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A new decade of Polish presence in space

At the Polish Space Agency (POLSA), we have always enthusiastically entered the new decade with ambitious development plans to strengthen Poland's position on the international stage and accelerate technological and economic progress in the country. In an era of increasing competition in the space sector, as a key institution, we have worked with commitment to build space infrastructure, develop innovative technologies and promote international cooperation. Our priorities for the coming years, in my opinion, should include, among other things, the development of advanced satellite systems, participation in space exploration, enhancing security in orbit, and building a human resource base for the space sector.

The Polish Space Agency (POLSA) was established in 2014 to support the development of the domestic space sector and integrate it with international programs. Over the decade, Poland has become an active participant in global initiatives, signing agreements with ESA, NASA and agencies from France, Italy, the US and Israel, among others, and joining the Artemis Accords in 2021 opened the way for Poland to participate in lunar exploration missions.

So far, the effect of the Polish Space Agency's activities has been the dynamic development of the space industry in Poland, which now numbers more than 400 entities, including companies, research institutes and universities. More than 150 of them are directly involved in European Space Agency (ESA) projects, with contracts worth more than €140 million. Total employment in the country's space sector is estimated at nearly 12,000 full-time jobs within several hundred business entities, compared to only 331 in 2020.

POLSA also actively participates in international projects on space security, orbital robotics and satellite communications. It cooperates with ESA within the framework of the Space Situational Awareness (SSA) program, monitoring space around the Earth, and participates in projects such as ENTRUSTED, which supports the development of secure satellite communications for government, and PERASPERA, focusing on space robotics. In the coming years, intensive development of satellite missions and the space security system can be anticipated and a significant share of the European space market can be achieved.

Satellite systems: a pillar of Poland's technological independence

In recent years, we have been working intensively on one of the key projects - the expansion of the National Satellite Information System (NSIS), which should become the foundation of modern satellite data management in Poland, fulfilling several important functions. First of all, it will enable us to monitor environmental changes and analyze natural resources, which we consider essential in the context of energy transition and sustainable development. In addition, NSIS will play a key role in emergency management, providing precise data on natural disasters such as fires, floods and atmospheric phenomena, which will significantly improve the effectiveness of our emergency response.

As part of the expansion, more than 70 new satellites can be launched, which will be used for Earth observation, navigation and communications. These satellites will play a key role in the realization of national technological goals, such as the development of geospatial services, monitoring of agricultural land or support for the defense sector. The development of satellite systems will help strengthen Poland's independence in acquiring data, which can be

considered extremely important in the context of global challenges related to natural resource management and environmental protection.

Astronaut on the ISS: a landmark moment for Poland

The year 2025 is already a landmark year for the Polish space sector - as early as this spring, a Polish astronaut, Sławosz Uznański-Wisniewski, will fly to the International Space Station (ISS) as part of the Ignis mission. This mission not only symbolizes the technological progress and advancement of the Polish space industry, but also provides a unique opportunity to carry out numerous scientific studies. It is scheduled to carry out 13 experiments covering such fields as biology, physics, medicine and materials engineering. The results of this research are applicable not only in the space industry, but also on Earth, including regenerative medicine and the development of new materials.

Our preparations for the mission to the ISS were comprehensive and included both close cooperation with international agencies such as the European Space Agency ESA and the American NASA, as well as intensive educational and promotional activities. We were committed to organizing numerous workshops, lectures and educational events to introduce young people to space exploration. We are also pleased to see how such initiatives not only build public awareness, but also inspire the younger generation to choose a career in the space sector.

Exploration of the Moon and Mars: global ambitions

POLSA has also been actively involved in international initiatives on lunar and Mars exploration. One of these is the Artemis Program, which aims to establish a permanent base on the Moon and test the technologies needed for further exploration. The program opens up a number of opportunities for cooperation on a global scale. As a signatory to the Artemis Accords, it is with great hope that we are building relationships with leaders in space exploration, and in turn building opportunities to contribute to the development of key technologies.

The role of Polish companies and research institutions in these projects, among others, will be to provide advanced research instruments, data analysis software and robotic systems. It is gratifying to see how Polish companies involved in the development of space technology are participating in projects related to the construction of infrastructure on the Moon, which has gained importance in recent years due to the growing interest in this celestial body. Participation in exploration projects on Mars, too, is a key step in the search for life on other planets, with the intention of testing technologies to enable future manned missions.

Space security as a priority

With the growing number of satellites in orbit, ensuring safety in space should be one of the key priorities. Together with the EUSST consortium, POLSA has been working on systems for monitoring space traffic and warning of potential collisions. Our POLON System, a tool for analyzing data and tracking active satellites and space debris, will allow us to better manage on-orbit traffic and hail alerts on impending threats. Space security is crucial for future exploration and commercial missions, and the development of collision avoidance and space debris management technologies is becoming a sine qua non for the long-term use of space. By engaging in these projects, Poland can play an important role in global efforts to protect space resources.

Education: an investment in the future

At the Polish Space Agency, we have for years considered the development of education and the inspiration of young people to be a key part of our activities. That's why we have been so enthusiastic about programs such as the AI Worden 'Endeavour' Scholarship, which offer young people and students the opportunity to gain practical skills and participate in international projects. Thanks to these initiatives, young Poles have the chance to work on new technologies, develop their competencies in the rapidly growing space sector and gain experience that will be invaluable on the job market.

We have also organized various educational events, such as hackathons, student competitions and technology workshops. Our initiatives promote creativity and innovation, encouraging young people to challenge themselves in areas such as engineering, programming or data analysis. We are pleased to see how hackathons, such as NASA Space Apps and the CASSINI Hackathon, engage participants in finding solutions to real-world problems, enabling young people to gain experience and develop practical skills.

Strengthening cooperation with ESA

We have worked intensively to strengthen cooperation with the European Space Agency, which we consider crucial to the development of the Polish space sector. We have proudly implemented trainee programs, such as the Polish National Trainee Program, which give young Poles a chance to gain valuable experience in an international organization, as well as enable them to cooperate with leading research institutions. In our opinion, such cooperation contributes to the effective transfer of knowledge and technology, which is essential in the context of innovation and competitiveness of the space sector.

At POLSA, we have also sought to actively participate in international technological research, supporting the development of research projects and initiatives that contribute to technology development. We are pleased to see how participation in these global projects is shaping the Polish space sector, enabling mutual exchange of experience and building strong relationships with other countries and institutions.

Changing approach to science teaching and working in the sector

Over the past decade, we have paid special attention to innovative approaches to science teaching. That is why we have been involved in projects such as Future Space and STEM (Science, Technology, Engineering, Mathematics) events, emphasizing the importance of introducing modern teaching methods in Polish schools. Thanks to the engaging and inspiring programs we create as part of our activities, young people have the opportunity to learn about and understand the fundamentals of scientific research and space technologies. And this is of fundamental importance for their later decision on the field of study.

Promoting careers in the space sector should be one of our important educational policies. To this end, various initiatives should be supported, such as the organization of open days, as well as scholarship programs. In this way, young people get the chance to shape their career paths and connect directly with international projects and also give them the opportunity to participate in internships at space agencies.

Directions for the next decade

At POLSA, we have been successfully combining educational activities, technology development and international cooperation for years, which we believe is fundamental for the Polish space sector. Our ambitious projects, such as the development of NSIS, the exploration of the Moon and Mars, or sending the first Polish astronaut to ISS, become a signal for young people to invest in their future. Through our hard work, we are not only bringing Poland into

the permanent orbit of global exploration efforts, but also expanding the expertise of Polish entities in the country.

Investment in science and education should be seen not only as an unprecedented opportunity, but also as an obligation that has the potential to bring privileges to society as a whole. It is very satisfying to see how the growth of the space sector is benefiting not only the scientific aspect, but also the economy, providing a boost to job creation and technological innovation.