

Proceedings of the symposium on COMAMRI

FOREWORD

Computer modelling has many important applications in several areas of metallurgical research and industries, e.g. on-line control of metallurgical processes, design of components, plants and furnaces, prediction of materials behaviour under conditions which are difficult to be simulated by experiment, phase diagram calculations, simulation of radiation damage in materials, on-line data acquisition and data processing etc. Research in these areas has acquired impetus recently in our country by virtue of increased availability of computers and due to a need to modernize the industries by utilizing the potential of digital computers. However, there was no forum where the work done in this area could be presented and discussed. In view of this, a need was felt to organize a symposium to review the state-of-art of the developments made in the field of computer utilization in metallurgy and to provide an opportunity for a close interaction between the scientists and engineers working in this field. Therefore, the Materials Science Committee of the Board of Research in Nuclear Sciences, Department of Atomic Energy organized a two-day National Symposium on "Computer Modelling and Applications in Metallurgical Research and Industry (COMAMRI)" at BARC Bombay on 14–15 March 1985. The symposium was spread over five technical sessions dealing with computer modelling and applications in the areas of nuclear fuel element behaviour, phase diagrams and phase stability, iron and steel industry, design and performance, simulation studies, image analysis and data processing. About 200 delegates from India and abroad participated in the symposium. A panel discussion held at the close of the symposium identified several important areas for future work and made suggestions for better interaction between the scientific workers in this field. Some of the points noted during panel discussion emphasized the need for (a) development of application-oriented computer models for on-line control of chemical and metallurgical processes, (b) development of sensors for high temperature use for the measurement of parameters such as pressure, temperature, flow rate etc. (c) holding short term courses on computer modelling techniques, (d) setting up of a National Code Centre, and (e) assisting the industries in intelligent use of computers.

The National Organising Committee decided to publish the symposium proceedings as a special issue of the *Bulletin of Materials Science* with a view to provide a wide circulation of the technical information contained in the invited talks and contributed papers presented at the symposium. Out of a total of 25 technical presentations made at the symposium, 17 are included in this volume. These papers cover a wide range of applications of computer modelling in metallurgy and materials science. To our knowledge, this is the first published document in our country containing a collection of papers on this topic and we are confident that it will be very useful to the scientists and engineers working in this field.

We wish to express our thanks to Prof. R. Vijayaraghavan of TIFR and Shri D. N. Sah, the Convener of Symposium on COMAMRI, for their strenuous efforts in reviewing and editing of the papers contained in this volume.

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