

# School of Physics and Astronomy

## HIGH ENERGY ASTROPHYSICS SEMINAR

The latest results from the HTRU-S Low Latitude Pulsar Survey: a zoo of new and exciting pulsars



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Pulsars, rapidly-rotating and highly-magnetised neutron stars, can be utilised as tools in the study of many aspects of fundamental physical, most notably in the application of binary pulsars to the study of gravitational theories such as General Relativity. The discovery of ever-more relativistic binary systems than those presently known will allow for such tests to probe even deeper into the nature of gravity. Here, I will present results from the processing of 44% of the the HTRU-South Low Latitude pulsar survey (HTRU-S LowLat), the most sensitive blind survey of the southern Galactic plane taken to date. This includes the discovery and long-term timing of 40 new radio pulsars identified through the continued application of a novel “partially-coherent segmented acceleration search” technique, which was specifically designed to discover highly-relativistic binary systems. These pulsars display a range of scientifically-interesting behaviours including glitching, pulse-nulling and binary motion, and appear to comprise a population of generally older, lower-luminosity pulsars as compared to the previously-known population. In addition, I will also present an in-depth report on PSR J1757-1854, the only relativistic binary pulsar to have been discovered in HTRU-S LowLat to date. This extreme double neutron star system (which remains the most accelerated pulsar binary ever discovered) promises to provide new insights into gravitational theories within the coming years.

When:	Friday 8 <sup>th</sup> March
Time:	11am
Where:	Level 1, Seminar Room 107, 10 College Walk, Clayton