

# Editorial

## CEM 2002

The Fourth International Conference on Computation in Electromagnetics CEM2002 took place in Bournemouth on 8-11 April 2002. The attempt to bring together three communities of Electromagnetics, Antennas and Propagation and EMC (Electromagnetic Compatibility) seems to have worked really well and the delegates enjoyed the relaxed atmosphere of the meeting and good facilities and ambience of the Cumberland Hotel. Emphasis on 'interactive presentations' and lack of parallel sessions helped to achieve the main goal of the conference of 'networking'. This was in fact a particularly successful example of networking and thus a proof that the new idea of Professional Networks within the IEE is beginning to bear fruit. It was also a very international event with delegates from 18 countries and 5 continents. Particularly pleasing was the presence of many young people and their active participation in discussions. Even the weather was superb which caused some minor but pleasant surprise amongst the overseas delegates. The social events were interwoven in a subtle way with the technical sessions and the two discussion forums created significant interest. The discussions in fact continued on the web for over a month after the event.

The Conference Committee initially selected 30 papers from the original submission of over 80 and the authors were invited to prepare an enhanced and extended version for publication in the IEE Proceedings. Following a thorough review process, requiring – in some cases – significant revisions, it is now my pleasure to present to you this Special Issue with 26 papers. The coverage of the topics reflects the scope of the conference itself with both low and high frequency applications featuring prominently, including EMC.

The research activity known as Computational Electromagnetics (CEM) has evolved alongside the latest developments in digital computing hardware. Moreover, CEM is both a special case and part of the broader subject of computational mechanics. The speciality arises in many obvious ways, e.g. free space is an unbounded magnetic 'material', there is a vast range of physical dimensions encountered with critical feature sizes often varying over many orders of magnitude, the fundamental properties of Maxwell's equations are different to equations governing other physical phenomena. There is also a very broad spectrum of frequencies encountered: from DC to daylight. Activities of the CEM community are well organised within the International Compumag Society (<http://www.compumag.co.uk/>), an international independent organisation in existence since 1993 with nearly 700 members from over 40 countries. The IEE Professional Network on Electromagnetics (<http://www.iee.org/OnComms/pn/electromagnetics/>) is also gaining momentum and establishing itself as an international forum for discussion. The IEEE Magnetics Society (<http://www.ieemagnetics.org/>) and ACES (<http://aces.ee.olemiss.edu/>) manage the activities in North America. Journals such as IEE Proceedings (<http://www.iee.org/Publish/Journals/ProfJourn/Proc/>), IEEE transactions on Magnetics (<http://www.ieemagnetics.org/>) and COMPEL (<http://www.emeraldinsight.com/compel.htm>) contain a significant number of papers showing fundamental advances and applications of CEM. There are many conferences

reporting regularly on recent developments, including COMPUMAG (<http://www.compumag2003.com/>), CEFC (<http://www.unipg.it/cefc2002/>), CEM (<http://www.iee.org/Events/ConfExh/CEM/2002/>), ISEF (<http://www.me.feri.uni-mb.si/isef2003/>), ISEM (<http://www.1gep.supelec.fr/ISEM/>), and other.

The purpose of this Special Issue is to reflect on the state of the art in Computational Electromagnetics as reported at the CEM conference in Bournemouth. Low frequency fields and applications, problems associated with antennas and propagation, as well as EMC issues are raised and thus the coverage of topics is pleasingly broad. At the same time the geographical spread of contributors is very encouraging showing that there is activity in CEM all over the world. I wish to thank all the authors for supporting this Special Issue and for their effort in preparing the manuscripts. Special thanks are due to reviewers, without whom the high standard of presentations could not have been achieved. As an Editor, I have enjoyed working on this Special Issue, despite the tight deadlines, and hope that the readers will welcome this publication.

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**Professor Jan Sykulski** has for many years led a large research team at the University of Southampton, UK. Between 1995 and 2000 he held a prestigious chair sponsored jointly by the Royal Academy of Engineering and distribution company Southern Electric plc. He is currently Professor of Applied Electromagnetics and Head of Electrical Power Engineering Research Group (with a research and technical staff of 53) which in the last two Research Selectivity Exercises, conducted by the government (in 1996 and recently in 2001), was awarded the top ranking of 5\*. His personal contribution is in the areas of power applications of high temperature superconductivity, modelling of superconducting materials, advances in simulation of coupled field systems (electromagnetic, circuits and motion), development of fundamental methods of computational electromagnetics, in particular dual energy approach (the method of 'Tubes and Slices') and new concepts in design and optimisation of electromechanical devices for practical applications in industrial environment. He has 144 publications listed on the official database of the University. He is a founding Secretary/Treasurer/Editor of International Compumag Society, a Visiting Professor at universities in Italy, Poland, Belgium and China, a founding member of the Professional Network Electromagnetics of IEE, Editor of COMPEL and a member of International Steering Committees of major international conferences, including COMPUMAG, IEEE CEFC, ISEF, EPNC, ICEF and others.