

Book Reviews

Solidification and Crystallization. Dieter M. Herlach, Ed. Wiley-VCH Verlag GmbH & Co. KGaA, Weinheim, Germany, 2004. ISBN 3-527-31011-8. List Price, \$230. 313 pages.

This volume consists of 32 papers selected from 96 abstracts submitted for a symposium on solidification at the 2003 EUROMAT Conference held in Lausanne, Switzerland. Each paper contains original results and was peer reviewed by two experts. The scientific level of the papers is uniformly high. There are occasional errors in English spelling and grammar but not serious enough to impair communication. The emphasis is on dendritic, eutectic, monotectic, and peritectic solidification, primarily of metal alloys. There are no papers on crystallization from a solution or vapor. Among the experimental methods utilized were casting, quenching, cooled drops that were levitated or freely falling, imposition of a rotating magnetic field to induce convection, microscopic observation of transparent analogues of metals, differential scanning calorimetry, surface tension measurements, transparent aerogel molds, influence of a magnetic field on nucleation, grain refinement by inoculation, ultrasound Doppler velocimetry, laser welding, arc melting, laser cladding using a powder jet, and crystallization of a thin amorphous film. Theoretical treatments included two- and three-dimensional phase-field modeling, transport phenomena (fluid

mechanics, heat transfer, mass transfer) calculations, a solid-on-solid model including elastic deformation caused by interaction of surface defects, Monte Carlo methods, free energy calculations to determine particle-size-dependent alloy phase diagrams, dendrite deformation caused by shear stress of the convecting melt, grain sedimentation, nucleation.

The front cover is a beautiful color illustration of simulated dendritic growth. However, several features of this book are annoying:

- (i) No employers or addresses were given for the authors. Some papers also failed to acknowledge funding sources, leaving the reader uncertain as to the nation where the work was performed.
- (ii) The author index contains only the authors of the papers in the volume and not the references cited.
- (iii) The subject index is less than one full page.
- (iv) The side margins are extraordinarily wide. It would have been easier to read with a slightly larger font and figures with narrower margins.

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