



«ETTORE MAJORANA» FOUNDATION AND CENTRE FOR SCIENTIFIC CULTURE
TO PAY A PERMANENT TRIBUTE TO GALILEO GALILEI, FOUNDER OF MODERN SCIENCE
AND TO ENRICO FERMI, THE "ITALIAN NAVIGATOR", FATHER OF THE WEAK FORCES



INTERNATIONAL SCHOOL OF MATHEMATICS «GUIDO STAMPACCHIA»

47th Workshop

VARIATIONAL ANALYSIS AND AEROSPACE ENGINEERING

Dedicated to Angelo Miele for his 85th Birthday

ERICE-SICILY: 8 - 16 SEPTEMBER 2007

Sponsored by the: • Italian Ministry of Education, University and Scientific Research • Sicilian Regional Government
• Agusta Helicopters • Departments of Mathematics and Aerospace Engineering of the University of Pisa
• Istituto Nazionale di Alta Matematica (GNAMPA)
• IDS SpA • Delft University • Consorzio Etruria S.C.A.R.L.

PROGRAMME AND LECTURERS

Commercial aircraft design
New aircraft configurations
Reduced noise and impact aircraft design
Optimal shape aircraft design
Mathematical tools for shape generation
Optimization of aerodynamic configurations
Composite fuselage-optimum stress distributions around cutouts
Interactions between aircraft manoeuvres and Aeroelasticity
Optimization of space missions
Global Optimization problems
Overview on Variational analysis
Modern methods in fracture mechanics
Optimum shape design and CFD

- P. ALLI, Agusta Helicopters, Varese, I
- M. ARDEMA, University of Santa Clara, CA, USA
- M. BELLONI, Università di Parma, I
- A. BEUKERS, Delft University of Technology, NL
- G. BUTTAZZO, Università di Pisa I
- F.L. CHERNOUSKO, Russian Academy of Sciences, Moscow, RU
- G. DAL MASO, SISSA, Trieste, I
- C. DEISSENBERG, Les Universités à Aix en Provence, Marseille, F
- A. DE SIMONE, SISSA, Trieste, I
- G. DEL PIERO, Università di Ferrara, I
- R. DILÃO, Instituto Superior Técnico, Lisboa, PT
- I.J. FIELDING, Cranfield University, UK
- L. FORMAGGIA, Politecnico di Milano, I

- A. FREDIANI, Università di Pisa I
- G. LEITMANN, University of California, Berkeley, CA, USA
- F. JOHNSON, The Boeing Company, Seattle, WA, USA
- E.P. HOFER, Universität Ulm, D
- R. KALMAN, ETH, Zurich, CH
- N.N. KRAVOSKII, Russian Academy of Science, Moscow, RU
- M. LUCCHESINI, Aermacchi Varese, I
- L. MODICA, Università di Pisa, I
- L. MORINO, Università di Roma Tre, I
- G. NOVEMBRINI, IDS, S.Piero a Grado, I
- J. OLSEN, University of Dayton, OH, USA
- S. PICKL, Universität Munich, D
- O. PIRONNEAU, Paris VI, F
- A. PLAKHOV, Universidade de Aveiro, PT
- H.J. PESCH, Universität Bayreuth, D
- M. PONTANI, Rome, I
- E. REITHMEIER, Universität Hannover, D
- D. SCHMITT, Airbus, Toulouse, F
- D. SILJAK, Santa Clara University, CA, USA
- P. TEOFILATTO, Università degli Studi "La Sapienza", Roma, I
- F. TOMARELLI, Politecnico di Milano, I
- F. UDWADIA, University of Southern California, Los Angeles, CA, USA
- V. VACCARO, Alenia, Torino, I
- M. Van TOOREN, Delft University of Technology, NL
- P. VILLAGGIO, Università di Pisa, I
- A. WAGNER, RWTH, Aachen, D

PURPOSE OF THE WORKSHOP

Very important mathematical methods have been developed and extensively applied in the Aerospace field; examples are: Finite Element Method, Computational Fluid Dynamics Methods, Fatigue, Fracture Mechanics, Optimization, Controls and Optimum Controls, Eigenvalues Problems, etc. The collaboration between Aerospace Engineering and Mathematics was very fruitful for both Engineers and Mathematicians in the past; even more so in the future. The School of Mathematics "Guido Stampacchia" of the "Ettore Majorana" Foundation and Centre for Scientific Culture is the most appropriate site where Aerospace Engineers and Mathematicians could meet. The present workshop aims at allowing aerospace engineers and mathematicians (from Universities, Research Centres and Industry) to debate about the advanced problems requiring an extensive application of Mathematics.

The workshop is dedicated to Professor Angelo Miele, Rice University, Houston, in occasion of his 85th birthday. Angelo Miele is both an eminent mathematician and a famous engineer, able, among the other activities, to conceive new scenarios for the space exploration. He was also the tutor of many PhD students at Houston, now eminent professors and speakers in this workshop.

The most advanced subjects in Engineering will be discussed and, in particular, the Computational Fluid Dynamics methods, the introduction of new materials, theory of Optimisation, Optimisation methods applied in Aerodynamics, Structures, Space missions, etc., Flight Mechanics, theories of Controls, Algebraic Geometry for CAD applications, Variational Methods and applications, etc. The workshop is conceived to capture the interest of people coming from both Academia and Industry and, in particular, of young researchers who could identify the new frontiers of applications of Mathematics to Engineering.

APPLICATIONS

Persons wishing to attend the Workshop should apply in writing to:

- Professor Aldo FREDIANI
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They should specify:

- i) Date and place of birth, together with present nationality;
- ii) Affiliation;
- iii) Address, e-mail address.

POETIC TOUCH

According to legend, Erice, son of Venus and Neptune, founded a small town on top of a mountain (750 metres above sea level) more than three thousand years ago. The founder of modern history — i.e. the recording of events in a methodic and chronological sequence as they really happened without reference to mythical causes — the great Thucydides (~500 B.C.), writing about events connected with the conquest of Troy (1183 B.C.) said: «After the fall of Troy some Trojans on their escape from the Achaei arrived in Sicily by boat and as they settled near the border with the Sicilians all together they were named Elymi: their towns were Segesta and Erice.» This inspired Virgil to describe the arrival of the Trojan royal family in Erice and the burial of Anchise, by his son Enea, on the coast below Erice. Homer (~1000 B.C.), Theocritus (~300 B.C.), Polybius (~200 B.C.), Virgil (~50 B.C.), Horace (~20 B.C.), and others have celebrated this magnificent spot in Sicily in their poems. During seven centuries (XIII-XIX) the town of Erice was under the leadership of a local oligarchy, whose wisdom assured a long period of cultural development and economic prosperity which in turn gave rise to the many churches, monasteries and private palaces which you see today.

In Erice you can admire the Castle of Venus, the Cyclopean Walls (~800 B.C.) and the Gothic Cathedral (~1300 A.D.). Erice is at present a mixture of ancient and medieval architecture. Other masterpieces of ancient civilization are to be found in the neighbourhood: at Motya (Phoenician), Segesta (Elymian), and Selinunte (Greek). On the Aegadian Islands — theatre of the decisive naval battle of the first Punic War (264-241 B.C.) — suggestive neolithic and paleolithic vestiges are still visible: the grottoes of Favignana, the carvings and murals of Levanzo.

Splendid beaches are to be found at San Vito Lo Capo, Scopello, and Corino, and a wild and rocky coast around Monte Cofano: all at less than one hour's drive from Erice.

More information about the «Ettore Majorana» Foundation and Centre for Scientific Culture can be found on the WWW at the following address:
<http://www.ccsem.infn.it>

PLEASE NOTE

Participants must arrive on September 8, not later than 7 pm.