

**Workshop “Encounter of the third kind”
on “Generalized continua and microstructures”
3-7 April 2018, Arpino, Italy**

LIA Coss&Vita

F2M and MEMOCS

Tentative Program

www.memocsevents.eu/wordpress/cossevita/workshop-encounter-of-third-kind-generalized-continua/

The workshop is divided into 6 sessions. The first session on Tuesday (April 3rd afternoon) is dedicated to general introductory lectures. The 6 sessions from April 4th to April 6th are devoted to various topics proposed below. For each session, a coordinator is designated whose role will be not only to introduce the lectures but also to organize the discussions of each topic. The role of the coordinator will be essential to foster the discussion so that the Workshop really is an "Encounter of the Third Type".

Tuesday 3rd April 2018

13:00 Meeting at the **Arrivals of Terminal 1 T1 exit 2** of the Airport of Rome Leonardo Da Vinci
13:30 Departure to Arpino

15:30 Arrival at Arpino

16:00-16:30 Welcome and Registration session at the hotel IL CAVALIERE D'ARPINO

Introductory general lectures

(Chair: Samuel Forest)

16:30 Albrecht Bertram

"On the second and third order non-linear gradient theory"

17:15 Francesco dell'Isola

"Data driven or theory driven?"

Some lessons from computer-aided manufacturing and nonlinear elasticity"

18:00 Wolfgang Mueller

"A new dawn for micropolar fluid theory?"

with Elena Vilchevskaya

Wednesday 4th April 2018

Session on Formulations of generalized continuum models (Coordinator: F. dell'Isola)

- 9:00 Nicolas Auffray
"Odd-order coupling in 3D strain gradient elasticity"
with H. Le Quang and Q.C. He
- 9:30 Sébastien Brisard
"On stress-gradient materials: Formulations and homogenization"
with V.P. Tran, K. Sab, J. Guilleminot
- 10:00 Selda Oterkus
"Peridynamic modelling of fully coupled thermomechanics"
- 10:30 Samuel Forest
"Second order micromorphic continua and its relations to strain and stress gradient media"
with K. Sab

11:00-11:30 Coffee break

Session on Construction of generalized continua by homogenisation (Coordinator: K. Sab)

- 11:30 Geralf Hütter
"Review of homogenisation approaches for micromorphic and strain gradient theories"
- 12:00 Barboura Salma
"Homogenization procedure to establish strain gradient constitutive relations"
with J. Li
- 12:30 Pierre Seppecher
"Examples of strain gradient and generalized continua obtained by homogenizing frame lattices"
- 13:00 Jean-François Ganghoffer
"Homogeneization of stratified composite materials including second gradient effects based on the method of oscillating functions and the unfolding method" with G. Maurice

13:30-15:00 Lunch break at Trattoria del Corso

Session on Dynamics of generalized continua
(Coordinator: V. Eremeyev)

- 15:00 Claude Boutin
"Dynamics of periodic composites.
High frequency modulation versus Bloch waves and standard homogenisation"
with A. Rallu A. and S. Hans
- 15:30 Arkadi Berezovski
"On the wave dispersion in microstructured solids"
- 16:00 Giuseppe Rosi
"Frequency dependent acoustic propagation and beam steering in hexagonal lattices:
continuum modeling in the framework of strain gradient elasticity"
with N. Auffray
- 16:30-17:00 Coffee break**

Session on Architected and meta-materials
(Coordinator: Justin Dirrenberger)

- 17:00 Arthur Lebée
"Fitting surfaces with origami tessellations? The case of the eggbox pattern"
with H. Nassar and L. Monasse

Thursday 5th April 2018

Session on Architected and meta-materials (continued)

(Coordinator: Justin Dirrenberger)

- 9:00 Uwe Muehlich
"Influence of topology, geometry and material properties on stiffness and failure of planar random networks"
- 9:30 Mario Spagnuolo
"Geometrical microstructure descriptors in strained co-continuous matrix-embedded regular networks"
with P. Franciosi, O.U. Salman
- 10:00 Martin Poncelet
"From a standard continuum experimental mechanics to a generalized one?"
- 10:30 Federica Ongaro
"A continuum model for composite cellular materials"

11:00-11:30 Coffee break

- 11:30 Maria Laura De Bellis
"Micropolar based homogenization for periodic and random composites"
with P. Trovalusci and R. Masiani
- 12:00 Yuri Solyaev
"Continuum micro-dilatation modeling of auxetic metamaterials with re-entrant lattice structure"
with Sergey Lurie

Session on Thin structures

(Coordinator: A. Lebé)

- 12:30 Karam Sab
"A stress-gradient model for in-plane loaded multilayered plates"
with A. Lebé
- 13:00 Emilio Barchiesi
"Asymptotic identification à la Piola of linear Timoshenko beam model for slender periodic planar frame-wall structures"
with Sergei Khakalo

13:30-15:00 Lunch break at Trattoria del Corso

- 15:00 Erkan Oterkus
"Beam and Plate Formulations in Peridynamic Framework"
with Zhenghao Yang, Bozo Vazic and Selda Oterkus

15:30 Elena N. Vilchevskaya
"Some remarks on recent developments in micropolar continuum theory"

16:00-16:30 Coffee break

Session on **Computational mechanics of generalized continua**
(Coordinator: S. Forest)

16:30 Emek Abali
"On the computation of generalized mechanics by using the finite element method"

17:00 Jarkko Niiranen
"Strain gradient elasticity theories and microstructural thin structures: models, methods and applications"
with Sergei Khakalo and Viacheslav Balobanov

17:30 Simon Raphael Eugster
"Modelling planar pantographic sheets using a nonlinear Euler-Bernoulli beam element based on B-Spline functions"

18:00 Luca Placidi
"Numerical simulations of fracture propagation in a 2-dimensional isotropic strain gradient continuum"
with Emilio Barchiesi, Anil Misra

20:00 Social dinner at Restaurant Il Ciclope

Friday 6th April 2018

On this day, the Workshop will move to the enchanting location of Fossanova (1 hour by bus from Arpino). The morning will be dedicated to the sessions as usual; after lunch, which will be organized and offered by the organizing committee, there will be the visit to the Abbey and the village of Fossanova, the medieval museum of Fossanova and the archaeological museum of Priverno.

9:00 Departure from the hotel Il Cavaliere D'Arpino for Fossanova

Session on **Computational mechanics of generalized continua (continued)** (Coordinator: S. Forest)

10:30 Massimo Cuomo

"Softening and damage for strain gradient materials: Thermodynamically consistent model and computational aspects"

11:00-11:30 Coffee break

11:30 Sergei M. Aizikovich

"Bilateral asymptotic method for solution of a system of dual integral equations and its application for modeling of nanoindentation experiments"
with Andrey S. Vasiliev, Sergei S. Volkov

12:00 Attribution of the Tullio Levi Civita award to Prof. Victor Eremeyev

"On elastic structures made of inextensible flexible fibers undergoing finite deformations as enriched models of continuum"

12:30 Victor Eremeyev

"On effective elastic properties of materials with microstructured surface coatings"

13:00-14:30 Lunch break

14:30 Visit to Fossanova and archaeological museum of Priverno

18:00 Return to Arpino

Saturday 7th April 2018

8:30 Departure of the bus to the Airport of Rome Leonardo Da Vinci.