

## Editorial

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*Rajaram Nityananda, Guest Editor*

The ‘Pancharatnam phase’ is now a standard concept in optics, entering advanced textbooks and laboratory experiments. It is the theme of an article in this issue – by yours truly – on the interference of polarised light, which, along with the biographical sketches, brings out the inside story, both scientific and human, of how this happened. The following question was once raised: if C V Raman had not shortened his name, would the whole world be speaking of Venkataraman scattering, Venkataraman microscopy, Venkataraman spectrum, etc? The question has now been answered – the optics community is indeed learning to pronounce the full name of Raman’s brilliant student! It is true that the full recognition of Pancharatnam’s contribution came nearly two decades after his untimely death. This time we cannot blame the rest of the world, since many Indians, including the author of this editorial, held this pearl in their hands. Though we did not throw it away, it was set aside without appreciating its value, until independent work by Michael Berry in quantum mechanics triggered a revival of interest. It is worth stressing that this was not an isolated contribution, and the biographical sketches bring out Pancharatnam’s other achievements and promise.

A contemporary achievement of high value from this country is celebrated in Dileep Jatkar’s article. This is from the area of theoretical physics known as string theory, which was launched in 1984 and has since attracted the brightest minds on every continent – one of whom, Ashoke Sen, is on our own subcontinent, indeed, in Allahabad, which defines our time zone! Jatkar’s task was unusually difficult, given the advanced and highly mathematical nature of the subject. One is reminded of a remark by the mathematician Paul Halmos in the preface to one of his texts – “The reader should not be disappointed if he does not



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have the prerequisites to understand the prerequisites”. But how could one not make the effort to convey an outstanding contribution which has justly been acclaimed by peers at the highest level (and attracted the Milner Prize which makes the Nobel seem like small change)? In any case, this is only one example of wealthy businessmen supporting activities in fundamental physics. Consider the Kavli chain of institutes, named for their benefactor, and also the Perimeter Institute in Canada, f(ounded by Lazarides, who is better known for the Blackberry line of mobile phones.

Fundamental physics needs all the help it can get, because this is the age of biology. The richness of phenomena, of processes, of techniques, of open problems, of concepts enthroned and then dethroned, and of applications which touch us all, fully justify the investment and the wealth of talent that the life sciences – in their broadest sense – attract worldwide. Keep this in mind when you read Jasmine Shah’s account of the remarkable chain of events connecting the kind of swelling in a tree trunk that all of us might have seen, to the contemporary frontiers of biology.

If there is one area which is giving biology a run for its money, it has to be computers! Today, ‘computers’ span the range from the ridiculous (young readers, pardon my labelling the more bizarre manifestations of social networking this way!) to the sublime – the laws of thought itself. Abhijit Vichare’s article on the ‘ $\lambda$  calculus’, a way of formalising algorithms and logic, is clearly at the deep end of this pool – refer to the issue devoted to Alan Turing for more on these lines. What I find remarkable is that such meditations on foundations have spin-offs in actual programming. Even an outsider like me has heard of a language called LISP (which is not for babies – it was once labelled ‘Lots of Irritating Silly Parentheses’ by lesser mortals unable to appreciate its logical beauty). The piece by Yegnanarayanan is in the typical *Resonance* mould, adding value to standard classroom topics (matrix multiplication and probability) by bringing out their connections and a real world application – the weather in this case. Overall, this issue has much to reward those readers who persevere – young or otherwise.

