

# Physics of the double pulsar

**R. Rafikov** (CITA)

[rrr@cita.utoronto.ca / (416)-978-3921]

Pulsar J0737-3039 is the only currently known double neutron star system in which both components exhibit themselves as radio pulsars. A number of peculiar properties - very compact orbit (with period 2.4 hours), almost edge-on orientation of the orbital plane with respect to our line of sight - provide us with unprecedented opportunities of checking effects of general relativity and probing the physics of pulsar magnetospheres. This report will provide a brief overview of our current understanding of some of the unique phenomena that have been observed in the double pulsar system: accumulation of relativistic plasma in the magnetosphere of normal pulsar causes periodic eclipses of its millisecond companion. Powerful wind of the millisecond pulsar distorts the magnetosphere of its normal companion, which affects the spindown and emission properties of normal pulsar. Future observational and theoretical work on this system may turn it into a Rosetta Stone of pulsar physics.