Special issue in computing and visualization in science (CVS), related to the European multigrid conference, EMG 2010

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With great pleasure we present the special issue in CVS related to the European Multigrid conference, which took place on the island Isola d'Ischia in Italy from 19 to 23 September, 2010.

The conference was organized by Alfio Borzi (at that time at the Università degli Studi del Sannio, in Benevento, Italy, now at the University of Würzburg, Germany), and Cornelis Oosterlee, from the CWI—Center for Mathematics and Computer Science in Amsterdam, and the Delft University of Technology in the Netherlands.

In fact, we have two special issues in two journals, as both organizers are handling editors of different journals. Next to this issue in CVS, we will have a second one in the journal Numerical Mathematics: Theory, Methods and Applications (NM-TMA). Both issues appear at approximately the same time, and contain seven contributions each, which makes fourteen special issue publications related to EMG2010 in total.

The EMG conference series provides a forum for researchers to present and discuss recent advances on the development, theory, and application of multigrid, multilevel, and multiscale methodologies. Previous EMG conferences were held in Cologne (1981, 1985), Bonn (1990), Amsterdam (1993), Stuttgart (1996), Gent (1999), Hohenwart (2002), Scheveningen (2005), Bad Herrenhalb (2008). With the

meeting in Italy, the European Multigrid conference celebrated its 10th anniversary.

In the EMG 2010 conference, there were about 100 participants from 16 countries. Main topics at EMG2010 were multigrid methods in general (efficiency, robustness, adaptivity, parallelism, application), domain decomposition and related iterative schemes and discretization methods, software tools and high performance computing, applications in classical and emerging areas like analysis of images, financial problems, inverse problems, multiscale and coupled systems, and optimization and design.

This variety of topics is also reflected in the contributions in the special issue, where we encounter efficient solution methods for problems with random coefficients by multilevel Monte Carlo methods, a multiscale method for a problem with continuum and particle equations, algebraic multigrid for the Helmholtz equation and multigrid and multilevel methods for optimal control and parabolic problems.

We would also like to thank the CWI—Center for Mathematics and Computer Science, Amsterdam, the Delft University of Technology, in particular the Delft Center for Computational Science and Engineering (DCSE), and the Università degli Studi del Sannio at Benevento for their support. Essential for the realization of this conference was their generous support as well as of the company AVL GmbH Austria and of the German Fraunhofer Institute SCAI (Institute for Scientific computing and Algorithms) in Sankt Augustin.

We wish you enjoyable reading of the interesting contributions.

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