

provided an opportunity for a large number of Indian students and scientists to attend the meeting, and listen to top scientists in the subject. There were about 600 participants from all parts of the world. The conference Chair, T. V. Ramakrishnan noted that the Indian participation, at 245 registered participants, was about two orders of magnitude larger than typical Indian participation in such meetings, if held abroad.

The invited lectures were chosen by a large international panel of experts, who try to identify the most important advances made in the subject in the recent past. As such, looking through the subjects of the invited talks gives one a good idea about the focus of research at present. This is, of course, important for a starting graduate student, trying to decide which area he should start working in, but also for those who do not want to fall into the rut of more of the same.

The scope of statistical physics is quite vast. The conference organizers identified twelve main subareas of research. They are: rigorous results and exact solutions, phase transitions and critical phenomena, non-equilibrium processes, pattern formation in non-equilibrium systems, dynamical systems and turbulence, liquid matter, soft condensed matter, quantum mechanical systems, disordered systems, biologically motivated physics, and other applications of statistical physics, ranging from modelling of traffic jams to stock markets.

The volume contains text of the lectures by E. G. D. Cohen and H. E. Stanley, delivered during the presentation of the Boltzmann medal to them. Cohen was honoured for fundamental contributions to non-equilibrium statistical physics. In his award lecture, Cohen traced the history of questions about the dynamical basis for a statistical theory to the differences between Einstein and Boltzmann on the subject. Einstein wanted the basic principles of statistical mechanics, like the famous Boltzmann's relation  $S = k_B \log \Omega$  not to be postulated, but derived from the equations of motion. Cohen suggested that some generalizations of the conventional statistical theory like the Tsallis statistics or super statistics may be useful in describing some non-equilibrium situations such as turbulent fluids.

In his address, Stanley selected three examples of correlated randomness from his work, from physics, economics and medicine. He discussed the different supercooled and metastable phases of water,

probability of large price changes in the stock market, and protein aggregation that is the cause of diseases like the Alzheimer's. In each case, he posed for himself the questions: What is the phenomenon? Why do we care? What do we do? An excellent model of clear presentation for any young (and old) scientist.

It is difficult, and perhaps not useful, to try to summarize all the other lectures in the volume. Just to pick some examples, there are excellent reviews by C. Dasgupta on theoretical approaches to the glass transition, and B. Derrida on large deviations in non-equilibrium systems. T. C. Lubensky discusses the slow dynamics in different soft condensed phases such as gels and liquid crystals, A. J. Guttmann has an interesting viewpoint about what makes some models exactly soluble. F. Ritort discusses the thermodynamics of experiments on the elastic response of a single DNA molecule.

The volume is good for a bird's-eye overview of the subject. A CD, free with the book, gives the list of abstracts of contributed talks. The only shortcoming in the volume is the fact that a significant fraction of the invited speakers have not provided written versions of their talks.

I should mention that the proceedings have appeared as a special issue of *Pramana* and are available free on the internet. But this is a volume that one would like to browse at one's own pace, comfortably curled up in bed. I am reminded of the definition of a good bedside book, as one that should be continually interesting, undramatic, not too exciting, and one that can be started anywhere, and dropped anywhere. Though it is unusual to characterize conference proceedings this way, it is certainly one such book, at least for the aficionados of statistical physics.

DEEPAK DHAR

*Tata Institute of Fundamental Research,  
Mumbai 400 005, India  
e-mail: ddhar@theory.tifr.res.in*

**Elementary Exercises in Geology.** C. V. R. K. Prasad. Universities Press (India) Pvt Ltd, 3-5-819, Hyderguda, Hyderabad 500 029. 2005. 198 pp. Price: Rs 240.

As most topics of geology are not taught at the school-level, the subject appears strange when students take it up at the undergraduate level. With this fact in

mind, C. V. R. K. Prasad has brought out this for providing a basic training in the principles of geology.

The book is divided into two parts: (i) Problems, consisting of exercises and (ii) Solutions to the exercises given in the first part. Chapters 1 and 2 of the former part deal with geography; 'Measuring the earth' and 'the Universe and solar system'. Some aspects of calculating distances, areas, orbital velocities and acceleration due to gravity of the earth are described in Chapter 1; posing related problems in the earlier (problems) part and providing solutions to corresponding problems in the later (solutions) part. Problems and solutions related to the Universe and Solar System are discussed in Chapter 2. 'Structure of the earth' is dealt with in Chapter 3. It includes the internal structure of the Earth calculated from seismic wave velocities, composition of the Earth and isostasy-erosion-sea level. Problems related to 'geochronology' are explained in Chapter 4, such as calculating the age of rocks and minerals from Pb/U,  $^{87}\text{Rb}/^{86}\text{Sr}$  and  $^{87}\text{Sr}/^{86}\text{Sr}$  ratios. 'Stratigraphy' problems related to geological timescale are taken up in Chapter 5. The vast branch 'petrology' is handled briefly in Chapter 6. 'Plate tectonics' concerned problems are given in Chapter 7, that deal with evidence of continental drift, plate boundaries and rate of drift. 'Economic geology' constitutes the final Chapter 8. The book also includes a 'Glossary' section.

The attempt of the author in composing elementary exercises in a meagrely discussed subject of geology has to be appreciated. Although the author expresses in the 'Preface' that '... more fundamental topics of mineralogy, palaeontology, structural geology, etc. are not included as they are expected to be covered in classroom teaching...', their omission is conspicuous. Upcoming branches of oceanography, Quaternary geology and environmental geology have also not been taken into consideration by the author. The vast branches of petrology and economic geology deserve wide coverage. Nonetheless, a fresh entrant to undergraduate college may find it useful in understanding the subject of geology by solving the problems given in the book.

R. V. KARANTH

*Department of Geology,  
Faculty of Science,  
M. S. University of Baroda,  
Vadodara 390 002, India  
e-mail: r\_v\_karant@yahoo.co.in*