



YUZHNOYE

design office



YUZHNOYE'S TECHNOLOGIES IN NATIONAL AND INTERNATIONAL SPACE PROGRAMS

**Committee on the Peaceful Uses of
Outer Space
Fiftieth session
11 June 2007**

UKRAINE – SPACE STATE



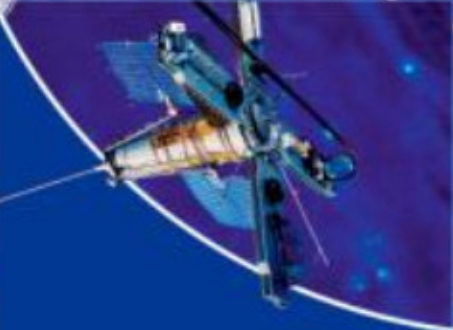


YUZHNOYE STATE DESIGN OFFICE

Yuzhnoye State Design Office named after M. Yangel is one of the largest research and design organizations developing rocket & space technologies.



Space Systems



Launch Services



Materials and
Technology Development



Analytical and Design Efforts

Testing

Trends of Development

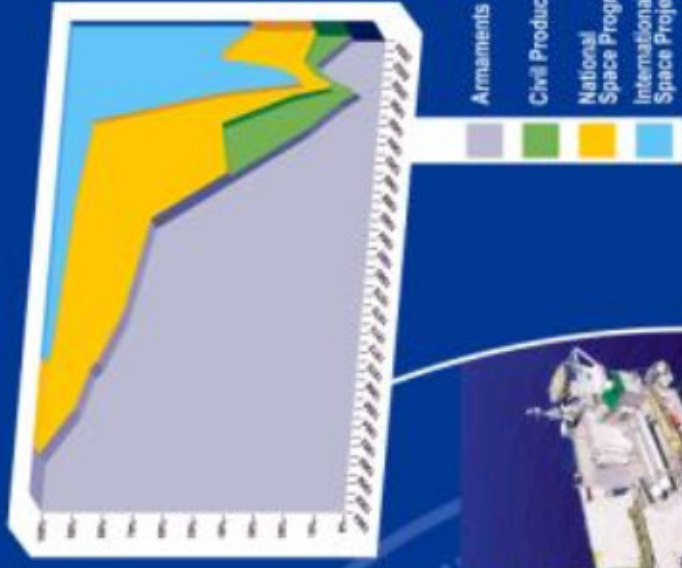
National Economic Complexes



Missile Complexes



Space Launch Systems



Block E (lunar launcher rocket segment)



SL-15 (RSC Energia)

Heavy Launch Vehicles

Space Launch Systems



Block A's strap-on booster (reusable strap-on booster)

Zenit-3M

Zenit-2M

Zenit-3SL

Medium Launch Vehicles



Cyclone-2 (SL-11) Cyclone-2 (SL-14)

SL-8 Mod 1

SL-7

Zenit-2 (SL-16)

Zenit-3SL

SL-8 Mod 2 (ASA Polyot)

Dnepr

Dnepr-M

Cyclone-4

Light Launch Vehicles





Launch Facilities

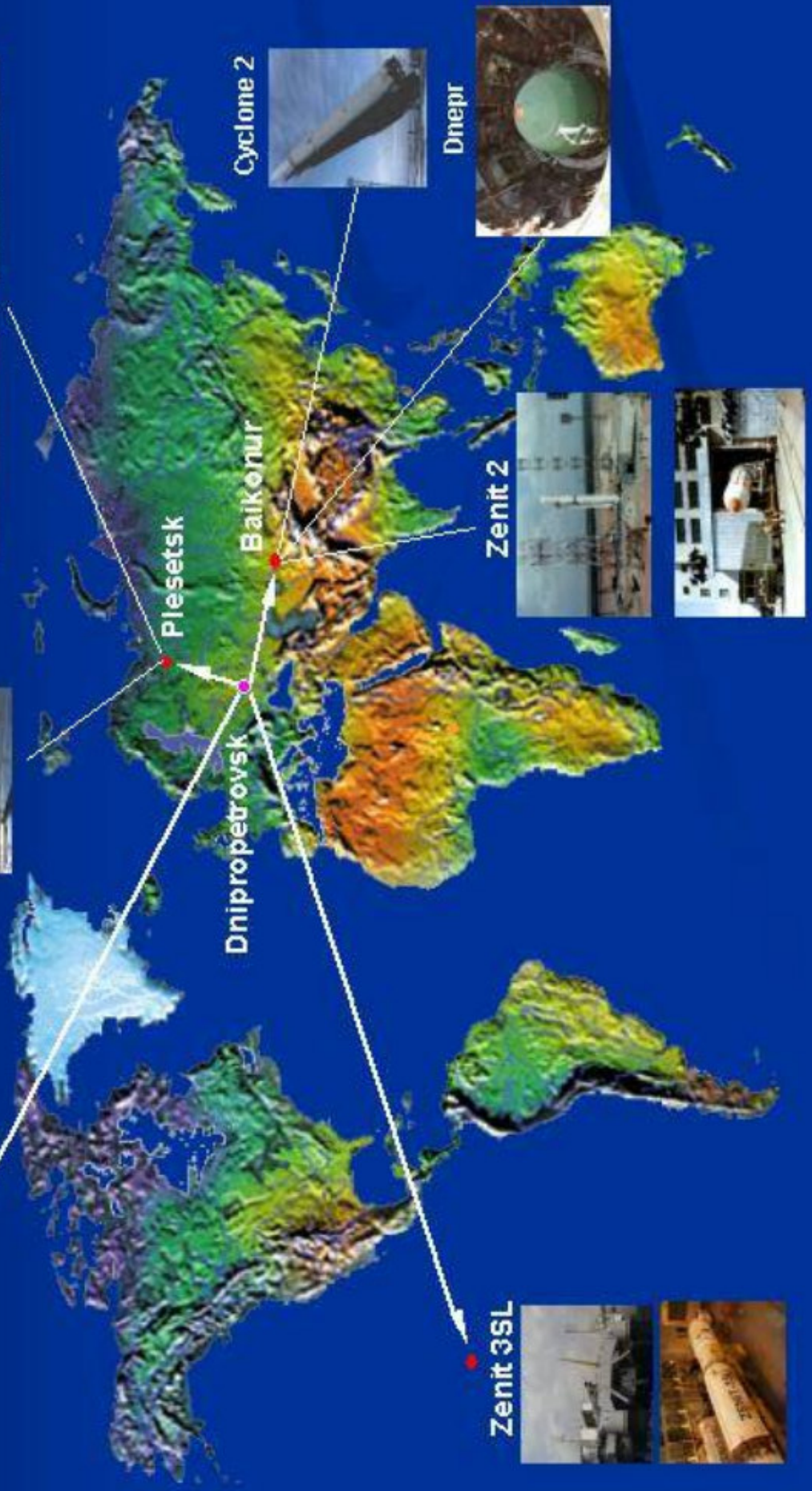
Air Based Launch



Railroad Launch (SS-24)



Cyclone 3



Zenit 3SL



Zenit 2



Dnepr



Dnipropetrovsk

Baikonur

Plesetsk

Cyclone 2



Cyclone 3



YUZHNOYE'S ACHIEVEMENTS



Cyclone-3

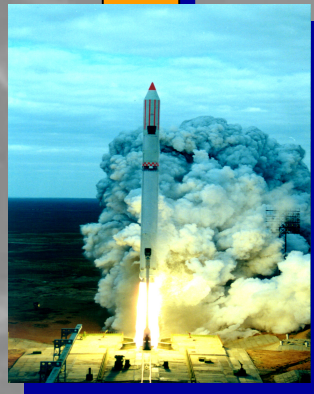


Cyclone-2

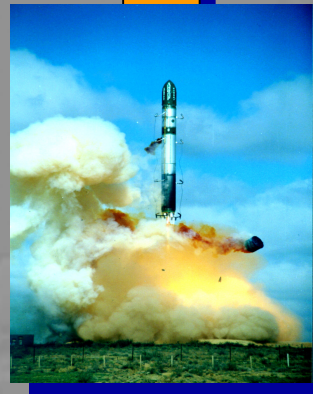
900 LAUNCHES OF THE SPACE VEHICLES WERE PERFORMED
70 TYPES OF SPACECRAFT AND 7 SPACE LAUNCH SYSTEMS WERE DEVELOPED
MORE THAN 400 SATELLITES OF YUZHNOYE SDO WERE DEPLOYED INTO ORBITS



Zenit-3SL



Zenit-2



Dnepr

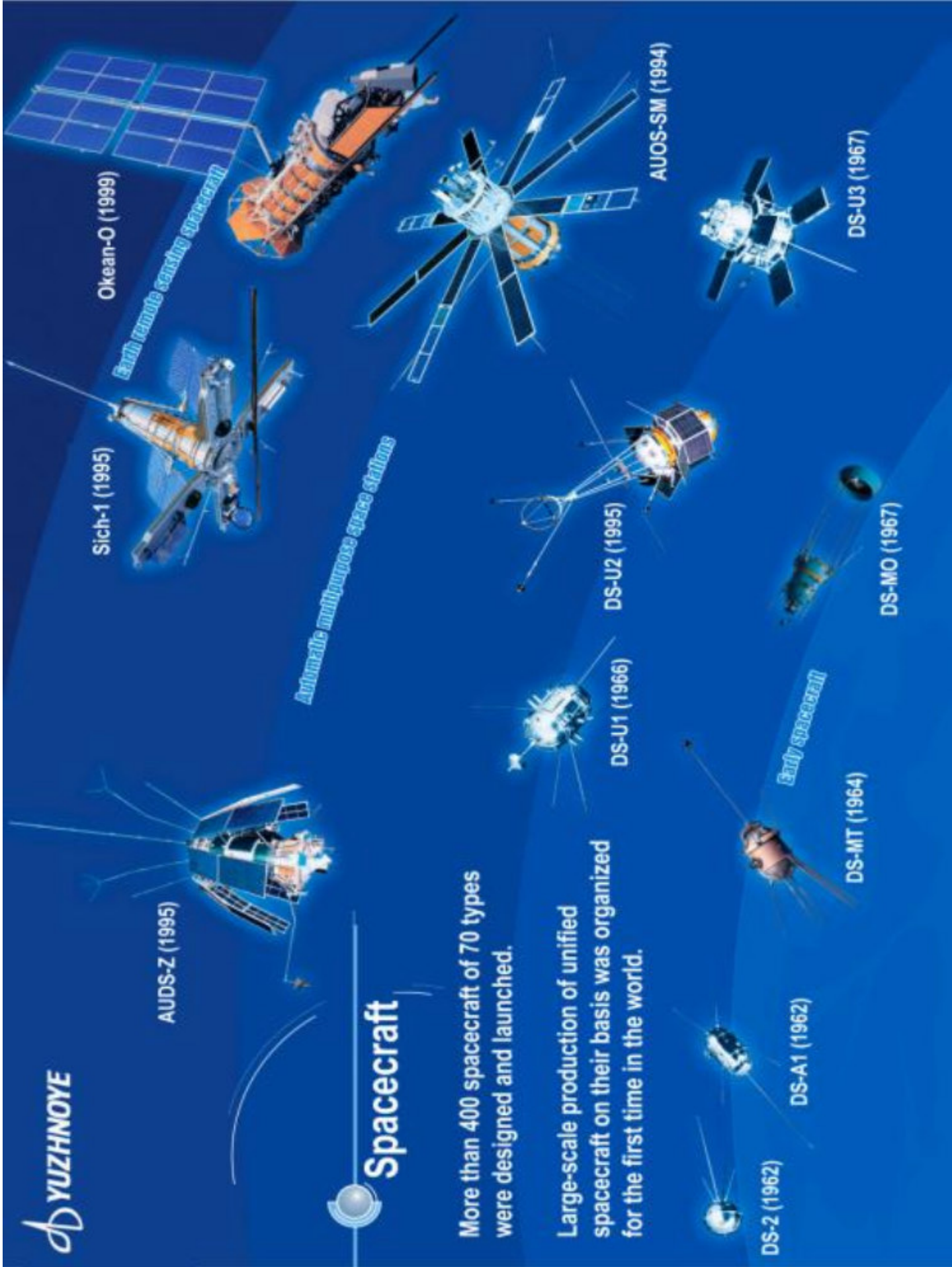


INCREASED NUMBER OF FOREIGN CONTRACTS

Spacecraft

More than 400 spacecraft of 70 types were designed and launched.

Large-scale production of unified spacecraft on their basis was organized for the first time in the world.



Okean-O (1999)

Earth remote sensing spacecraft

Sich-1 (1995)

Automatic multipurpose space stations

AUOS-SM (1994)

DS-U3 (1967)

DS-U2 (1995)

DS-U1 (1966)

DS-MO (1967)

AUOS-Z (1995)

Early spacecraft

DS-MT (1964)

DS-A1 (1962)

DS-2 (1962)



YUZHNOYE'S SPACE ACTIVITIES



THE MOST PERSPECTIVE REGIONS FOR COOPERATION



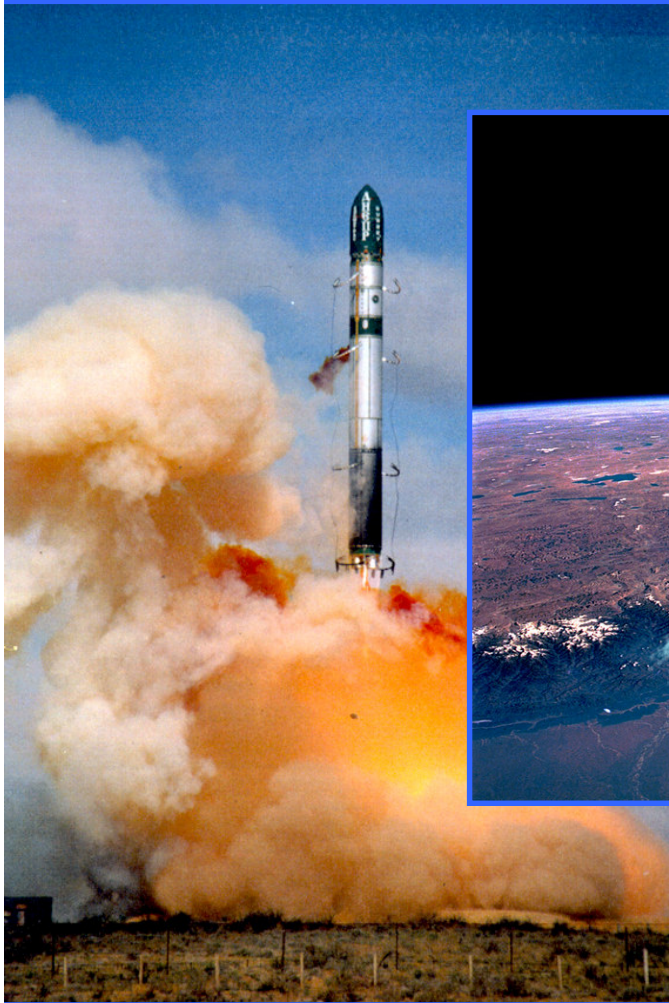
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SEA LAUNCH PROJECT



YUZHNOYE

DNEPR INTERNATIONAL PROJECT



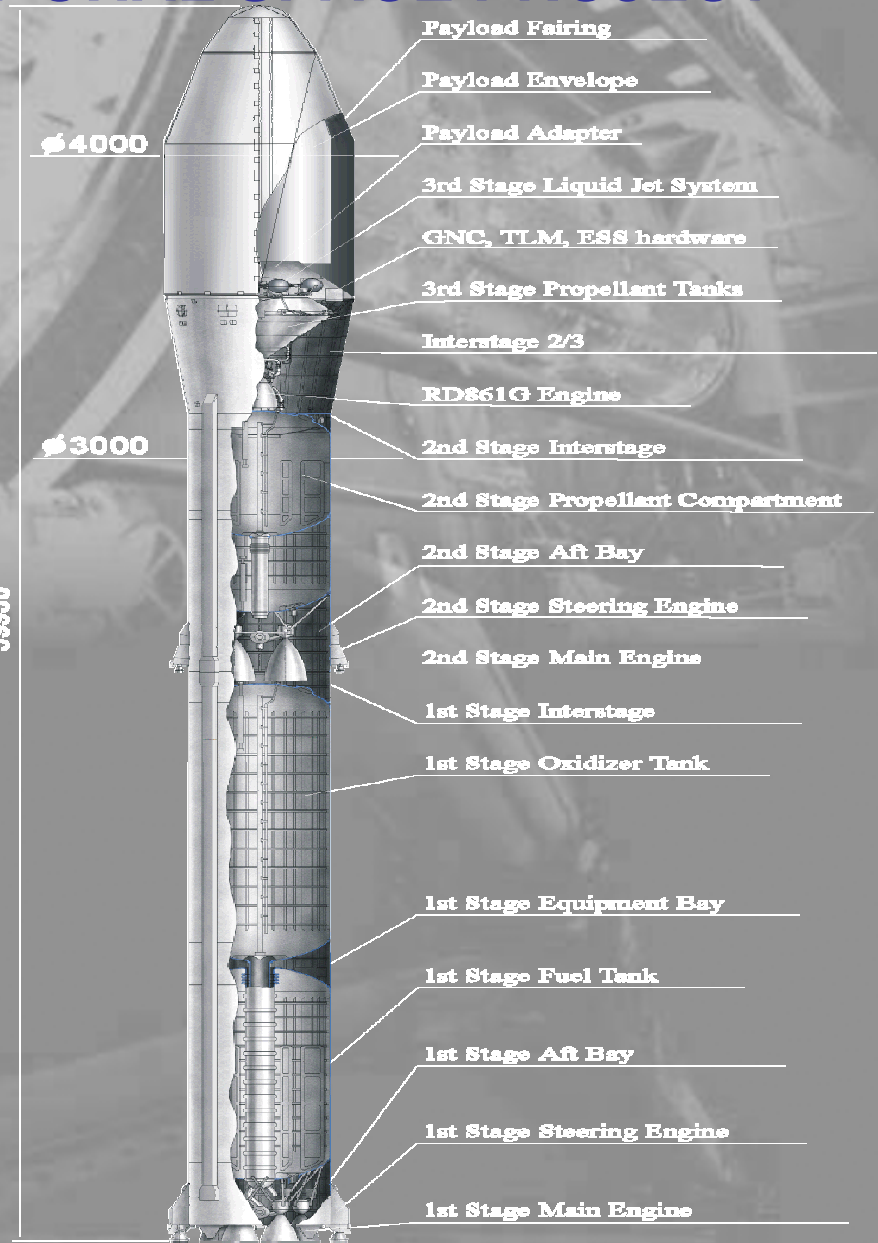
 YUZHNOYE

LAND LAUNCH INTERNATIONAL SPACE PROJECT



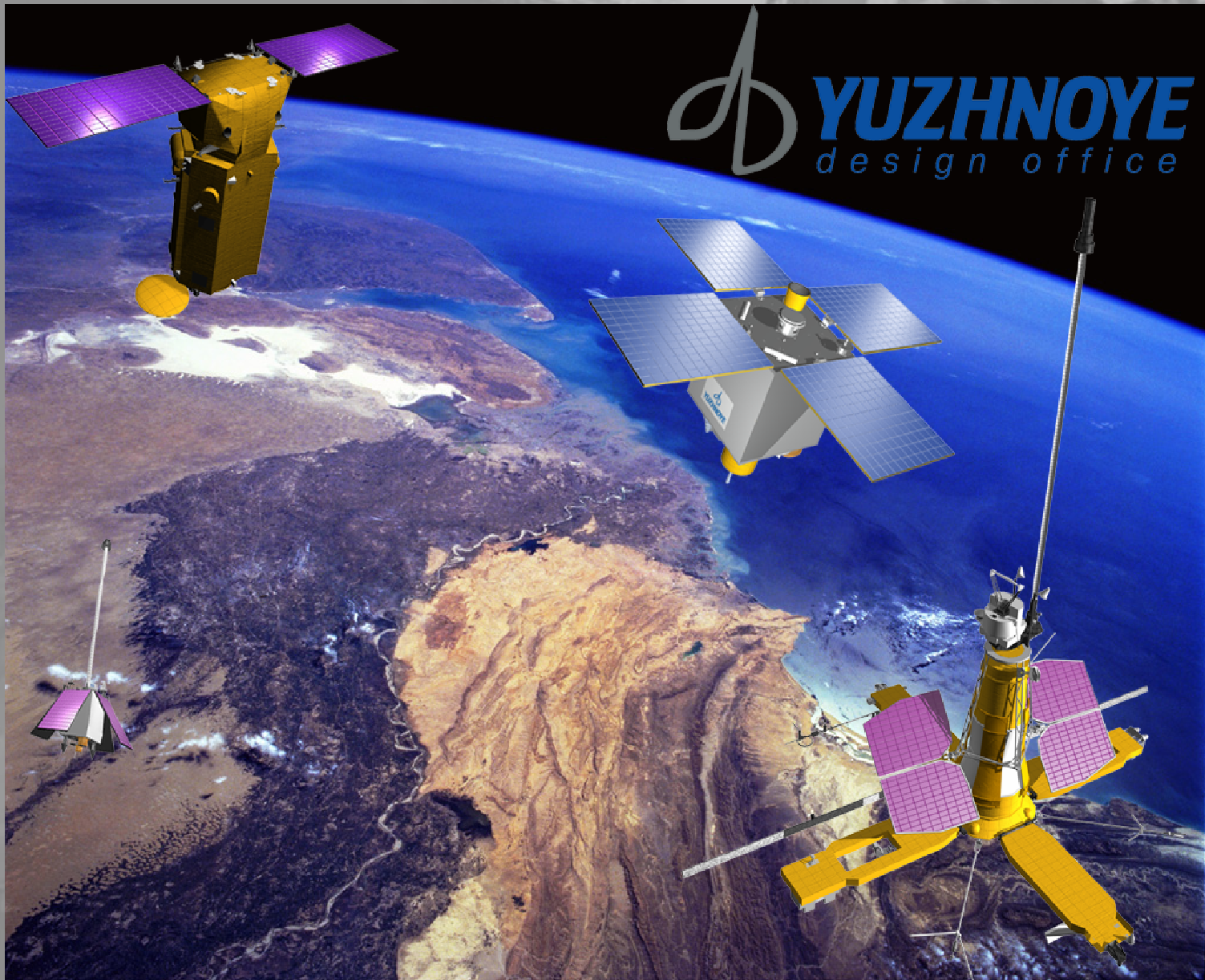


CYCLONE-4 INTERNATIONAL SPACE PROJECT



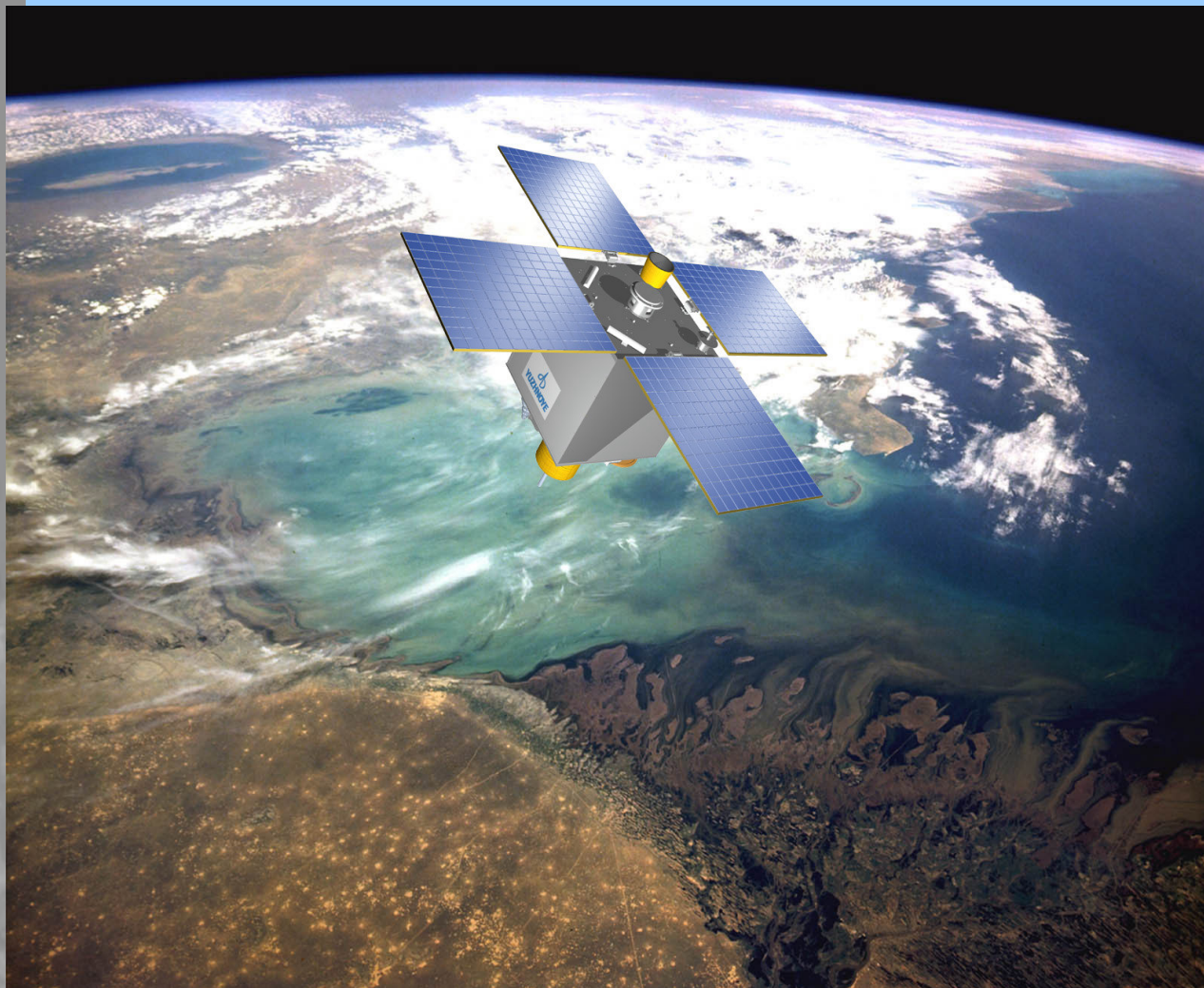
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CREATION OF NEW SPACECRAFT



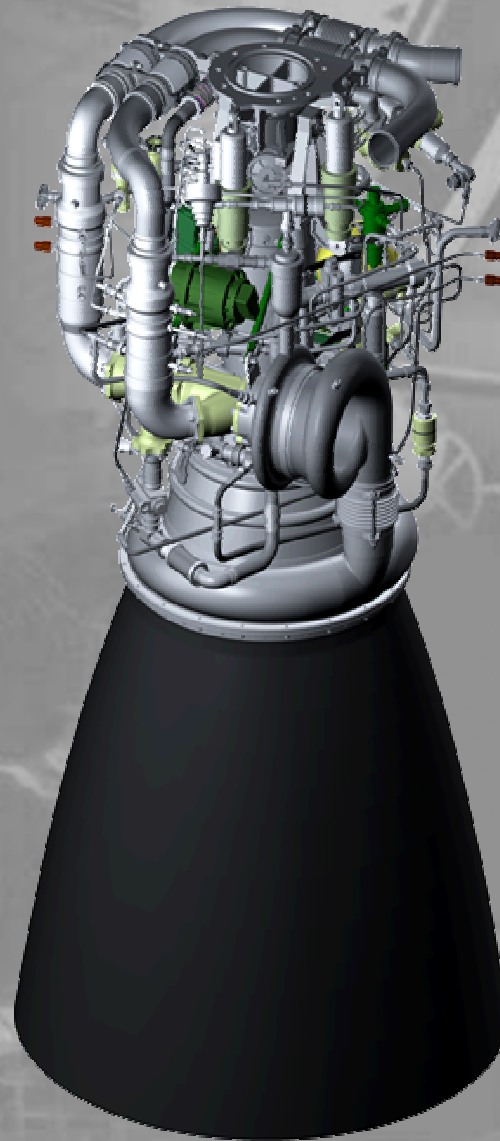
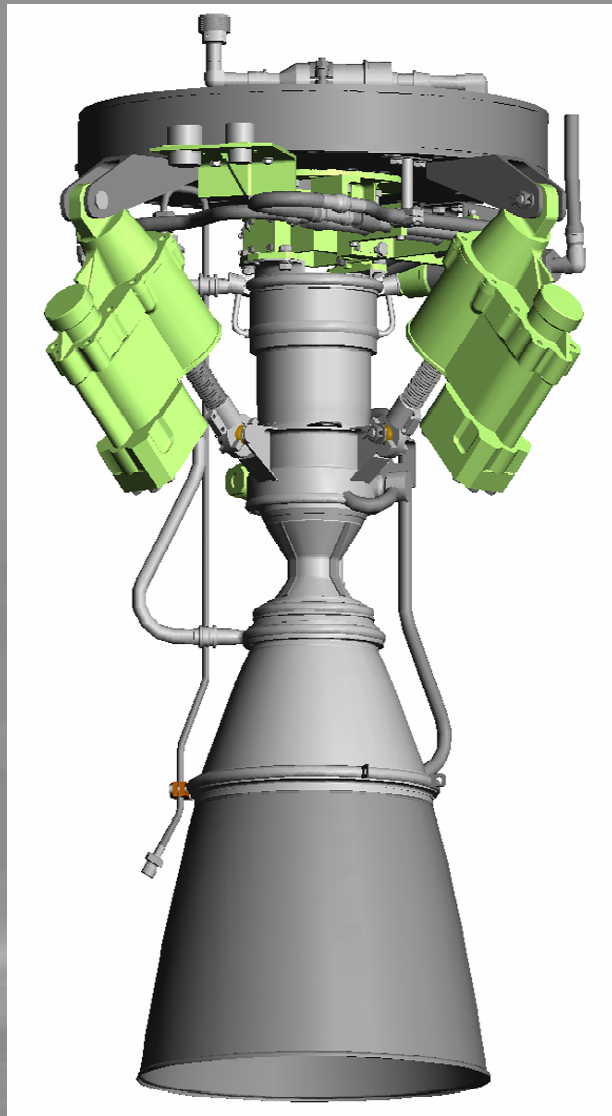
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EGYPTSAT SPACECRAFT DEVELOPED BY YUZHNOYE

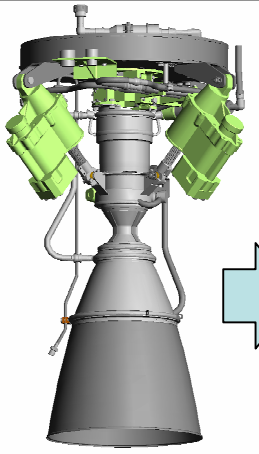


SUCCESSFULLY LAUNCHED ON APRIL 17, 2007

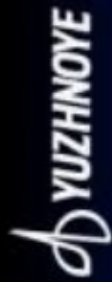
YUZHNOYE'S PROPULSION SYSTEMS



EUROPEAN VEGA PROJECT



Yuzhnoye SDO participates in this project by supplying the main engine unit, which is the component of the liquid-propellant propulsion system used on the 4th stage of the European Vega LV.



Wind power generator blades and mine structures made of fiberglass plastic



Non-metallic composites



Metal Composites

are produced by explosion welding

Multilayer composites



Plain bearings



Heat exchangers

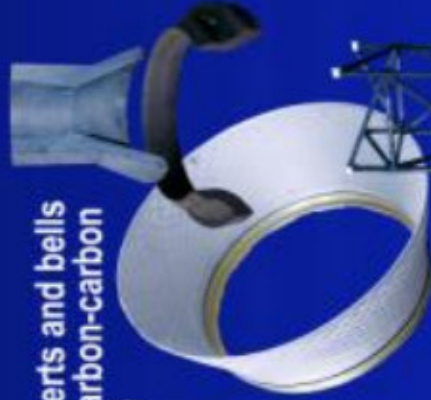


Bimetallic adapters



Advanced Materials and Technology

Nozzle inserts and bells made of carbon-carbon composite



Solid rocket motor body of "cocoon" type



Launch vehicle aft sections and spacecraft trusses made of carbon fiber composite



Metal-Plastic Composites

Metal plastic bottles

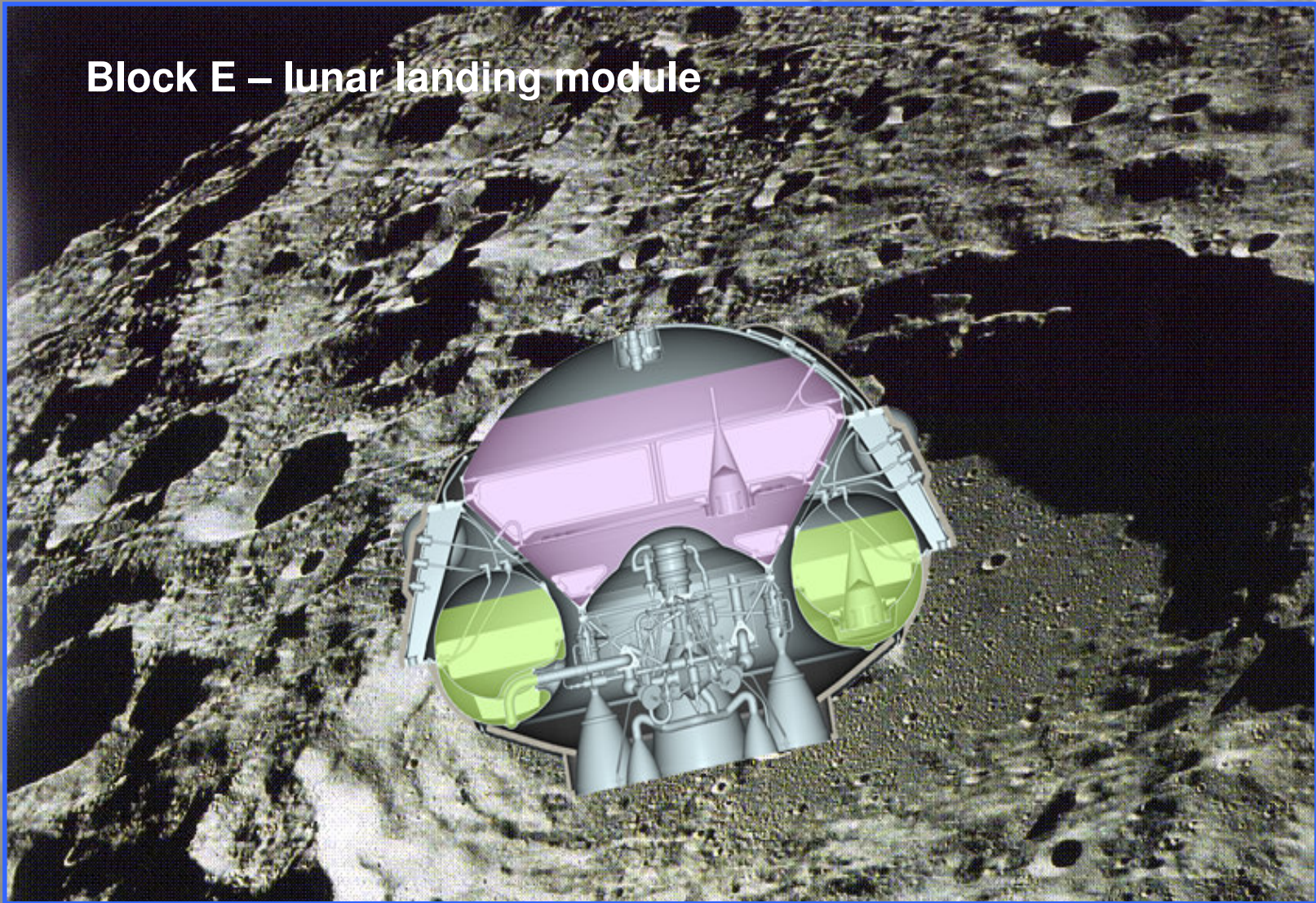


3-layer honeycomb structures

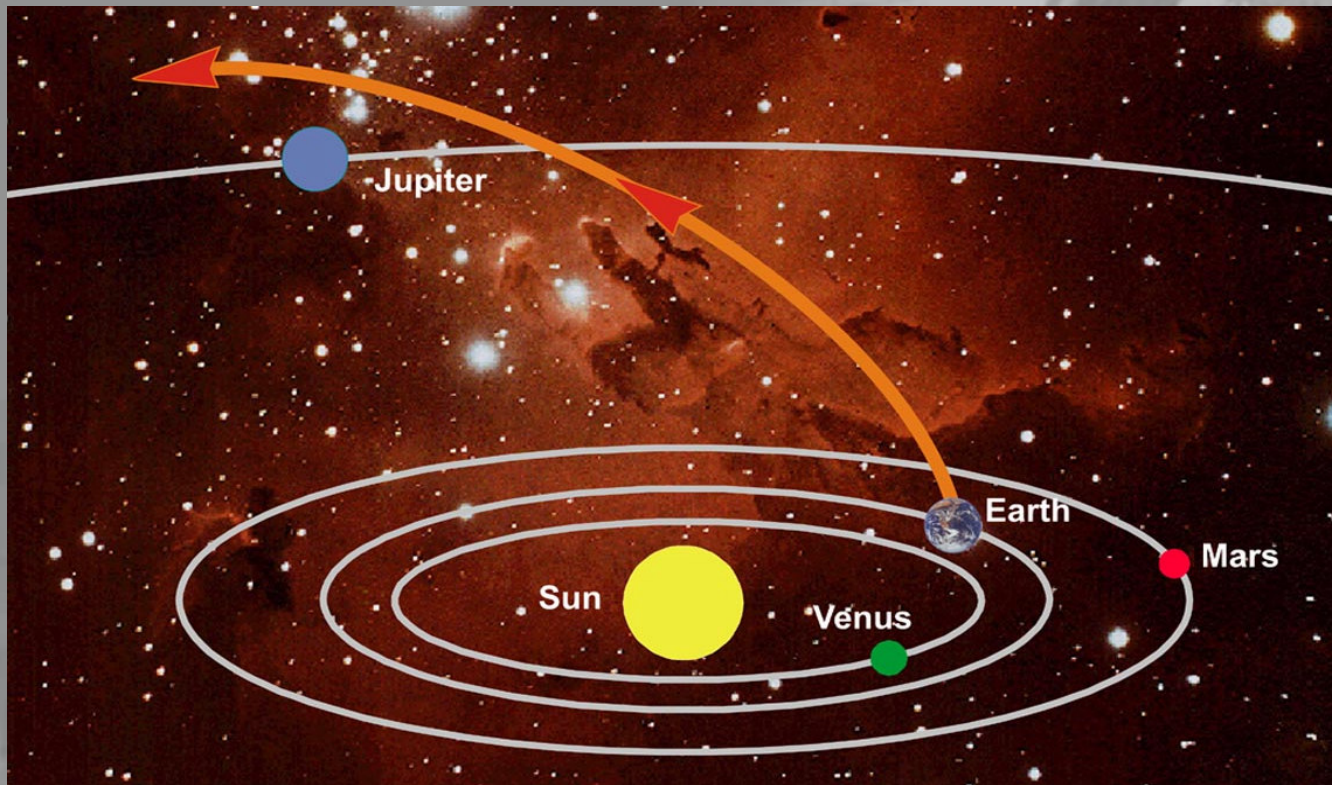


LUNAR MISSION

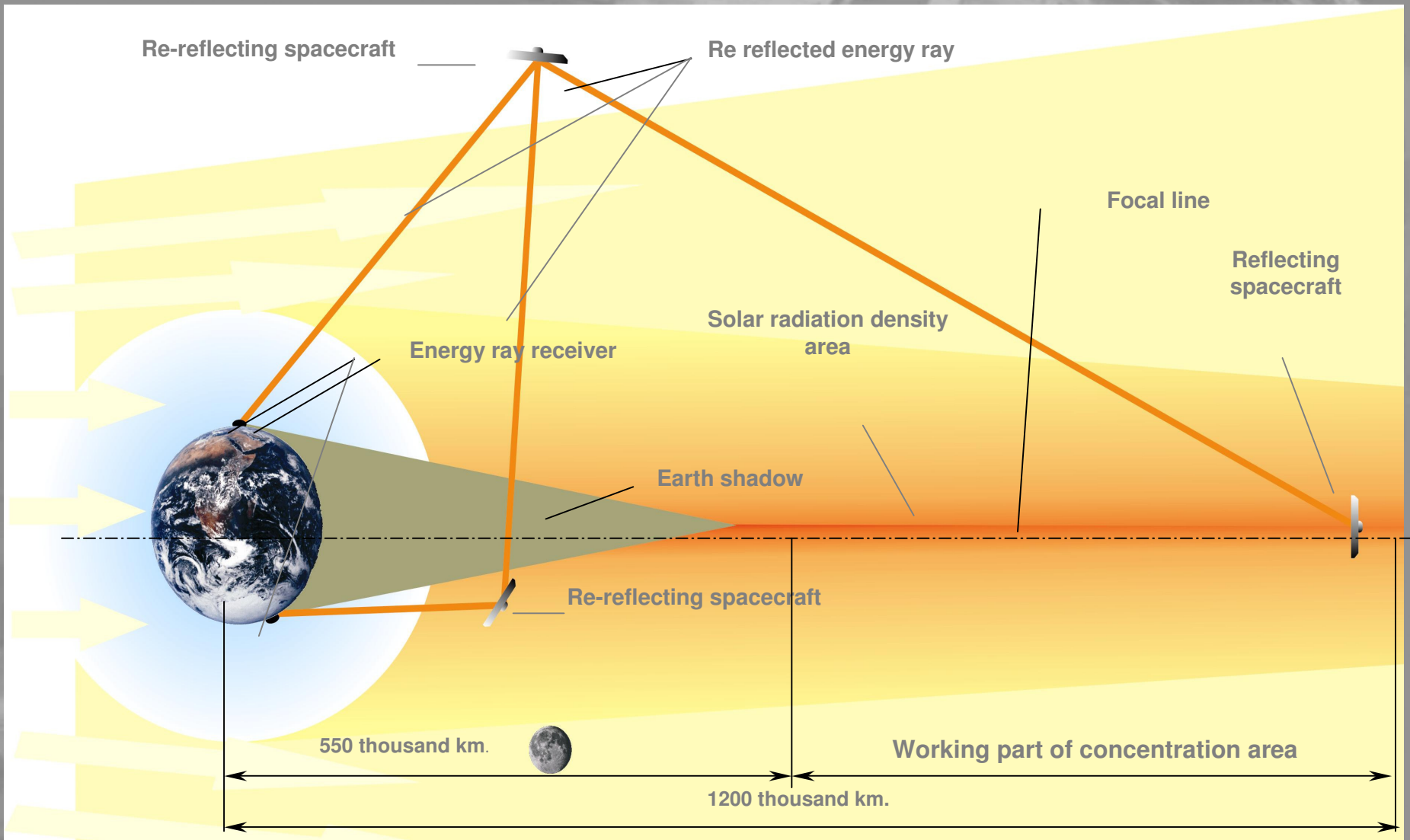
Block E – lunar landing module



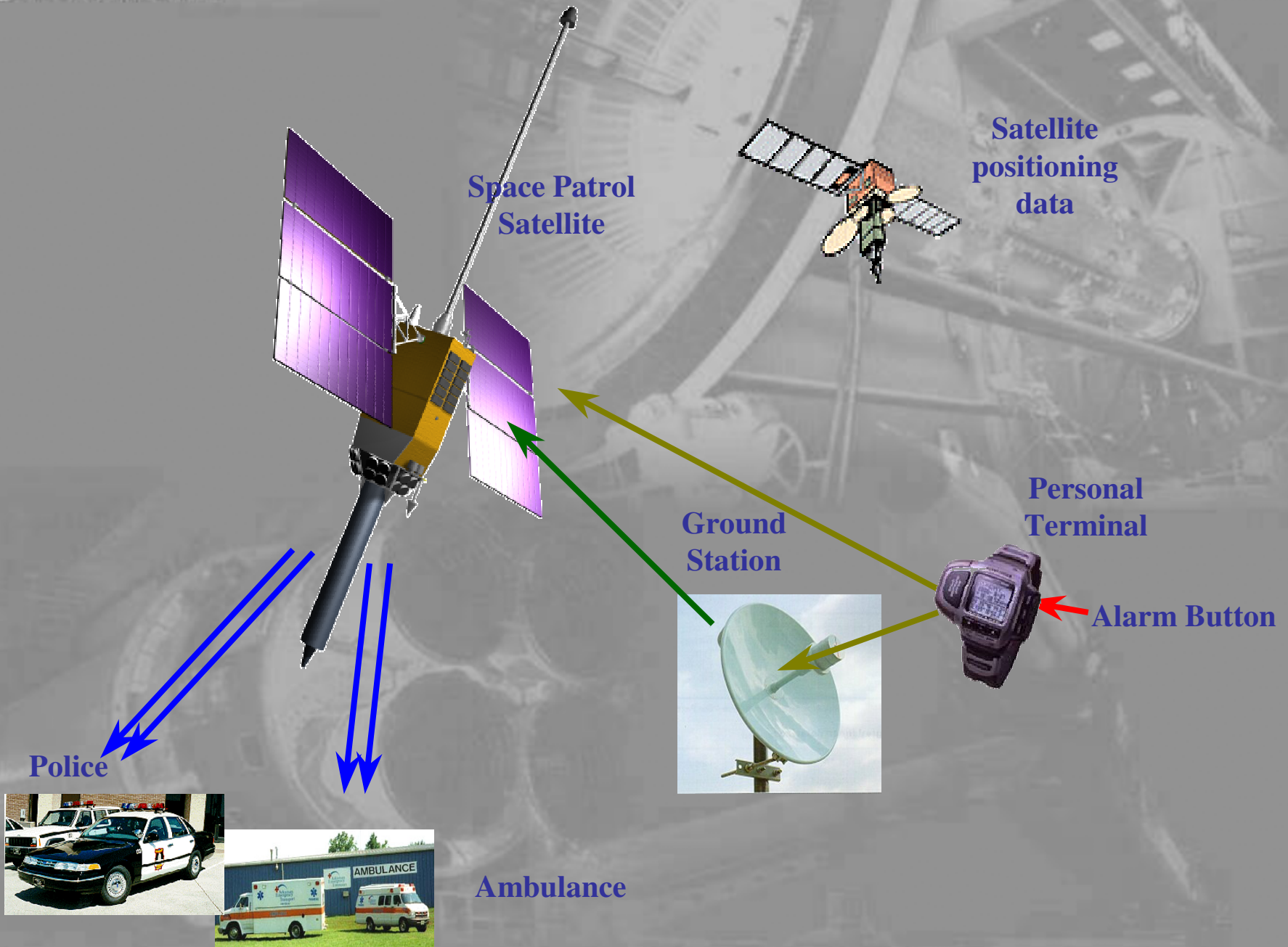
NUCLEAR WASTE DISPOSAL TO SPACE



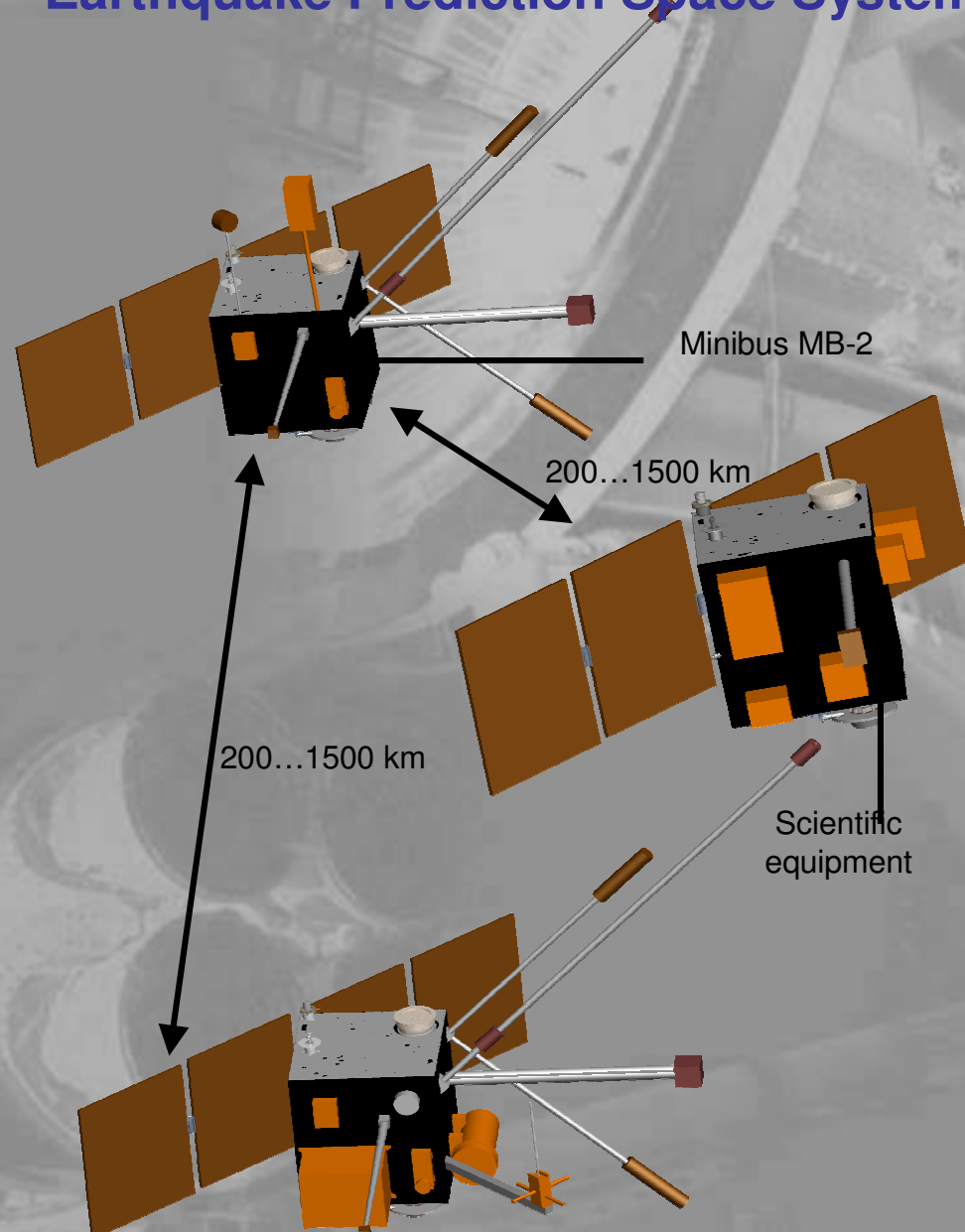
KEY TO THE SUN SPACE PROJECT



SPACE PATROL PROJECT



Earthquake Prediction Space System



BASIC FUTURE TASKS

- **International cooperation expansion**
- **Development of the perspective technologies**
- **Investment activities**

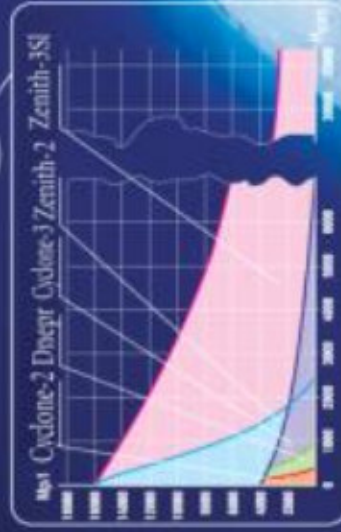


Full scope of launch services is provided, including:

- development and manufacture of SC individual adapter and separation system
- SC delivery to and storage at launch site
- clean room for SC processing
- SC thermostating before launch
- SC health telemetry data acquisition in real time at launch
- comfortable conditions for customer personnel

Launch services

Yuzhnoye's launch vehicle payload capability



Sea Launch Joint Venture (Ukraine, Russia, USA, Norway) is a provider of Zenith launch services

Cosmosbras Joint Venture (Ukraine, Russia) is a provider of Dnepr launch services

Available inclinations



Available launch sites



CONTACT DETAILS

Stanislav Konyukhov
General Designer-
General Director
Yuzhnoye SDO

3, Krivorozhskaya Street
Dnepropetrovsk, UKRAINE, 49008
Phone: +380 56 770 04 47
Fax: +380 56 770 01 25
e-mail: space@yuzhnoye.com

Alexander Degtyarev
First Deputy General Designer-
General Director
Yuzhnoye SDO

3, Krivorozhskaya Street
Dnepropetrovsk 49008, UKRAINE
Phone: +380 56 770 04 47
Fax: +380 56 770 01 25
e-mail: space@yuzhnoye.com

Oleg Ventskovsky
Director
European Representation
Yuzhnoye SDO

20, rue Vautier, B-1050, Bruxelles,
BELGIUM
Phone/Fax +32 (2) 644 90 64
e-mail: oventskovsky@brutele.be