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Guest Editorial

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This special issue of *Journal of Phase Equilibria and Diffusion* (JPED) contains selected papers presented at the International Symposium on User Aspects of Phase Diagrams, Materials Solutions Conference and Exposition, sponsored by ASM and held in Columbus, OH, October 18 to 20, 2004.

Phase diagrams to materials scientists are equivalent to maps to travelers. They guide us through the composition space to find phases, fulfilling specific materials performance requirements. In view of the importance of phase diagrams, a series of Symposia on User Aspects of Phase Diagrams have been held previously in cooperation with the Alloy Phase Diagram International Commission (APDIC), and this is the fourth symposium following the last one held in Sendai in 2000.

This symposium focused on recent applications of phase diagrams in materials design and materials processing aimed at providing efficient routes in developing new materials and improving existing materials. The large number of presented papers emphasizes the considerable academic and industrial interest in the conference theme. Recent progress in computational thermodynamics was reviewed, and case studies for a wide range of materials were presented. From the four oral sessions and one poster session, participants found out how they can utilize phase diagrams and computational thermodynamics to both reduce cost and improve performance in their materials research and development. The organizers wish to thank the authors and delegates for their participation and cooperation, which made the conference successful.

This special issue contains the revised version of high-quality papers that were submitted to the conference. After the strict peer-review process, these were accepted for publication in the special issue. We would like to express our sincere appreciation to all the contributors. In particular, we give special thanks to two other organizers, Professor Z.-Kui Liu at Penn State University and Professor J.E. Morral at The Ohio State University, and to ASM International, in particular, to Dr. John F. Smith, Editor of JPED.

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