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国台学术报告 NAOC COLLOQUIUM

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Time: Wednesday 2:30 PM, June 19th Location: A601, NAOC

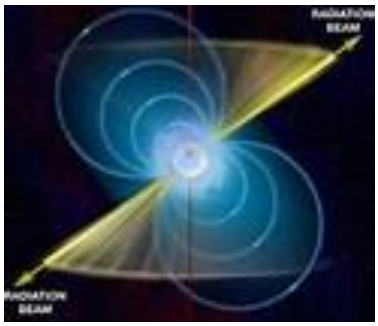
Mechanism of Pulsar Radio Emission

Prof. R. T. Gangadhara

Indian Institute of Astrophysics

After obtaining Master of Science in Theoretical Physics from the University of Mysore, Prof. R T Gangadhara moved to Indian Institute of Science in 1997 to do a PhD in Astronomy and Astrophysics, more precisely on the "Nonlinear propagation of intense electromagnetic waves in quasar and pulsar plasmas". Later, he was awarded with Alexander von Humboldt Fellowship for conducting research at Max-Planck Institut fu¨r Radioastronomy, Bonn during 1995 – 97 to work with the director Prof. Richard Wielebinski on Radio Pulsars in particular on the radio emission theory. After working for an year or so with Giant Metrewave Radio Telescope (GMRT), he moved to Indian Institute of Astrophysics in 1998. Since then he has been conducting research on the radio pulsars theory and observations, and guiding for PhDs. Recently in 2019, Prof. Gangadhara has been awarded with the prestigious CAS Presidents International Fellowship Initiative (PIFI) for his research achievements. Since June 1, 2019 he is visiting NAOC for about 9 months and conducting research in the group on Compact Objects and Diffuse Medium at NAOC headed by Prof. JinLin Han.

Abstract



Pulsars provide a clear case of coherent radio emission among celestial bodies. But the mechanism of coherent emission is still an outstanding problem. The observation of very high brightness temperature 10^{25} – 10^{33} K of radio pulsars imply that the emission is coherent. In a pulsar magnetosphere the relativistic plasma accelerated along the dipolar magnetic field is believed to produce the radio waves. The problem of pulsar radio emission has been addressed in terms of both incoherent and coherent emission models. Though the incoherent radio emission models have been well developed, they have been only partially successful in explaining some of the pulsar profile characteristics such as pulse shapes and polarization. However the pulsar radio emission is intrinsically extremely bright, and it requires an emission mechanism that is coherent because incoherent emission, in which each of the particles radiate independently of the others, is totally inadequate. The collective plasma radiation process is believed act coherently on a time scale of microseconds and below in generating pulsar radio waves. The pulsar radio emission is believed to arise due to growth of plasma instabilities in the relativistic secondary electron-positron plasma, which is bunched and streaming out along the curved open dipolar magnetic field lines.

All are welcome ! Tea and coffee will be served at 2:15 PM.