

## EVENTS

**K. Z. Markov**

### **European Mechanics Colloquium No 278 "Microstructure and Effective Properties of Random Particulate Solids"**

The Euromech Colloquium 278 was held from 4 to 7 June 1991 in the town of Schumen, Bulgaria. It was organized by "K. Preslavski" University of Schumen, with the help and sponsoring of the National Committee for Theoretical and Applied Mechanics at the Bulgarian Academy of Sciences, Institute of Mechanics and Biomechanics at the same Academy, "St. Kl. Ohridski" University of Sofia, Union of scientists in Bulgaria, U. S. Office of Naval Research European Office, Firms "Tekom" and "Softex" (Sofia) and firm "Yunona" (Schumen). The joint Chairmen of the Colloquium were Prof. K. Markov from the University of Sofia, Bulgaria, and Prof. J. Willis from the University of Bath, U. K. The number of participants was 38 from nine countries: Bulgaria (18), Denmark (1), France (4), Germany (2), Italy (1), Holland (1), U. K. (1), USA (5), USSR (5). The total of 23 lectures, over a scheduled time of 12 1/2 hours, allowed enough time for discussions among individuals.

The participants could be classified (roughly) into three groups: mathematicians, physicists (including three or four experimentalists) and specialists in applied mechanics. Two of the participants were from industrial laboratories (Exxon and Shell). They had, however, strongly overlapping interests and no tendency to fragment developed.

One of the principal concerns of the Colloquium was the elucidation of macroscopic material behaviour in terms of microstructure. The four main lectures reflected this. S. Torquato (USA) reviewed a range of physical phenomena and also described progress in the theoretical generation of microstructural parameters, from the standpoint of statistical mechanics. B. Felderhof (Germany) developed in detail the incorporation of those parameters in macroscopic constitutive models. S. Kanaun and V. Levin (USSR) addressed similar problems, but employing their own distinctive methods, and also indicated an approach to dynamical problems. G. Milton (USA) discussed the range of constitutive behaviour that was attainable from actual microstructures, this topic being of importance in optimal design.

The shorter lectures developed these themes and introduced others. Examples included a novel observation — and theoretical explanation — of two waves, one fast and one slow, in a suspension (P. Sheng, USA), a new method for bounding the behaviour of nonlinear composites (J. Willis, U. K.) and a combined theoretical and experimental study of the development and coalescence of brittle microcracks, explained

in terms of fractals (V. Silbershmidt, USSR). These and other lectures generated lively interest from the "opposite" group — in the case of the fractal approach to fracture, this coming from the most "theoretical" participants associated with the activity centered at the Courant Institute (New York, USA).

The end result of the meeting was a more complete appreciation of approaches not easily accessible — partly because of the East-West divide. Other valuable interactions occurred, which would continue: one of which we had detailed knowledge about was that P. Iske (Shell, Holland) had implemented a scheme of J. Willis (U.K.) for the description of waves in a composite and had made comparisons with experiment. A further discussion, with exchange of data and theoretical ideas, had already been arranged. Further contact, at least by post, was certain between many of the participants from East and West, previously known to each other only through subsets of their work.

We conclude that the meeting fulfilled the objectives of the European Mechanics Colloquia.