

Opportunities for applied R&D&I, industry projects implementation, prototyping and manufacturing with CASTRA

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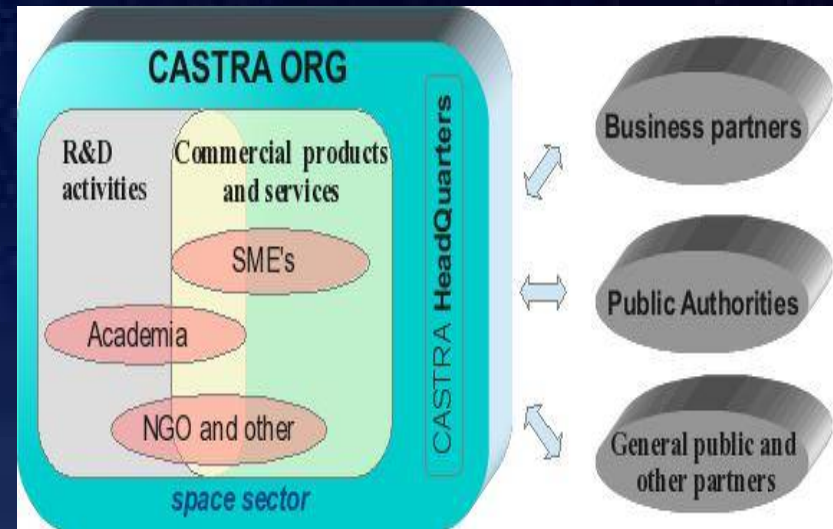




Who we are?

CASTRA is an independent NGO industry-driven consortia (cluster) of high-tech SME's, academic institutions and other interested stakeholders with expertise and capacity to jointly develop technologies, products and services in the aerospace domain and its applications serving society.

CASTRA's *vision* is to promote the research, innovation, technology and business developments in the aerospace sector to the benefit of society and to act as a major industry player.

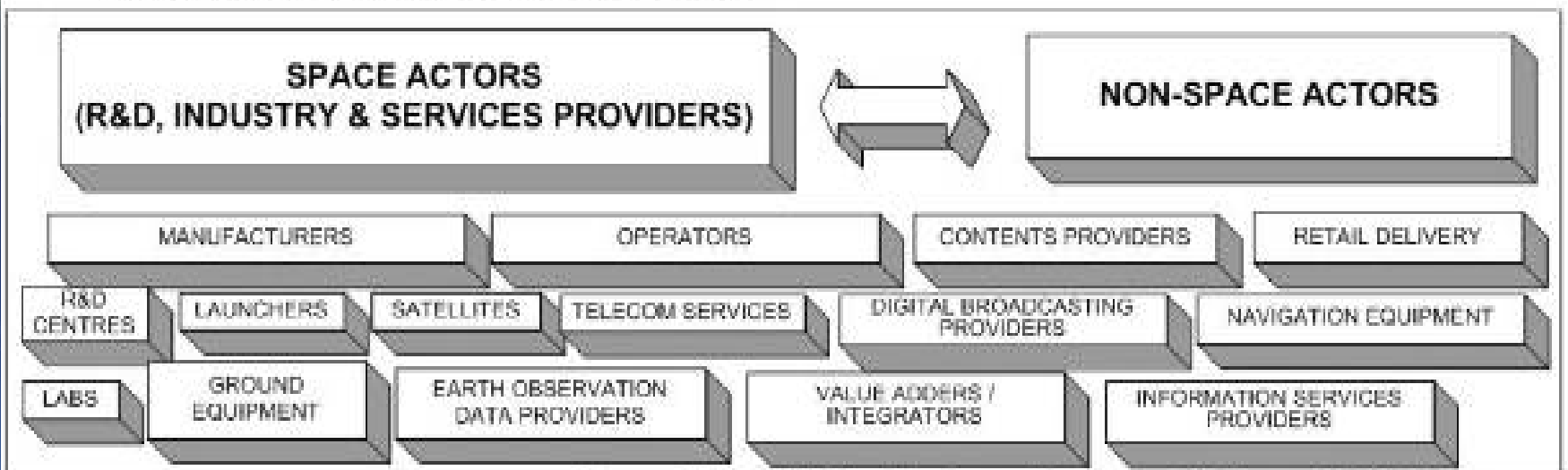


“Together we are stronger” - Bulgaria's strategy to success

The GLOBAL SPACE ECONOMY is a MAJOR DRIVING FORCE for developing plenty of business cases

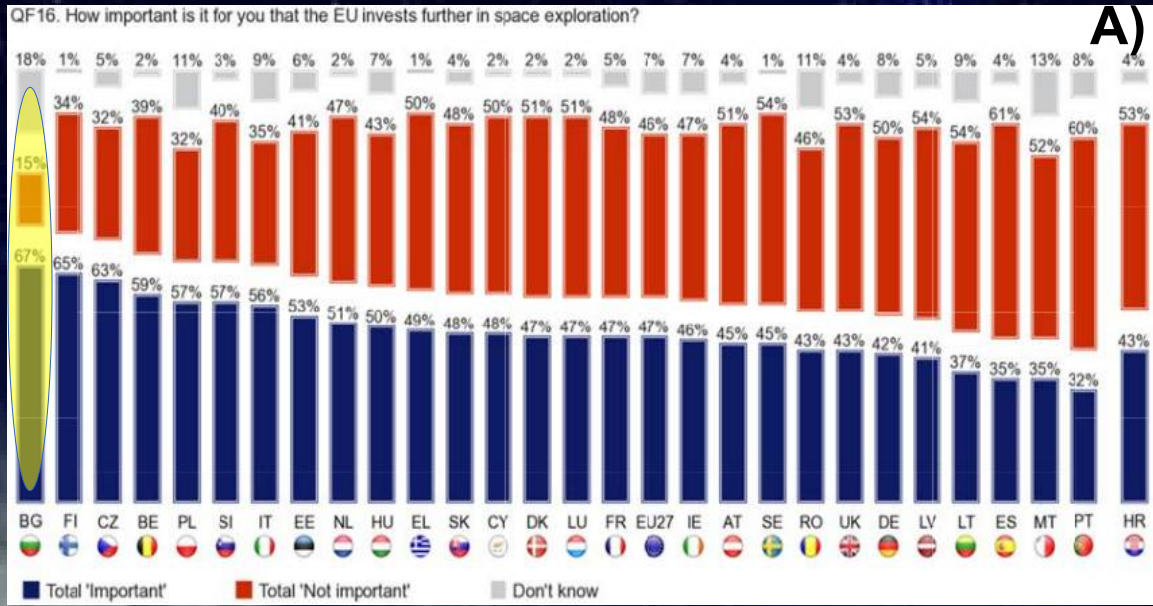
The space economy embraces:

“All public and private actors involved in providing space-enabled products and services. It comprises a long value-added chain, starting with the manufacturers of space hardware (e.g. launch vehicles, satellites, ground stations) and ending with the providers of space-enabled products (e.g. navigation equipment, satellite phones) and services (e.g. satellite-based meteorological services or direct-to-home video services) to final users.”



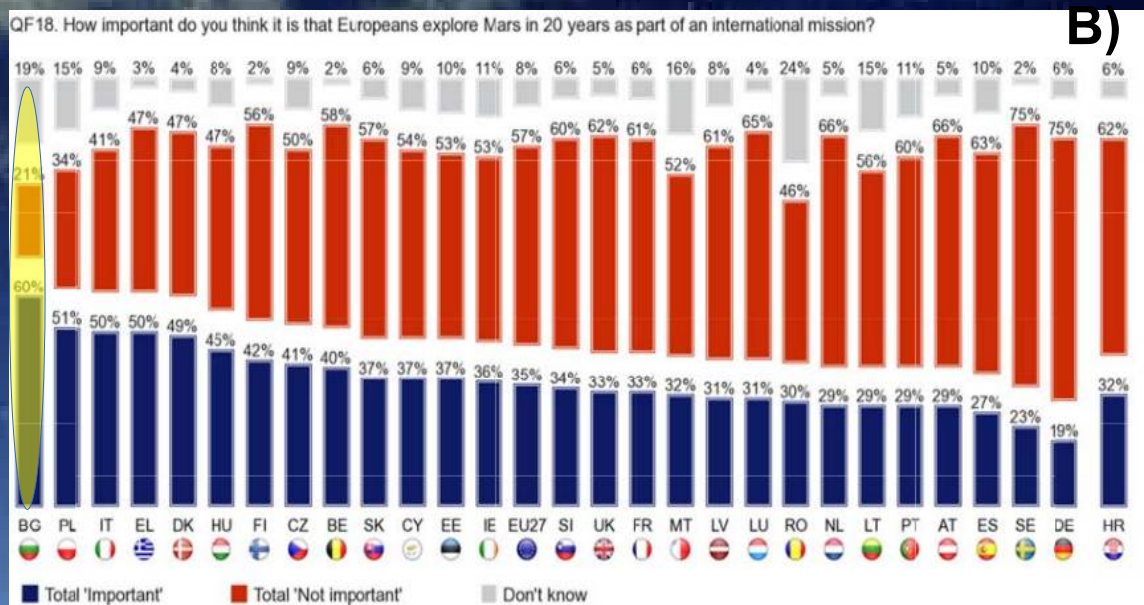
Source: OECD (2007), *The Space Economy at A Glance*, OECD, Paris

Bulgarian Public Supports *THE MOST* the EU Investment in space



A)

The public opinion in Bulgaria supports the most in the EU the increase of the EU investments in space exploration (see chart A)



B)

The public opinion in Bulgaria supports the most in the EU the implementation of long-term large scale space programs e.g. mission to Mars (see chart B)

EU survey analysis

(‘Eurobarometer’, 2013)

High-Tech space heritage

Two Bulgarian R&D cosmonaut space flight programs implemented – 1979, 1988

Developed unique experience and infrastructure in program management, developed numerous spaceborn and ground instruments and infrastructure, fundamental sciences and other related areas



NEW high-tech SME potential

Electronics, IC design, automation, robotics, UAV systems, high-speed satellite communications, software and embedded systems and other.

Examples of our high-tech SMEs industrial products and services with application in space projects

RADIATION HARD ASIC Design & Test

MEMS Sensors and actuators

GNSS tracking solutions

Moon base greenhouse simulation study

Embedded IoT systems

High-reliability digital electronic systems

Example of a federated modeling and simulations of space infrastructure & virtual reality tools

RF systems design

EMP - phase Nuclear explosion




Induced electrical discharges and over-voltages

50,000V/m for 200ns - E1
2kV for 20-300microsec - E2

3-12 GHz - 10kW
500ns pulses - 10MW

UAV systems

Vertical takeoff and landing Low profile disc shaped UAV



Satellite communication systems

Jet UAV shooting targets



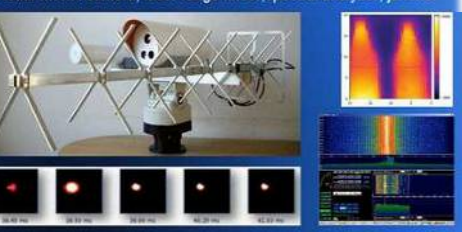
MW Antennas



carbon fiber products for automotive, space, robotics, consumer

Dron detection and counter measures system

Visual-MWIR camera, laser range finder, spectral analyzer, jammer



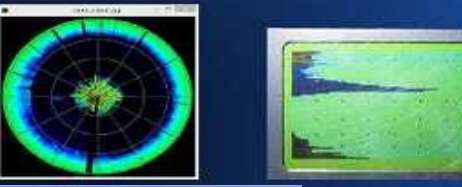
Multi-spectral camera prototype with integrated high-speed downlink



Small Sat platform & missions design. EO imaging and data comm payload development



FMCW panoramic drone radar



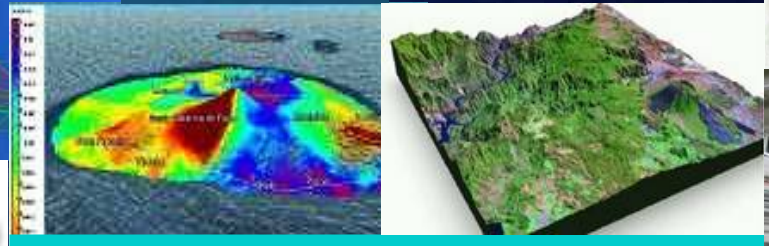
Design & manufacturing of specialized equipment and industrial systems



Software tools for multi-satellite systems analysis

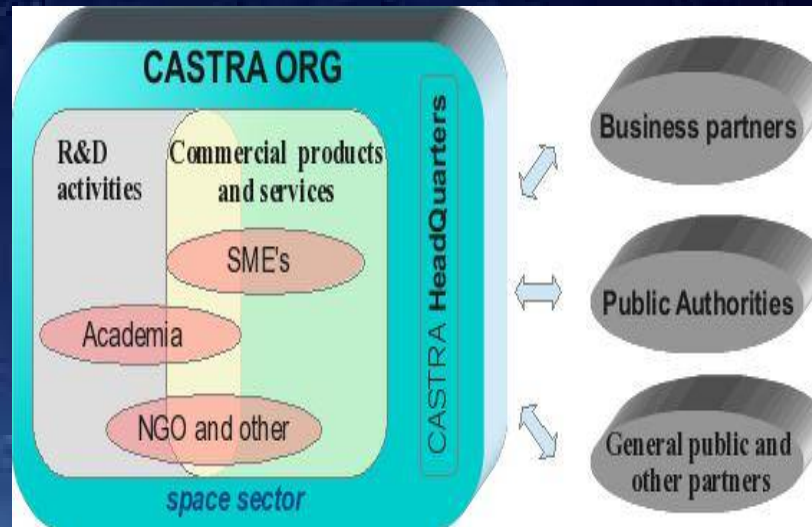
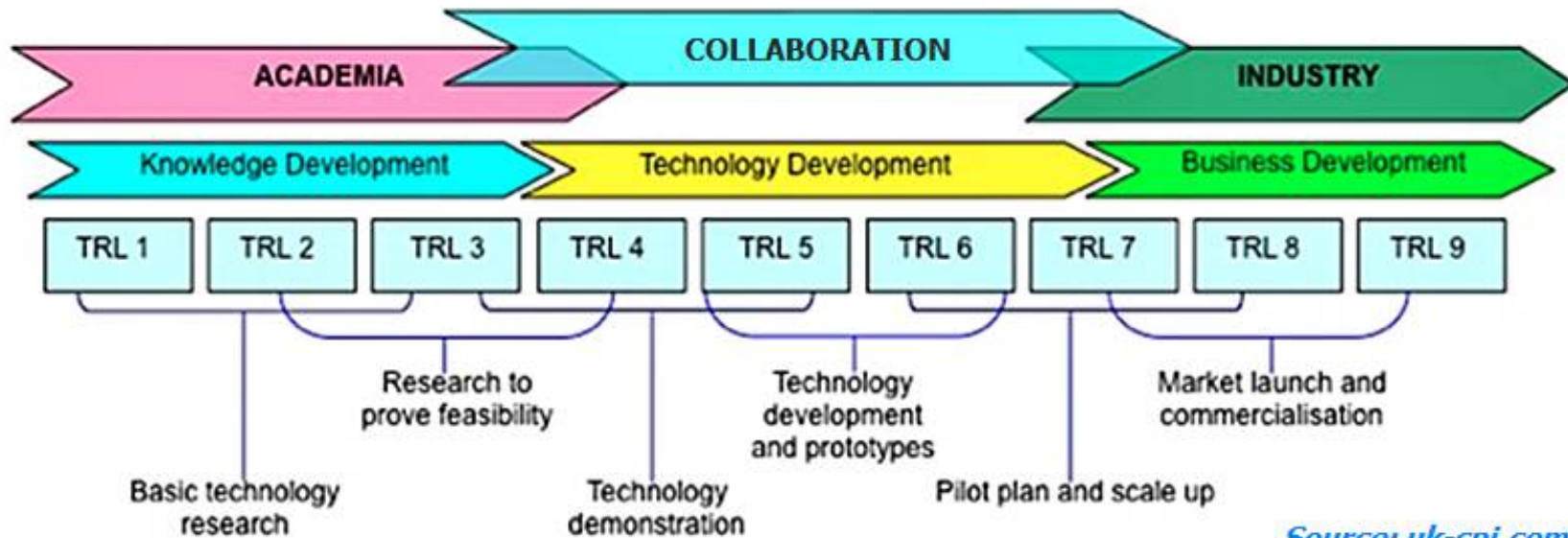
AI & BigData tools for satellite based ICT systems

Multispectral and SAR remote sensing processing from air/space born sensors



CASTRA's approach and experience with Academia – Business interactions and Technology transfer

The Innovation Chain: Converting Science into Wealth



CASTRA's APPROACH TO COOPERATION

- ✓ **IDENTIFY MATCHING / COMPLIMENTARY BUSINESS VALUE CHAINS OF COMMON INTEREST**
- ✓ **ESTABLISH JOINT R&D AND B2B INTERACTION BASED ON THE CAPACITY AND EXPERTISE OF THE PARTNERS**
- ✓ **DEVELOP JOINT B2B AND B2C PROJECTS IN THE TECH VALUE CHAIN**
- ✓ **DEFINE AND IMPLEMENT A JOINT PRODUCT/SERVICE**

“Together we are stronger” - Bulgarians strategy to success

A journey of a thousand miles begins with a single step ! 千里之行，始於足下 (qiānlǐ zhī xíng, shǐ yú zúxià)

Laozi

LET US DO IT TOGETHER !



Neil Armstrong, the first man on the Moon, has never visited Bulgaria but the Bulgarian space engineer Prof. Widen Tabakoff was a key contributor to the Apollo program