Contributed talk

Splinter Non-Thermal

The High Time Resolution Universe Survey For Pulsars

M. Cruces[1], on behalf of HTRU Collaboration

[1] *Max-Planck Institute for Radioastronomy, Bonn*

Pulsars are neutron stars, detected mainly through the pulses of electromagnetic radiation emitted from their poles, which is modulated by the stable rotation of the object. Since their discovery in 1967 they have become fundamental tools for understanding stellar evolution, to test theories of gravity, to map the electron content of our galaxy and to understand the behavior of matter at extreme conditions, to name a few. Further discoveries allow us to advance in these areas.

Although more than 2500 pulsars have been found so far, most of them are normal isolated pulsars. Of the more rare objects, only fewer than 20 are double neutron stars systems and just one is a double pulsar system. Moreover, no neutron star-black hole system has been detected to date. With the aim of finding the most intriguing pulsars and the potential pulsar-black-hole binaries, in early 2008 the High Time Resolution Universe (HTRU) collaboration began, an all sky blind survey for pulsars. In the southern hemisphere the survey was conducted with the 64-m Parkes radio telescope, while in the northern hemisphere the observations were carried out with the 100-m radio telescope Effelsberg. The data have a high time- and frequency-resolution that allows an unprecedented volume of the galaxy to be searched. This has led to the discovery of hundreds of new pulsars, among them tens of millisecond pulsars, a Fermi-millisecond pulsar, the first radio-loud magnetar, two pulsar-planet systems and the most relativistic pulsar to date. Additionally, among its findings, the HTRU establish the existence of a cosmological population of Fast Radio Bursts (millisecond duration burst whose origin remains unknown).