

# Communicating the science of the 11-year sunspot cycle to the general public

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Astrophysics is one branch of science which excites the imagination of the general public. Pioneer science popularizers like George Gamow and Fred Hoyle wrote on different aspects of astrophysics. However, of late, we see a trend which I find disturbing. While it has become extremely fashionable to write popular science books on cosmology, other areas of astrophysics are grossly neglected.

The 11-year sunspot cycle, which is essentially the magnetic cycle of the Sun, is one of the most intriguing cyclic phenomena known to us. Magnetic fields of large sunspots can cause such explosive phenomena like solar flares and coronal mass ejections, which are capable of affecting our lives—by disrupting radio communications, by making polar airline routes and space flights dangerous, by even producing power blackouts in extreme situations. While talking to my non-physicist friends, I find that many of them are quite curious about the sunspot cycle and would be interested in reading a popular science book explaining the science behind this cycle. To the best of my knowledge, no such book exists in the English language. Recently I have signed a contract with Oxford University Press for writing such a book.

I had the good fortune of doing my PhD thesis under the supervision of Professor E. N. Parker, the most influential solar physicist of our time, and have personally known many of the major players in this field. I have also been involved in the development of the flux transport dynamo model (Choudhuri, Schüssler & Dikpati 1995; Nandy & Choudhuri 2002), the currently most promising model of the sunspot cycle. This model was used by us to predict the strength of the cycle 24 (Choudhuri, Chatterjee & Jiang 2007). Our prediction now appears to be coming true. A recent survey of our field has been given by Choudhuri (2011).

After an introduction to the phenomenology of the sunspot cycle, my book will explain the basic ideas of standard solar model and magnetohydrodynamics. Then the central part of the book will be devoted to the core topics of sunspot formation by magnetic buoyancy and dynamo generation of the solar magnetic field, giving an introduction to the flux transport dynamo. The Sun-Earth connection will be discussed at the end. Throughout the book, there will be accounts of the historical development of this field, sometimes giving my personal reminiscences.

## References

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