The Best of Annals of Improbable Research. Marc Abrahams (ed.). WH Freeman. 1998. p. 208. Price: $14.95. ISBN 0-7167-3094-4.

The public image of scientists is that they are stiff, dull, boring and suffer from tunnel vision – that of single-minded pursuit of their goals in their often-esoteric fields. While it is true that there do exist eccentric scientists who are oblivious to wordly things, this is not always the case. Here then is a book that will explode the myth about the serious scientist. Note however, that I use the word *serious* but not eccentric – readers of this book are going to be convinced now and forever about the eccentricities of scientists.

But first, some history. In 1995, Alexander Kohn and Harry Lipkin started a magazine called *Journal of Irreproducible Results*. This journal met with increasing success for many years before a decline in sales and an eventual close down in 1994. Marc Abrahams who was its editor from 1990 to 1994 then began *Annals of Improbable Research* (*AIR*) as its sucessor. The aim of the journal ['The journal of record for inflated research and personalities'] is to prove that research can be fun as well as scientific – or at least the former! In keeping with this belief, Abrahams initiated the *Ig* Nobel prizes [the *Igs*] for research that cannot and should not be reproduced. Every year, the journal doles out prizes to outlandish research and statements made by individuals. For instance, Dan Quayle was awarded the *Ig* in 1991 for showing, better than anyone else, the need for science education while three executives of three leading tobacco companies received their awards for their sworn statement that tobacco was not addictive! Authors of papers published in the biomedical research journals on 'transmission of gonorrhoea through an inflatable doll' and 'the effect of ale, garlic and sour cream on the appetite of leeches' are also among the lucky impious few.

Remarkably, real Nobel prize winners hand over the prizes thus proving that genius and a sense of humour can go hand in hand.

This book is a selection of the best of the whackiest. Clearly, some scientists do not take themselves too seriously and know to have a good laugh. Of the numerous laughs that I had, none perhaps were louder than those for 'The effect of peanut butter on the rotation of the earth', 'How to write a scientific paper', and 'How dead is a doornail?' Those likely to only browse through the book must also make it a point to read 'The aerodynamics of potato chips', 'Apples and oranges – a comparison', 'The mickey mouse gene', 'A guide to politically correct cardiology' and 'Mathematics' – An anagrammatic if pointless tale'. Specifically, also do look up chapters entitled 'May we recommend' in which the reader is referred to wierd articles [or at least titles which sound ridiculous to those not in the same field] from the real world of science literature. Even the index raises a few laughs as one finds references to 'wow, variant spellings of, page 458' and 'Curie, Marie, theaterical career of, page 379' – in a 208 page book! Marilyn vos Savant [who has the highest IQ in the world] as well as several Nobel prize laureates including Walter Gilbert, John Kendrew, Richard Roberts are on the editorial board of the magazine. However, as is to be expected, not all agree. At least Carl Sagan was known to have refused to join the group because he felt such activities were dangerous, while Robert May, the chief scientific advisor to the British government, was vehemently against such frolic in science.

It is pleasing to see that Indians do have a sense of humour judging by their presence in the book – either in the form of people who have actually written such papers (e.g. Rana and Sharma, *Br. J. Urol.*, 1994, **73**, 722) or those readers (probably Indians settled abroad) who have noticed such papers and pointed them out to the editors at *AIR*.

This book complements two other books which are loosely speaking, in the same genre, i.e. humour in science. The first is Richard Feynman's *Surely You're Joking Mr Feynman* which exhibits an eccentric genius at his best. The other is *A Bedside Nature* published by *Nature* in 1997 which contains some of the best essays from *Nature* for the period 1869 to 1953 – with some wonderful examples of British humour. To my knowledge, *AIR* is not available in India. This is a great pity. However, those interested will be able to access material on the world wide web at www.improb.com or www.improbable.com.

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Harmonic Analysis and Hypergroups. K. A. Ross *et al.* (eds). Birkhäuser Verlag AG, P.O. Box 133, CH-4010, Basel, Switzerland. 1998. pp. 249. Price: SFr 178.

This book is a collection of articles based on lectures given at an international conference on 'Harmonic Analysis' held at Delhi in the winter of 1995.

Most of the articles, though not all, centre around the theme of harmonic analysis on hypergroups. While the term 'harmonic analysis' needs no explanation, the expression 'hypergroup' may not be familar to many people. Rather than launch into a technical definition of a hypergroup, we will be content to say here that the double coset space of a non-compact connected semi-simple Lie group modulo its maximal compact subgroup K, i.e. $K\backslash G/K$ is perhaps one of the most important examples of such an object. The harmonic analysis on this class of hypergroups is really the harmonic analysis of spherical functions on semi-simple Lie groups. This again is a small but important part of the formidable area of harmonic analysis of functions on a semi-simple Lie group, a field which was dominated by the towering figure of Harish-Chandra during the period 1950–1980. (ref. 1). Given the importance of just this single class of hypergroups, it is therefore perfectly legitimate to study hypergroups in general. The theory of hypergroups was systematically developed by Charles Dunkl, Robert Jewett and René Spector in the 70's. It turns out that hypergroups arise in a surprisingly large number of completely different situations.

The articles by K. A. Ross and A. L. Schwartz give a comprehensive survey of the theory of hypergroups.

Schwartz's article ends with a list of open problems. V. S. Sunder and N. J. Wildberger give a good introduction to the theory of actions of finite hypergroups. (Readers interested in exploring the connections between hypergroups and von Neumann algebras should consult ref. 2.) In 'Wavelets on Hypergroups', K. Trimeche defines wavelets on hypergroups and proceeds to give an account of the theory of continuous wavelet transforms on hypergroups. (In the context of the real line, wavelet-theory happens to be one of the 'hot' areas of modern Fourier analysis.)

Notable among the articles not directly connected with the theme of hyper-groups are 'Disintegration of Measures' by H. Helson and 'Multipliers of de Branges – Rovnyak spaces II' by B. A. Lotto and D. Sarason.

There are fifteen articles in all, but for the sake of brevity we have restricted ourselves to mentioning just a small sample. This by no means implies that the other articles are not interesting! To conclude, this collection of articles will be very useful to researchers in harmonic analysis as well as advanced Ph D students, and Ross *et al.* should be thanked for compiling this collection.

1. Gangolli, R. and Varadarajan, V. S., *Harmonic Analysis of Spherical Functions on Real Reductive Groups*, Springer-Verlag, 1988.
2. Sunder, V. S., *Contemp. Math.*, 1995, **183**, 331–340.

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The Physics of Fluids and Plasmas. Arnab Rai Choudhuri. Cambridge University Press, The Edinburgh Building, Cambridge CB2 2RU, UK. 1998. pp. 427. Price: $29.95. Indian edition, Price: Rs 350.

The book under review provides a pedagogical introduction to the core disciplines of fluid and plasma physics to graduate students of astrophysics. The author has set himself the challenging task of developing the material from first principles. I enjoyed reading this book, and found the author's viewpoints fresh and interesting. He manages to entertain the reader and succeeds in conveying the essentials of the subject simultaneously. It is a rare textbook that is as well written and presented as this. In the minds of most physics students, and unfortunately too many physics teachers, 'modern physics' and 'classical physics' are regarded as polar opposites, with the latter having an air of past grandeur, now sadly decrepit. Nothing can be farther from the truth! As is made amply clear in this book, a very large part of the Universe is governed mostly by classical (including Einstein's theory) gravity, gas dynamics, statistical mechanics, plasma physics and electromagnetism. Contrary to popular misconceptions, there are many outstanding problems yet to be solved in this supposedly 'worked out' area of knowledge. One could say with justification that the outstanding unsolved problem of classical physics, namely the construction of a truly predictive theory of fluid/plasma turbulence, is as challenging as any that occurs in quantum theory or particle physics. Solving that problem would broaden the frontiers of knowledge in fields as disparate as aerodynamics and astrophysics and bring untold benefits to mankind in the bargain. It is often the case that physics students miss out virtually completely on a proper background in fluid and plasma physics, because these subjects are mistakenly thought to be branches of applied mathematics or engineering. Astrophysics provides the natural forum for a true appreciation of the physics content of gas dynamics, and it is gratifying to find at last a textbook in which the close relationship between these areas is justly emphasized. As a fusion plasma theorist with a fluids background, I have sometimes been surprised by the relative lack of appreciation by plasma physicists of potent and useful analogies between plasma dynamics and fluid mechanics. In the present book, the organic relation between the two subjects, so vital for a true understanding of astrophysical and laboratory phenomena, is clearly and explicitly discussed. The book falls naturally into two parts, the theory of neutral fluids and that of plasmas. After a brief but thoughtful general introduction, the author presents the theory of neutral fluids in Part I. A 'top-down approach is adopted, deriving gas dynamics in the usual Chapman–Enskog way from kinetic theory: Although I liked the treatment in general, references to the literature seemed to miss out some classics: for instance, Harold Grad's wonderful article in the *Handbuch der Physik* and Sommerfeld's treatment in his lectures on statistical mechanics (required reading for every student of transport theory) are not mentioned. In the next few chapters, the author manages to discuss an astonishing range of topics, often pausing to offer interesting astrophysical applications on such topics as the solar corona, accretion disks, supernova explosions and galactic dynamics. The choice of problems for the student is also generally excellent. Fluid mechanics is a deep and mature subject with many ramifications, and endowed with many excellent texts. The author's course should equip aspiring students with the tools and fundamental understanding necessary to move on to more advanced treatments. Inevitably, given the constraints, there are regrettable omissions: shock waves could have been illustrated by the exactly soluble Burgers' equation; the Kutta condition, separation and stall are not mentioned in the theory of lift; there is no mention of the Rayleigh–Orr–Sommerfeld–Heisenberg–Lin theory of flow shear instabilities. The latter is surely an important topic to which every student should at least have a basic introduction? The same comment would seem to apply to the complete absence of any discussion of G. I. Taylor's work on flows between rotating cylinders, a truly beautiful paradigm for transition from laminar to turbulent flow. In particular, the chapter on Turbulence seems dated. I am somewhat surprised that the author does not discuss perturbation methods, at least in outline, with some well-chosen examples. A more disappointing omission is the lack of presentation, however brief, of the only really *general* (the emphasis is Feynman's) method of solving problems in the physical sciences, viz. the numerical method. It is vital that students should have the confidence to tackle 'analytically impossible' problems