

Editorial

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Published online: 21 December 2006
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Three special issues (Vol. 11, 1–3, 2008) of the journal *Computing and Visualization in Science* are devoted to the 8th European Multigrid Conference (EMG). This conference was held on De Pier in Scheveningen, the Netherlands from 27–30 September 2005, with 120 participants from 22 countries.

EMG has built up an impressive and memorable tradition, with previous meetings held in Cologne (1981, 1985), Bonn (1991), Amsterdam (1993), Stuttgart (1996), Ghent (1999) and Hohenwart (2002). EMG and the Copper Mountain conferences in the USA are the main meeting events for the multigrid/multilevel community. The 8th EMG belonged to the Thematic Conferences 2005 series of ECCOMAS.

The conference was devoted to dissemination of recent advances and ideas concerning multigrid, multilevel and multiscale methods. Over the years, we have seen multigrid methods become well established as the fastest numerical methods for the solution of elliptic partial differential equations. The challenge is to bring the power of multigrid to bear on boundary value problems in complicated domains. Multigrid methods also give or promise to give major breakthroughs in efficiency of computing methods for other classes of problems, such

as other types of partial differential equations, integral equations etc. There is a growing trend of multigrid and multilevel methods being efficiently used in complicated applications, in optimization, and for non-elliptic and nonlinear equations.

A broad range of problems in the sciences and engineering require multiscale modeling and simulation techniques, because of the range of scales involved and the prohibitively large number of variables implied by a mono-scale approach. Multigrid, multilevel and multiscale methods are interrelated in various ways. The conference aimed to bring researchers in these fields together.

In summary, the following themes were covered:

- * Multilevel solvers, Multigrid methods,
- * Algebraic Multigrid,
- * Theory and applications of methods,
- * New fields of application,
- * Multiscale solution methods and modeling.

This variety of multigrid related topics is reflected by the following 17 papers constituting these three special issues.

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