Polish Space Agency

Arctic Workshop, July 2024

dr Aleksandra Bukala, Director of Strategy and International Cooperation Department

National governmental agency

Executive agency of Ministry of Economic Development and Technology Coordinating / supporting all civil space activities in Poland

Cooperation with Ministry of Defence on dual use applications

Offices in Gdańsk, Warsaw & Rzeszów

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THE ROOTS ...

Mikołaj Kopernik (1473-1543)



Copernicus vision of the Universe in De revolutionibus orbium coelestium



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Jan Heweliusz

(1611 - 1687)

Selenography,

or the description

of the Moon... (1647)

Poles at NASA for the Apollo Program (1966-1972)

Mieczysław Bekker (1905-1989) Eugeniusz Lachocki (1921-2010) Apollo equipment

Chief constructor

of the Apollo LRV

rover. creator of

terramechanics



Werner Ryszard Kirchner (1918-2008) Engines of LM lander



Interkosmos program (1967-1988) Space Research Centre of the Polish Academy of Science (1976)





>70 research instruments on satellites and interplanetary







probes



POLES IN(TO) SPACE



Mirosław Hermaszewski

Sojuz 30/Salut 6 (27.06– 5.07.1978). Mirosław Hermaszewski made 126 orbits of the Earth,

- conducted biological experiments (including the body's reaction to the state of weightlessness, psychological aspects of flight geophysical tests (e.g. observations of the Earth's water and land resources, observations
- of the aurora borealis).

- PhD Sławosz UZNAŃSKI was elected in November 2022 to the European Space Agency's reserve astronaut corps.
- In the recruitment process, which lasted 1.5 years, he proved better than more than 22,500 candidates from Europe.
- Scientist and PhD in electronics working at the European Organisation for Nuclear Research (CERN) in Switzerland.



Sławosz Uznański

P • L S A POLAND IN SPACE – A NEW CENTURY



POLSA STRUCTURE

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SPACE SECTOR OF POLAND IN A NUTSHELL

Heritage:

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- 1973 first instrument in orbit
- 1978 first cosmonaut
- 2012 first satellite (16 till today)
- 2012 joining ESA

LSA

- 2014 POLSA established
- 2017 Polish Space Strategy
- 2021 Artemis Accords signed
- 2023 Increase of contribution to ESA

Today:

- ~400 companies and research centres
- 20% research institutions
- 80% Industry mainly SME's

Strengths: High innovativeness High quality workforce Proactive attitude

Opportunities: Increase of contribution to ESA National Space Programme 2024-2028 Artemis Accords

SPACE BUDGETS - POLAND

Public investment in 2023:

• 163M€

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• 69M€ ESA

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- 80M€ national investment (mil + civil)
- 14M€ Eumetsat
- +32% evolution since 2022
- 9th largest space budget of ESA Member States

Private investment (under verification with ESA):

- 2022 10M€
- 2023 4M€



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Contributions of ESA members (mln €) for 2019-21 and 2022-24



P • L S A SATELLITE INFRASTRUCTURE FOR MODERN SOCIETY

Today satellites' systems in orbit are **an infrastructure**, as much needed as roads, airports, power lines, internet fibers etc.

Basic elements: telecommunication, navigation, Earth observation, space weather, planetary defence, scientific instrumentation

Application areas & examples:

Navigation & Logistics
Internet, TV broadcasting
Agriculture & forestry
Architecture

Crisis prevention & handling (natural disasters)









L S A NATIONAL SATELLITE INFORMATION SYSTEM

- Collecting data from Copernicus, national & commercial satellites
- Data storage, archive, catalogue, preprocessing

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- Companies can add algorithms, services & products
- Users (public & provate) can search for data, products & services



NATIONAL SPACE SAFETY SYSTEM

Worldwide network of sensors for satellite survey & tracking POLSA coordinates network and provides data for EU SST partnership: 2020-22: ~6 mln. single measurements, ~ 308 tys. Tracking Data Messages Sensors built, owned & operated by industry and research institutions



SUBORBIAL FLIGHTS

Current status

Several rockets successfuly tested up to 20 km

The feasibility study conducted for >100km flights (Dec 2021):

- Current military training areas for rocket launches are too small
- Development of the ground infrastructure is required
- Implementation of legal regulations

Actions

POLSA works on legal and logistic preparations for:

- testing fuel tanks
- testing engines
- prelaunch integration
- Iaunch services



BIGOS

PERUN

POLAND IN 11/24 ESA MISSIONS



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INTERNATIONAL COOPERATION

Poland is a member of the most important international organizations involved in the exploration and use of outer space:

International Astronomical Union (IAU), 1922 International Astronautical Federation (IAF), 1956 Committee for Space Research (COSPAR), 1960

INTERKOSMOS program, 1975-1992 European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT), 2009 European Space Agency (ESA), 2012 European Southern Observatory (ESO), 2014 EU Agency for the Space Programme (EUSPA), 2021



S A INSPIRING THE NEXT GENERATION P



Students satellite PW-Sat2



Student Council at the President of POLSA (with prof. Christopherem Welchem from ISU)



Starachowice 2018



DRilling Experiment for Asteroid Mining





TOP PRODUCTS OF POLISH COMPANIES

- CloudFerro: cloud computing services
- **KPlábs:** on-bóard Al processing

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- **Thorium Space:** digital transponder KA/W/X, 1Gb/s
- Hertz: military GNSS logistics systems
- Creotech Instruments: microsatellite platform HyperSat
- SatRev: EO small satellites
- Silesian Science and Technology Centre of Aviation Industry Ltd. composite structures
- Vigo Systems: IR detectors
- PIÂP Space: robotic manipulators
- Astronika: penetrators
- ITTI: EO and GNSS solutions for industry
- Cillium, 6Roads, Sybilla: SST telescopes & software





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- Artemis Accords signed in 2021
- Participation in "Moon to Mars" workshops in London in 2022 and 2023 and Washington 2024
- Co-chairing Artemis Accord signatories working group on participation of emerging space countries
- Oraganising Artemis workshop in Gdańsk 2023 and participation in Montreal 2024
- Managing lunar missions Repository

