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FLYING HIGH

Poland's AERONET – Aviation Valley is a groundbreaking collaboration between the science sector and industry, states project co-ordinator Prof. Romana Ewa Śliwa, from Rzeszow University of Technology

The Centre of Advanced Technology, AERONET – Aviation Valley was founded in order to realise interdisciplinary, collective and long-term research and training programmes as well as effective implementation and commercialisation of new technologies aimed at the aerospace industry.

CAT AERONET – Aviation Valley became active in the following main scientific fields pertaining to aviation and related areas:

- design and testing of aviation structures and propulsions;
- aviation teleinformatics and avionics systems;
- modern materials and surface engineering processes;
- modern production techniques in the aerospace industry;
- aerodynamics.

The objectives of the Aviation Valley Association is the organisation and development of a low-cost supply chain, the creation of favourable conditions for the development of the aviation industry companies in the region, the further development of research, skills and qualifications in the field of aviation and the co-operation and development of the aviation industry and universities, which will promote new ideas and develop the research and development sector in the aviation industry.



It is a challenge for our time to develop good mechanisms of communication across science and the economy. Co-operation between universities, scientific institutes and businesses in the aerospace industry, which has been going on for years, has provided a good basis for joint actions towards the development of the industry and science sectors.

‘CAT AERONET AV is primarily involved in the implementation of a variety of projects. One of them is an individual key project titled ‘Modern material technologies in the aerospace industry’, which is co-ordinated by the Rzeszow University of Technology.’

CAT AERONET – Aviation Valley, in closely collaborating with the Aviation Valley cluster, is a good example of this. The technical potential of our laboratories and the highly-qualified staff allow us to provide specialised education and conduct research for the aerospace industry at the highest, world-class level. CAT AERONET, which is co-ordinated by the Rzeszow University of Technology, comprises 11 universities and R&D institutions and currently 92 companies in the Aviation Valley industrial cluster. The consortium includes the Lublin, Czestochowa, Silesian, Lodz and Warsaw Universities of Technology, the Institute of Aviation in Warsaw, the University of Rzeszow, the Air Force Institute of Technology, the Institute of Fundamental Technological Research – PAS (Polish Academy of Sciences) in Warsaw, the Szewalski Institute of Fluid-Flow Machinery – PAS in Gdansk, and the Aviation Valley industrial cluster.



The Rzeszow University of Technology has opened one of the most state-of-the-art laboratories in Europe – the Aerospace Materials Research Laboratory, which is still developing.

Its tasks include research in the fields of comprehensive materials specification, high speed machining (HSM), monocrystal and directional crystallisation, and technologies for heat-resistant coatings and chemical vapour deposition (CVD) coatings, as well as other cutting-edge technologies for manufacturing, including



composite materials, plastic working, and surface engineering.

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a variety of projects. One of them is an individual key project titled 'Modern material technologies in the aerospace industry', which is co-ordinated by the Rzeszow University of Technology – the winner of the Funds & Science contest, in the category of "Commercialisation of Research."

The PKAERO project was awarded the Quality of the Year mark twice in 2010 and 2011 by the Polish Center for Testing and Certification. The organisation's experts take into account factors such as transfer of innovation to the economy, efficient work on research projects, the significance of research accomplishments in Poland and abroad, and good co-operation between research institutions and the market and other organisations.

'The PKAERO project has resulted in developing innovative materials technologies for use in the production of aerospace materials and parts characterised by increased durability, lightness, thermal resistance, and other enhanced parameters.'

The project is being implemented within the Operational Programme Innovative Economy 2007-2013. Its strategic goal is to lead Polish research in the aerospace industry. The project's specificity is indicated by the performance indicators which take into account the research tasks achieved by producing scientific papers, master's, doctoral, and postdoctoral theses linked to the project – and by presenting, in recognised scientific publications and patent solutions, results which form the basis for future implementation in the aviation industry.



Research teams affiliated with the AERONET Aviation Valley Centre for Advanced Technology are working to enhance the properties and durability of materials used to build, for example, aircraft engine components that heat up to very high temperatures.

The researchers are developing technology to produce different kinds of highly specialised coatings and composite materials based on polymers, metals and ceramics. The end products will be resistant to very high temperatures such as those caused by fires. The other objective is an extremely durable material with a monocrystalline structure for use as a coating on such parts as turbine blades in aircraft engines.

Composite materials are usually lighter than metal, aircraft made of them can weigh less and consume less fuel, making them cheaper to use. Composites are also more durable than materials made from a single constituent, which improves flight safety. For example, it will be possible to embed special sensors in composite aircraft plating to constantly monitor the aircraft's condition and track down any defects that might occur. Plating with such properties is considered 'intelligent material'.

The PKAERO project has resulted in developing innovative materials technologies for use in the production of aerospace materials and parts characterised by increased durability, lightness, thermal resistance, and other enhanced parameters. Their future implementation will help aerospace businesses in Poland gain a competitive edge on the global market – through applying cutting-edge solutions and potentially reducing production costs, and Centre of Advanced Technologies AERONET – Aviation Valley eventually aiding the operating costs of airplanes.

The implementation of the project started in July 2008 and is to be concluded by the beginning of 2014. Its total value is PLN85.9m (~€19.8m). It should be expected that the technological solutions to be developed within the project will contribute to the progress of aerospace companies in Poland and, through this, will stimulate economic growth on a regional, national and global scale.

Foreign investors and partners are interested in Aviation Valley. It makes sense to receive education from our schools and this education at the highest level. At the same time, we have an industry able to co-exist with our splendid natural environment and create a high quality of life.



INNOVATIVE
ECONOMY
NATIONAL COHESION STRATEGY



EUROPEAN UNION
EUROPEAN REGIONAL
DEVELOPMENT FUND



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