

# ROBOLAB

Local STEM Incubator







## FOUNDATION FOR THE SUPPORT OF EDUCATION AT THE AVIATION VALLEY ASSOCIATION

The Foundation for the Support of Education at the "Aviation Valley Association" was established in order to create new development opportunities for children and young people by organizing a specially prepared, interactive classes and scientific demonstrations. Its main goal is to prove to young people that science does not have to be boring and can give a lot of satisfaction, and its mission is to develop their interests and encourage them to explore the world, so that the "adventure" with science would bring benefits in their future professional lives. The Foundation pursues its goals through projects involving free classes for children and young people, as well as popular science events. Until February 2018, the Foundation was the organizer of popular science classes called the "Children's University of Technology", which originated in Rzeszów. In the following years, the project opened its branches in Mielec, Dębica, Ustrzyki Dolne and Stalowa Wola. As of March 2018, as a result of establishing cooperation with the University of Rzeszów, the Foundation launched a new project for children called the "Children's Technical University" implemented, similarly to the previous one, in Rzeszów, Mielec, Dębica, Ustrzyki Dolne, Stalowa Wola and, since 2020, also in Jasło. The number of participants in these popular science lectures was over 21,700 individuals. In addition to lectures conducted in Rzeszów and the Branches, the Foundation for the Support of Education at the "Aviation Valley Association" also conducts classes and scientific demonstrations as part of other educational projects. The demonstrations of the Children's Technical University are presented at primary schools, mainly in rural areas throughout the entire Podkarpackie region. To date, over 8,700 children have been covered by the project. Educational programs such as Super Cool Physics or Suggestion have been designed for secondary school students, from which over 16.5 thousand young people have already benefited.



The Foundation is also the organizer of the Festival of Science, which takes place every two years and brings together a huge number of participants. Over 40,000 people took part in the last three editions of the event. The idea of the Festival of Science is to popularize and disseminate science, including above all the exact sciences and engineering subjects. The event aims to increase the science-related awareness of the community and raise interest in exact science, and to show that science can be great fun and adventure. Each Festival of Science covers lectures, workshops and demonstrations and provides experimental stands available to the participants where scientific issues are demonstrated for the audience in an interesting way. The last edition took place under the name of Podkarpackie Festival of Science.

FOUNDER

AVIATION VALLEY

Thanks to cooperation with universities from the region, the Foundation also implements research projects and supports the education system. In the years 2015 - 2016, together with the Rzeszów University of Technology, the Foundation conducted postgraduate studies designed for teachers of vocational subjects teaching in upper-secondary schools. The study programme was developed together with representatives of companies, thanks to which the skills acquired by the participants met the requirements of the labour market.

From November 2017 to October 2019, the Foundation was a partner in an educational Learn&Fly project - co-financed by the European Commission under the Erasmus + programme. The project was implemented by partners from Poland (coordination), Portugal and Spain. The Learn&Fly project was a response to the problem of the lack of basic skills of students associated with the so-called STEM (Science, Technology, Engineering, Mathematics) in the field of science, technology, engineering and mathematics, by applying innovative and engaging teaching methods of education related to aviation. As part of the project, a set of materials supporting the work of teachers and students (STEM Kit) as well as a career guide (Careers Kit) in the aviation industry in three countries participating in the project was created, and also the national competitions followed by the international final of flying aircraft models took place. In total, over 170 people took part in the events associated with the project.

Parallel to its statutory activity, the Foundation pursues economic activity thanks to which it is possible to organize innovative company picnics in the form of popular science events, which in recent years has turned out to be a very interesting alternative for companies organizing such events for their employees. The Foundation is continually

expanding its activities and looking for new forms of popularization of science as well as new partners, while constantly striving to maintain the best quality of their respective activities.

The Foundation for the Support of Education at the "Aviation Valley Association" is among others, a member of the „Society and Science SPIN" Association – associating the science centers in Poland, is involved in the development of the Podkarpackie Science Centre and it also consults a number of other initiatives and educational and popular science projects in the region.





# ROBOLAB

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The Foundation for the Support of Education at the "Aviation Valley Association" was established in 2012. Since then, it has been continuously engaged in activities promoting science among children and young people, especially in the field of technical subjects. In its activities, the Foundation strives not only to continuously improve the quality of the classes already conducted, but also to constantly expand its offer. One of the new initiatives of the Foundation is the launch of a program based on renowned, known and appreciated around the world programs such as FIRST Robotics (USA) or proprietary programs such as Learn&Fly, created together with other European institutions. Apart from improving technical skills, these programs emphasize the key "soft" skills.

The Foundation's response to the above-mentioned challenge is the RoboLAB project, which is innovative and involves the implementation of multi-directional activities with an extensive formula. In its main assumptions, RoboLAB has the task of conducting classes that will allow to increase competences among primary and secondary school students, both in the field of STEM and advanced technologies. One of the priority assumptions of the project is also the development of soft competences by children and young people, with particular emphasis on problem-solving skills, cooperation, communication, teamwork and the development of critical thinking. No less important for the creators of the project is also to inspire young people to act and instill in them the faith that thanks to their work and development they can shape their future and overcome obstacles encountered in pursuing their goals. The organizers also assume that the participation and involvement of young people will allow for the preparation of potential teams to compete with students from other countries during the international robotics competition - FIRST Robotics Challenge. The organizers of RoboLAB also plan to organize their own, prestigious, international robotics competition with very attractive prizes.



All planned activities under the RoboLAB project can be implemented thanks to the involvement of the Foundation's employees, who over the years of its activity have gained extensive experience in running programs addressed to children and young people.

So far, over 30,000 participants have taken part in the flagship project run by the Foundation - Children's Technical University - and over 40,000 participants at different ages and from various places have taken part in the cyclically organized Festival of Science.

The activity of RoboLAB covers two groups of tasks. The first is the activity related to conducting classes and training, while the second is the organization of robotics competition.

The activities related to conducting classes and training are dedicated mainly to secondary school students, and the organizers also allow the possibility of participation in classes by students of the last grades of primary schools. In addition, the classes and training courses can be attended by adults who are passionate about robotics, are experts in this field or are employees of project partners, who in their free time create robotic structures at their homes or garages. The organizer, by allowing adults to participate in the project, intends to build in the near future a community of people who will support young people with their knowledge and experience in striving for achieving the set goals in the field of robotics, especially members of teams participating in the competition. Such support will allow them to acquire knowledge and solve problems and difficulties that arise during the implementation of tasks assigned to them. The organizer assumes that the project will include six different types of classes to be conducted.

The activity related to the organization of international robotics competition assumes its organization once a year, whereas the subject matter of the competition is announced at the beginning of each year. The subject matter of the competition includes tasks that must be performed by the constructed robot. The organizer does not impose the types of materials from which the robots are to be built. The competition will be attended by multi-person teams and their participants will undergo training that will enable them to gain the knowledge needed to perform the tasks. During the competition, it will also be necessary for team members to use the soft skills acquired during the training because in addition to designing and constructing a robot, it will be necessary to present a report on the process of its preparation. The organizer provides very attractive financial prizes for the participants of the competition, and moreover, an incentive to compete are also extra points awarded during the recruitment process in the higher educational institutions, the opportunity to participate in, often paid, internships and traineeships organized by partner enterprises, and other additional prizes provided by RoboLAB partners.

RoboLAB is a nationwide project, and soon it will be an international project, therefore, meeting the expectations of its participants, many of the classes, meetings and training courses offered can be carried out remotely.





# ROBOLAB CLASSES

## SUPER COOL EDUCATION

One of its forms are one-off popular science classes which are conducted during 3 hours by experienced science popularizers and take the form of demonstrations or workshops. During these classes, the class instructors conduct fascinating experiments that inspire children to broaden their horizons and to discover the fascinating world of science on their own.

## ROBOCAMP

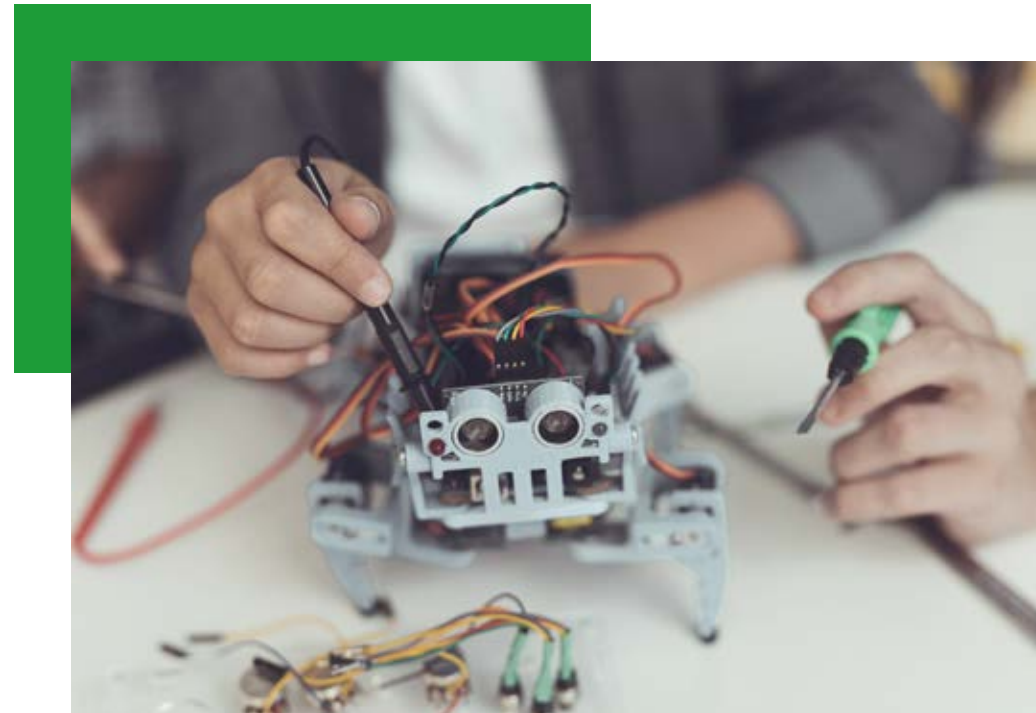
The second form of classes planned to be implemented are cyclical extracurricular activities, for which participants will be able to apply individually. The activities designed for primary and secondary school students aged 12 to 18 will take place twice a week for two hours each and will be of a practical nature. The aim of the classes will be the development of creativity, manual skills and technical skills of their participants. During the entire educational path, participants will take a full course in building robots. The course is planned for the entire school year divided into seasons. The commencement of this form of classes is planned in the next years of RoboLAB's activity.

## ROBOWORKSHOP

Another form of planned classes is classes dedicated to potential teams which initially declare their willingness to participate in competition organized as part of the RoboLAB project. These classes are conducted during sixteen hours and are carried out in eight-hour blocks over two days in the form of workshops. Each team receives mentoring support both in terms of developing specialist skills and soft competences. The subject matter of the classes is adapted to the age of the participants, and the organizer allows for the possibility of conducting classes on the basics of robotics, so that each participant of the project could have the opportunity to build a robot and program it. For individuals with greater knowledge and experience in the field of robotics, there are classes during which they can plan and independently implement a robotic structure. The main goal of the classes is to familiarize participants with the basic issues in the field of electronics, mechanics and programming, and then use the acquired knowledge to build their own robot, using the soft skills competences acquired during the classes.

## CREATIVE WORKSHOPS

The next form of classes offered under the RoboLAB project are six-hour classes, which are conducted as part of a mobile Creative Thinking Laboratory specially designed by the Foundation. The main point of the classes is a workshop panel during which participants may acquaint themselves with the basics of mechanics, electronics and programming with the use of specialized robotic modules. During these classes, participants work in a group, and their task is to construct a robot that performs a task specified by the class instructor, e.g. a robot that moves around a closed arena. Participants of the classes will also get acquainted with basic information about the planned robotics competition.



## ROBOSTUDIO

The fifth form of classes offered under RoboLAB project are open meetings and consultations that take place weekly on Saturdays and which are intended for the most involved and advanced participants of other classes offered by RoboLAB and for teams declaring their participation in competition. The aim of these classes is to help participants solve problems encountered by them during the implementation of projects and to improve the skills already acquired during other classes conducted under the project. The organizer wants these classes to be a meeting place for enthusiasts who wish to share their knowledge and skills, and for people looking for a place to implement their innovative, individual ideas and projects. The organizer hopes that these classes will create a community clustered around robotics and new technologies.

## ROBOEXPERT

As part of RoboLAB, professional training is also conducted for teams declaring their participation in competition during which the participants of these teams gain theoretical and practical knowledge in the field of specialist skills and soft competences. Training is conducted by experienced mentors - experts who cooperate with the industry on a daily basis and RoboLab partners. The mentors' task is also to help the teams during the implementation of their projects. The mentors are recruited from among employees of partner companies as well as from among independent experts, and their task is to share knowledge and experience gained during their professional career.

# PARTNERSHIP



The activity of a project such as RoboLAB, its development and positive impact on young people is possible only if Partners work together with the organizers.

**STRATEGIC PARTNER** - is involved in all elements of the activity and supports the project both financially and substantially. It is with our Strategic Partner that we set goals, set the topic of the competition and select the subject matter of training for participants.

**MAIN PARTNER** – each of the main partners is involved in the organization of RoboLAB classes, training and competitions. Together with them, we are building the RoboLAB brand, planning the scope of the competition, promotional activities and prizes for participants.

**PARTNER** – supports the activity financially by providing the necessary tools or services as part of the activities carried out. Partner directly supports emerging teams financially, with equipment, logistics or by helping to build robots.

## STRATEGIC PARTNER

**Pratt & Whitney Rzeszów** is a world-class manufacturer of subassemblies, parts, components and aircraft engines for helicopters as well as civil and military aircraft in the world, including Airbus, Boeing, Lockheed Martin and others. The facility in Rzeszów manufactures GTF transmissions for the PW1000 engine family, which drive, among others, Airbus A320 NEO aircraft. The company also produces several components for the F135 engine, which is the drive for the F-35 fighter. PWR has its own Research and Development Center. It consists of a design office, a prototyping workshop, a material laboratory and advanced experimental engine test houses for testing turboprop, turbo-shaft and auxiliary engines, the so-called APU. The Rzeszów-based facility employs over 3,000 highly qualified employees, uses the latest technologies and is an important part of Pratt & Whitney, which is part of the Raytheon Technologies Corporation. The company also cooperates with the Polish Army in the production, repair and maintenance of PZL-10W (Sokół helicopter), PZL-10S (Bryza), GTD-350 (Mi-2 helicopter) drives.

[www.pwrze.com](http://www.pwrze.com)



**GO BEYOND**

## MAIN PARTNERS

**Rzeszów** - the largest city of south-eastern Poland, capital of Podkarpackie Province and Rzeszów Metropolitan Area. The economic, academic, cultural and recreational centre of south-eastern Poland and important hub for industries such as: aviation, IT, chemical, commercial and construction. Rzeszów is a dynamically developing city of young and enterprising people, highly valued by inhabitants in terms of the quality of life. They declare that it is clean, safe and comfortable city, ensuring stability and satisfaction with the possibility of personal and professional development.

[www.erzeszow.pl](http://www.erzeszow.pl)



**RZESZOW UNIVERSITY OF TECHNOLOGY**

**The Ignacy Łukasiewicz Rzeszów University of Technology** is the oldest and largest technical university in south-eastern Poland. It is a modern research centre closely related to industry and the university with a unique atmosphere of study, providing conditions for the creative development of all passions and interests. For over 70 years it has been educating engineering staff prepared to conduct scientific research, implement innovative solutions and modern technologies, and cooperate with the social and economic environment. Over 11 thousand students study here.

[www.prz.edu.pl](http://www.prz.edu.pl)

**Podkarpackie Province** - a space that offers unlimited investment opportunities, infrastructure supporting the development of technology, the research community allowing for the creation of new, ambitious projects, and human resources enabling the implementation of unconventional projects. An additional advantage of the region is the road infrastructure, which is a link between the East and the West of economic Europe, and the activity of the Rzeszów-Jasionka Airport. Thanks to such values, the Podkarpackie region opens up to the world, creating mutual opportunities for cooperation.

[www.podkarpackie.eu](http://www.podkarpackie.eu)



**Republic of Poland**



**European Union**  
European Regional Development Fund



# TEAM WAY

**"Everything is hard before it gets easy"**  
Johann Wolfgang von Goethe

## 1 Inspiration

Do you dream about building an incredible robot? Maybe you want to create something innovative or have an insatiable desire to learn? Or maybe you were inspired by some professions? Super! The first point is behind you.

**"Whoever wants to move the world, let him first move himself"**  
Socrates

## 2 Team

Two heads are better than one, let alone three or four! Gather information about yourself, identify your strong and weak points, then choose a leader and assign each member a role in the team.

## 3 Partners

You already have the knowledge, the team, and the plan. Now, it would be nice to find the funds! The better the sponsor is, the more advanced the design will be. At RoboLAB we'll tell you our secret ways of how to negotiate effectively.

**"Nothing will do itself"**  
M. Pudzianowski

## 4 Design / Construction

Now, the most interesting part. It's time to turn your vision into a working robot. Together, you will build a complete device based on a previously arranged plan. Participants of our classes have the opportunity to use the equipment and resources located in our laboratory.

## 5 Plan

Great constructions are not created without a plan. Together with the team, you should define the goal of your project and develop all the functionalities that your robot is to meet. Then you must determine the techniques your robot will be based on and what alternatives you can use. Remember that you have to adapt the robot to the competition regulations.

## 6 Knowledge

To build a robot, your team needs to know how to do it. You can get it by yourself or during our classes in the RoboLAB laboratory or online. Remember that you don't need to know everything. If you do not feel strong enough in a given field, you can always turn to the RoboLAB team for help.

What should your team know before the RoboChallenge competition? Here are the main points:

- Competition regulation guidelines
- How to solve certain problems in a creative way (remember that every idea is good)
- Basics of electronics, but in fact reading with understanding, that is how to find information in catalog notes
- Basics of programming (you need to know how to write a robot control program)
- How to cooperate with each other, set goals and share responsibilities

## 7 Competition

Now put your machine to the test in battle! The competition is the perfect place to meet new people and partners. It is also an opportunity to improve your robot and deepen your knowledge of the solutions used by your opponents. Have fun!

## 8 Prizes

This is what you have been working for!

♦ Very attractive cash prizes!



♦ Extra points during the recruitment process in the higher educational institutions.

♦ Paid internships and traineeships with RoboLAB partners.



# X Challenge

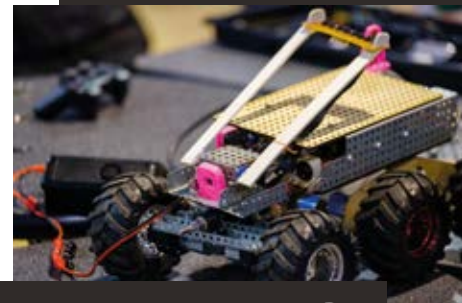


photo T. Hućko

**XChallenge** aims to implement many categories of competitions at the international level, where competitors will be able to test their manual and programming skills. The competition is intended for both high school students and university students, but there will also be some competition for younger and older participants.

**Task Hunters** - the team and its robot must face the tasks and score as many points as possible in the previously prepared arenas. Things will happen here!

- Competition for high schools;
- Earn points by completing tasks;
- Cleverness and creativity are inherent in the competition;
- Extra points for selected universities during recruitment;
- Cash prizes;



## TASK HUNTERS

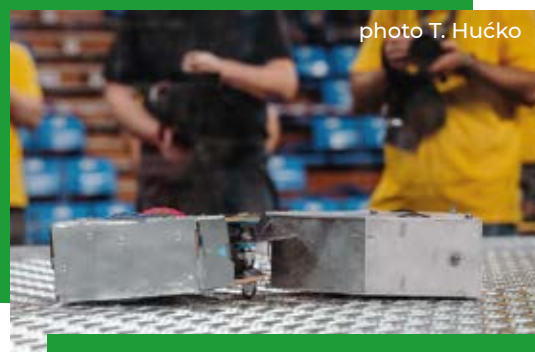


photo T. Hućko

## SMASH BOTS

**Smash Bots** - the most demanding competition out there! In a special arena, remote-controlled robots will fight each other until the last breath. Sparks and flames are guaranteed here.

- No age restrictions;
- Victory is guaranteed not only by the robot but also by the tactics;
- Merciless robot fight;
- Hammers, saws, blades - everything is allowed;
- Extra points for selected universities during recruitment;
- Cash prizes;

**ROBO~motion** - a competition known by all robotics enthusiasts, during which participants can compete in many popular competitions, including LineFollowery or Sumo. In addition to standard competitions, the organizers have prepared many surprises for all the participants.

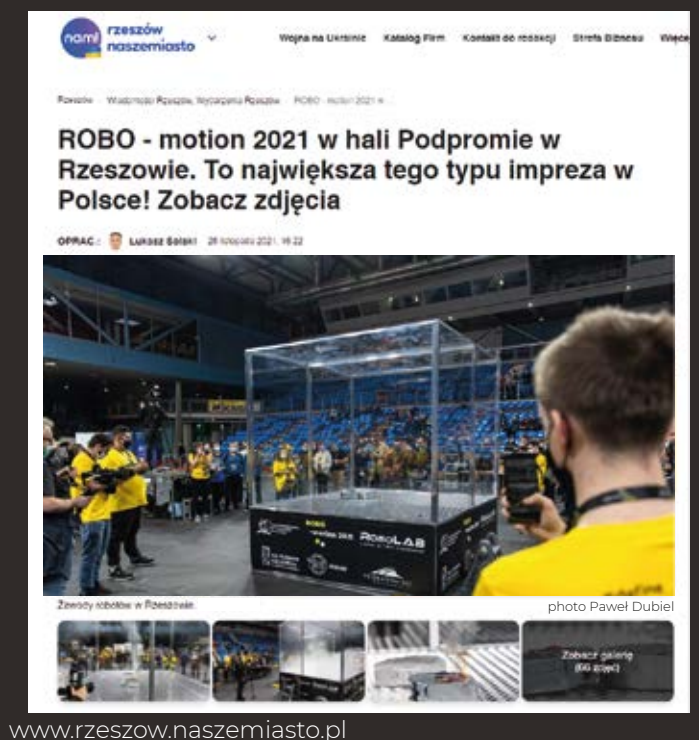
- No age restrictions - open category;
- Many categories- everyone will find something for themselves;
- Competitions dedicated to LEGO® fans
- Material prizes;



photo J. Baran

## ROBO~MOTION

# MASS MEDIA ABOUT US







# ROBOLAB

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 [www.dolinawiedzy.pl](http://www.dolinawiedzy.pl)

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