



ADVANCED COMPUTATIONAL TOOLS FOR TURBOMACHINERY WITH THE EUROPEAN PROJECT “EXPERTISE” COORDINATED BY POLITECNICO DI TORINO

15 international young researchers at work to improve virtual testing of turbines, useful in many sectors, from aircraft engines to hydrocarbons extraction and energy production.

Torino, April 23rd 2018 - Torino, April 23rd 2018 -15 Ph.D. students from all over the world and 15 parallel and complementary research projects with the ambitious goal of defining a virtual testing system for a turbomachinery, simulating the entire machine and not the single components as it is usually done. This is the objective of the EU project **EXPERTISE - models, Experiments and high PERFORMANCE computing for Turbine mechanical Integrity and Structural dynamics in Europe**. This is coordinated by Professor Stefano Zucca from Politecnico di Torino. A research consortium of 11 beneficiaries, including Professor David Hills from Oxford University are involved together with 9 partner organizations from 8 countries.

Among disruptive technologies for energy and mobility, turbines will play a major role and the European research community needs to prepare for the upcoming challenges. Simulation is crucial in designing turbomachinery, which are used in many applied fields such as energy production, gas extraction, engines for civil or military airplanes or ships, turbochargers.

Rotating elements are critical because high rotation speed could damage them and threaten the structural integrity of the entire machine. For an airplane engine, the worst-case scenario could include human injury or death.

This is why design and certification of components is a complex and expensive process, which requires massive experimental testing. The use of efficient and accurate simulations could then considerably decrease development costs and improves the final project reliability, so reducing time to market.

EXPERTISE methodology to reach this ambitious goal foresees 15 individual projects performed by 15 ESR-Early Stage researchers (the Ph.D. students), selected and supervised by Consortium researchers. The exchange between those young researchers involved in the project will contribute to create a **new generation of international researchers used to tackle complex challenges by working in team**. Moreover, they will benefit of multidisciplinary training in the fields of structural mechanics and parallel computation, developing their competence to contribute to the demanding tasks in numerical simulation for mechanical project and design.

The Research Consortium for the Expertise project is composed by 11 Beneficiaries and 9 partner organizations:

Expertise Beneficiaries	Expertise partner organizations
Imperial College of Science Technology and Medicine (United Kingdom)	Rolls-Royce PLC (United Kingdom)
Universitaet Stuttgart (Germany)	NEC Deutschland GmbH (Germany)
University of Oxford (United Kingdom)	Doosan Skoda Power (Czech Republic)
Ecole Centrale de Lyon (France)	SAFRAN Aircraft Engines (France)
Middle East Technical University (Turkey)	General Electric Deutschland Holding (Germany)
Technische Universitaet Muenchen (Germany)	Nuovo Pignone Tecnologie srl (Italy)
Barcelona Supercomputing Center (Spain)	SAFRAN (France)
VŠB – Technical University of Ostrava, IT4Innovations (Czech Republic)	University of Bristol (United Kingdom)
Cray UK Limited (United Kingdom)	
Mavel AS (Czech Republic)	

More information on the project website: <http://www.msca-expertise.eu/>