

Technion's Turbo & Jet Engine Laboratory Cooperation Opportunities

The Turbo & Jet Engine Laboratory, headed by Assoc. Professor Yeshayahou Levy is an integral part of the Faculty of Aerospace Engineering at the Technion - Israel Institute of Technology and the Aeronautical Research Center of the Technion R&D Foundation Ltd. It is the main academic center in Israel for R&D in subjects related to Jet Engines (JE) and Gas Turbines (GT).

We are seeking to join FP6 Integrated Projects and Network of Excellence groups.

We specialize in both experimental as well as computational aspects of:

- Combustion
- Control System for Small Engines
- Compressor Dynamics
- Development of Optical Diagnostics
- CFD
- Solar Energy

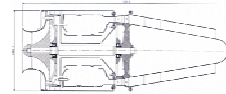
Our research team at the Turbo & Jet Engine Laboratory includes about 20 people whose areas of specialization cover combustion, aerodynamics, diagnostics and control, eight of which hold a Ph.D. degree and six are post graduate students.

We currently serve successfully as the coordinator of the FP5 RTD project "FLOXCOM" (see the web page <http://floxcom.ippt.gov.pl/>). The project is concerned with the development of a novel low NO_x combustor, based on the flameless oxidation method, for gas turbines and jet engines. The work is conducted together with seven partners from across Europe. It has just passed its mid term stage.

The laboratory premises embraces a - 900 sq. meter building with research facilities including several test stands for medium and small jet engines (the SR 30 Engine of Turbine Technologies Ltd. (150 Nt), S.T. Turbomeca Marbore II Turbojet C Medium (3,000Nt), and Olympus Engine of AMT Netherlands).

The main diagnostics equipment include:

- Two systems of Phase Doppler Anemometry (PDA)
- Particle Image Velocimetry (PIV)
- Chemical luminescence monitoring
- Data acquisition system for temperature and pressure and flow monitoring
- IR CCD camera with computer interface for temperature monitoring of surfaces.
- On-line and computerized gas analysis system for CO, CO₂, NO, NO₂, O₂, H₂O, SO₂ and THC.



For fluid dynamics and combustion process computation we use the STAR-CD computer code from Computational Dynamics (UK) by parallel processing. It is capable of performing 3D transient two-phase flows with chemical reaction. The GRIDGEN code is utilized for automatic grid (mesh) generation and the CHEMKIN program is used in conjunction with STAR-CD for evaluating the chemical process.

We are seeking to join FP6 Integrated Projects and Network of Excellence work groups in the following topics:

- Theoretical and numerical studies of jet engine and gas turbine combustion process
- Low NOx combustion
- Combustion of biomass
- Renewable energy systems
- Poly-generation of energy
- Eco-buildings (solar energy aspects)
- Integrated energy systems
- Experimental investigation of combustion systems with large variety of diagnostics
- Full scale testing of small jet engines and gas turbine combustors
- Development of atomization and ignition systems
- Simulation and control of gas turbines and jet engines for steady state and transient operation
- Analysis of compressor instabilities (surge and stall)

And ...

- We are ready to consider additional related (and not listed) topics

More detailed information about our laboratory, its research team, facilities, and projects can be found on our Website at: <http://jet-engine-lab.technion.ac.il>

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