



«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»

53rd Workshop: VARIATIONAL ANALYSIS AND AEROSPACE ENGINEERING II

ERICE-SICILY: 8 – 16 SEPTEMBER 2010

Sponsored by the: • Italian Ministry of University and Research • Sicilian Regional Government
• Regione Toscana • University of Pisa • University of Delft • GNAMPA - INDAM

PROGRAMME AND LECTURERS

Fracture Mechanics

Computational Fluidodynamics

Shape Optimization in Aerodynamics

Flight Mechanics

Optimal Control Problems Innovative Aircraft Design

- A. BEUKERS, Delft University of Technology, NL
- E. CARRERA, Politecnico di Milano, IT
- F.L. CHERNOUSKO, Russian Academy of Sciences, Moscow, RU
- V. CIPOLLA, Università di Pisa, IT
- G. DAL MASO, SISSA, Trieste, IT
- A. DE SIMONE, SISSA, Trieste, IT
- G. DEL PIERO, Università di Ferrara, IT
- I.J. FIELDING, Cranfield University, UK
- G.L. GHIRINGHELLI, Politecnico di Milano, IT
- K. HENKE, Universität Aachen, DE
- F. JOHNSON, The Boeing Company, Seattle, WA, US

- G. LA ROCCA, Delft University of Technology, NL
- M. LUCCHESI, Università di Firenze, IT
- G. MAIER, Politecnico di Milano, IT
- S. NAZAROV, University of St. Petersburg, RU
- G. NOVEMBRINI, IDS, San Piero a Grado, Pisa, IT
- O. PIRONNEAU, University of Paris VI, FR
- A. PLAKHOV, Universidade de Aveiro, PT
- H.J. PESCH, Universität Bayreuth, DE
- R. POPELA, University of Brno, CZ
- A. QUARTERONI, Politecnico di Milano, IT
- E. RIZZO, Università di Pisa, IT
- D. SCHMITT, Bauhaus Luftfahrt, Munich, DE
- V. SELMIN, Alenia Aeronautica, Roma, IT
- F. TOMARELLI, Politecnico di Milano, IT
- M. Van TOOREN, Delft University of Technology, NL
- D. VIGNERON, Airbus, Toulouse, FR
- P. VILLAGGIO, Università di Pisa, IT

PURPOSE OF THE WORKSHOP

The collaboration between Aerospace Engineering and Mathematics has always been very fruitful both for engineers and mathematicians; aerospace system design is based on advanced mathematical tools, and successfully facing the new challenges for aerospace systems requires mathematics more than ever. In the past, some of the most important mathematical methods of analysis in industrial engineering were developed and applied in the Aerospace field for the first time. Examples are: finite element methods, computational fluid dynamics methods, fatigue and crack propagation prediction methods, optimization, controls and optimum controls, eigenvalues problems, hybrid materials with complex constitutive laws, etc. The development of Aerospace Engineering is continuous and, after the introduction into service of aerospace vehicles, technological advancements are introduced into various other fields of Engineering. The International School of Mathematics "Guido Stampacchia" of the Ettore Majorana Foundation and Centre for Scientific Culture has always been one of the most appropriate sites where Aerospace Engineers and Mathematicians could meet. This tradition comes from the teaching and research activity of Guido Stampacchia, one of the most eminent mathematicians of the last century and professor of Mathematical Analysis at the Faculty of Engineering of Pisa. The present Workshop is the continuation of the first one, organised in 2007 under the same title, and aims at bringing together aerospace engineers (from universities, research centres and industry) to discuss their advanced problems requiring an extensive application of mathematical concepts, and mathematicians, who can provide new methods, advanced tools and their culture and experience in an advanced field of many technological applications. Like the last one, the present Workshop is dedicated to the most advanced subjects in Engineering and, in particular to computational fluid dynamics methods, introduction of new materials, optimisation in aerodynamics, structure and space missions, flight mechanics, theories of controls, AD 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 can identify the new frontiers of research for the future applications of Mathematics to Engineering.

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>

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 Sicanians 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 Anchises, by his son Aeneas, 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 Cornino, and a wild and rocky coast around Monte Cofano: all at less than one hour's drive from Erice.

APPLICATIONS

Persons wishing to attend the Workshop should apply by e-mail to the Co-Director of the Workshop:

- Professor Aldo FREDIANI
Dipartimento di Ingegneria Aerospaziale "L. Lazzarino"
University of Pisa
Via Diotallevi 2 – 56122 PISA, Italy
Tel + 39.050.2217265 – Fax + 39.050.2217244
e-mail: a.frediani@ing.unipi.it

They should specify: i) date and place of birth, together with current nationality; ii) affiliation; iii) address, e-mail address.

PLEASE NOTE

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

Closing Date for Applications: 15 April 2010