



**FONDAZIONE
CIME**
ROBERTO CONTI

CENTRO INTERNAZIONALE MATEMATICO ESTIVO
INTERNATIONAL MATHEMATICAL SUMMER CENTER

Summer Courses 2022

Geometric and analytic aspects of functional variational principles

Cetraro (CS), Italy, June 27 - July 01, 2022

Scientific Directors:

A. Cianchi
V. Maz'ya
T. Weth

Univ. Firenze, Italy
Linköping Univ., Sweden
Goethe-Univ., Frankfurt, Germany

andrea.cianchi@unifi.it
vladimir.mazya@liu.se
weth@math.uni-frankfurt.de

Lectures and Topics:

R. Frank
G. Mingione
L. Pick
O. Savin
J. Van Schaftingen

LMU Munchen, Germany
Univ. Parma, Italy
Charles Univ., Praga, Czech Republic
Columbia Univ., New York, USA
UC Louvain, Louvain-la-Neuve, Belgium

- Sharp constants in functional inequalities
- Gradient estimates for every taste
- Reduction principles for integral operators, Sobolev embeddings and traces
- The Monge-Ampere equation and its applications
- Limiting Sobolev estimates for vector fields and canceling differential operators

HyperKähler manifolds and related geometries

Cetraro (CS), Italy, August 28 - September 03, 2022

Scientific Directors:

G. Mongardi
K. G. O'Grady
G. Pacienza

Univ. Bologna, Italy
Univ. La Sapienza, Roma, Italy
Univ. Lorraine, France

giovanni.mongardi2@unibo.it
ogrady@mat.uniroma1.it
gianluca.pacienza@univ-lorraine.fr

Lectures and Topics:

O. Debarre
C. Lehn
E. Macri
K. G. O'Grady
G. Saccà

Univ. Paris (ex Paris 7), France
Chemnitz Technische Univ., Germany
Univ. Paris-Saclay, France
Univ. La Sapienza, Roma, Italy
Columbia Univ., USA

- The geometry of Gushel-Mukai varieties
- Singular varieties with trivial canonical class
- Non commutative K3 surfaces, with application to HyperKähler and Fano manifolds
- The geometry of projective HyperKähler manifolds
- Lagrangian fibrations and symplectic resolutions

Mathematical modeling for epidemiology: analysis, simulation and forecasting

Cetraro (CS), Italy, September 05-09, 2022

Scientific Directors:

C. Mascia
R. G. Plaza
C. Simeoni
A. Pugliese

Univ. La Sapienza, Roma, Italy
Univ. de México, Mexico
Univ. Côte d'Azur, Nice, France
Univ. Trento, Italy

corrado.mascia@uniroma1.it
plaza@mym.iimas.unam.mx
simeoni@unice.fr
andrea.pugliese@unitn.it

Lectures and Topics:

O. Diekmann
M. Falcone
T. Britton
C. Donnelly

Utrecht Univ. The Netherlands
Univ. La Sapienza, Roma, Italy
Stockholm Univ., Sweden
Imperial College London, United Kingdom

- Population dynamics of infectious diseases
- Optimal control with epidemiological applications
- The mathematics and statistics of infectious disease outbreaks
- Outbreak response case studies

Honorary Lectures:

A. Bertozzi

Univ. California Los Angeles, USA

Seminars and Project Session:

The case study of the COVID-19 pandemic

<https://sites.google.com/unifi.it/cime/>

fondazione.cime@gmail.com

CIME Director: *Elvira Mascolo*

CIME Scientific Secretary: *Paolo Salani*

CIME activity is carried out with the collaboration and financial support of INdAM (Istituto Nazionale di Alta Matematica)

Summer Courses 2022