



ALERT Geomaterials

NEWSLETTER - March 2015
N 13 - year 9

<http://alertgeomaterials.eu>

In This Issue ...

EDITORIAL	1	New Members	3
ALERT Workshop 2014	2	ALERT Special Lecture 2014	4
ALERT PhD Prize 2014	2	ALERT Workshop & School 2015	4
ALERT Doctoral School 2014	3	Zienkiewicz Course 2014 & 2015	5

EDITORIAL

Dear ALERT member,

during the last ALERT Workshop in Aussois 2014, the ALERT General Assembly elected 15 candidates who will compose the new Board of ALERT Directors for the next three years. I would like to thank all directors from the past Board for their contributions and time spent working on the ALERT issues. I am sure that the new Board will overtake the responsibility for ALERT Geomaterials with the same commitment and I wish all the members full success.

The new Board of Directors elected Prof. Manuel Pastor as ALERT President for his second period and confirmed his proposal for the ALERT Bureau: Prof. Ivo Herle (Director), Dr. Andrea Galli (Vice-

Director for Administration) and Dr. Sté-fane Grange (Vice-Director for Economy). Thus, I have a pleasure to address you this Editorial for the next three years!

One important decision was made during the ALERT General Assembly last year. ALERT Geomaterials stands now for *Alliance of Laboratories in Europe for Education, Research and Technology*! Adding *Education* into the name pays tribute to the important activities of ALERT linked to the Doctoral Schools, Olek Zienkiewicz Courses (Summerschools) and PhD Prizes.

You may notice that the layout of the Newsletter changed. We have switched from Word to Latex format and made

some minor changes which should improve the readability of the document. Many thanks to Max Wiebicke who spent a lot of time on this task.

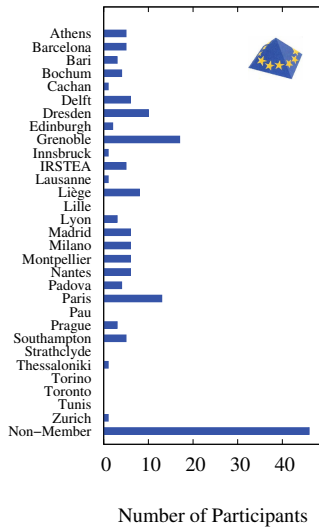
The number of the ALERT member institutions increased to 34 last year. We are proud that the association remains attractive for new members. We hope that the trend will continue also in the future. We are also aware of an increasing administrative effort which we want to manage by a better efficiency of internal communication and tools.

Yours sincerely,

Ivo Herle
Director of ALERT Geomaterials



Impressions of Aussois
Photographs by David Masin



Participants of the ALERT
Workshop 2014

ALERT Workshop 2014

In 2014 the annual ALERT Workshop was held from Monday, 29th September until Wednesday, 1st October again in Aussois, France. The regional distribution of the participants from the institutional members of ALERT Geomaterials is shown on the left hand side. In total, 168 participants registered for the ALERT workshop 2014.

As it was introduced in 2013, the session on Tuesday lasted only half a day allowing the Board of Directors meeting, the PhD-prize ceremony and the Special lecture to be held in the afternoon.

The three topics of the ALERT Workshop 2014 are

listed below:

- 1 Constitutive modelling: what's new?**
coord. Claudio di Prisco & Roberto Nova
- 2 Railway Geomechanics**
coord. Antonis Zervos & Farhang Radjai
- 3 Multiphysics coupling**
coord. Robert Charlier, Lorenzo Sanavia & Jean Vaunat

We thank all active participants and coordinators for their effort.

[Back to Contents](#)

The presentations of the speakers can be downloaded from the ALERT website.

<http://alertgeomaterials.eu/presentations-of-the-alert-workshop-2014/>

ALERT PhD Prize 2014

The jury of the ALERT PhD Prize 2014 was composed of the professors Manuel Pastor (Universidad Politécnica de Madrid), Itai Einav (University of Sydney, Australia), Claudio Tamagnini (University of Perugia) and Pierre Delage (Laboratoire Navier, France). Only PhD students from one of the institutions belonging to ALERT are eligible candidates for the prize which is dated to 1000 Euro.

The jury picked the theses of Giuseppe Sciumè (University of Salento), Edward Andò (Laboratoire 3SR), Matteo Ciantia (Politecnico di Milano) and Patrick Sebastian Kurzeja (Ruhr-University Bochum) out of 11 applications for a closer selection.

The jury awarded the PhD student Giuseppe Sciumè for his work entitled

THCM model of concrete at early ages and its extension to tumor growth numerical analysis

The thesis by Dr. Sciumè focused on the prediction of concrete strain at early age as well as the modeling of tumor growth.

Concrete is modeled as multiphase system consisting of three phases: a solid phase, a liquid phase,

and a gaseous phase. The solid phase contains several species: anhydrous grains of cement, aggregates, and hydrates (CSH, ettringite, etc.). The liquid phase is liquid water and the gaseous phase is modeled as an ideal binary gas mixture of dry air and water vapour. The mathematical model shares the general conservation equations of mass, energy and linear momentum of Gawin et al. [2006], whereas several originalities have been introduced at the constitutive level. This model is also exploitable for repaired structures.

An important part of the PhD thesis concerns tumor growth modeling: this work has been carried out within the context of a collaboration between the Italian PhD Director (B. Schrefler) and the Methodist Hospital of Houston. The mathematical model developed for tumor growth is based on multiphase porous media mechanics and has relevant formal analogies with that of concrete at early age (phases' transport, intra-phase and inter-phase exchanges of mass, etc.).

The abstract of the PhD thesis of Dr. Giuseppe Sciumè as well as his presentation in Aussois are available on the ALERT website.

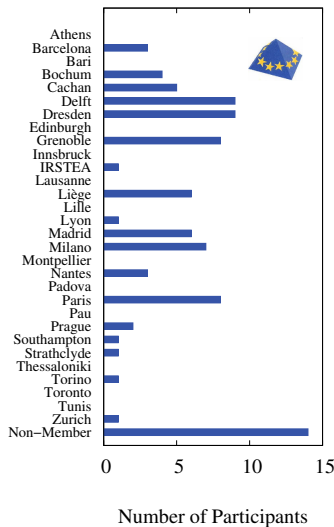
[Back to Contents](#)



Giuseppe Sciumè
(University of Salento)



ALERT Doctoral School 2014



Participants of the ALERT Doctoral School 2014

The ALERT Doctoral School 2014 lasted from Thursday, 2nd October to Saturday, 4th October and was attended by 90 participants. The topic of the school was dedicated to

Stochastic Analysis and Inverse Modelling

The organization was carried out by Michael A. Hicks and Cristina Jommi (both Delft University of Technology, The Netherlands). The accompanying book, containing articles referring to the lectures, can be downloaded from the ALERT website.

The lectures were presented by

- Michael A. Hicks (Delft University of Technology)
- Cristina Jommi (Delft University of Technology)
- Gordon A. Fenton (Dalhousie University)
- Abdul-Hamid Soubra (University of Nantes)
- Alberto Ledesma (UPC Barcelona)
- Michele Calvello (Università di Salerno)

The framework to account for uncertainties in engineering design was provided by giving a review of the basics of probability theory, including random variables, common distributions and reliability analysis methods. Random fields were introduced in order to discuss methods of simulating the spatial variation of geotechnical properties. With regard to numerical modelling, the random finite element method was presented, enabling the analysis of the influence of soil heterogeneity on soil behaviour and geotechnical performance. Furthermore, different aspects of inverse modelling were discussed in order to meet common geotechnical problems, such as, for example, the back-analysis of geotechnical model parameters from field measurements.

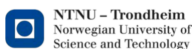
In the name of all the ALERT members we want to thank the lecturers and the organizers for their commitment.

[Back to Contents](#)

The accompanying book, containing articles referring to the lectures, as well as some books of previously held doctoral schools can be downloaded from the ALERT website.

<http://alertgeomaterials.eu/publications/>

CHALMERS



New institutional Members of ALERT

New Institutional Members of ALERT

At its meeting in Aussois, September 2014, the ALERT Board of Directors approved four submitted applications for the membership in the ALERT Geomaterials association:

- Chalmers University of Technology represented by Minna Karstunen
- University of Perugia represented by Claudio Tamagnini

- Norwegian University of Science and Technology represented by Steinar Nordal
- McGill University represented by A.P.S. Selvadurai (associated membership)

With this decision, the number of the member institutions of ALERT Geomaterials increased to 34!

[Back to Contents](#)



The ALERT Special Lecturer 2014
Prof. Itai Einav

Special Lecture 2014: Prof. Itai Einav

The ALERT Special lecture 2014 was delivered by Prof. Itai Einav from University of Sydney, Australia.

The title of the lecture was:

Geomaterials under extremes

The Special lecture during the coming ALERT Workshop 2015 will be presented by Prof. Hans Muhlhaus from the University of Queensland, Australia. He will talk about

Mechanical and hydraulic instabilities in Geomechanics

The lecture was digitized during the presentation and will be available for downloading on the ALERT website soon.

On the ALERT website an abstract of his presentation will be published soon.

[Back to Contents](#)



ALERT Workshop & School 2015

The ALERT Workshop in 2015 will be organized from Monday, 28th September till Wednesday, 30th September. The workshop will again take place in the Centre Paul Langevin in Aussois, France.

The focus of the three workshop sessions and the responsible coordinators are listed below:

1 From discrete methods to continuum methods: Applications, Problems and Solutions

coord. Y. Dafalias, L. Sibille & E. Andò
yfdafalias@central.ntua.gr
luc.sibille@3sr-grenoble.fr
edward.ando@3sr-grenoble.fr

2 How should we teach geomechanics?

coord. G. Viggiani & I. Herle
cino.viggiani@3sr-grenoble.fr
ivo.herle@tu-dresden.de

3 Fracturing and fractured reservoirs

coord. E. Papamichos, H. Lewis & G. Couples
epapamic@civil.auth.gr
Helen.Lewis@pet.hw.ac.uk

Gary.Couples@pet.hw.ac.uk

The deadline for the submission of abstracts is 30th April 2015.

The workshop is followed by the ALERT Doctoral School which will be hosted from Thursday, 1st October to Saturday, 3rd October also in Aussois. The topic of the ALERT School will be dedicated to

Coupled and multiphysics phenomena

and will be organized by Bernhard Schrefler (Università degli Studi di Padova), Lorenzo Sanavia (Università degli Studi di Padova) and Frederic Collin (Université de Liège).

The online registration for the ALERT Workshop & School will open in June 2015 on the ALERT website and will be announced in advance again.

[Back to Contents](#)

Organising Institutions of the
ALERT Workshop & School 2014

Please do not forget to submit your abstract by email directly to the coordinators using the abstract form which can be downloaded at the ALERT site:

<http://alertgeomaterials.eu/2015/02/alert-workshop-2015-call-for-abstracts/>



ALERT Olek Zienkiewicz Course



POLITÉCNICA

UNIVERSITÀ
DEGLI STUDI
DI PADOVAUniversità
degli Studi
di PerugiaPOLITECNICO
DI MILANOBundesanstalt für
Materialforschung
und -prüfungUNIVERSITÀ DEGLI STUDI
DI SALERNO

Lecturing Institutions of the
ALERT Olek Zienkiewicz Course
2014

The 7th edition of the Olek Zienkiewicz Course will be held from 25th to 29th May 2015 in Barcelona, Spain. It will be dedicated to the

Behaviour of unsaturated soils

Further details on the course will be provided at the ALERT website soon.

The 6th ALERT Summer school 2014 was held in June in Madrid, Spain. The school focused on

Advanced numerical modelling in Geomechanics

The content of the school was prepared and presented by the lecturers:

- Manuel Pastor (Madrid)
- Pablo Mira (Madrid)
- Miguel Martín Stickle (Madrid)
- Claudio di Prisco (Milano)
- Claudio Tamagnini (Perugia)
- Lorenzo Sanavia (Padova)
- Bernhard Schrefler (Padova)
- Pablo Cuéllar (Berlin)
- Sabatino Cuomo (Salerno)

The objective of this course was to provide the students with a sound basis for the study of Computational Geomechanics. Thus, the lectures were, more or less, divided into the following aspects

- Mathematical models
- Constitutive equations
- Numerical models
- Applications

In addition to the lectures, which covered topics from computational plasticity via SPH and MPM models to landslide propagation, practical sessions took place each afternoon. During these sessions, the students were allowed to create different nu-

merical models in order to deal with a variety of problems, such as numerical aspects or the simulation of boundary value problems, with an in-house software.



The course was closed with the lecture *Beyond Geomaterials* given by Bernhard Schrefler. It was impressively shown, how the numerical methods used for the modelling of geomaterials can be applied to biomaterials, such as, for example, tumour cells.



The ALERT Summer school was attended by 23 participants from 10 different countries.

[Back to Contents](#)

To subscribe to our mailing list please go to
<http://alertgeomaterials.eu>

Newsletter production
Max Wiebicke