

Foreword

This book about pulsars, by Academician Kadomtsev, may be surprising to people in the future because of the insights it provides into the field. He has combined an excellent introduction to pulsar physics with reflections on important informational and biological issues, all the while fusing this into a personal approach to educating the reader.

At first, the book appears to be a ‘pop’ book on physics but only for a few moments. The book contains two main strands: the first concerning the physics and the second dealing with a narrative about two boys that an old professor takes for a journey into the unknown. The story evolves in using the dialogues of Professor Leonid Andreevich with two teenagers who have a budding interest in science, Sasha and Misha. At times the story sounds like a piece of fiction, it has recollections from childhood, philosophical deviations and personal comments. Some of these tales are an interesting reflection on the period in which Kadomstev was writing the book at the end of last century, when Russia was going through an historic transition from socialism to capitalism.

Pulsars are the product of neutron stars, so this topic explains in close detail the behaviour of matter at extremely high density, when all nucleons are close together, thus creating a strong magnetic field. Professor Kadomtsev likes to start his explanations with simple things understandable by everybody, such as bouncing balls.

He then continues explaining the strange world of super strong magnetic fields, where mass is anisotropic and hydrogen atoms could form polymer chains.

Parts of the book are science fiction but they were deliberately designed so as to better illustrate the point in reference. In the beginning the reader will be able to tell the difference between that which is real and that which is fantasy but in the last two chapters the lines will not be so evident. There, the book takes an unusual turn and takes the reader to the wonders of self-organization and living organisms, topics which seem to be completely unrelated to the pulsar. The meaning of it becomes clear in the last section. Could the pulsar be sentient? To find out, the professor takes the boys to the pulsar itself and they find some evidence of self-organization, only to wake up to find it was a dream!

The level of the book is ambiguous. The author is driven by common sense and tries his best to make it an easy read. Kadomtsev believes that much of the book should be comprehensible to high school students. But, as a book written in Russia where the physics programme in schools and universities was, at the time, more advanced, the book therefore deals with topics which will not be familiar to a high school student in the US or Europe. The author tries to stretch the reader, to involve them in the process. His examples are highly original and revealing. The switches between simple and complicated topics occur very naturally during the dialogues; “what is the colour of an electron?” one of the students ask, “it is white”, the professor replies. This would never occur to me!

Appendices explain the more complex subjects and have an excellent collection of problems with solutions.

This book has an unforgettable spirit which may seem old-fashioned to some or too ‘soviet’ to others. We can see Kadomtsev building a temple of science in front of us, while he explores different halls and chambers, some of them well illuminated and other slightly murkier. The voices of people like Landau and Sakharov still resound in this temple. The book clearly reflects the scientific and

educational establishment of the Soviet Union during its last decades. This is what it was, and it is a system that had shortcomings, but at the same time produced scores of the brightest minds.

So go on, reader, explore and enjoy this book on the pulsar.

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