National Technical University of Athens, GREECE

- **Founded in 1837**

- **Nine Schools of Science & Technology**

  - ▶ School of Civil Engineering
  - ▶ School of Mechanical Engineering
  - ▶ School of Electrical & Computer Engineering
  - ▶ School of Architecture
  - ▶ School of Chemical Engineering
  - ▶ School of Rural & Surveying Engineering
  - ▶ School of Mining & Metallurgical Engineering
  - ▶ School of Naval Architecture & Marine Engineering
  - ▶ School of Applied Mathematical & Physical Sciences

- **Teaching & Research Staff (~620)**

- **Under-Graduate Students (~13.200)**

- **Post-Graduate Students (~1.800)**

- **Perspective Doctorates (~2.500)**

Athens
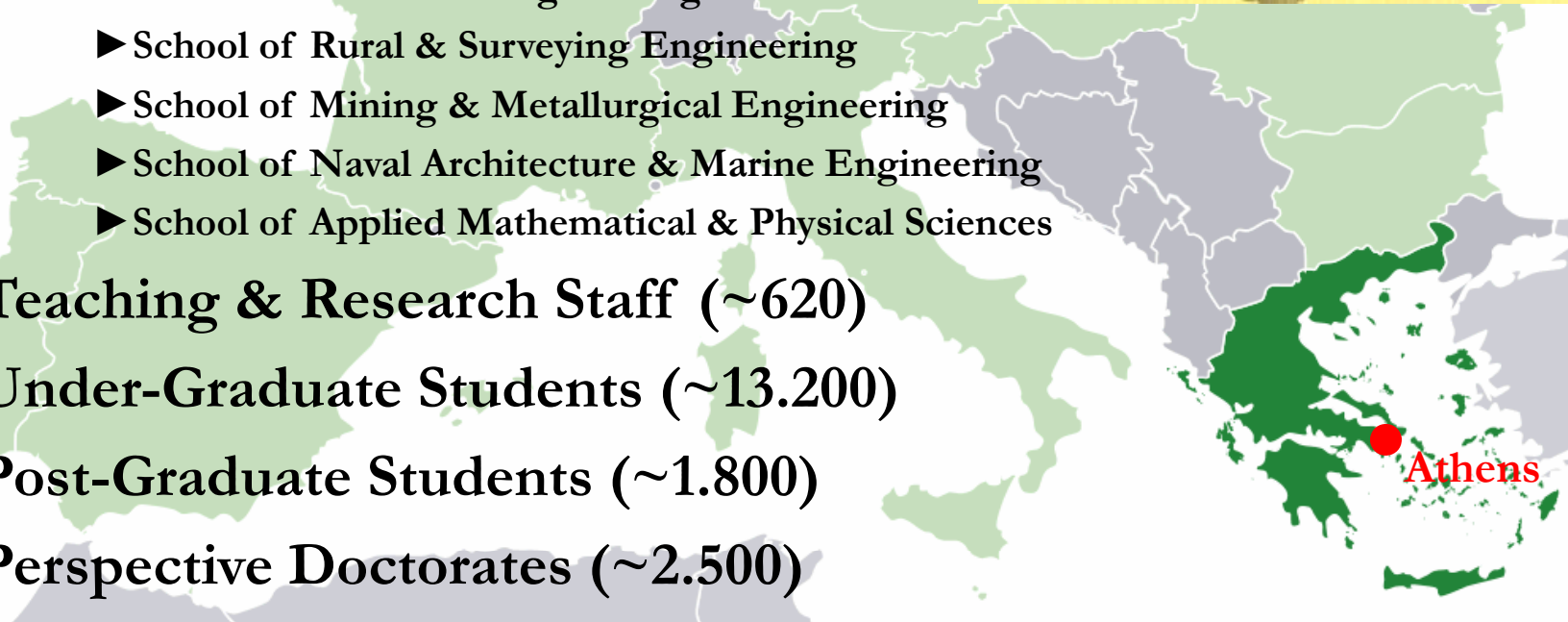
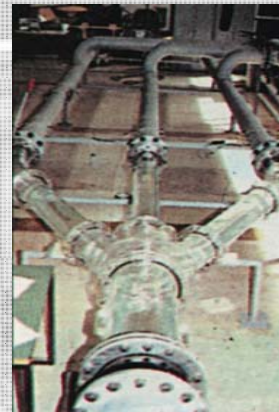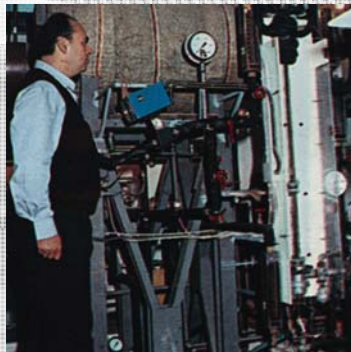## Six Departments or Sections:

▶Thermal Engineering

▶Fluids Engineering ➡️

▶Nuclear Engineering

▶Mechanical Design & Control Systems

▶Manufacturing Technology

▶Ind. Management & Oper. Research

▶Lab. of Aerodynamics

▶Lab. of Thermal Turbomachines

▶Lab. of Hydraulic Machines

▶Lab. of Bioengineering

▶Lab. of Env. Protection Research

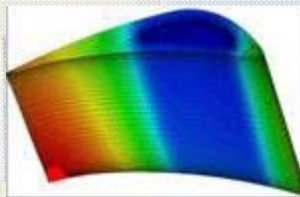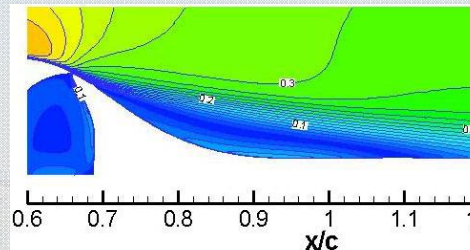▶Parallel CFD & Optimization Unit

Lab. of Thermal Turbomachines, NTUA

- **Personnel: 29** *(3 Professors, 20 Engineers, 2 Technicians, 4 support staff)*
- **R&D budget: ~0.6 MEuro / year**

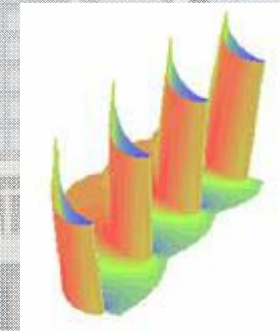## Development of CFD & Optimization Methods & Tools - Services

CFD tools for the analysis of turbomachines
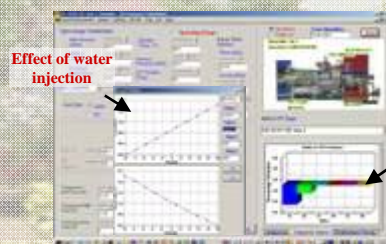
Optimal Flow Control - Synthetic Jets

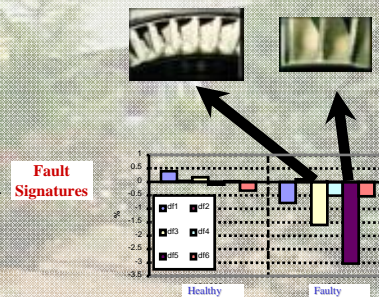### Evolutionary and Adjoint methods for design and optimization

Small Gas Turbine Technology

Gas Turbine Performance Analysis and Diagnostics

Performance Modelling

Effect of water injection

Fault Signatures

Fault diagnosis

Healthy   Faulty

Diagnostic Systems Development

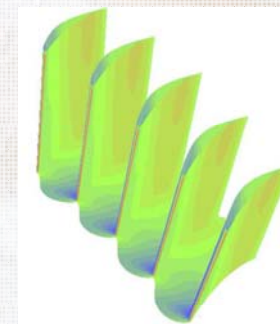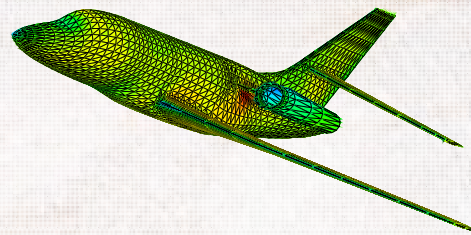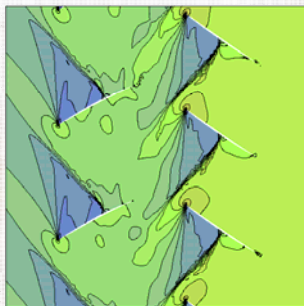Testing

Development of Analysis & Design-Optimization tools

- **Parallel CFD tools** (analysis tools for steady & unsteady flows, incompressible up to supersonic flows, using structured and unstructured grids), including grid generation.

- **Parallel Stochastic Optimization methods**: Hierarchical-Distributed Metamodel-Assisted Evolutionary Algorithms for cost-effective design-optimization in order to make EAs applicable to industrial problems.

- **Parallel Deterministic Optimization methods**: Continuous and discrete Adjoint methods for inverse design and shape optimization problems. Cluster & grid computing.

- The **EASY v2.0** (**E**volutionary **A**lgorithm **SY**stem) optimization platform; for *Cluster & Grid Computing*.

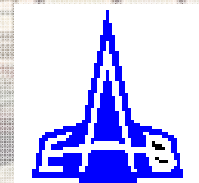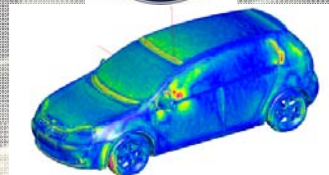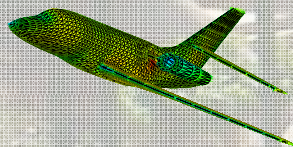**Participation in research projects funded by the EUROPEAN UNION**

Participation in research projects funded by the GREEK GENERAL SECRETARIAT FOR RESEARCH

Participation in basic research projects funded by NTUA

EASY v2.0: An optimization platform brought to market by NTUA.
Selling software & services

HELLENIC PUBLIC POWER CORPORATION

HELLENIC AEROSPACE INDUSTRY

Series of research projects (on CFD, optimization & parallelization) funded by European Industrial Outfits

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URL (Overview of Research Activities):
http://velos0.ltt.mech.ntua.gr/research/

URL (The EASY Optimization Platform):
http://velos0.ltt.mech.ntua.gr/EASY/