

INVITED LECTURERS

Prof. W. Bangerth, Colorado State University, USA

3 lectures on developing massively parallel and efficient methods for the solution of solid mechanics problems with the finite element method. He is the founder and one of the current maintainers of the widely used open source software library deal.II (see <http://www.dealii.org/>).

Prof. D. Bigoni, Università di Trento, Italy

1 lecture on material modeling of ceramic materials for the green economy. Prof. Bigoni has been awarded an ERC advanced grant in 2013 by the European Research Council.

Prof. A. Piccolroaz, Università di Trento, Italy

1 lecture on material modeling of ceramic materials for the green economy. Prof. Piccolroaz coordinates a large EU project on Ceramics involving five universities and three industrial partners.

Prof. S. Mogilevskaya, University of Minnesota at Minneapolis, USA

3 lectures on fundamentals of homogenization theory. Professor in the Department of Civil, Environmental, and Geo-Engineering at the University of Minnesota, she is author of over 70 archival journal papers in the field.

Prof. A. Salvadori, University of Brescia, Italy - University of Notre Dame, USA

3 lectures on multi-scale and multi-physics energy storage processes and materials. He founded and coordinates the Multi-scale Mechanics and Multi-physics of Materials Lab at the University of Brescia.

Prof. A. Sanson, Institute of Science and technology for Ceramics (ISTEC), Italy

3 lectures on challenges and opportunities of ceramic-based materials for the green economy. She authored more than 60 international publications and coordinates the CNR referees of the projects of the Ministry of Economic Development in the frame of the Sustainable Development Funding scheme.



Contacts and registration:

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A. Piccolroaz, Università di Trento,
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Extensive information at:

<http://m4lab.unibs.it/flyer/index.html>



International Summer school

Mechanics for the green economy

Modeling and High
Performance Computing in
multi-scale and multi-
physics processes.

*Brescia and Trento, Italy
19-25 July 2017*

The school is organized in
synergy with the international
congress

CERMODEL2017, Modelling and
Simulation meet Innovation in
Ceramics Technology
July 26-28, 2017, Trento, Italy.

Faced as we are with global environmental deterioration, policies to promote cleaner, less polluting technologies must be advocated. This economical-technological-normative framework, named "green economy", poses novel challenges to the scientific community, in industry as well as in academia. This summer school highlights the important role that the mechanics can have in it.

The school, organized in synergy with the international congress CERMODEL, aims at investigating the challenges and opportunities of materials for the green economy, at promoting innovative visions in multi scale modeling and multi-physics of materials, at exploring and implementing high-performance, massively parallel computing codes. Such a scientific road-map allows the world of modeling and simulation to face up new challenges as well as to provide scientific and technological developments that will translate into benefits on the health and quality of life for all humanity.

Schedule	10:00 - 12:00	13:30 - 15:30	15:45-17:45
July 19		Sanson	Sanson
July 20	Sanson	Bigoni	Piccolroaz
July 21	Mogilevskaya	Salvadori	Mogilevskaya
July 22	social event on the Lake of Garda		
July 24	Mogilevskaya	Bangerth	Salvadori
July 25	Bangerth	Salvadori	Bangerth

Further information can be found at <http://m4lab.unibs.it/flyer/index.html>

Registration fees have been kept as small as possible. The 150 euros fee package includes 5 lunches (Wed 19 to Tue 25), lecture notes, and wi-fi internet access. They do not include accommodation and the social event on Saturday July 22 on the lake of Garda. Agreements have been reached with hosting facilities, which will provide excellent and convenient accommodation. 10 fellowships, which will grant free registration to the school and partial reimbursement of the travel costs, are available to non-italian students. Participants who register to CERMODEL can register to the school at a 50 euros fee.

Preliminary suggested readings

Kushch, V.I., Mogilevskaya, S.G. 2016. Philosophical Magazine Letters. DOI:10.1080/09500839.2016.1234720.

Mogilevskaya, S.G., Stolarski, H.K., Crouch, S.L. 2012. Journal of the Mechanics and Physics of Solids 60, 391-417.

Mogilevskaya, S.G., Nikolskiy, D. 2015. The Quarterly Journal of Mechanics and Applied Mathematics 68: 363-385.

N.J. Dudney, W.C. West, J. Nanda "Handobook of solid state batteries" world scientific press, 2nd edition, Materials and Energy vol 6

Ishihara Ed. "Perovskite for solid oxide fuel cells" Springer edition, 2009

"T. Markvart amd L. Castaner Edit "Solar Cells, Materials, Manufacture and Operation" Elsevier, 2nd edition " 2005

N. Armaroli V. Balzani "Energy for a Sustainable World" Wiley-VCH, 2011

<http://www.math.colostate.edu/~bangerth/videos.html>

Salvadori A., Grazioli D., Geers M.G.D., International Journal of Solids and Structures, 59 (2015) 90–109

Salvadori A., Grazioli D., Geers M.G.D., Danilov D., Notten P., Journal of Power Sources 293 (2015) 892-911

Grazioli D., Magri M., Salvadori A., Computational Mechanics, Review Article December 2016, Volume 58, Issue 6, pp 889–909 2016