«ETTORE MAJORANA» FOUNDATION AND CENTRE FOR SCIENTIFIC CULTURE

TO PAY A PERMANENT TRIBUTE TO ARCHIMEDES AND GALILEO GALILEI, FOUNDERS OF MODERN SCIENCE AND TO ENRICO FERMI, THE "ITALIAN NAVIGATOR", FATHER OF THE WEAK FORCES

INTERNATIONAL SCHOOL OF MATHEMATICS «GUIDO STAMPACCHIA»

71st Workshop: *ADVANCES IN NONSMOOTH ANALYSIS AND OPTIMIZATION*

ERICE-SICILY: 24 JUNE – 1 JULY 2019

Sponsored by the: • Italian Ministry of Education, University and Scientific Research • Sicilian Regional Government • University of Naples Federico II • "Mediterranea" University of Reggio Calabria • University of Catania • Istituto Nazionale di Alta Matematica (GNAMPA)

PROGRAMME AND LECTURERS

Nonsmooth, stochastic and convex optimization
Variational inequalities and differential inclusions
Optimization and control of dynamical systems
Equilibrium problems
Nonsmooth and variational analysis
Optimization for imaging, finance and machine learning
Energy optimization
Computational mathematical programming and optimization algorithms

- S. ADLY, University of Limoges, Limoges, FR
- F.J. ARAGÓN ARTACHO, University of Alicante, Alicante, ES
- J. BOLTE, Toulouse School of Economics, Toulouse, FR
- R. CSETNEK, University of Vienna, Vienna, AT
- A. DANIILIDIS, University of Chile, Santiago de Chile, CL
- W. de OLIVEIRA, Mines ParisTech, Paris, FR
- C. DOSSAL, University of Bordeaux, Bordeaux, FR
- O.-E. ERNST, Aix-Marseille University, Marseille, FR
- M. FERRARA, Mediterranea University of Reggio Calabria, Reggio Calabria, IT
- Y.V. GARCÍA RAMOS, University of the Pacific, Lima, PE
- W. HARE, University of British Columbia, Kelowna, CA
- M. HINTERMÜLLER, Humboldt University of Berlin, Berlin, DE
- D.R. LUKE, University of Göttingen, Göttingen, DE
- Y. MALITSKY, University of Göttingen, Göttingen, DE
- L. MALLOZZI, University of Naples Federico II, Naples, IT
- T. PENNANEN, King's College London, London, UK
- G. PFLUG, University of Vienna, Vienna, AT
- R. PINI, University of Milan-Bicocca, Milan, IT
- J.O. ROYSET, Naval Postgraduate School Monterey, Monterey, CA, US
- U. STEFANELLI, University of Vienna, Vienna, AT
- S.A. SANTOS, University of Campinas, Campinas, BR
- M. SOLODOV, IMPA Rio de Janeiro, Rio de Janeiro, BR
- W. VAN ACKOOIJ, EDF Research and Development, Paris, FR
- S. VILLA, Polytechnic University of Milan, Milan, IT
- J. YE, University of Victoria, Victoria, BC, CA
- X. YUAN, The University of Hong Kong, HK
- H. ZIDANI, ENSTA-Paris Tech, Palaiseau Cedex, FR

PURPOSE OF THE WORKSHOP

The aim of the Workshop is to review and discuss recent developments of the theory of Nonsmooth Analysis and Optimization and to provide a forum for fruitful interaction in closely related areas. Nonsmooth problems appear in many fields of applications, such as data mining, image denoising, energy management, optimal control, neural network training, economics and computational chemistry and physics. Motivated by these applications Nonsmooth Analysis has had a considerable impulse that allowed the development of sophisticated methodologies for solving challenging related problems. The origin of variational analysis and nonsmooth optimization lies in the classical calculus of variations and as such is intertwined with the development of Calculus. Strong smoothness requirements, that were present in the early theory, have lately been replaced by weaker notions of differentiability, which are more natural in applications. Nonsmooth optimization is devoted to the general problem of minimizing functions that are typically not differentiable at their minimizers. In order to optimize such functions, the classical theory of optimization cannot be directly used due to lacking certain differentiability and strong regularity conditions. However, because of the complexity of the real world, functions used in practical applications are often nonsmooth. Significant progress in deriving more general optimality conditions for mathematical programming models has been made in the recent years as a result of advances in nonsmooth analysis and optimization. The study of nonsmooth problems is motivated in part by the desire to optimize increasingly sophisticated models of complex manmade and naturally occurring systems that arise in areas ranging from economics, operations research, and engineering design to variational principles that correspond to partial differential equations. Results in nonsmooth optimization have expedited understanding of the salient aspects of the classic smooth theory and identified concepts fundamental to optimality that are not based on differentiability assumptions.

APPLICATIONS

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

Professor Annamaria BARBAGALLO
Department of Mathematics and Applications "R. Caccioppoli"
University of Naples Federico II, Via Cinthia – 80126 Naples, Italy
e-mail: *annamaria.barbagallo@unina.it*

They should specify: date and place of birth, together with current nationality, affiliation, address and e-mail address. Additional information about the Workshop can be found at the following address:

www.dma.unina.it/NAO2019

Closing date for applications: 31 May 2019.

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 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 Cornino, and a wild and rocky coast around Monte Cofano: all at less than one hour's drive from Erice.

More information about the other activities of 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 24 June, not later than 6 p.m.

A. BARBAGALLO – R.I. BOT – C. SAGASTIZÁBAL
DIRECTORS OF THE WORKSHOP

G. BUTTAZZO – F. GIANNESSI – M. THÉRA
DIRECTORS OF THE SCHOOL

A. ZICHICHI
PRESIDENT EMFCSC