Statphys – Calcutta III. Proceedings of the International Conference on Statistical Physics. S. S. Manna and B. K. Chakrabarti (eds). Elsevier North Holland, (Reprinted from *Physica A*, **270**, Nos. 1–2). 1999. 334 pp. Price not stated.

An edited volume comprising papers presented (and in some cases, not quite in the form presented!) at a conference is necessarily to be 'reviewed' somewhat differently from standard books. *Statphys – Calcutta III* is the hardcover version of the journal *Physica A*, (**270**, Nos. 1 and 2), so that all the articles contained in it have already gone through the process of peer review, and are, otherwise, standard papers. Ergo, the book is an excellent document of the state-of-the-art in January 1999, when Statphys Calcutta III – the conference – was held.

Within the country, Calcutta appears to have an unusual affinity for Statphys conferences. Indeed, all three conferences with this title have been held in the city, the latter two at the S. N. Bose (another connection with statistical physics!) Centre. All three have attracted a wide participation from within the country as well as a fair sprinkling of practitioners of the science from outside. The proceedings of the previous two conferences were also published in *Physica A*, as it happens, so from the point of view of continuity alone if nothing else, this volume is well worth having.

There is, however, much else to commend the book. For one thing, this volume also celebrates the career of Chanchal Kumar Majumdar, erstwhile director of the S. N. Bose National Centre for Basic Sciences. Majumdar's contributions to science and to science in India are described in a moving tribute, containing a brief biographical sketch and summary of his research contributions, written by Indrani Bose in a preface to the volume. Majumdar has (in the words of Walter Kohn) 'given so much for physics in India at great personal cost'. His very untimely demise in June this year further emphasizes the magnitude of this cost.

The conference itself was a lively meeting of about 100 participants, with about 40 talks and the same number of posters. Roughly half these contributions have made it to the conference proceedings, which appeared in journal form in 1999 itself (this is most certainly a tribute to the efficiency of the Convenors of the conference, the Editors of this special volume, S. S. Manna and B. K. Chakrabarti). The special themes of the conference were the currently hot topics of 'Fracture, Breakdown and Earthquakes', though a fair number of other topics also came in for extensive covering. These include SOC (self-organized criticality), granular materials, interfaces, and hydrodynamic flow, as well as BIP (biologically inspired physics).

The volume reflects this diversity. The articles by Benguigui, Chakrabarti, Roux, Vilotte, Stanley and their various coworkers, are on different aspects of fracture and breakdown. SOC is represented in articles by Dhar, Tadic and Bose, while granular materials are the focus of the papers of Manna, Hermann, Kumar and Puri. The article by Bose is on a model of evolution and can be classified as 'BIP', though this is really in a different category from biomembranes or DNA dynamics. Other articles in this field are by Hansen, Stanley, Sastry and Pradhan. There has been a lot of work in the past few years on turbulence, chaos and nonlinear phenomena, and contributions from Bhattacharjee, Pandit, Ananthakrishna and Sinha are representative of the work being done here. Similarly, interface growth and the study of disorder and ordering are represented here by the papers of Dasgupta, Mookerjee, Banerjee, Barma, Das, Rao and Bhattacharya. Finally, the properties of natural materials also figure, in studies of clay by Fossum, and sandstones by Biswal. (The cited names are those of the authors who presented the work at the meeting; several of the papers have additional co-authors.)

The articles are, by and large, discursive, and provide enough of an introduction to the different areas covered in the conference, though it should be mentioned that some of the articles do have the 'conference' feel: they are summaries of papers that appear elsewhere. That does not necessarily diminish the utility of such a volume, since as an entry to the literature, this provides an excellent source of references and pointers to current work.

RAMAKRISHNA RAMASWAMY

School of Physical Sciences,
Jawaharlal Nehru University,
New Delhi 110 067, India
e-mail: rama@jnuniv.ernet.in

Perplexing Problems in Probability – Festschrift in Honor of Harry Kesten. Maury Bramson and Rick Durrett (eds). Birkhauser Verlag AG. 1999. 408 pp. Price: SFr 138/DM 158.

The book under review is a collection of articles in honour of Harry Kesten. Although a substantial portion of the 20 articles here is on percolation, which has been Kesten's interest since the beginning of the 80s, the collection of articles here is as varied as has been Harry Kesten's academic output in the last four decades. It is impossible for an individual to attempt a just review of a book like this with specialized research articles on a variety of topics on probability; as such, a short abstract of the articles is presented here.

The paper by Gordon Slade is a survey of recent results which show that, in high dimensions, integrated super-Brownian excursion arises as the scaling limit of both lattice trees and incipient infinite percolation cluster. The paper by Roberto Schonmann considers the site percolation model on the transitive, non-amenable graph $T_b \times Z$, where T_b is a homogeneous tree of degree $b + 1$. It is shown that for this model, parametrized by p, for b large, at $p = p_u = \inf\{p$: there is a unique infinite cluster a.s.$\}$ there are a.s. infinitely many infinite clusters.

Olle Häggström, Yuval Peres, and Roberto Schonmann consider i.i.d. bond percolation on quasi-transitive graphs. For this it is known that there are two critical parameters, p_c and p_u, such that for $p > p_c$ there exists an infinite open cluster w.p.1, and for $p_c < p < p_u$ the number of infinite clusters is infinite w.p.1. In this paper, it is shown that under canonical coupling simultaneous versions of these results hold. In addition, for $p_c < p < p_u$, each infinite cluster has uncountably many ends. Moreover, if the graph is also unimodular, then for all $p_c < p_1 < p_2 < p_u$, every infinite cluster at level p_2 has infinitely many infinite clusters at level p_1 w.p.1.

Geoffrey Grimmett discusses some well-known and lesser-known inequalities in percolation and random-cluster models. Applications of these inequalities are given in the study of entanglements and to obtain strict inequality between the bond and site critical parameter as well as strict inequalities for