Preface

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Biographical notes: Peter J. Witt is a Research Scientist in the Fluids Process Modelling group at CSIRO Mathematics, Informatics and Statistics Division, Australia. In 1997, he received a PhD in Mechanical Engineering from Swinburne University. He has applied CFD to areas including slag granulation, quenching of vapours in supersonic flows, coal combustion, fluidised bed cokers and aluminium reduction cells. His research interests are in the development and application of CFD models to solve industrial problems.

Mahesh Prakash is a Principal Research Scientist at CSIRO Mathematics, Informatics and Statistics, Australia. His research interests include application of grid-free methods to industrial and geophysical flow problems, multi-phase flow and turbulence modelling using Smoothed Particle Hydrodynamics (SPH).

David F. Fletcher received both his BSc and PhD (Mathematics) from the University of Exeter, UK. In 2002, he was awarded a Habilitation à Diriger des Recherches (HDR), by the Institut National Polytechnique de Toulouse, France for his CFD work across many disciplines. He has worked on a very wide range of CFD problems over the last 25 years using a variety of commercial and purpose written codes.

Gregory J. Sheard received his PhD in 2004 from Monash University, Melbourne, Australia. He is presently employed as a Senior Lecturer in the Faculty of Engineering, Monash University, where he specialises in the development and application of high-order computational fluid dynamics algorithms to problems spanning biological flows through to planetary atmospheric dynamics, and has published over 40 papers in both journals and international conference proceedings.

M. Phil Schwarz is the Research Program Leader for CSIRO's Computational and Mathematical Modelling program. Over the past 20 years, he has conducted and led research in CFD aimed at improving processes and equipment in the minerals industry. This has mostly comprised mathematical and numerical modelling of single phase and multi-phase industrial flows. Specific projects include bath smelting processes (Sirosmelt and HIsmelt), thickeners, waste heat boilers, heavy medium cyclones, fluidised beds, and flotation cells.

It is with great pleasure that we introduce this special issue of Progress in Computational Fluid Dynamics containing 14 papers selected from the 157 presented at the Seventh International Conference on Computational Fluid Dynamics in the Minerals and Process Industries. The conference was held in Melbourne, Australia from 9 to 11 December 2009 and is the seventh in this series attracting a broad range of international and local leaders in various fields (conference website: www.cfd.com.au/cfdconf).

Unlike many other areas of fluid dynamics, applications in the minerals and process industries typically involve more than one phase and frequently require coupling of multiple physical phenomena. To capture the breath of applications and significant developments in modelling capability key papers from the conference have been selected for publication in three special issues.

Papers chosen for this issue of PCFD are those related to solving new industrial applications or shedding new light on a specific application area. Other papers from the conference dealing specifically with multiphase flows are published in *J. Computational Multiphase Flows* and those developing new techniques and approaches were selected for *Applied Mathematical Modelling*.

All papers in this special issue were subject to the standard peer-reviewing process. We wish to thank the authors who have reworked their original conference papers into full journal articles and the reviewers who have contributed their time and efforts to improving the quality of the publication.