

# BULGARIAN SPACE INSTRUMENTATION



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## Project objectives

### Compilation

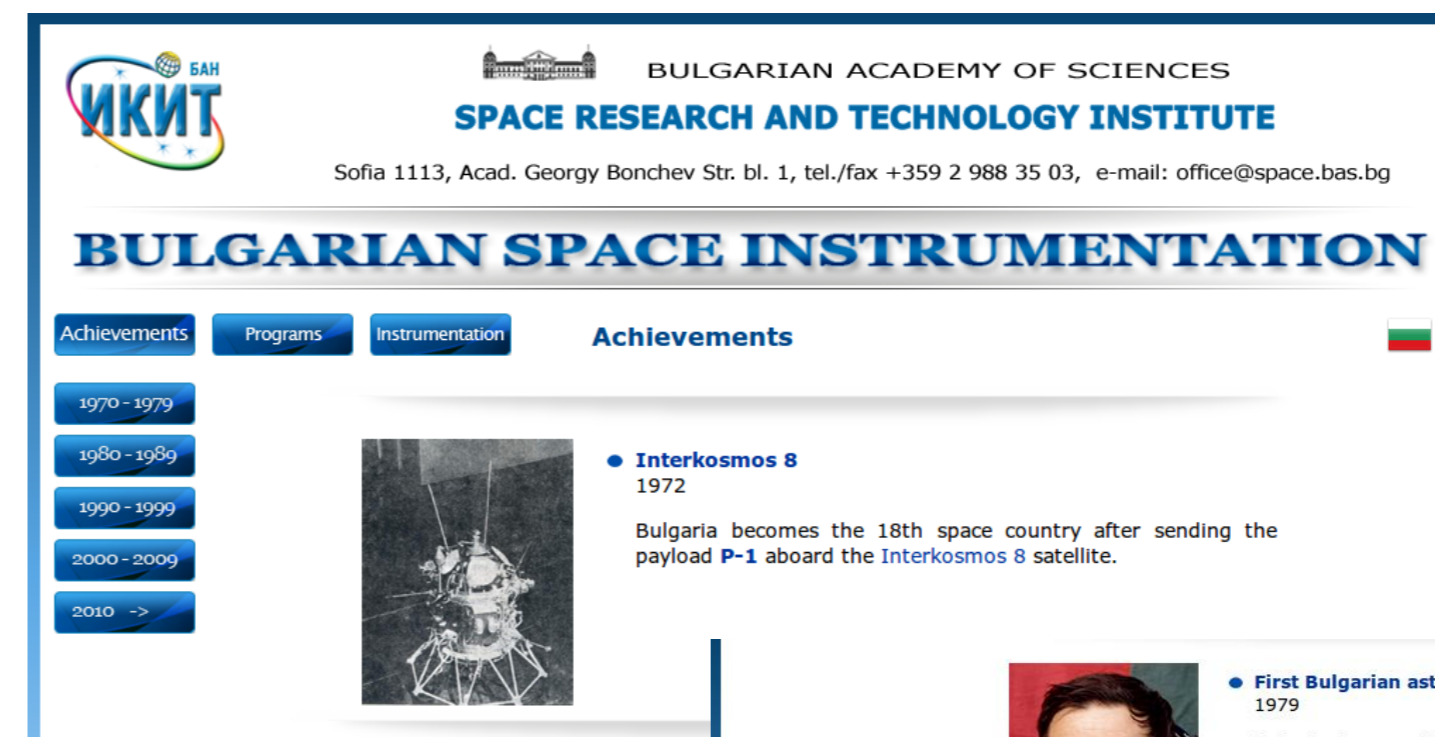
The objective of this initiative is to gather the available information, photos and open-access publications about the Bulgarian space-dedicated instrumentation and to organize it in a concise form.

### Archive

The information will be structured according to a set of criteria (chronology, alphabetical lists, etc.) and provided with free online access.

### Outreach

The web-site will disseminate the Bulgarian space efforts to a wide range of communities – in Bulgaria and worldwide – both in academia and the general public. The web-site will be supported in Bulgarian and English.



P-1 payload

**Project web-site**  
[www.space.bas.bg/legacy](http://www.space.bas.bg/legacy)

## Classification scheme

- ✓ Chronologically: 1970s (first Bulgarian payload for space exploration); 1980s; 1990s; 2000s; 2010s (most recent instrument is in Martian orbit)
- ✓ By scientific programs: INTERKOSMOS; PHOBOS; VEGA; Shipka; MIR-Shuttle; MIR-NASA; ExoMars, etc.
- ✓ By abbreviation of the instrument/payload/complex system

## 1970s

- 1972–12–01  
*Interkosmos 8*  
**P-1**
- 1974–12–31  
*Interkosmos 12*  
**P-2**
- 1975–12–12  
*Interkosmos 14*  
**P-3**
- 1975–09–02  
*Vertical 3*  
**P-1R**
- 1976–10–14  
*Vertical 4*  
**P-2R**
- 1977–10–25  
*Vertical 6*  
**P-3R; EMO-2R**
- 1977–11–07  
*Vertical 7*  
**P-3R ; EMO-2R; 4ELI**
- 1978–11  
*Centaure-II*  
**EMO-1R; RIKI**
- 1979–02–27  
*Interkosmos 19*  
**P-4; EMO-1**
- 1979–04–10  
*Science program for the first Bulgarian Cosmonaut Georgy Ivanov*  
**Spectrum-15; Duga; Sredec; Vital**

## 1980s

- 1981–07–10  
*Meteor-Priroda*  
**SMP32; RM-1; BU**
- 1981–08–07  
*Interkosmos-Bulgaria 1300*  
**P6-IL; ID-1; P7-3L; DIET; AMEI; ANEPE; PROTON-1; IESP; IMAP; POTON-1; EMO-5; OLSS**
- 1981–12–21  
*Vertical 10*  
**ID-1R ZOND-R**
- 1984–12–15  
*Vega 1*  
**TKS**
- 1984–12–21  
*Vega 2*  
**TKS**
- 1988–06–07  
*Science program for the second Bulgarian Cosmonaut Alexander Alexandrov Shipka program: 14 experiments*  
**• 1988**
- 1988–07–07  
*Granat*  
**Sunflower**
- 1988–07–12  
*Phobos 1*  
**FREGAT; LIMA-D**
- 1988–07–12  
*Phobos 2*  
**FREGAT; LIMA-D**
- 1988–04  
*MIR Space Station*  
**LIULIN**

## 1990s

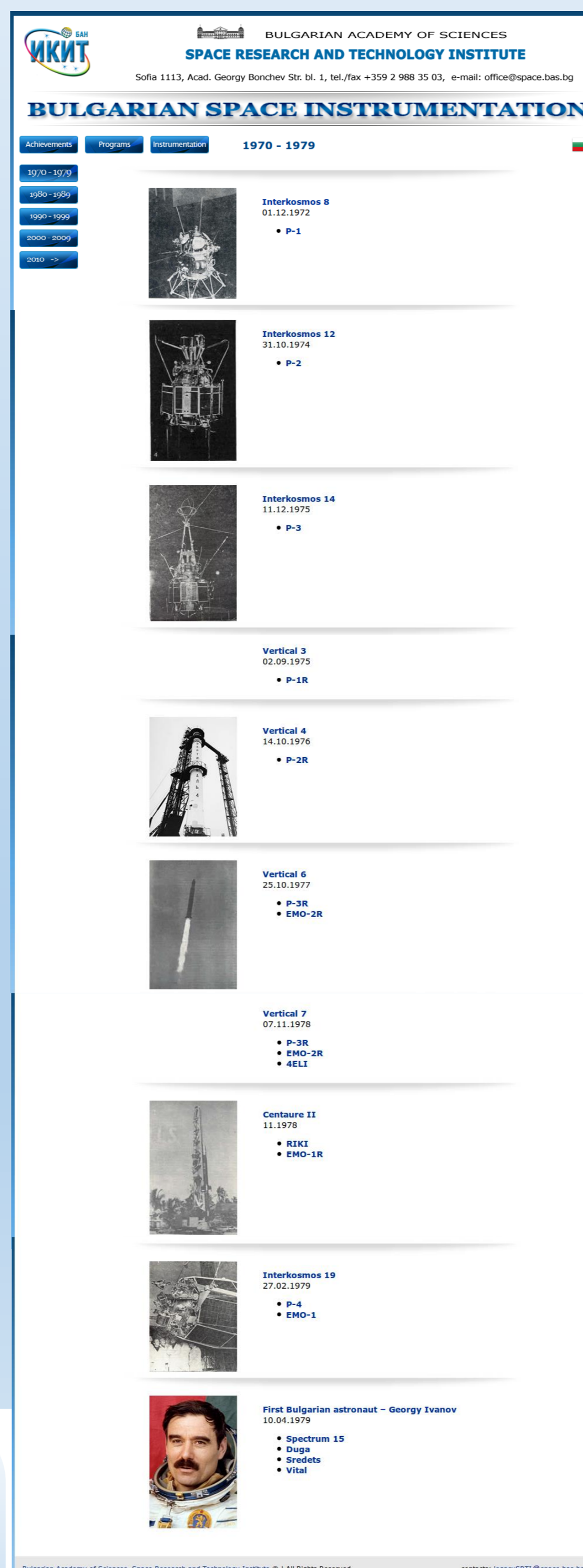
- 1990–06–10  
*MIR-Kvant-Soyuz*  
**SVET greenhouse**
- 1996–11–16  
*Mars-96 (satellite lost)*  
**2 Solid State**

## 2000s

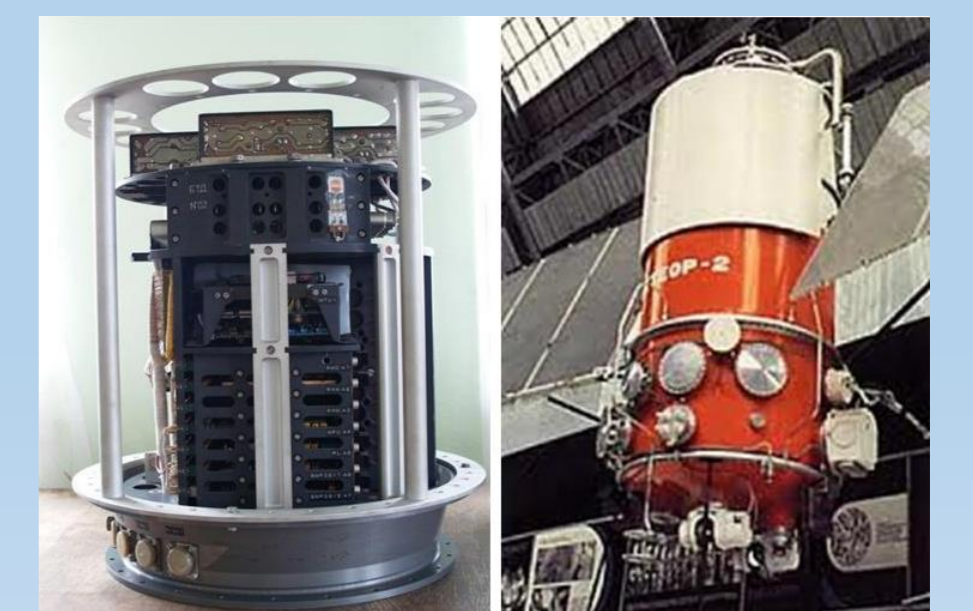
- 2001–05–05  
*International Space Station (ISS)*  
**Liulin-E094**
- 2005–06–01  
*Foton M2*  
**R3D-B2**
- 2005–09  
*ISS*  
**Liulin-MKS**
- 2007–05–17  
*ISS*  
**Liulin-5**
- 2007–09–14  
*Foton M3*  
**R3D-B3; Liulin-Photo**
- 2008–02–17  
*ISS, Columbus module*  
**R3DE**
- 2008–10–22  
*Chandrayaan-1*  
**RADOM**
- 2009–03–11  
*ISS, Zvezda module*  
**R3DR**

## 2010s

- 2011–11–09  
*Phobos-Grunt*  
**Liulin-Phobos**
- 2013–04–19  
*BION-M No.1*  
**RD3-B3**
- 2014–07–18  
*Foton-M No. 4*  
**RD3-B3**
- 2016–03–14  
*ExoMars TGO*  
**FREND/Liulin-MO**



Interkosmos Bulgaria 1300



Meteor Priroda



Liulin-MO/FRIEND/ExoMars

## Selected references

- K. Serafimov, Space research in Bulgaria, Sofia, 1979 [in Russian]
- K. Serafimov, Bulgaria and space, Sofia, 1979 [in Bulgarian]
- T. Ivanova and V. Stoyanov, Greenhouse under the sky, Sofia, 2002 [in Bulgarian]
- D. Mishev, Space research in Bulgaria, Sofia, 2004 [in Bulgarian]
- T. P. Dachev et al., Life sciences in space research, 2015, Vol. 4, pp. 92-114
- <https://nssdc.gsfc.nasa.gov/nmc/SpacecraftQuery.jsp>

10<sup>th</sup> Workshop  
“Solar Influences on the Magnetosphere,  
Ionosphere and Atmosphere”,  
4–8 June 2018,  
Primorsko,  
Bulgaria

## Disclaimer

The above list of instrumentation and the dedicated web-site are still under construction!

Photos used: from SRTI-BAS and private archives

Contact, comments & suggestions:  
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