



# Taiwan - Czech Republic Space Industry Webinar

**Petr Bareš, Czech Space Alliance**

# Where are we?



**Charles bridge  
since 1357**



**Full member  
since 2008**

19th January 2021



**GSA HQ since 2012**  
**→ EUSPA in 2021**



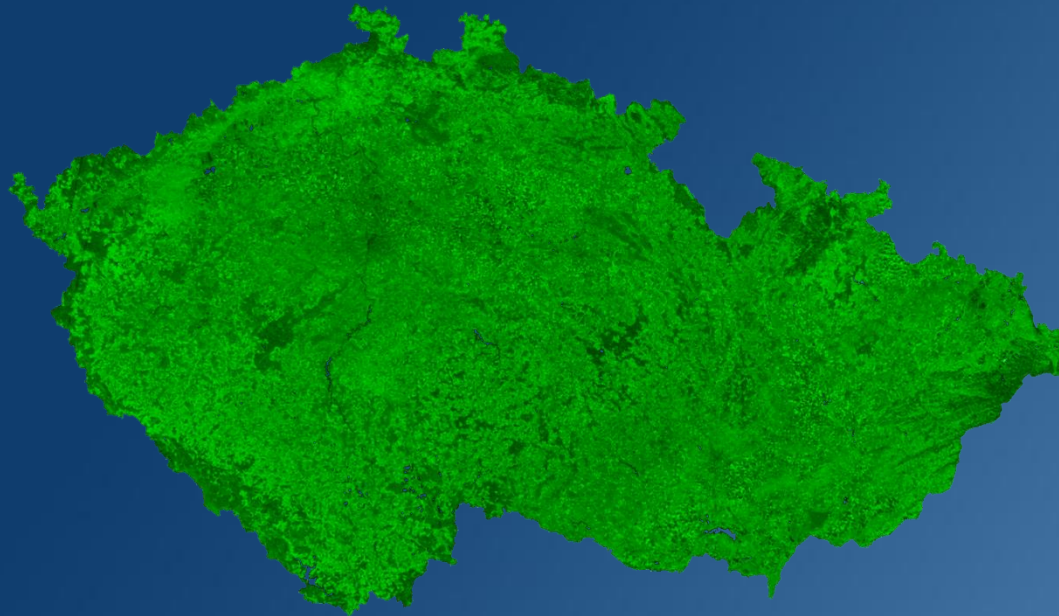
**Czech Republic since 1991**



**Since  
2004**

# The Czech Republic from space

## The Czech Republic from space





# Europe from space (no borders)



United Space in Europe  
United Europe in Space



European Space Agency

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Wallpaper: <http://gocilla.deviantart.com> | Original image: <http://visibleearth.nasa.gov>

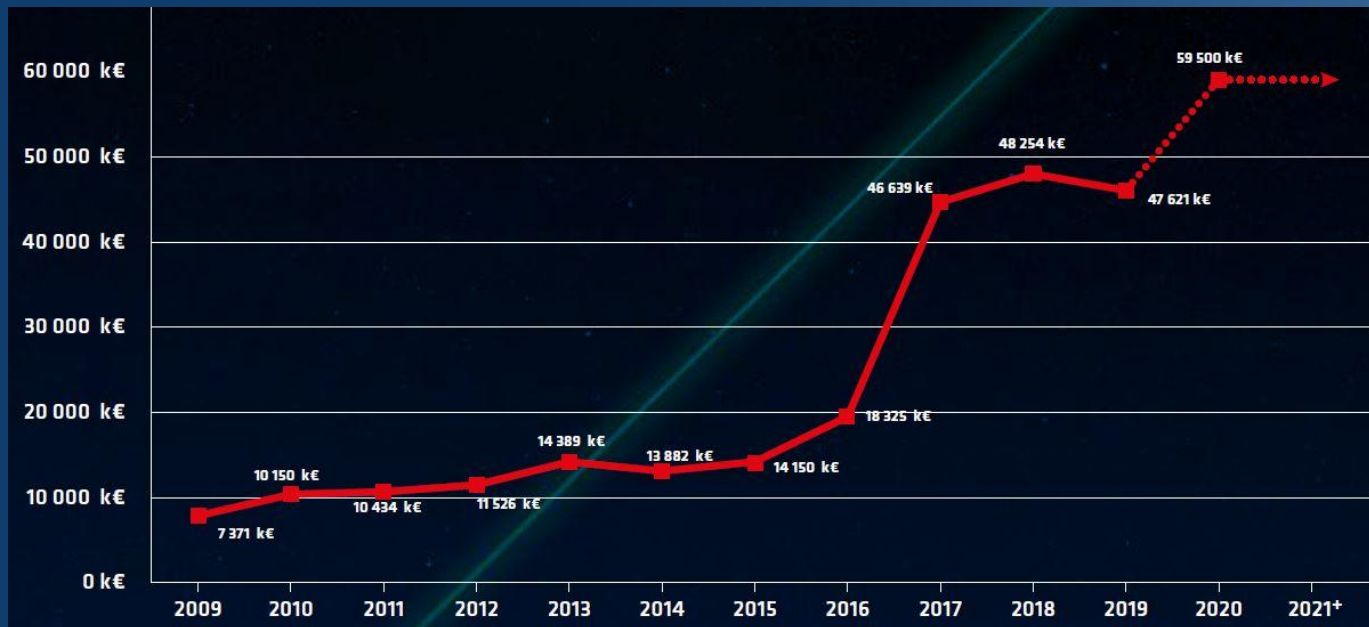
# The Czech Republic in ESA

- 2005 Joined the ESA Programme for Cooperating States (PECS)
- First former Eastern block country to qualify for full ESA membership
- 2008 Acceded to the ESA Convention
- now competing not only with much more experienced ESA members but also in commercial projects worldwide (Japan,Africa..)



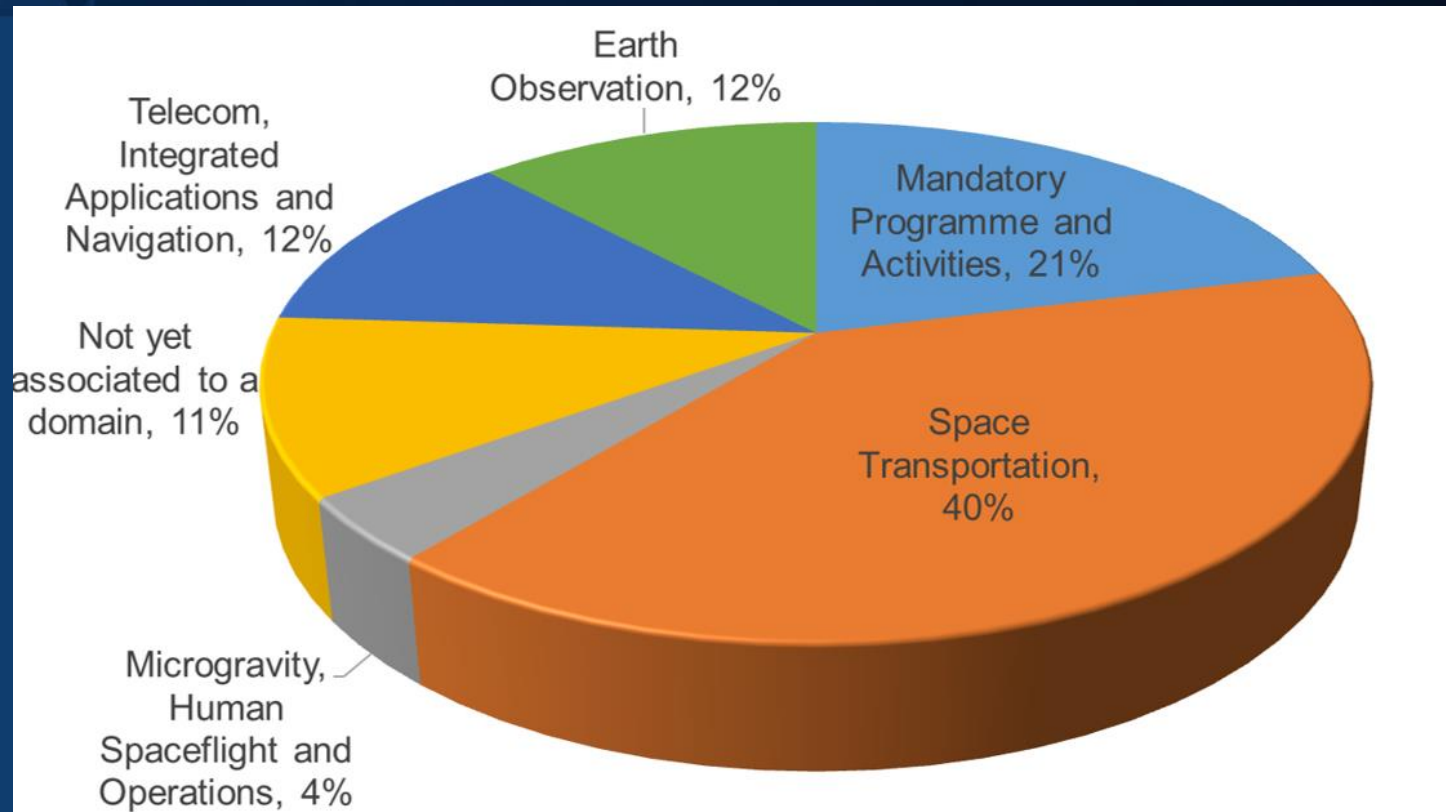
# The Czech Republic in ESA

Contributions to ESA show excellent growth



+ an additional national space budget created

# The Czech Republic in ESA



# The Czech Republic in ESA

21 ESA Member States are our competitors:

19 Member States from the EU  
plus Norway and Switzerland N.B. i.e.  
ESA is NOT an EU agency

Cooperating State - Canada

Associate Member – Slovenia, Latvia

Cooperating States (ECS) -

Bulgaria, Croatia, Cyprus, Lithuania,  
Slovakia,





# Czech Space Alliance



- Private trade association of SMEs and associated larger companies
- Established in 2006 by 4 SMEs
- Now 16 members, non-SMEs associated
- Wins the majority of CZ geo-return in ESA
- Cofounding member of SME4Space
- Member Int'l. Astronautical Federation

SME4SPACE



# Czech Space Alliance



## **CSA was created to further the following :**

- Liaise with the Czech space governance, lobby for space industry interests
- Promote the skills and interests of its members worldwide
- Establish relationship and communicate with space associations, agencies and other entities worldwide

# Czech Space Alliance



## **CSA existence praised by ESA and primes:**

- Very welcome and strongly supported by ESA
- Given as an example to follow to candidate ESA member countries
- Incumbent Czech space companies being encouraged to join the alliance by
  - ESA
  - European space prime contractors

# Czech Space Alliance



## **Organises, or co-organises :**

- ➔ Industry missions abroad (UK, NL, Spain, Italy, Luxembourg, Brazil, Japan, Canada, Thailand...)
- ← Events in CZ for space companies, associations or agencies from abroad (Astrium, TAS, SJAC and JAXA Japan, Chile, GISTDA Thailand, ISRO ..)

## **Participates in and presents itself in:**

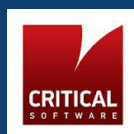
- International space conferences and exhibitions



# Czech Space Alliance



And our clients and partners include :



# Czech Space Alliance



## Main clients in Europe:

- European Space Agency (ESA)
- Ministry of Defence of the Czech Republic
- European Defence Agency (EDA)
- space technology primes and their suppliers

## Overseas clients:

- USA, Japan, Korea, West Africa
- aim – Thailand, e.g. in the GNSS/ SBAS development, Taiwan

# Czech Space Alliance



## **Actively participates in creating the Czech space strategy by:**

- Drafting the industry sections of the National Space Plan
- Participating in the Space Coordination Board of the Minister of Transport, and chairing its Industry and Application Committee

# CSA Members /1



## Electronics

**AVX** - world's No. 1 tantalum and niobium capacitor manufacturer (Japanese parent)



**ADVACAM** – X-ray imaging, detectors

**EGGO Space** – passive electronics test facility

**BD Sensors** – space electronics h/w & s/w, clean room manufacturing, electronic pressure sensors, transmitters and switches technology

**Unites** - development and production of test and measurement systems for aerospace



# CSA Members /2



## Software

**Atos Convergence Creators s.r.o** (former Siemens) – large ground segment systems such as EGSE, S2K MCS, GS, satcom, as well as EO data management

**Evolvsys/ESC** – flight software for payloads & EO and other data processing

**Iguassu Software Systems** – GNSS/SBAS navigation tools, EGSE, satcom, studies, SSA including robotic telescopes, Ariane 6 on-board and ground segment

# CSA Members /3

## Specialised R&D



**BBT** – infra-red crystal optics & acousto-optics, infra-red polarizers, scramblers, thermal infra-red hyper-spectral imaging

**RIGAKU** – R&D, world class precision X-ray optics, part of Rigaku corporation



# CSA Members /4



## Mechanical systems and engineering

**Sobriety** – Computational Fluid Dynamics, Self-deployable Habitat for Extreme Environments

**Frentech** – mechanical subsystems, such as solar panel deployment mechanisms

# CSA Members /5



## Advanced materials R&D

**TOSEDA** – nanocomposite materials R&D and production

**TTS** – thin film metallisation, dew point sensors, simulation of radiation related effects

**5M** – development & production of composite materials



# Some commercial sales/1



**Examples of h/w commercial sales  
derived from ESA / space experience**

## **Mechanical subsystems**

**Solar pane deployment mechanisms design  
and manufacture :**

for Iridium NEXT fleet and for O3B

**Turbo pumps parts for the main engine:  
Ariane 5**

# Some commercial results/2



## Examples of s/w commercial sales derived from ESA / space experience

**Iguassu : GNSS performance monitoring software** : Thales Alenia Space France, Japanese government, Romania, West Africa, ESSP (EGNOS operator) Spain, Korea SBAS

**ESC : C-UAS drone detection** : US airports

**Science data on-board processing** : Russian Mission Coronas-Photon

# Some commercial results/3



## Examples of advanced materials commercial sales derived from ESA / space experience

**5M :**

**composite springs for solar panels**

**composite tubus**

**application of sandwich materials for Airbus  
350 and 380**

# CSA International relations



## Good rapport with JAXA, AEB, AEM, GISTDA

...



President Brazilian Space Agency AEB



G. Director Mexican Space Agency



JAXA president Okumura

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# CSA International relations



- We organise member missions abroad

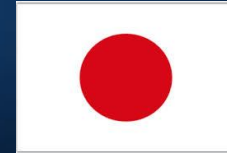


Czech Brazil Space Industry Days



UK Mars landscape 2014

# CSA missions to



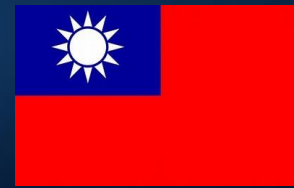
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# 访问台湾 2020



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## For further information

Official Czech space website (Ministry of Transport)

<https://www.czechspaceportal.cz/en/home/>

Catalogue of Czech space industry and academic entities

[www.czechspaceportal.cz/wp-content/uploads/2020/12/cz\\_successful\\_in\\_esa\\_2021\\_web.pdf](http://www.czechspaceportal.cz/wp-content/uploads/2020/12/cz_successful_in_esa_2021_web.pdf)

Czech space alliance

[www.czechspace.eu](http://www.czechspace.eu)

Thank you for your attention

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