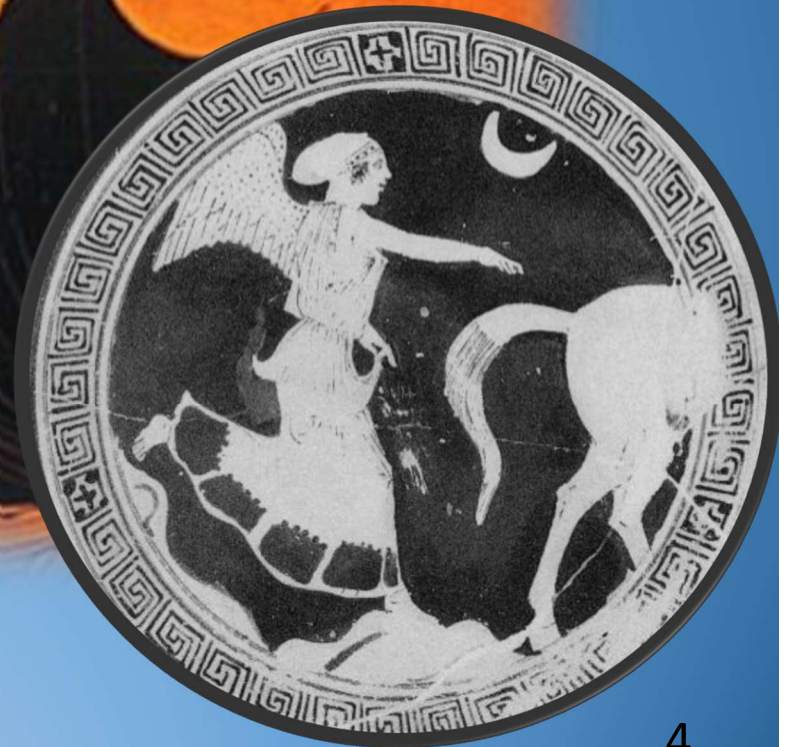
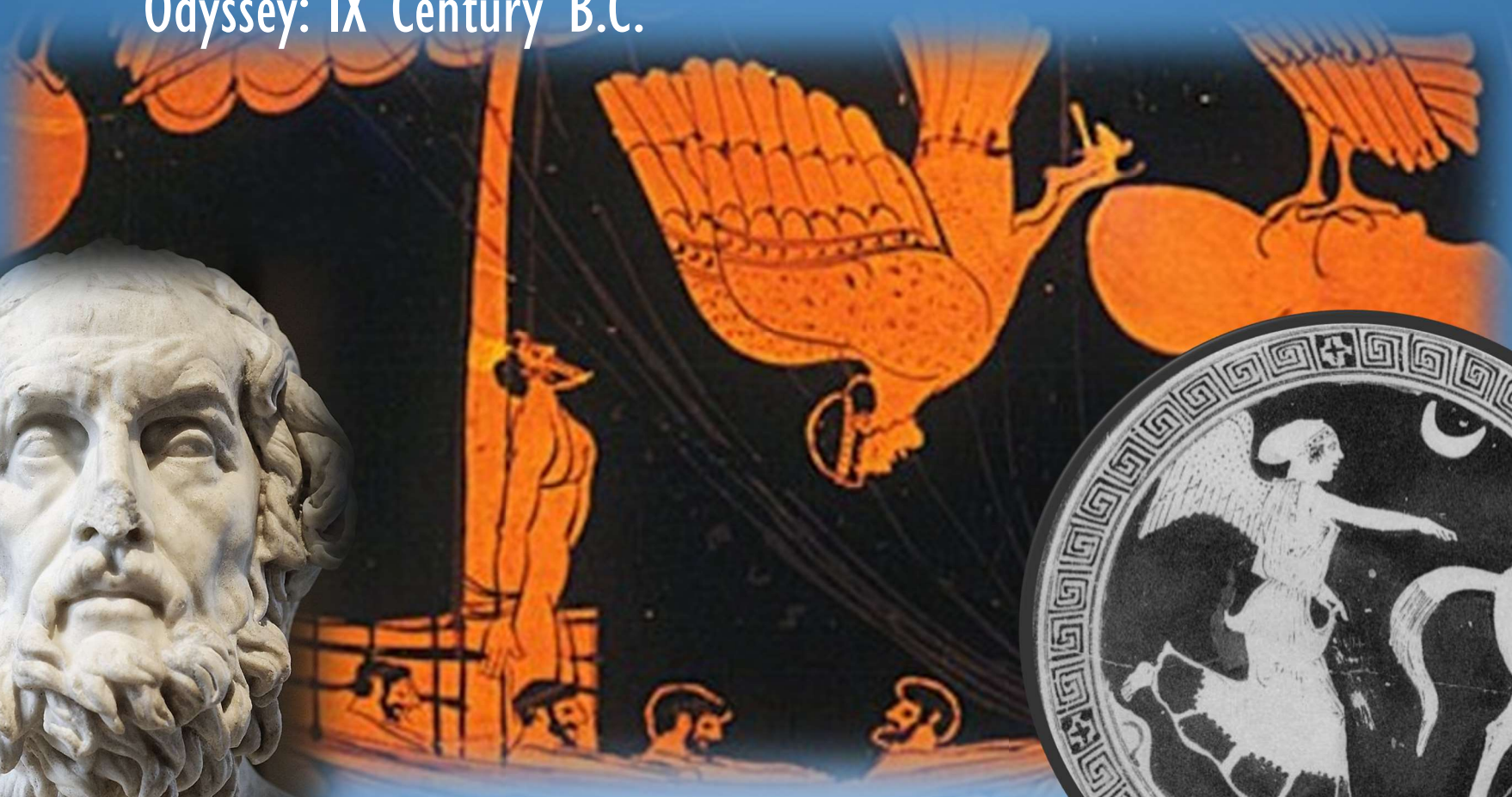
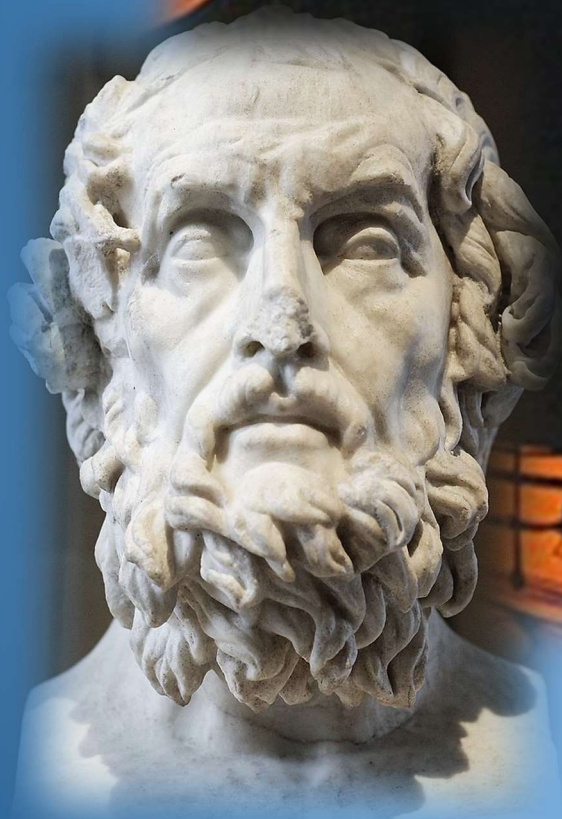


Aristotle: 384—322 B.C.

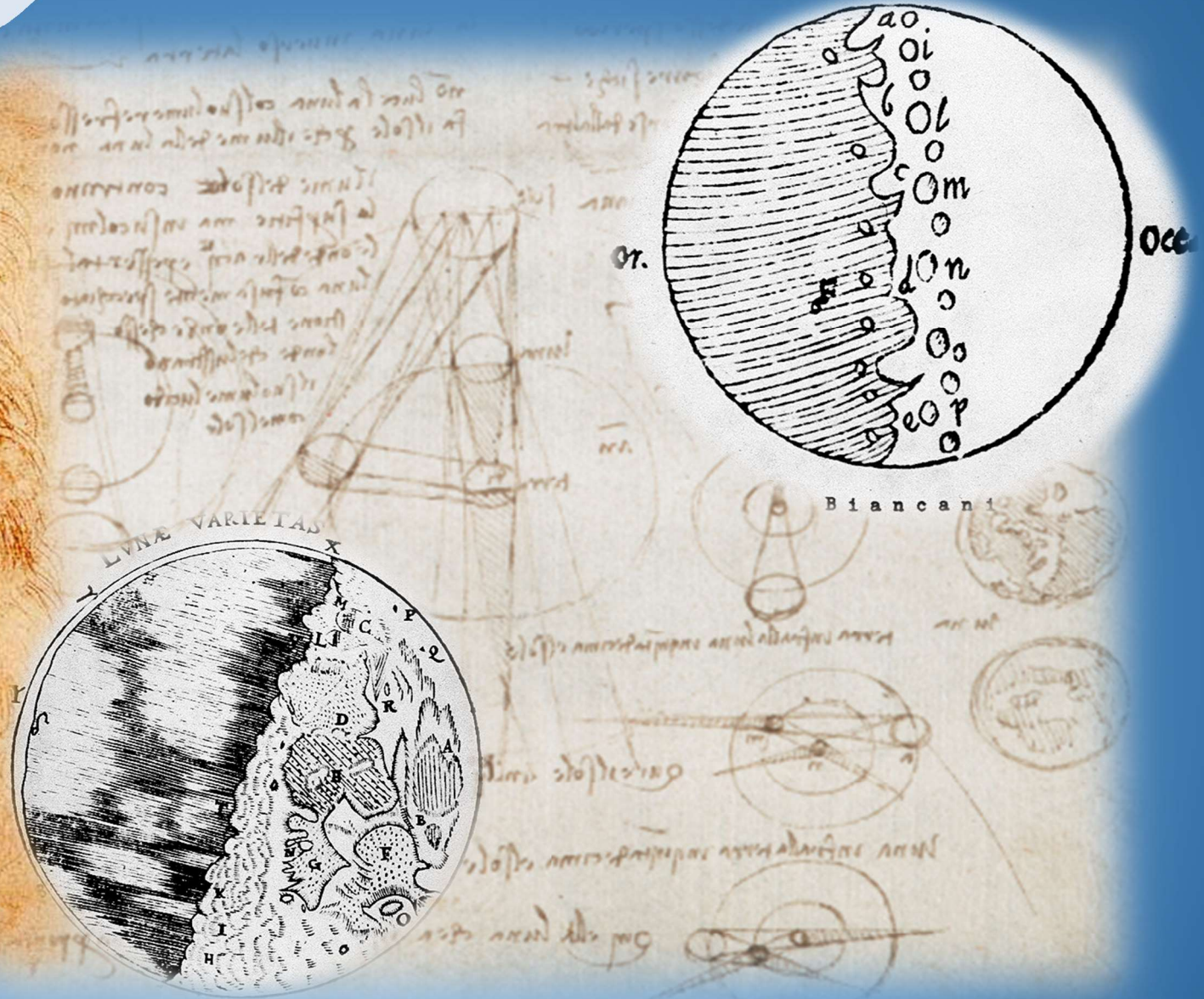
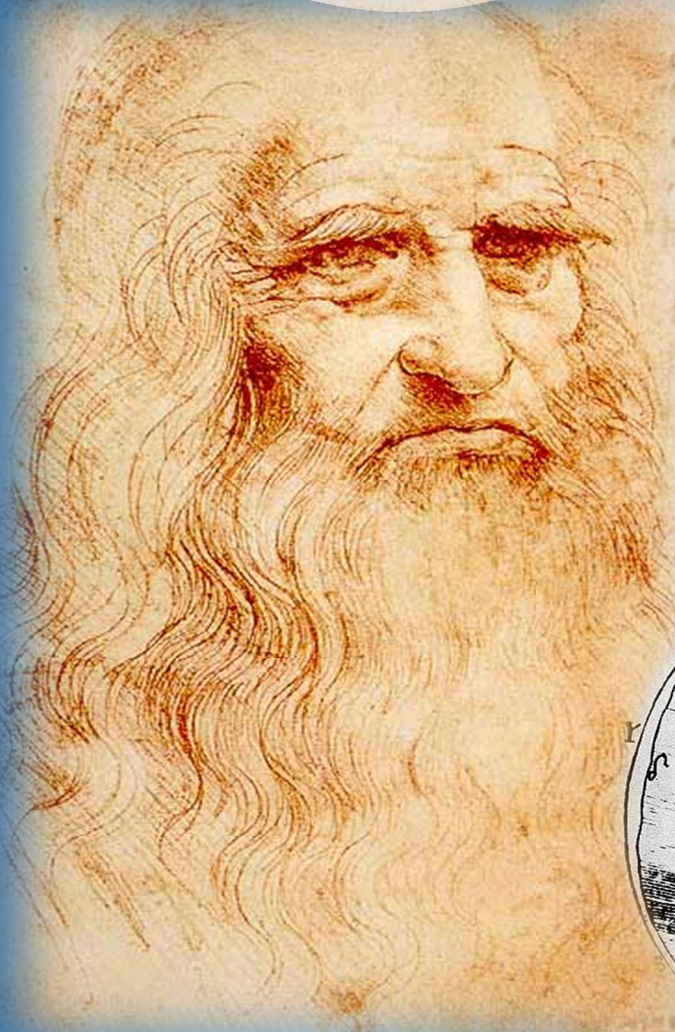


*Studies of the heavens and observations
of astronomical phenomena go back to
archaic time and cross the centuries ...*

Odyssey: IX Century B.C.



*We owe to the famous “Diaries” of
Leonardo Da Vinci the early most
detailed representation of the Moon...*



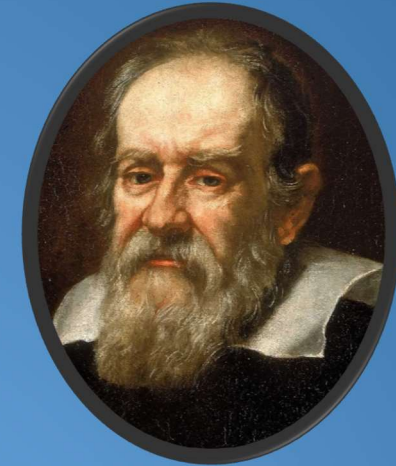
*In the seventeen century, many scientists
laid the groundwork for the recent
development of astronomical science...*



William Gilbert (1544-1603)



Giordano Bruno (1548-1600)



Galileo Galilei (1564-1642)



Johannes Kepler (1571-1630)



Thomas Digges (1560-1621)



Isaac Newton (1642-1726)

*Space observation deeply inspired the
universe of art and dreamy writers...*



Cyrano de Bergerac (1619-1655)

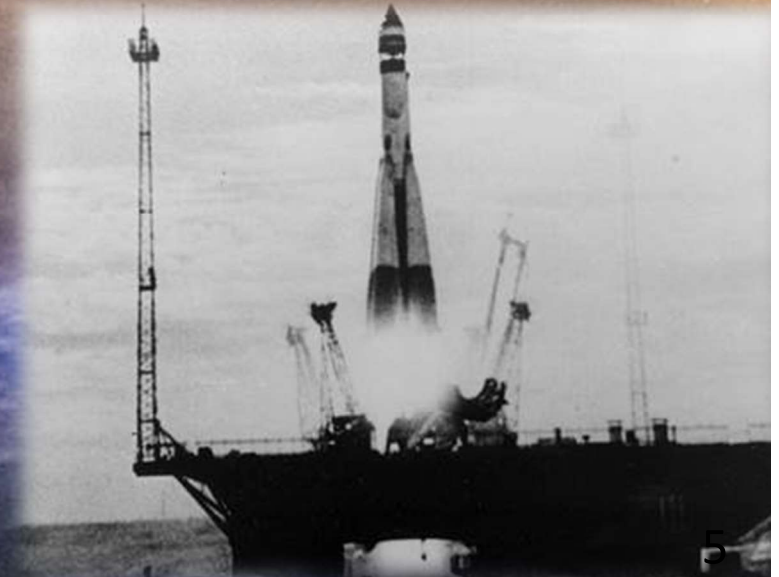


Jules Verne (1828–1905)



Herbert G. Wells (1866 – 1946)

By the middle of last century an impulse was given to the development of public domain and humankind interest in space matters





*... a specular impulse to the general
progress of technology...*



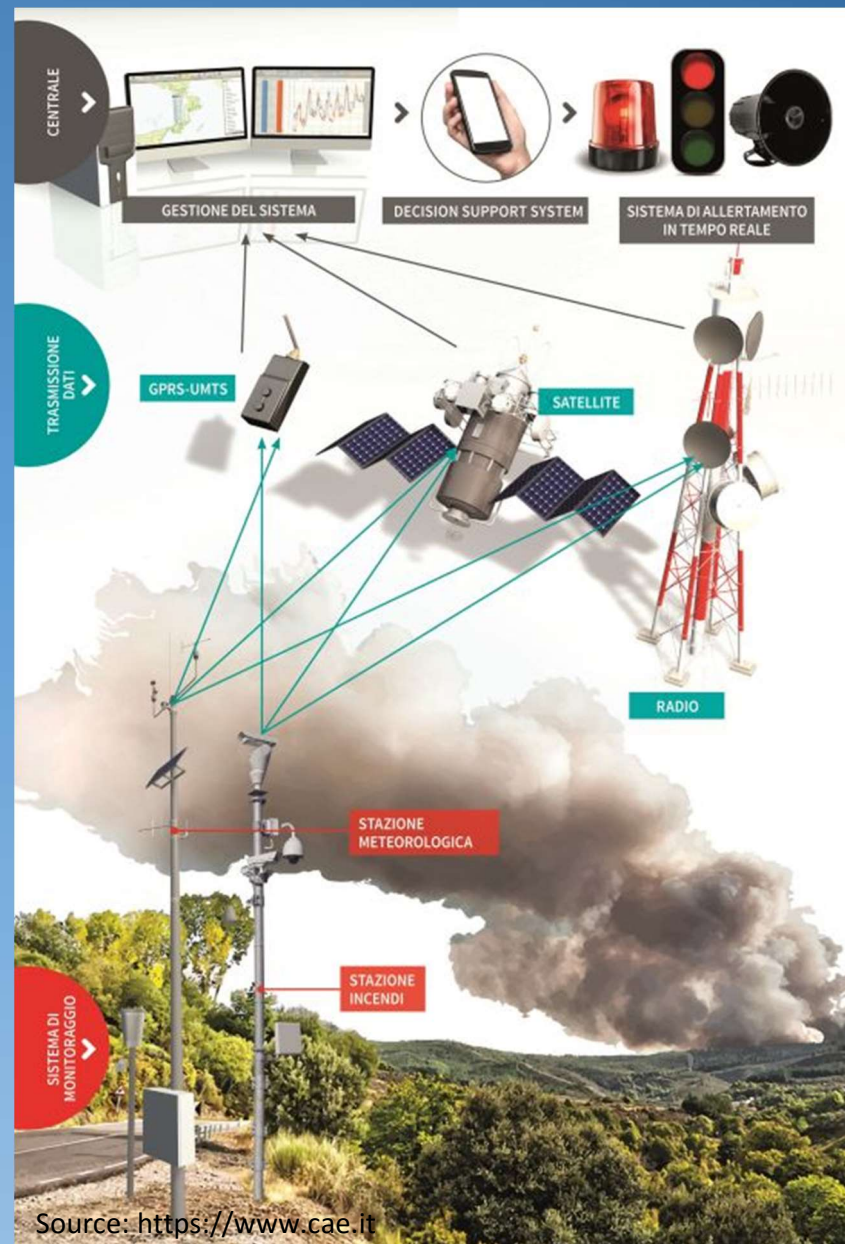
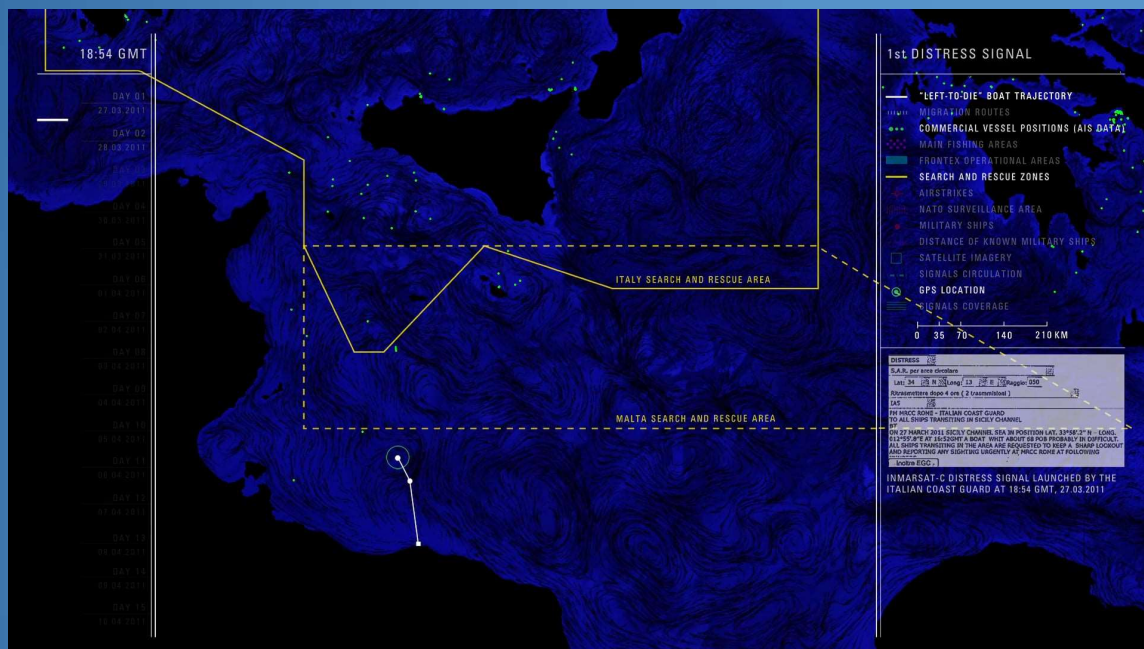
*The scientific knowledge developed for
space systems has become important
for the society ...*



At the global scale space systems integrated into fields as weather forecasting, communication, navigation, imaging, maritime surveillance and so on....



in the Mediterranean Region, aerospace data are used to assess forest fire risk or to track and rescue migrants in the sea...



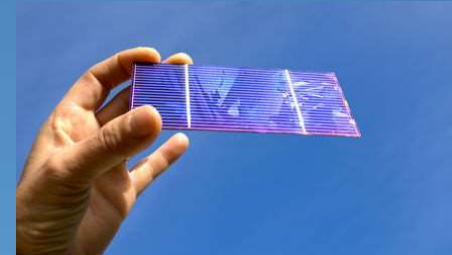
There are many hundreds of objects developed through space-generated research, familiar to everyday life...



Each innovation example is proof of the mutual impact of technology transfer from space to Earth and vice versa...

Energy

Space satellite sector



Agriculture and
environment

Canadian Space Agency



Health and
welfare

UK Space sector



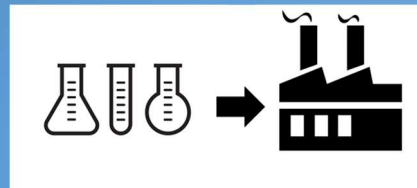
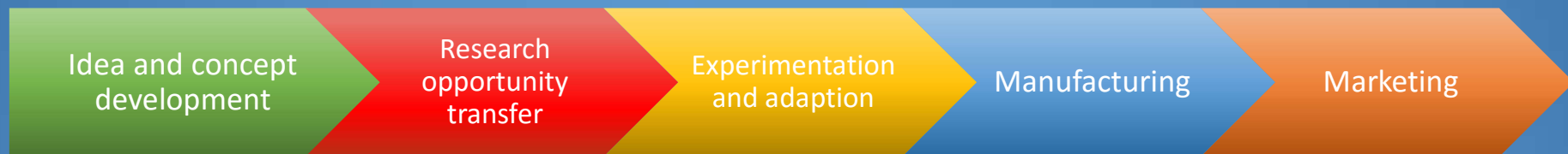
Many fields of
everyday life

ESA





Technology transfer crosses many phases ...



(source: Petroni et al., 2010; adapted from Rogers et al., 2001)

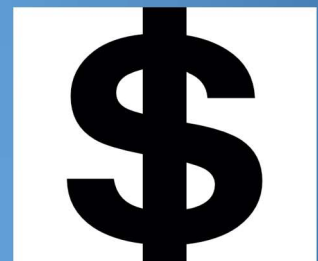
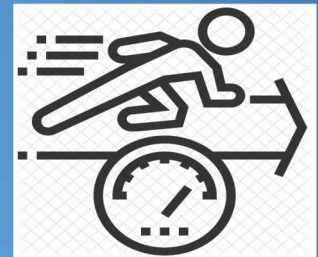
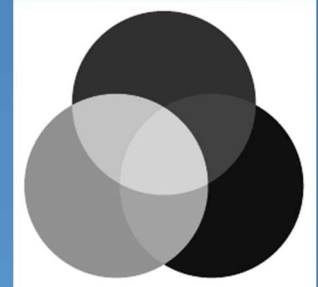
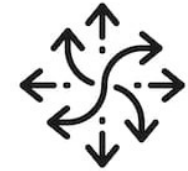
*There is no terrestrial equivalent to
space technologies...*

Versatility

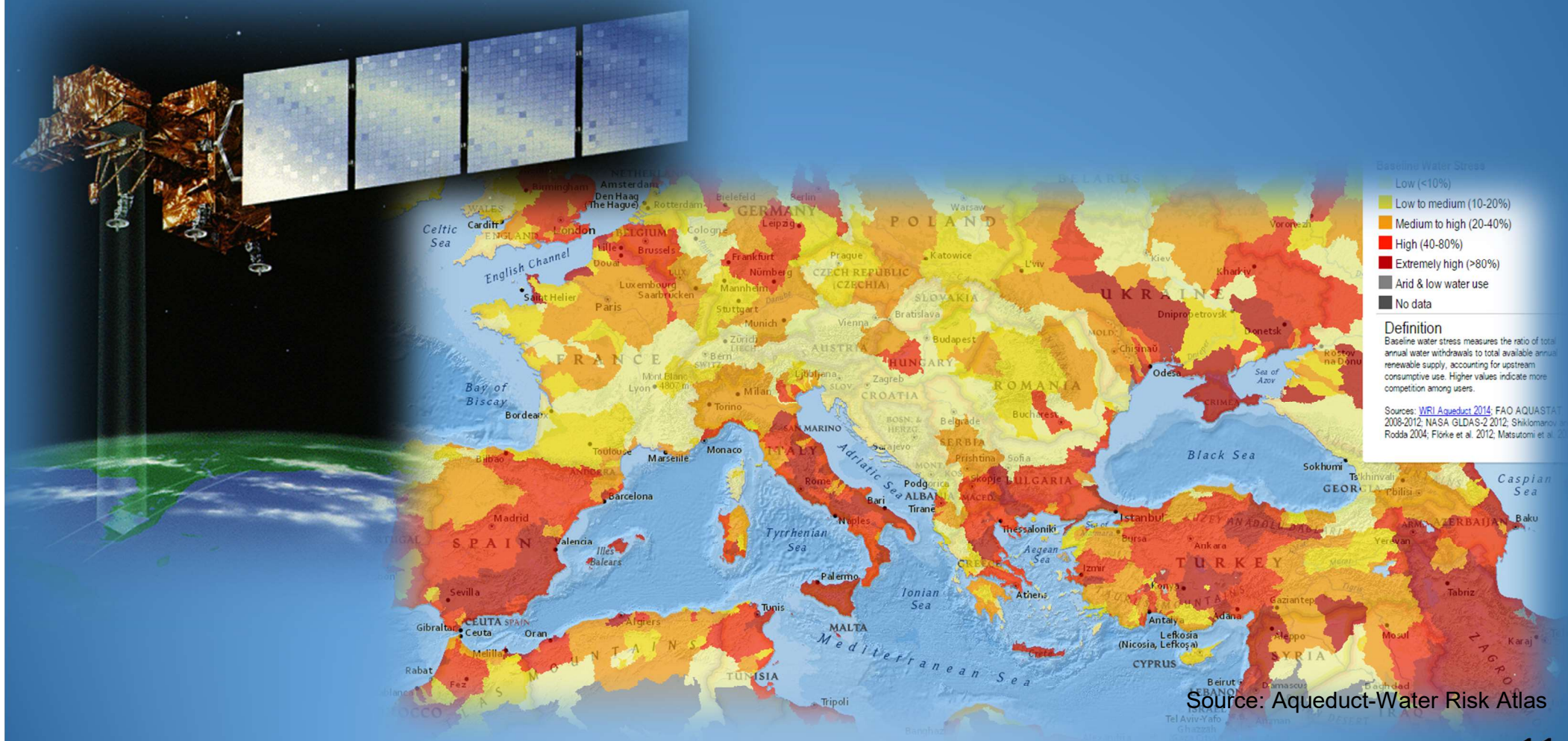
Integrability and Flexibility

High Performances and Reliability

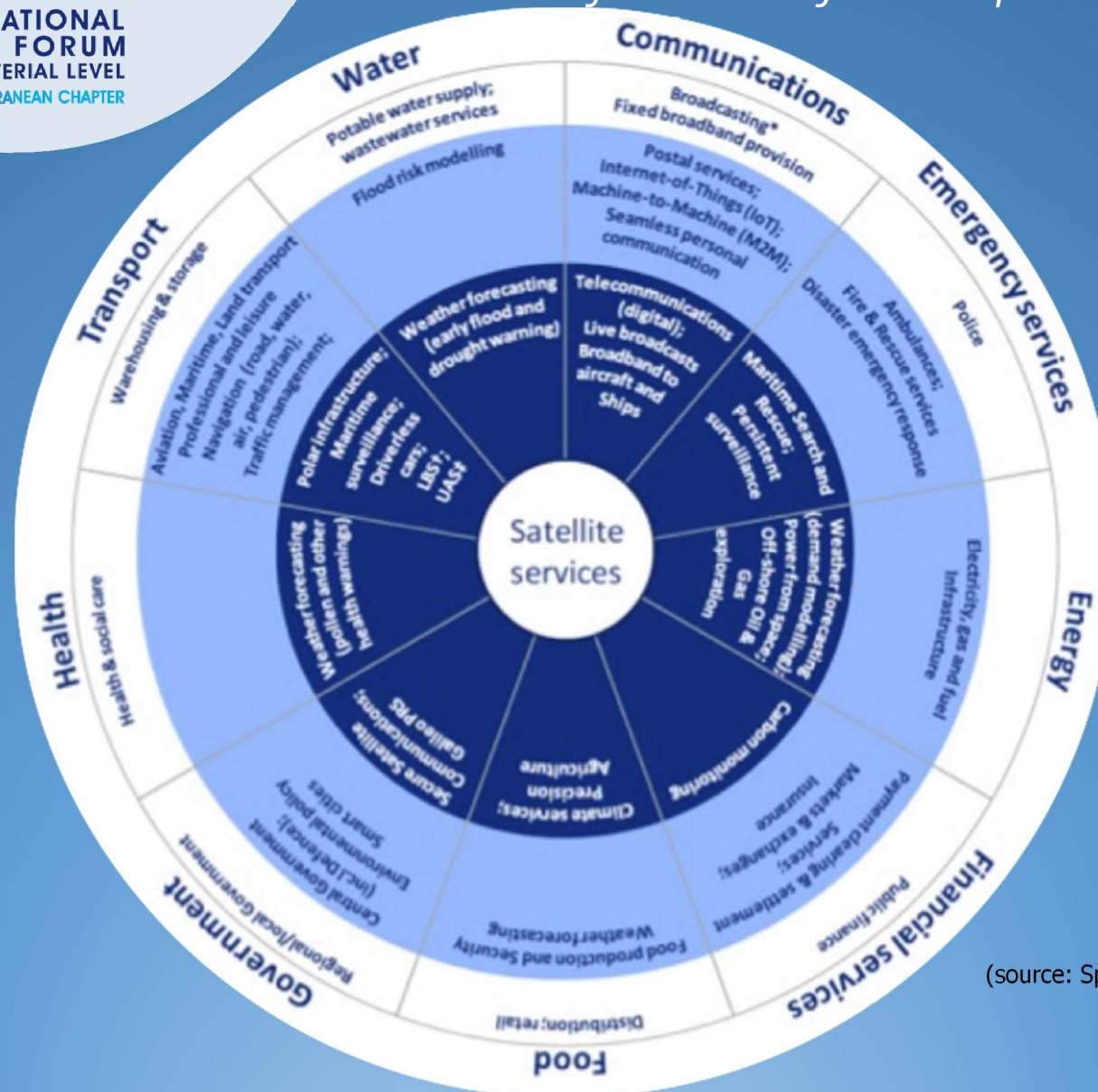
Small Mass and Economic Convenience



... it is impossible monitoring natural phenomena occurring in very large areas without using aerospace technologies...



Many fields can be considered under the influence of aerospace spinoffs...



(source: Space Sector Report, 2017)

Alternative solution
Enhancing solution
Enabling solution



Main obstacles to the visibility to people of innovations coming from aerospace research...



Time lag of innovation marketing

**18 months
10 years**

Cost of the space missions

**240 billion to
500 billion \$
(2030)**

(source: Space Sector Report, 2017)



Main obstacles to the visibility to people of innovations coming from aerospace research...



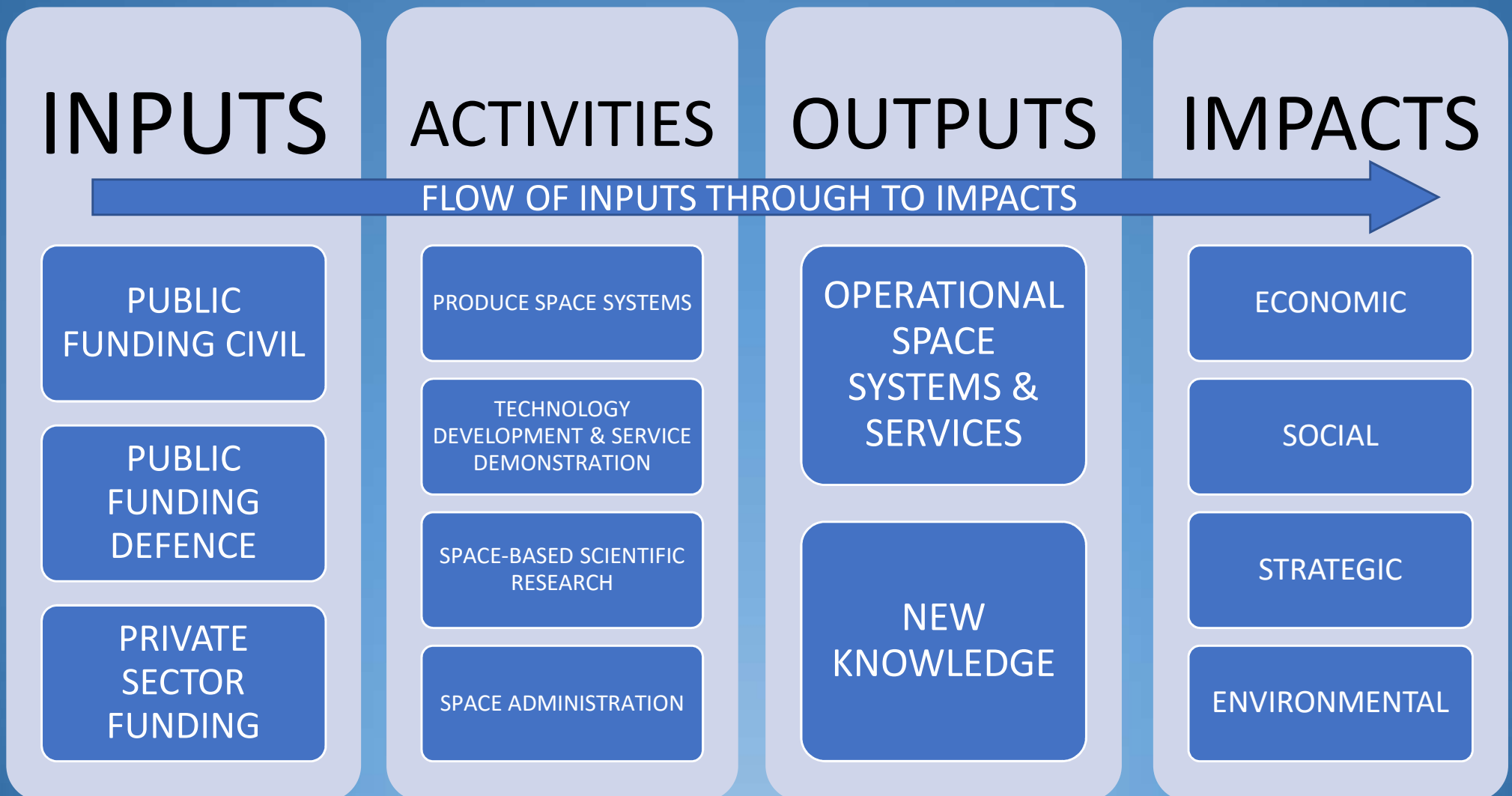
25%

People not aware about its social positive return

10%

People considering space technology not solving humanity problems

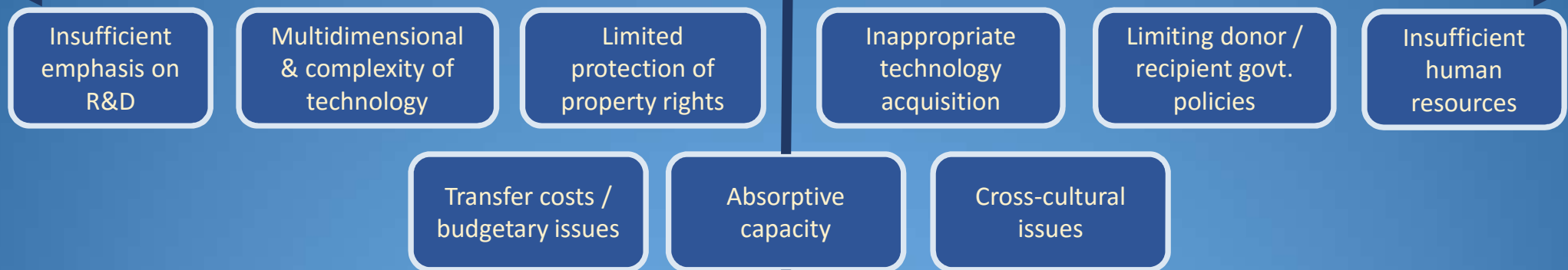
*It is crucial the role played by the
“facilitators” of the space chain, usually
space agencies and public research
actors...*



Many barriers and constraints still hamper a large dissemination of scientific knowledge among countries...

INTERNATIONAL AEROSPACE TECHNOLOGY TRANSFER

MAIN BARRIERS ITT



UNDERLYING ISSUES





Effective synergy of University with other key actors in the dissemination paths of aerospace knowledge...



HIGH-LEVEL
EDUCATION



TECHNOLOGY
PROMOTION AND
TRANSFER

(source: Hof et al., 2012; Clark et al., 2014)



TRENTO SPACE STATEMENT (2016)

“..... promotion of space capacity building, the expansion of the scientific and academic cooperation in the space field as a key factor for social, economic, and, more generally, the cultural development in the Mediterranean region”

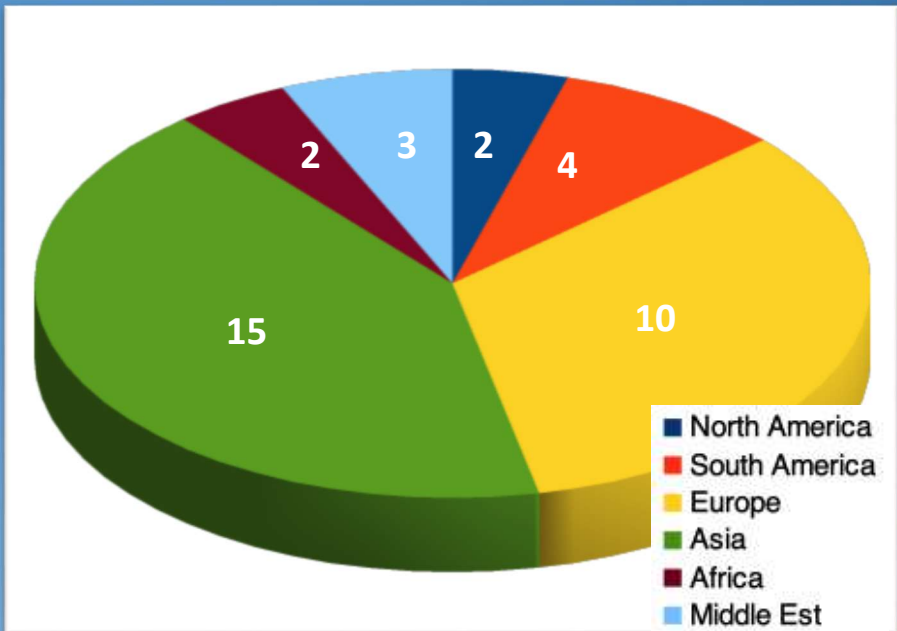
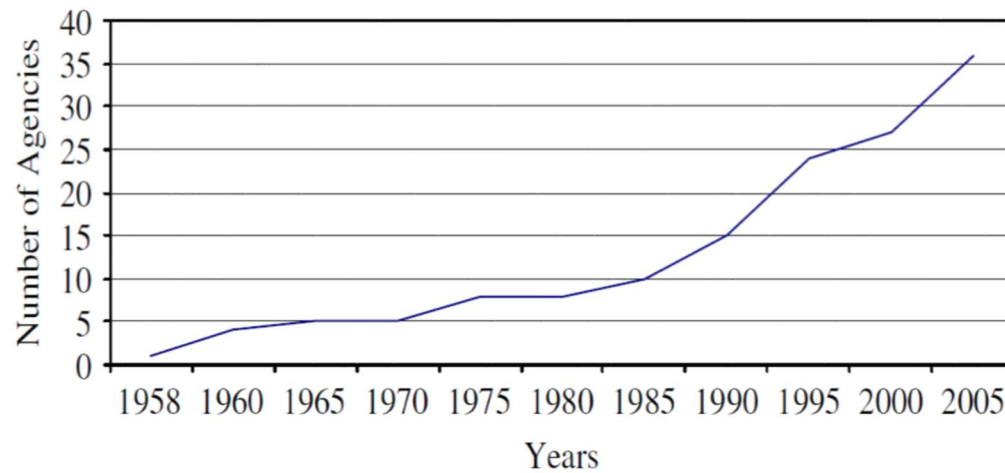
International Space Station as “open structure” and symbolic research laboratory ...



National civilian space agencies over the time...

Distribution per geographic region

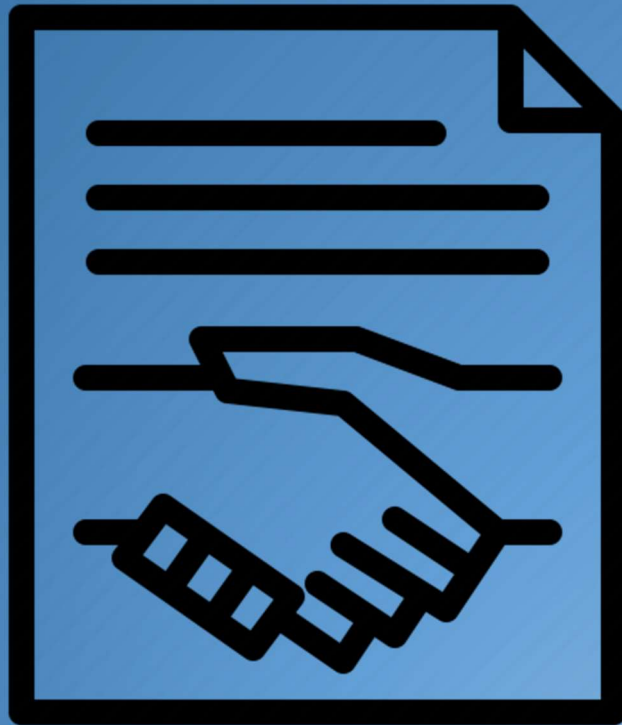
Evolution over time



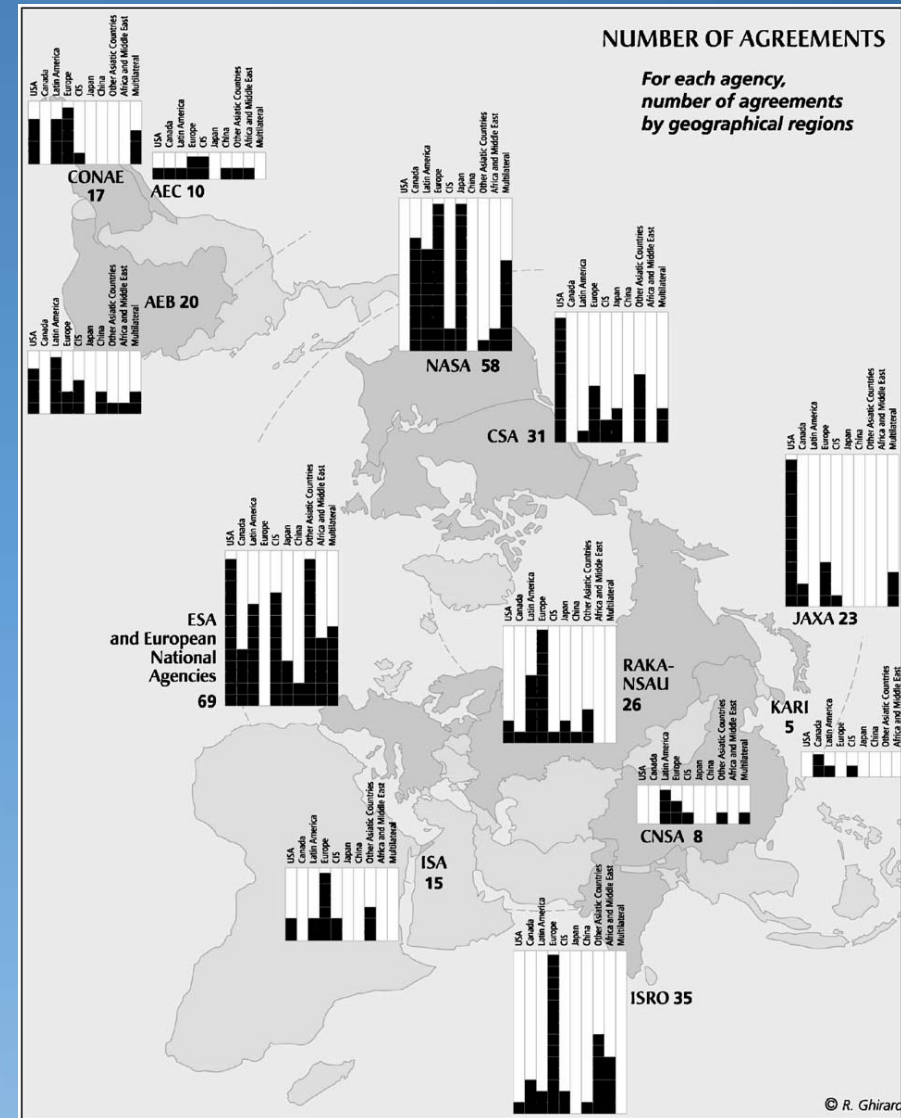
(Does not include multinational space agencies)

(source: Peter, 2006)

Number of agreements among the major space agencies

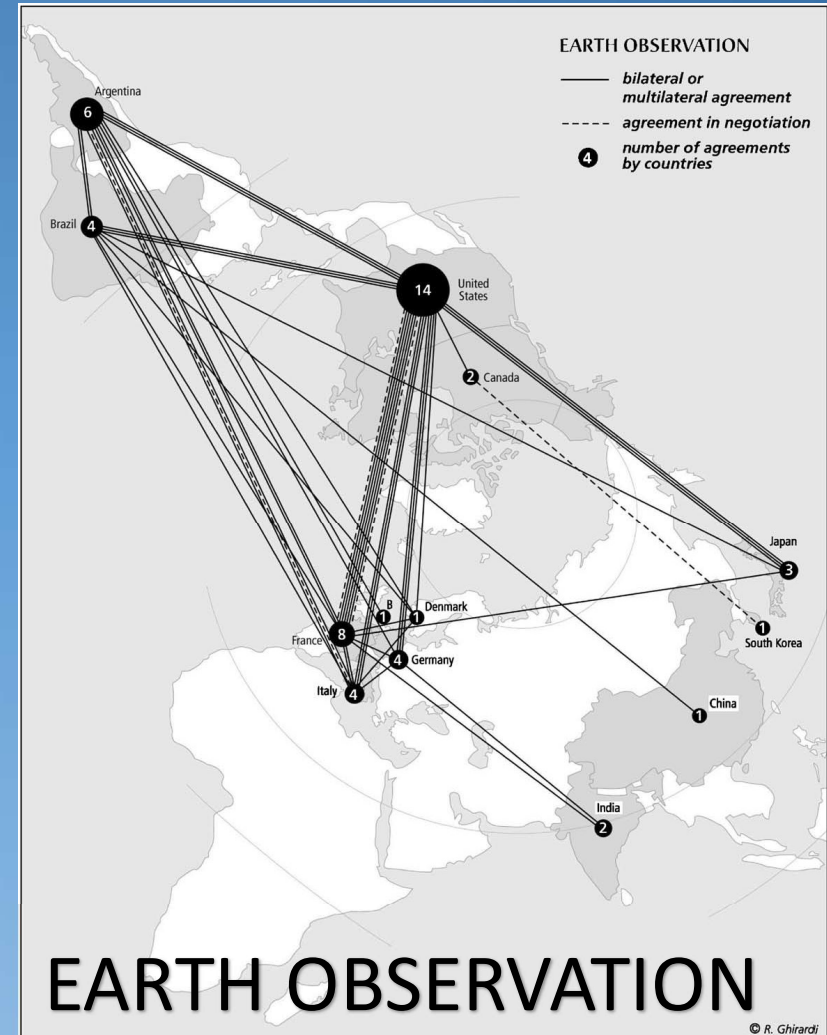
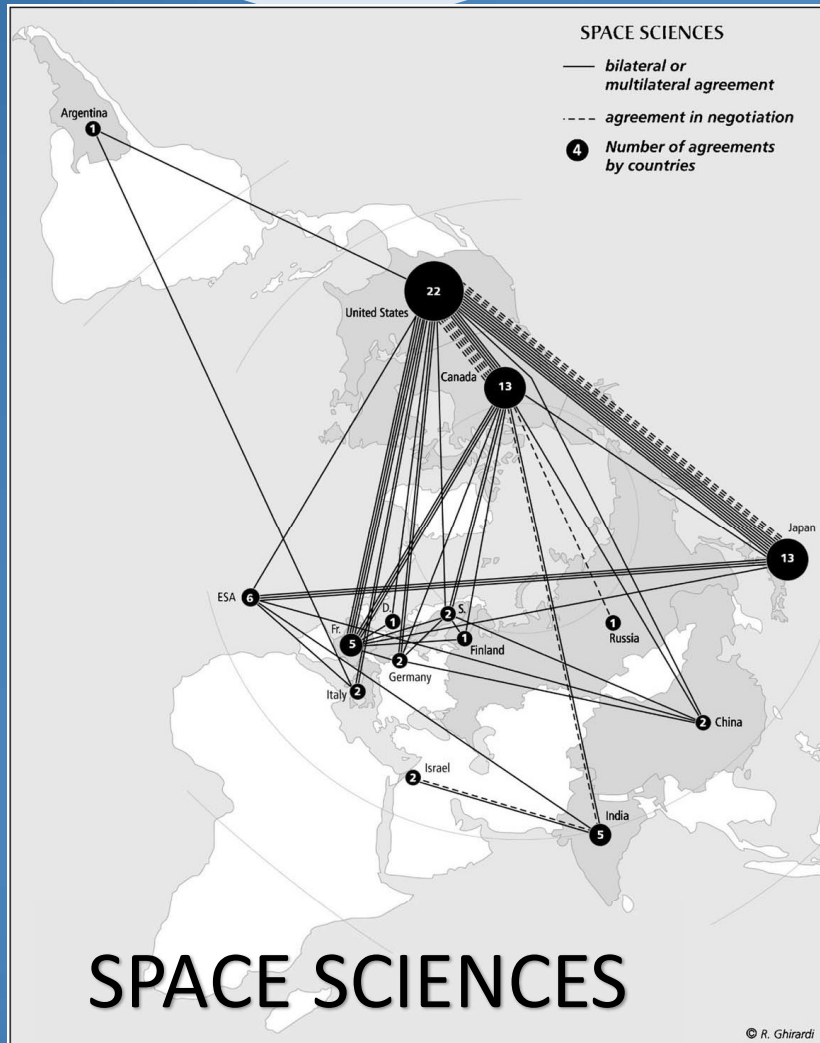


SPACE COOPERATION



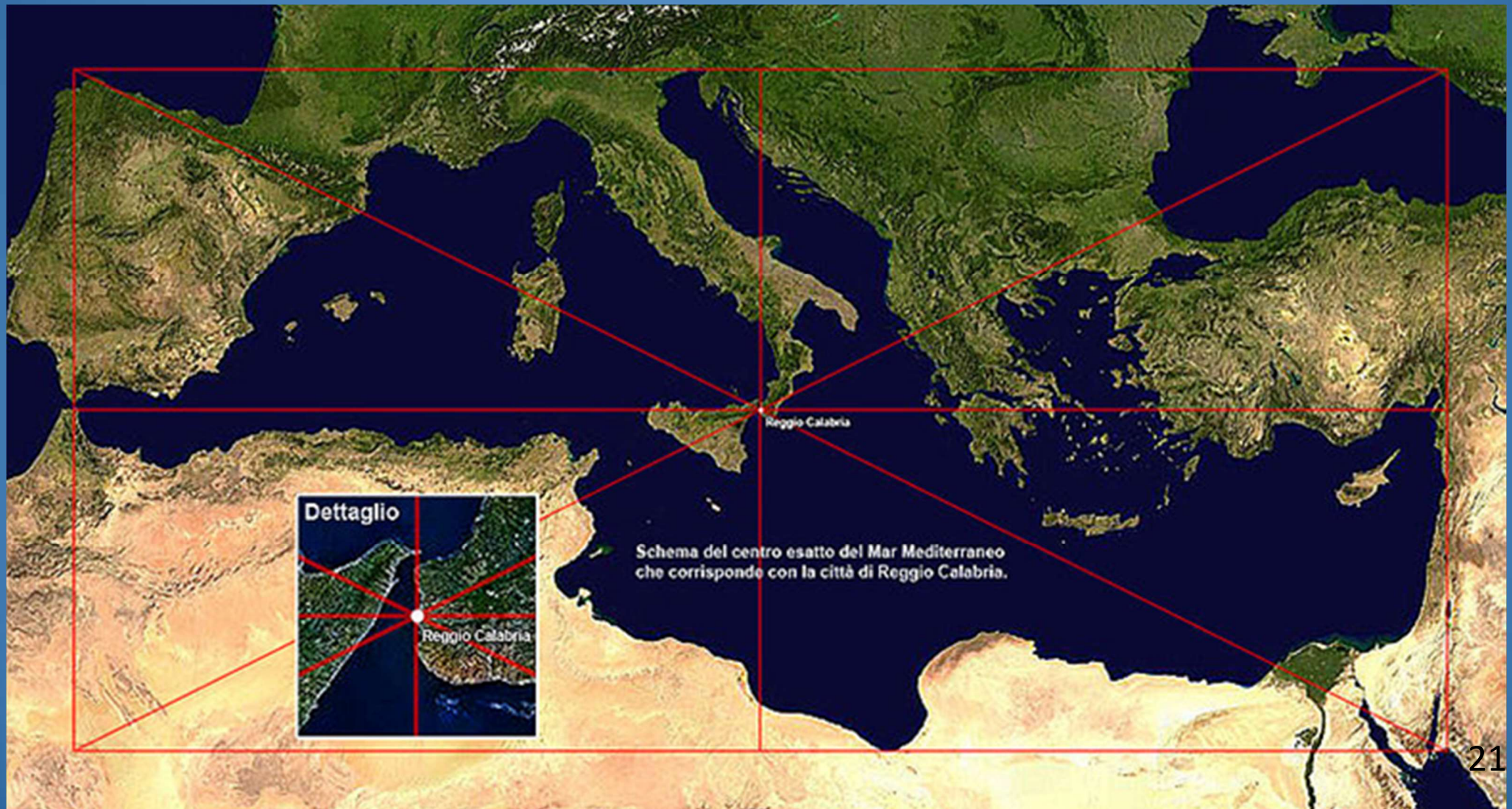
(source: Peter, 2006; 2016)

Bilateral or multilateral agreements (current or in negotiation) among countries





THE CENTRALITY OF THE MEDITERRANEAN REGION



THE UNIVERSITY MEDITERRANEA OF REGGIO CALABRIA, ITALY ...

CIVIL, INFORMATION, INDUSTRIAL AND TELECOMMUNICATION ENGINEERING



AGRICULTURE, FORESTRY AND FOOD PROCESSING



ARCHITECTURE, ARCHAEOLOGY HERITAGE AND LANDSCAPE



LAW, ECONOMY AND HUMAN SCIENCES



THE UNIVERSITY “MEDITERRANEA”

Fields of operation and interest

CIVIL, INFORMATION,
INDUSTRIAL AND
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ENGINEERING

LAW, ECONOMY AND
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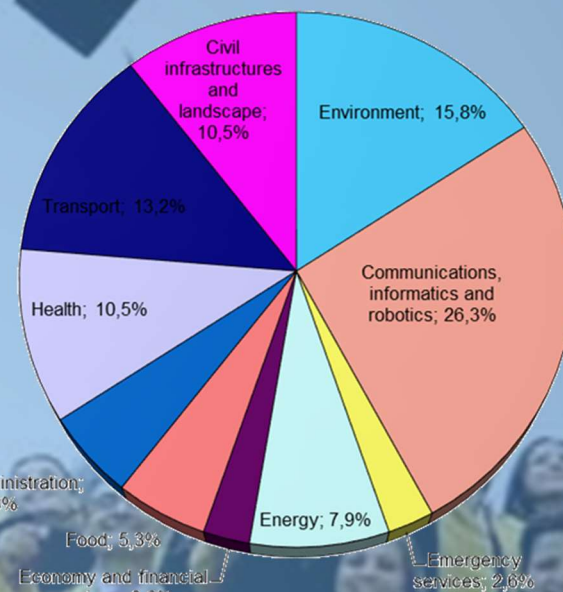
AGRICULTURE, FORESTRY
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THE UNIVERSITY “MEDITERRANEA”

Fields of operation and interest



Distribution of scientific papers sample within spinoff sectors of aerospace sciences.



“..... starting point to identify proper ways and proposals to promote scientific knowledge, education paths and cooperation possibilities specific to the whole Mediterranean Region and the related needs for security and prosperity.

This with the target of building a productive and peaceful alliance among Peoples of the Mediterranean Countries.....”



*With the help of
courage, creativity and
passion, this Community
should really become
the “Space for
Mediterranean”....*

THANKS FOR THE ATTENTION

SANTO MARCELLO ZIMBONE