Czech Space Activities and Organisations

DASIA 2003
DAta Systems In Aerospace
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Presentation for DASIA 2003, Prague, June 2-6,
by Iguassu Software Systems a.s.

Welcome in Prague – Vítejte v Praze

EUROSPACE

CANADIAN SPACE AGENCY

CNES

ESA

EUMETSAT

EUROCONTROL

and others

Welcome in Prague – Vítejte v Praze

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Overview

- Czech Republic basic facts
- are Czechs new to space?
- some historical achievements
- current space projects
- relationship with ESA
- ESA Survey by NODAL consultancy
- conclusions – opportunity- will you use it?

Where are we?

You are not in the East, but rather In the heart of Europe

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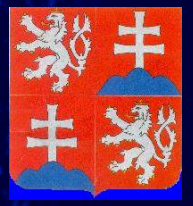
Key national dates

- Czechoslovakia founded in 1918

- communist took power in 1947

- velvet revolution in November 1989



- velvet “divorce” in 1992

Key international dates

- member of NATO since March 1999
- to become EU member in May 2004
- to join ESA as PECS state in 2004 ?

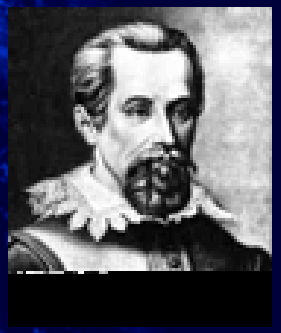
Czech Republic basic figures

- 10.4 million inhabitants
- GDP per capita 2001 (ROM)
  - $ 6,500 at exchange rate
  - $15,000 at PPP (purchase power parity)
- foreign Direct Investment into Czech R.
  - automotive industry – 50%
  - IT and Electronics – 20% (2nd largest)

Are the Czechs new to space science & technology?

Charles University founded in Prague in 1348

Kepler (1600)
Doppler (1840's) worked in Prague
Einstein (1912)
& many others…



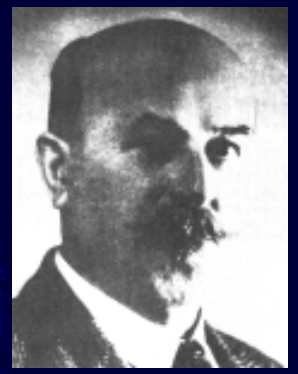
Wider public interest demonstrated by books published

- 1928 "Rocket flights to space" published
- 1932 book on space law by JUDr. V. Mandl

Some further historical achievements`

.. launcher technologies

- 1931 Očenášek reached 1,5 km with solid fuel rockets and envisaged “Pegasus like” aerial launches
- 50’s development of 2-stage sounding rockets at Military Academy Brno, stopped for political reasons
- more historical details in the paper “Czechs in Space” presented at the IAF Rio 2000, and published in Acta Astronautica, Vol. 48, No. 5-12, pp.957-965, 2001



…third country to have a man in earth orbit

- 1978 Vladimir Remek transferred by Sojuz 28 to Saljut 6
- 7 days on board Saljut space station

Czechs & Slovaks in Intercosmos

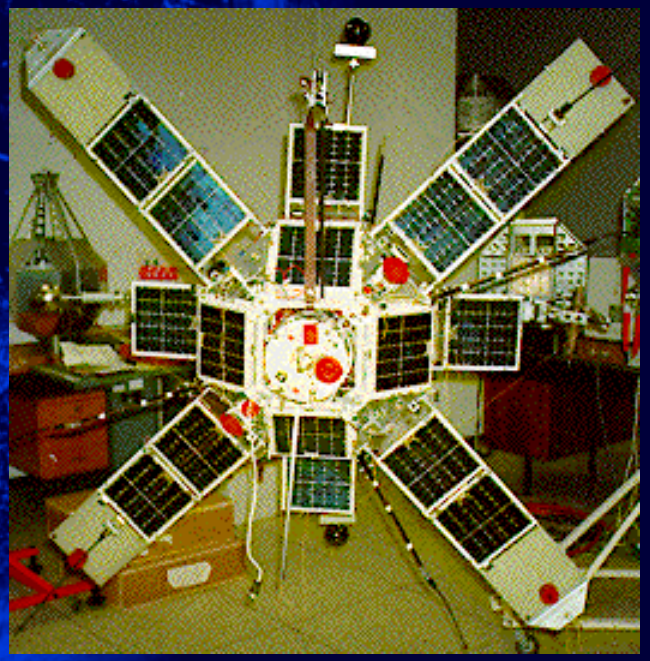
Czech payloads flew since 1969 - Examples :

- 1982 Saljut 7, low-cost X-ray telescope
- Czechoslovak equipment was included on 23 out of 25 Interkosmos mission payloads
- stabilised platform (APS), world-class pointing accuracy, used on Vega 1 & 2 spacecraft to study Venus and the Halley comet and on Mir

MAGION (MAGnetospheric & IONospheric)

Satellite series from Czechoslovakia

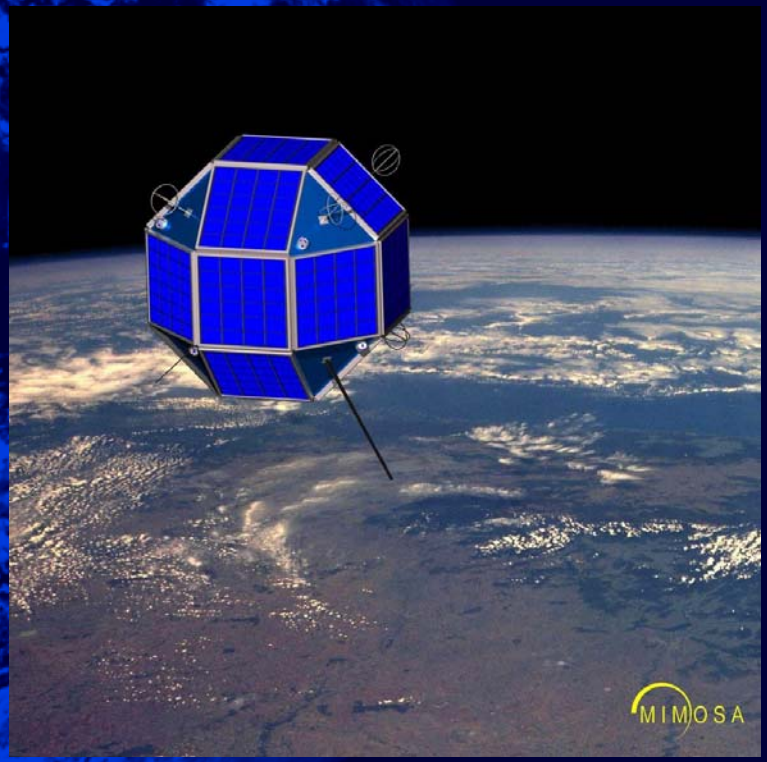
- 1st parallel plasma measurements from 2 satellites with controlled spacial separation
- 1978 Magion1, 15 kg
- 1989 and 1991 Magion 2 & 3
  52 kg, own propulsion
- 1995 and 1996, Magion4 & 5
  spin stabilised



Current satellite development - Mimosa

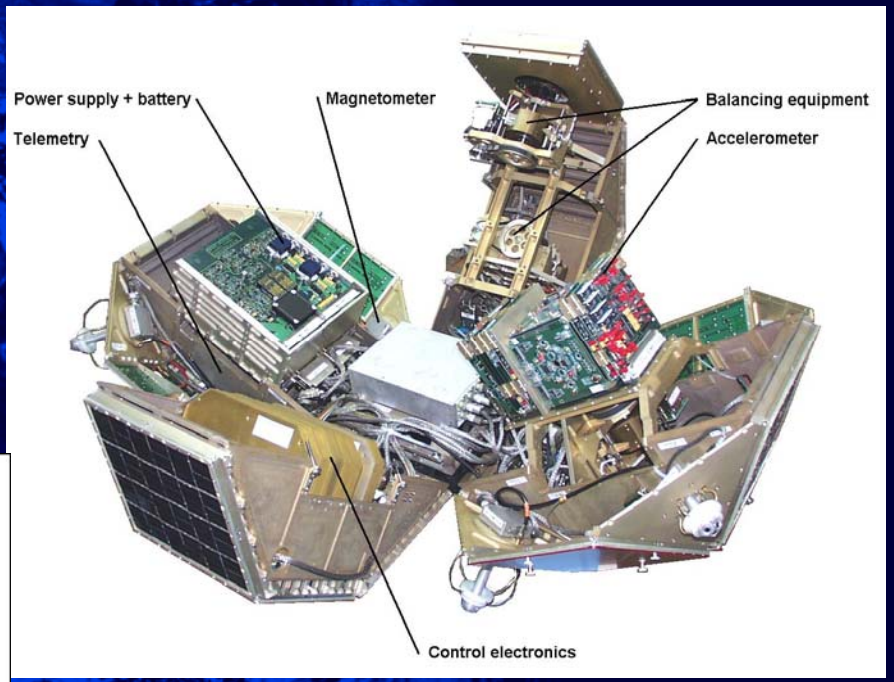
MIcromeasurements **O**f **S**atellite **A**cceleration

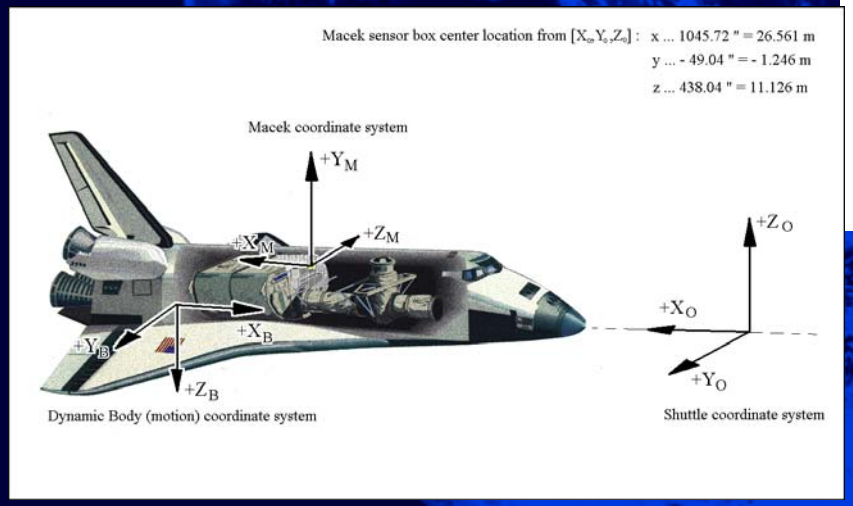
- to measure atmospheric drag and other non-gravitational forces in LEO
- built by Space Devices Ltd. for the Astronomical Institute of the Czech Academy of Sciences
- life expectancy 5 years, 65 kgs



Current satellite development - Mimosa

based on 3-axis compensated μ-accelerometer Macek



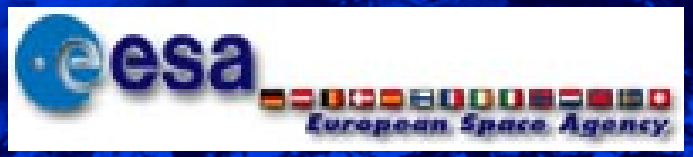


that flew on the Shuttle Atlantis in 1996

Current satellite development - Mimosa

- orbit 320 km x 820 km, incl. 96,7º
- to be launched from Plesetsk on 30th June 2003 at UT 15h14m12s by ROKOT
- launch shared with
  - Canadian MOST stellar observation satellite
  - 2 Japanese earth observation(!) nano-satellites 10x10x10 cm, weighing 1kg
- Mimosa will be the 1st to separate

Relationship with ESA



- open-ended co-operation frame agreement with ESA signed in November 1996
- participation in PRODEX « (**PRO**gramme de **D**éveloppement d'**EX**périences Scientifiques)"
  - space physics
  - astronomy,
  - earth observation,
  - materials research
  - sociopsychology
- THE GOAL : full membership in ESA

ESA Plan for European Co-operating States

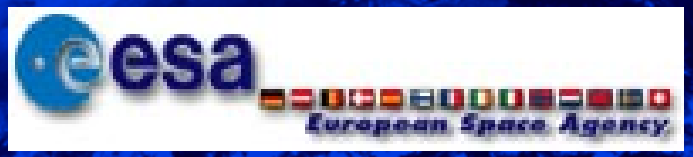
To enable the ex-communist European countries Czech Republic, Hungary, Poland and Rumania to bridge the high hurdle of joining ESA, the agency developed the PECS - the **P**lan for **E**uropean **C**o-operating **S**tates

- ESA council approved the plan on 21/22 May 2001
- it is exclusive to other programmes (e.g. Prodex)
- minimum contribution is 1 million € per annum for min. 5 years

Objectives

- to prepare the countries for future accession to ESA convention
- allow **indirect** access to ESA programmes
- foster understanding of ESA organisation and procedures

ESA PECS and Czech Republic



- Czech government agreed the entry into PECS and reserved the required funds
- series of negotiations culminated recently in draft agreement between the agency and CR
- ESA council will vote to approve the agreement in June
- formal agreement by the Czech government and ratification by the parliament is expected by the end of 2003 or early 2004

Current space organisations

Two parallel and independent entities exist at this stage

- Czech Board for Space Activities
  - under the Ministry of Education
  - ESA, official representation in UN Committee for Peaceful Use of Outer Space (COPUOS)
- National Committee for Research and Use of Space
  - under the Czech Academy of Sciences
  - science & research, official representation in IAF and COSPAR

Additional future key players in space ??

- CzechTrade & Czechinvest ??
  - under the Ministry of Trade & Industry

Czech Board for Space Activities (CBSA)

CBSA is an advisory body

created by the Ministry of Education in 1997, and
originally called the Czech Board for Co-operation with ESA

- only advisory role – real responsibility for negotiations with ESA lies with international department of the Ministry of Education, Youth and Sports

- CBSA's administrative support office is called the Czech Space Office (CSO);
  (N.B. unlike e.g. HSO it is not an official state entity!)

CBSA members and aims

Currently 12 members

- originally only from academic institutes

In 2001 the Ministry of Education invited also

- representatives of interested industries
- and the Ministry of Transport & Communications

In 2002 CBSA changed to current name, expanding its aims

- integration into non-ESA international co-operation in space research & applications
- support of bi-lateral co-operation with other countries

?? Future structures ??

Czechs assessed by Nodal Consultants

In preparation for PECS, ESA commissioned the French company Nodal Consultants to

- to assess the capabilities and potential of Czech industry and research institutes and
- to make recommendations to ESA

Nodal Consultants

- started with a pre-selected shortlist of 133 entities
- singled out 15 potential suppliers to visit and interview, and remotely analysed others

Thanks to Nodal Consultancy and ESA for allowing the use of their slides.

Nodal/ESA - Czechs in space projects

Company	Space projects
ANF Data	SCOS 2000, Cokmas/Mister, ICC (ESA), Teseus (Eutelsat)
BBT	Prodex (ESA), CSK (DLR), Titus (Mir99), Magion 5, Cluster II
CSRC	Prodex (ESA), Integral, Smart, Cluster, Demeter, etc
Gisat	Prodex (ESA), Corine (EU), Mars 95 (JRC Ispra), Radarsat (CZ)
Pramacom	Inmarsat (Xantic)
Reflex	US/CZ projects, LE Angel Optics
Science Systems Iguassu Software	SCOS 2000 (ESOC), Envisat (ESA), Meteosat (Eumetsat), telescope tracking (CZ Sciences Academy), Hispasat, Slick (SSSL)
Space Devices	Macek-SH04, XHRS, Mimosa (Astron. Inst.), Fireball (Ondrejov, UK)
Tescan	Fixed station interface, OBP
Testcom	Intelsat, Eutelsat, Inmarsat, Intersputnik, Viasat, Comsat

Thanks to Nodal Consultancy and ESA for allowing the use of their slides.

Nodal/ESA - Qualitative Assessment

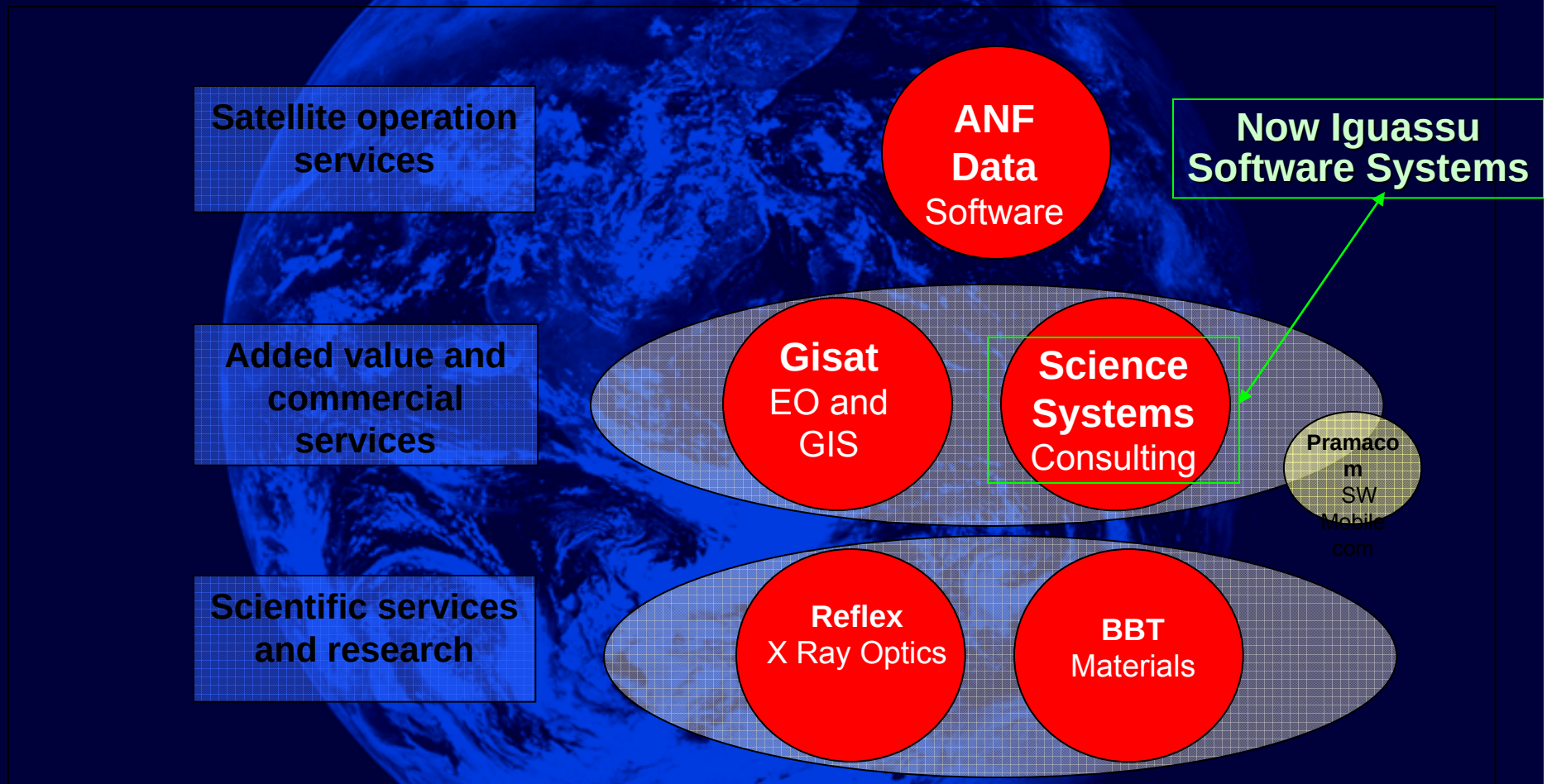
Six categories assessed

- Technologies potentially transferable to Space
- Company structure, quality organisation
- Partners network (clients, suppliers, institutions)
- Competitive position
- Financial capacities
- Human resources

For the 6 categories, most companies were ranked at a « high » or « average »

Thanks to Nodal Consultancy and ESA for allowing the use of their slides.

Nodal/ESA – 5 companies can already play a role providing commercial & scientific space services



Thanks to Nodal Consultancy and ESA for allowing the use of their slides.

Nodal/ESA assessment summary

- two “success stories” highlighted :
  - Demeter Project
    (CSRC & Institute of Atmospheric Physics / ESA)
  - Meteosat (MSG) test tool package for the ground segment system validation
    (Iguassu Software Systems / Science Systems UK)
- high technical competencies and quality, with attractive costs
- high motivation, involvement and flexibility of the Czech teams

Thanks to Nodal Consultancy and ESA for allowing the use of their slides.

Among the assessed Czech companies

Wide range of applications, such as

- space materials research – BBT
- space qualified hardware - CSRC
- remote sensing applications - GISAT
- satellite control software – Iguassu Software Systems a.s.
- mini-satellite platform & payload construction - Space Devices

Thanks to Nodal Consultancy and ESA for allowing the use of their slides.

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Example – Iguassu Software Systems a.s.

One of the companies that achieved distinction in the Nodal survey in several categories

- established in 1994, extensive international experience in UK, Germany, Austria, Argentina
- develops space subsystems in Prague, Germany and UK, mostly real-time ground segment subsystems

- participated in ESOC, ESRIN, Eumetsat, Iridium projects, totalling 40 man-years
- provides also marketing consultancy in Latin American aerospace, based on 10 years' experience

MINISTÉRIO DA CIÊNCIA E TECNOLOGIA
INSTITUTO NACIONAL DE PESQUISAS ESPACIAIS

Final comments

Czech Republic

- maintained a high standard education system
- Has above average language skills (Czechinvest survey)
  - 35% population speak fluent English
  - 75% Czechs / 53% EU citizens - speak a foreign language
- “high technical competencies and quality, with attractive costs” (Nodal Consultancy / ESA)

→ excellent human resources & high cost-effectiveness
→ good basis for international co-operation

Conclusion
Your opportunity for co-operation

Czech Republic

- has a long unbroken record of achievements in space science and technology
- is expected to be a “European Co-operating State” in ESA within a year
- has been externally assessed to have active and highly competent industrial and scientific resources
  - capable of immediate contribution (some currently contributing) to ESA projects
  - be a competent partner in international co-operation

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