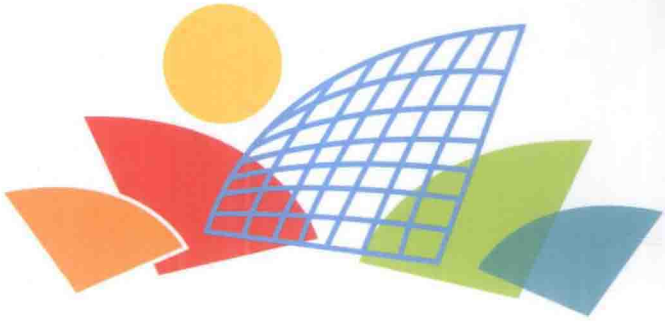

WCCM/APCOM 2010

19-23 JULY SYDNEY AUSTRALIA

Proceedings of the 9th World Congress on Computational Mechanics and 4th Asian Pacific Congress on Computational Mechanics

EDITORS: NASSER KHALILI, SOMASUNDARAM VALLIAPPAN, QING LI AND ADRIAN RUSSELL

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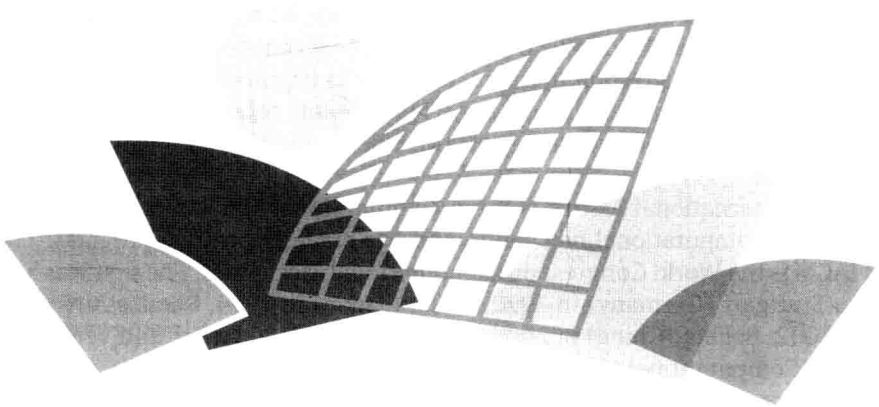

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Editors: Nasser Khalili[1], Somasundaram Valliappan[1], Qing Li[2] and Adrian Russell[1]
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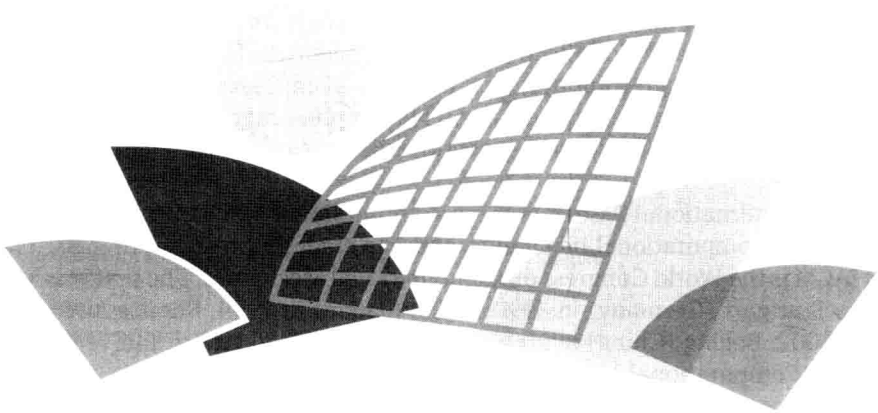

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Preface

The use for mathematical models of natural phenomena has underpinned science and engineering for centuries, but until the advent of modern computers and computational methods, the full utility of most of these models remained outside the reach of the engineering communities. Since World War II, advances in computational methods have transformed the way engineering and science is undertaken throughout the world. Today, theories of mechanics of solids and fluids, electromagnetism, heat transfer, plasma physics and other scientific disciplines are implemented through computational methods in engineering analysis, design, manufacturing and in studying broad classes of physical phenomena. The discipline concerned with the application of computational methods is now a key area of research, education and application throughout the world.

In the early 1980's, the International Association for Computational Mechanics (IACM) was founded to promote activities related to computational mechanics and has made impressive progress. The most important scientific event of IACM is the World Congress on Computational Mechanics. The first was held in Austin (USA) in 1986 and then in Stuttgart (Germany) in 1990, Chiba (Japan) in 1994, Buenos Aires (Argentina) in 1998, Vienna (Austria) in 2002, Beijing (China) in 2004, Los Angeles (USA) in 2006 and Venice (Italy) in 2008. The 9th World Congress on Computational Mechanics is held in conjunction with the 4th Asian Pacific Congress on Computational Mechanics under the auspices of Australian Association for Computational Mechanics (AACM), Asian Pacific Association for Computational Mechanics (APACM) and International Association for Computational Mechanics (IACM).

The 1st Asian Pacific Congress was in Sydney (Australia) in 2001, then in Beijing (China) in 2004 and Kyoto (Japan) in 2007.

The WCCM/APCOM 2010 publications consist of this book of abstracts given to delegates, along with 247 full length peer reviewed papers published with free access online in *IOP Conference Series: Materials Science and Engineering*. The editors acknowledge the help of the paper reviewers in maintaining a high standard of assessment and the co-operation of the authors in complying with the requirements of the editors and the reviewers.

We also would like to take this opportunity to thank the members of the Local Organising Committee, Regional Scientific Committee and the International Scientific Committee for helping make WCCM/APCOM 2010 a successful event. We also thank The University of New South Wales, The University of Newcastle, the Centre for Infrastructure Engineering and Safety (CIES), IACM, APACM, AACM for their financial support, along with the United States Association for Computational Mechanics for the Travel Awards made available. Thanks goes also to our sponsors including World Scientific and Dassault Systémes.

N. Khalili
S. Valliappan
Q. Li
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19 July 2010 Sydney, Australia

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