



# Physical Research Laboratory, Ahmedabad

## COLLOQUIUM - 13 – 27

**Speaker:** Prof. S. Ananthkrishnan  
Dept. of Electronic Science, University of Pune, Pune.

**Title:** Declining solar magnetic fields: Are we heading towards a Maunder minimum?

### Abstract

One of the primary indicators of Solar activity is the Sunspot number and the associated 11 year solar cycle. This activity is controlled by the solar magnetic field. There are clear indications based on a variety of studies that the magnetic field on the Sun has been steadily decreasing in the past ~ 20 years resulting in lower activity on the Sun. The Sunspot formation has decreased by ~ 30% since the early 90's. It has been speculated that if this continues, there will be no sunspots by the latter part of this decade, leading to a Maunder-like minimum in the next cycle. Using Interplanetary scintillation data from radio telescopes, surface photospheric fields measured by National Solar Observatory and He abundances measured by ACE, SDO spacecraft, my collaborators from PRL, Ahmedabad & Harvard Smithsonian Observatory and I have been studying this monotonic decrease.

Interplanetary Scintillation observations between 1983 and 2009 clearly show a steady drop in the turbulence levels in the entire inner heliosphere starting from around 1995. Our recent analysis of the solar magnetic fields have shown that a steady decline of the fields have taken place since around 1996 and meridional flows also appear to have changed. Similarly, Helium abundance dropped dramatically during 2008-2010. All these lead us to state that the build-up to the deepest solar minimum in 100 years actually began more than a decade earlier. We will examine the evidence in detail in this talk.

### The Speaker

Prof. Subramaniam Ananthkrishnan had his collegiate education in Calcutta University from where he obtained BSc (Hons) (1963), B.Tech (1965) and M.Tech (1966) degrees. He obtained his PhD (1976) from Bombay University, worked as a Post-doctoral Research Associate at the University of California, Sandiego (1977-79). He was a Visiting Scientist at MPIFR (Bonn), NRL (USA), Nagoya University (Japan), ATNF (Australia) and Hartebeesthoek Observatory (South Africa) besides being an NRC Senior Research Associate, (1991-92) at the Space Environmental Lab, Boulder. He joined the Radio Astronomy Group of the Tata Institute of Fundamental Research (TIFR) in 1966 as a research scholar and remained there till retirement (2007) as a Senior Professor at the National Centre for Radio Astrophysics, TIFR, Pune. Currently, he is an Adjunct Professor and Raja Ramanna Fellow at the Electronic Science Department of Pune University. Prof. Ananthkrishnan was deeply involved in setting up the large Ooty Radio Telescope (1966-73) and its operation till 1988. He made the first radio scintillation observations of a cometary plasma tail during the apparition of comet Kohoutek using the Ooty telescope. Prof. Ananthkrishnan has published about 85 papers in national and international journals. He is a Founder Member of the Astronomical Society of India and was its Vice President (2002-05). He is also a Member of the International Astronomical Union, and Chairman (elect) of the Radio Astronomy Commission J of URSI (2008-11). He is a Member of the INSA Council (2008). Prof. Ananthkrishnan received the Sir C. V. Raman Gold Medal of the Jagadish Bose National Science Talent Search Institution, Kolkata and a recipient of Raja Ramanna Fellowship of DAE-BRNS (2007-10). He is a Fellow of Indian Academy of Sciences, Bangalore and National Academy of Sciences (India), Allahabad.

**Wednesday: 23 October, 2013, 16:00 hrs**

**K.R. Ramanathan Auditorium, PRL**

**Tea at 15:30 hrs**

**ALL ARE WELCOME**