
The Conference is devoted to most recent results concerning mathematical problems which arise from materials with memory. Challenging analytical problems are originated from applications in which materials with memory, and smart materials in general, are more and more widely used. Indeed, in a variety of different technological environments materials with memory are nowadays employed. Crucial physical properties of these materials depend on time also through the whole past history. This peculiar behavior induces to make use of such materials in various different applications such as biomedical tools and in sensors and actuators. The aim of the Conference is to provide an overview of new and interesting analytical results which are originated, more generally, from different applicative areas.

Sponsors

- ◇ INdAM - Istituto Nazionale di Alta Matematica ‘F. Severi’
- ◇ SAPIENZA Università di Roma

Scientific and Organizing Committee of the Conference

Sandra Carillo (Sapienza Università di Roma, Italy)
Claudio Giorgi (Università degli Studi di Brescia, Italy)
Maurizio Grasselli (Politecnico di Milano, Italy)
Davide Guidetti (Università di Bologna, Italy)
Brian Straughan (Durham University, United Kingdom)

Scientific and Organizing Committee of the Special Session

Michele Ciarletta (Università degli Studi di Salerno, Italy)
Barbara Lazzari (Università di Bologna, Italy)
Jaime E. Muñoz Rivera (LNCC, Brazil)
Maria Grazia Naso (Università degli Studi di Brescia, Italy)

Program

April 16, 2012 — afternoon

14.25–14.30 *opening*

14.30–15.05 Bernadette MIARA (Noisy-le-Grand): *Asymptotic pyro-electricity and pyro-elasticity in thermo-piezo-electric plates*

15.10–15.30 Cecilia CAVATERRA (Milano): *On a 3D isothermal model for nematic liquid crystals accounting for stretching terms*

15.35–15.55 Ivana BOCHICCHIO (Salerno): *Asymptotic dynamics of nonlinear coupled suspension bridge equations*

16.00–16.25 *coffee break*

16.25–17.00 Paola LORETI (Roma): *TBA*

17.05–17.25 Merab SVANADZE (Tbilisi): *Theory of viscoelasticity for materials with double porosity*

17.30–17.50 Michela ELEUTERI (Verona): *A thermodynamic model for material fatigue under cyclic loading*

17.55–18.05 *short break*

18.05–18.40 Tomáš ROUBIČEK (Praha): *Modelling of phase transformations in magnetostrictive materials like NiMnGa*

18.45–19.20 Angelo FAVINI (Bologna): *Inverse problems for evolution equations in Banach spaces*

April 17, 2012 — morning

9.00– 9.35 Cornelia SCHIEBOLD (Sundsvall): *Recursion operators and hierarchies of noncommutative KdV-type equations*

9.40–10.00 Giulio SCHIMPERNA (Pavia): *On some nonisothermal models for nematic liquid crystals*

10.05–10.25 Diego GRANDI (Brescia): *A phase field approach to solidification and solute separation in water solutions*

10.30–11.05 Roberto TRIGGIANI (Charlottesville): *TBA*

11.10–11.35 *coffee break*

11.35–12.10 Viorel BARBU (Iași): *Stochastic models of nonlinear diffusion and heat conduction with memory*

12.15–12.35 Francesca BUCCI (Firenze): *Regularity analysis and optimal boundary control of composite PDE dynamics*

12.40–13.00 Vittorio ZAMPOLI (Salerno): *Damping effect on seismic vibrations of a viscoelastic stratum of Kelvin-Voigt type*

13.00 *lunch @ ...*

April 17, 2012 — afternoon

- 15.00–15.35 Piermarco CANNARSA (Roma): *Indirect stabilization of weakly coupled systems of evolution*
- 15.40–16.00 Elena BONETTI (Pavia): *A phase transition approach to hydrogen storage: modeling and analysis*
- 16.05–16.25 Francesca PASSARELLA (Salerno): *Orthotropic micropolar media in a plane strain state: some results about the strong ellipticity*
- 16.30–16.50 Francesco MAINARDI (Bologna): *Completely monotonic and Bernstein functions for linear viscoelastic and dielectric materials*
- 16.55–17.20 *coffee break*
- 17.20–17.55 Alain MIRANVILLE (Poitiers): *A Cahn-Hilliard model with dynamic boundary conditions*
- 18.00–18.20 Stefano BOSIA (Milano): *Cahn-Hilliard-Ladyzhenskaya systems with singular potentials*
- 18.25–18.45 Filippo DELL'ORO (Milano): *Type III thermoelastic beams and plates with memory*
- 18.50–19.25 Hao WU (Shanghai): *Wellposedness and stability of the Ericksen-Leslie system for nematic liquid crystal flows*

April 18, 2012 — morning

- 9.00– 9.25 Angelo MORRO (Genova): *TBA*
- 9.30– 9.55 Sandro GRAFFI (Bologna): *TBA*
- 10.00–10.25 Tommaso RUGGERI (Bologna): *TBA*
- 10.30–10.55 Nicola BELLOMO (Torino): *From microscopic to macroscopic biological tissue models*
- 11.00–11.25 *coffee break*
- 11.25–11.50 Alfredo MARZOCCHI (Brescia): *Boundary value problems for second-gradient fluids*
- 11.55–12.20 Pierluigi COLLI (Pavia): *A nonstandard Cahn-Hilliard system with viscosity - Part I*
- 12.25–12.50 Gianni GILARDI (Pavia): *A nonstandard Cahn-Hilliard system with viscosity - Part II*
- 12.55–13.20 Giorgio FERRARESE (Roma):
- 13.30 *lunch @ ...*

April 18, 2012 — afternoon

- 14.45–15.10 Constantine M. DAFERMOS (Providence): *Solutions with shocks for continuous media with memory*
- 15.15–15.40 Vittorino PATA (Milano): *Equation with memory in the minimal state framework*
- 15.45–16.10 Roberta NIBBI (Bologna): *TBA*
- 16.15–16.40 Salvatore RIONERO (Napoli): *Advances in global nonlinear stability of diffusive convective fluid motions in porous media*
- 16.45–17.10 *coffee break*
- 17.10–17.35 John Murrough GOLDEN (Dublin): *Free energies in a general non-local theory of a material with memory*
- 17.40–18.05 Stan CHIRITA (Iași): *Wave propagation in a viscoelastic half space*
- 18.10–18.35 Michel FRÉMOND (Roma): *Clouds: a predictive theory*
- 18.40–19.05 Brian STRAUGHAN (Durham): *TBA*
- 20.00 *social dinner @ ...*

April 19, 2012 — morning

- 9.00– 9.35 Luca DESERI (Trento): *TBA*
- 9.40–10.00 Monica CONTI (Milano): *Asymptotic behavior of a generalization of the Caginalp phase-field system*
- 10.05–10.25 Elsa Maria MARCHINI (Milano): *On optimal control problems with applications to systems with memory*
- 10.30–11.05 Silvia ROMANELLI (Bari): *Continuous dependence on the boundary conditions for the Wentzell telegraph equation*
- 11.10–11.35 *coffee break*
- 11.35–12.10 Farid AMMAR KHODJA (Besançon): *Controllability of a string submitted to unilateral constraints*
- 12.15–12.35 Alessia BERTI (Novedrate): *Vibrations of a damped extensible beam between two stops*
- 12.40–13.00 Antonio SEGATTI (Pavia): *A variational view at gradient flows in metric spaces*
- 13.00 *lunch @ ...*

April 19, 2012 — afternoon

- 15.00–15.35 Jaime E. MUÑOZ RIVERA (Petrópolis): *TBA*
- 15.40–16.00 Elisabetta ROCCA (Milano): *Weak formulation of a degenerating PDE system for phase transitions and damage*
- 16.05–16.25 Vincenzo TIBULLO (Salerno): *Christov-Morro theory for non-isothermal diffusion*
- 16.30–16.55 *coffee break*
- 16.55–17.30 Irena LASIECKA (Charlottesville): *Global existence, differentiability and analyticity of solutions to quasilinear thermoelastic systems*
- 17.35–17.55 Daniela SFORZA (Roma): *Control problems for coupled systems with memory terms*
- 18.00–18.20 Vito Antonio CIMMELLI (Potenza): *Generalized heat transport equations in nanosystems: an overview*
- 18.25–19.00 Luciano PANDOLFI (Torino): *Traction, deformation and velocity of deformation in a viscoelastic string*

April 20, 2012 — morning

- 9.00– 9.35 Pedro M. JORDAN (Stennis): *Nonlinear acoustic propagation in thermoviscous, thermally relaxing fluids: Shock formation and viscosity mitigation*
- 9.40–10.15 Gabriela Georgeta MARINOSCHI (Bucharest): *An optimal control problem for a singular system of solid-liquid phase transition*
- 10.20–10.40 Sergio Pietro FRIGERI (Milano): *Nonlocal diffuse-interface models for binary viscous incompressible fluids*
- 10.45–11.20 Maria Agostina VIVALDI (Roma): *TBA*
- 11.25–11.50 *coffee break*
- 11.50–12.25 Sergio POLIDORO (Reggio Emilia): *TBA*
- 12.30–13.05 Pavel KREJČI (Praha): *Mathematical and thermodynamic ill-posedness of the Souza-Auricchio model for shape memory alloys*
- 13.10 *end of the workshop*