

# European Workshop on High Order Nonlinear Numerical Methods for Evolutionary PDEs: Theory and Applications (HONOM 2011)

**University of Trento, Italy**  
**April 11<sup>th</sup> to April 15<sup>th</sup> 2011**

## ORGANIZERS

Eleuterio Toro (Chairman), University of Trento, Italy  
Michael Dumbser, University of Trento, Italy  
Clauss Dieter Munz, University of Stuttgart, Germany  
Remi Abgrall, University of Bordeaux, France

## INVITED PLENARY SPEAKERS

Dinshaw Balsara, Notre Dame University, USA  
Francesco Bassi, University of Bergamo, Italy  
Juan Cheng, Inst. of Appl. Physics and Comp. Math., Beijing, China  
Bernardo Cockburn, University of Minnesota, USA  
David Darmofal, MIT, USA  
Bruno Després, University Paris VI, France  
Giacomo Dimarco, University Paul Sabatier, Toulouse, France  
David Schuster, NASA Langley Research Center, USA  
Spencer Sherwin, Imperial College, UK  
Vladimir Titarev, Cranfield University, UK

## INTERNATIONAL SCIENTIFIC COMMITTEE

Hideaki Aiso (JAXA Tokyo, Japan)  
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Spencer Sherwin (UK)  
Jiang Song (China)  
Peter Sweby (UK)  
Yoko Takakura (Japan)  
Jaap van der Vegt (The Netherlands)



## **BACKGROUND**

A very wide variety of processes in science, engineering and biology involve evolutionary PDE. Numerical simulations and predictions, particularly for scientific purposes, demand the use of accurate numerical methods for solving systems of time dependent partial differential equations. This is most evident in acoustics, when attempting to evolve weak signals for long distances and for long times or in the simulation of turbulent flow when attempting to capture small structures on relatively coarse grids. In addition to the classical requirement of conservation, of fundamental importance is high accuracy in both space and time for all processes involved (e.g. advection, reaction, diffusion, dispersion). However, as is well-known from Godunov's theorem, accuracy of linear schemes greater than one brings in the Gibbs phenomenon, producing solutions with spurious oscillations. The real challenge is then to construct non-linear (non-oscillatory) schemes of high accuracy, even for solving linear problems.

Significant advances have been made in the last two decades on the construction of conservative, non-linear schemes of high order of accuracy in both space and time. These advances were pioneered by the family of TVD (Total Variation Diminishing) methods, by now a well-established approach that produces relatively simple and practical second-order schemes. To go beyond second-order, a high degree of sophistication is required. There are at present several approaches that, at least partially, fulfil some of the basic requirements. Examples include the ENO method and its variant the WENO method, the DG Finite Element methods and the ADER approach.

## **THEMES OF THE CONFERENCE AND CONTRIBUTED PAPERS**

Algorithm design, analysis and applications of non-linear schemes of accuracy greater than two, following the finite difference, finite volume or finite element approaches. Potential contributors are invited to submit an abstract of no more than two pages in ps or pdf format via email to the organizers.

## **10 GRANTS FOR YOUNG SCIENTISTS**

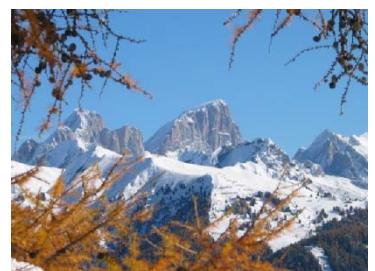
There will be 10 grants for young scientists (PhD students or post-doctoral research fellows) that will cover in full all local subsistence expenses (hotel and meals for the duration of the conference). Potential beneficiaries are invited to submit a CV and a letter of recommendation from the academic supervisor to the conference organizers.

## **REGISTRATION, ACCOMMODATION AND OTHER INQUIRIES**

Early registration is advised, as our objective is to limit the number of participants to allow for greater interaction and to avoid parallel sessions. The conference secretary, Mr. Micheletti, will help you with hotel information and bookings and other administrative aspects of the conference.

## **ABOUT TRENTO AND THE DOLOMITES**

The historical city of Trento is in the Trentino Province, close to the Dolomites, and is easy to reach by car or train from the north through Austria and from the south through Verona. Trento is located 150 km south of Innsbruck and 90 km north of Verona. The nearest and most convenient airport is Verona Airport, 15 minutes from the Verona train station. The region around Trento is of extraordinary beauty, with mountains, rivers, lakes, and all within a small radius.



## IMPORTANT DEADLINES

**Registration and extended Abstract submission:** **January 31, 2011**  
**Abstracts should be sent directly to:** [michael.dumbser@ing.unitn.it](mailto:michael.dumbser@ing.unitn.it)

## CONFERENCE FEES

**No conference fees will be charged.** Expenses for travel and subsistence are at the responsibility of each participant.

## CONFERENCE VENUE

The conference will take place in the conference centre of IRST, in Povo, a couple of kilometres from the centre of town.

## CONFERENCE SECRETARY

*Postal address*

Mr. Augusto Micheletti  
Centro Internazionale per la Ricerca Matematica  
38050 Povo (TN) – ITALY  
**e-mail :** [michelet@science.unitn.it](mailto:michelet@science.unitn.it)  
*Tel.:* +39 0461 281628  
*Fax.:* +39 0461 810629

## SCIENTIFIC INQUIRIES TO:

**Prof. E. F. Toro**  
Laboratory of Applied Mathematics  
Faculty of Engineering, University of Trento  
38050 Trento, ITALY  
*Tel.:* +39 0461 282674; *Fax.:* +39 0461 282672  
*e-mail:* [toroe@ing.unitn.it](mailto:toroe@ing.unitn.it)  
*Webpage:* <http://www.ing.unitn.it/toro>

**Dr.-Ing. M. Dumbser**  
Laboratory of Applied Mathematics  
Faculty of Engineering, University of Trento  
38050 Trento, ITALY  
*Tel.:* +39 0461 282646  
*e-mail:* [michael.dumbser@ing.unitn.it](mailto:michael.dumbser@ing.unitn.it)

**Prof. Claus-Dieter Munz**  
Institut für Aerodynamik und Gasdynamik  
Universität Stuttgart  
Pfaffenwaldring 21  
D-70569 Stuttgart, GERMANY  
*e-mail:* [munz@iag.uni-stuttgart.de](mailto:munz@iag.uni-stuttgart.de)

**Prof. Remi Abgrall**  
INRIA and Institute Polytechnique de Bordeaux  
Bat A29 bis  
341 cours de la Libération  
F-33405 Talence Cedex, FRANCE  
*e-mail:* [abgrall@math.u-bordeaux1.fr](mailto:abgrall@math.u-bordeaux1.fr)

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