

Special issue on multigrid methods

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This special issue of Computing and Visualization in Science contains selected papers from the 2014 European Multigrid conference (EMG 2014), which took place in Leuven, Belgium, from 9 to 12 September, 2014.

European Multigrid (EMG) is a series of conferences on the theme of multigrid methods and related fields. EMG is one of the most important conference series on this topic worldwide. Previous EMG meetings have been held in Cologne (1981 and 1985), Bonn (1990), Amsterdam (1993), Stuttgart (1996), Gent (1999), Hohenwart (2002), Scheveningen (2005), Bad Herrenalb (2008), Ischia (2010) and Schwetzingen (2012).

The EMG 2014 conference took place at the Irish College, in Leuven, an old university college founded in 1607. It attracted more than 80 participants of 15 countries, of which 20 were PhD-students; 12 participants attended the conference from outside Europe. Further details are available on the conference homepage

<http://metronu.ulb.ac.be/EMG2014/>

The contributions presented at EMG 2014 provided a snapshot of the research activities in multigrid methods and related fields. They demonstrated that some of the well-established topics, such as algebraic multigrid, non-linear

multigrid, parallel multigrid, Fourier analysis, multi-level optimization, and multigrid for CFD applications, still represent an active area of research. The talks also addressed more recent topics, such as parallel-in-time multigrid, multigrid for the Helmholtz equation, structured solvers and preconditioners (including \mathcal{H} - and \mathcal{H}^2 -matrices), as well as some emerging trends, including application to biology. This diversity of topics is further reflected in the papers selected for the present special issue.

This special issue will appear in two volumes. The first volume contains three papers [1–3]. Hackbusch [1] gives an overview of various tensor-based methods for the solution of linear systems. Kriemann and Le Borne [2] study some factored approximate inverses based on \mathcal{H} -matrix arithmetics. Speleers and coauthors [3] prove h -optimality of two-grid methods for B-spline isogeometric analysis discretizations.

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