

## Special Issue “NMR in Porous Media”

*A selection of papers presented at the Eighth International Bologna Conference on Magnetic Resonance in Porous Media, 10-14 September 2006, University of Bologna, Italy.*

This special issue of the online Journal *Diffusion Fundamentals* contains a number of contributions presented at the *Eighth International Bologna Conference on Magnetic Resonance in Porous Media*, held in Bologna from 10 to 14 September 2006. The idea to publish this special issue was evoked shortly after the Conference as the large number of original and high quality contributions could not be published in the traditional printed Proceedings issue of *Magnetic Resonance Imaging* because of space limitations. The Editorial Board of the online Journal decided to support the idea and to devote the issue to Giulio Cesare Borgia, professor of Petroleum Engineering at the University of Bologna, founder and promoter of the Magnetic Resonance in Porous Media (MRPM) Conferences, who died unexpectedly from a sudden illness in September 2002. Paola Fantazzini was asked to be guest editor. The idea was discussed within the Steering Committee and accepted with great enthusiasm.

For those who do not know these conferences it is worth reviewing their history.

The MRPM Community is now a vast community of scientists from all over the world, who recognize in Magnetic Resonance an instrument of choice for the characterization of pore space and of behavior of fluids inside in a vast range of different materials. The MRPM international conferences are the occasions in which this Community gets together, compares notes and grows. These conferences are devoted to the progress of our understanding of structure, molecular dynamics, and fluid transport and behavior in porous media, by use of Magnetic Resonance techniques, with regard to Physics, Chemistry, Engineering, Industrial applications and Life sciences. One can say with good reason that Magnetic Resonance for fluids in Porous Media now constitutes an interdisciplinary field with a wide range of scientific expertise and applications, also thanks to the MRPM conferences.

The scene was different in 1990, when this series of conferences was promoted at the University of Bologna (G.C. Borgia and P. Fantazzini). After MRPM1 the series continued: MRPM2 was held in 1993 at the University of Kent at Canterbury, UK (chairman John H. Strange), MRPM3 in 1995 at the Université Catholique of Louvain-la-Neuve, Belgium (chairman Jean Dereppe), MRPM4 in 1997 in Trondheim, Norway (chairpersons T. Skjetne and G.C. Borgia). The conference returned to Bologna in 2000 (chairpersons G.C. Borgia and P. Fantazzini). MRPM6 was organized in 2002 at the University of Ulm, Germany (chairman Rainer Kimmich). MRPM7 has been organized in 2004 in Palaiseau (France) through the chairmanship of Jean-Pierre Korb. MRPM8 returned again to the University of Bologna in 2006 (chairperson P. Fantazzini).

In 2002 the growing vitality and interest of these Conferences and the consideration that the community which the conference series serves had grown considerably over the years suggested giving the MRPM community a more formal structure. After MRPM7 the community has joined the Groupement Ampere as the *MRPM Division*, and the Conferences, which are now Ampere Events, are explicitly called the “*Bologna MRPM Conferences*,” in order to adequately recognize the contribution made over almost two decades by the University of Bologna Group.

The last conference in Bologna covered a wide range of traditional magnetic resonance and novel methods for traditional and new applications, to describe normal and anomalous phenomena, including complex fluids and fluids in nanopore structures. Special attention was focused on multidimensional NMR, including diffusion, relaxation and flow correlations. New instruments, apparatus, pulse sequences and experiments were presented for solving problems in traditional applications (such as oilfield) and new ones (such as Cultural Heritage and hydrogeology).

The Proceedings of all the MRPM Conferences [1-8] have been published as Special Issues of *Magnetic Resonance Imaging*, and to have all the Proceedings published in an international Journal with a worldwide readership has been important for the growth of the MRPM Community and for the formation of an ever-increasing number of young researchers interested in this area.

Many of the oral communications presented at Bologna MRPM8 have been written up as the papers appearing in the published Proceedings, but a number of original papers could not be published in the Proceedings. Differently from the previous 7 conferences, for the Proceedings of Bologna MRPM8 it was necessary to severely limit the number of published papers, because of the publication costs, notwithstanding the generous contribution of the publisher who, thanks to the good auspices of the Editor-in-Chief John Gore, allowed a substantial number of pages free of charge.

As already said, it is for that reason that the Editorial Board of *Diffusion Fundamentals* decided to give to the authors of papers that could not be included in the Proceedings the possibility of the publication of their presentations in this Special Issue.

*Diffusion Fundamentals*, a peer-reviewed interdisciplinary open-access online journal, publishes generally original research articles in the field of diffusion and transport. It was launched about two years ago with the aim to facilitate a rapid information exchange of scientists working in this broad and interdisciplinary field and to create an open-access communication platform. During this time we have published four volumes. The contributed papers refer to any kind of matter (solids, fluids, gases, soft matter, interfaces, etc.) and describe an enormous variety of diffusing objects from atoms and molecules to bacterial colonies and animals. This issue contains 8 papers dealing with all aspects of diffusion from theory to experiments and applications related to the specific field of porous media.

It has been decided that the 9<sup>th</sup> Bologna MRPM Conference, which will cross the Atlantic Ocean for the first time, will be hosted July 13-17, 2008, by Schlumberger-Doll Research in Boston (USA), chaired jointly by Pabitra N. Sen and Martin H. Hürlimann. The 10<sup>th</sup> Bologna MRPM Conference is expected to be held in Leipzig (Germany) in 2010.

It is highly likely that this online issue will not remain an isolated event, but that also in the future the online Journal *Diffusion Fundamentals* will ensure space for contributions of the following Bologna MRPM Conferences, in a form that has to be decided in agreement with the Organizing and Steering Committees.

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## References

- [1] Borgia GC, Brown RJS, Fantazzini P, Gore J, Mansfield P, Maraviglia B, Mesini E, Sgubini L. *Editors, Proceedings of the First International Meeting on Recent Advances in NMR Applications to Porous Media*, Bologna 14-16 Nov. 1990. *Magn Res Imaging* 1991; 9(5): 639-888.
- [2] Borgia GC, Fantazzini P, Gore J, Smith RM, Strange JH. *Editors, Proceedings of the Second International Meeting on Recent Advances in MR Applications to Porous Media*, Canterbury 14-16 April 1993, *Magn Res Imaging* 1994;12(2): 161-378.
- [3] Borgia GC, Fantazzini P, Gore J, Halse MR, Strange JH. *Editors, Proceedings of the Third International Meeting on Recent Advances in MR Applications to Porous Media*, Louvain-la-Neuve, 3-6 Sept. 1995, *Magn Res Imaging* 1996; 14(7/8): 697-1006.
- [4] Borgia GC, Fantazzini P, Gore J, Strange JH. *Editors, Proceedings of the Fourth International Meeting on Recent Advances in MR Applications to Porous Media*, Trondheim, 31 Aug-3 Sept 1997. *Magn Res Imaging* 1998; 16(5/6): 449-714.
- [5] Borgia GC, Fantazzini P, Gore J, Strange JH. *Editors, Proceedings of the Fifth International Meeting on Recent Advances in MR Applications to Porous Media*, Bologna, 9-11 Oct 2000. *Magn Res Imaging* 2001; 19(3/4).
- [6] Borgia GC, Fantazzini P, Gore J, Holz M, Strange JH, Editors, *Proceedings of the Sixth International Meeting on Recent Advances in MR Applications to Porous Media*, Ulm, 2-12 Sept 2002. *Magn Res Imaging* 2003; 21: (3/4).
- [7] Fantazzini P, Gore J, J-P. Korb, Editors, *Proceedings of the Seventh International Conference on Recent Advances in MR Applications to Porous Media*, Palaiseau, 4-8 July 2004. *Magn Res Imaging* 2005; 23: (2).
- [8] Fantazzini P, Gore J, Editors, *Proceedings of the Eighth International Bologna Conference on MR in Porous Media*, Bologna, 10-14 September 2006. *Magn Res Imaging* 2007; 25: (4).