FMRC Fluid Mechanics Research Seminar Series

Neutron Stars, Supernova Remnants and Fallback Disks

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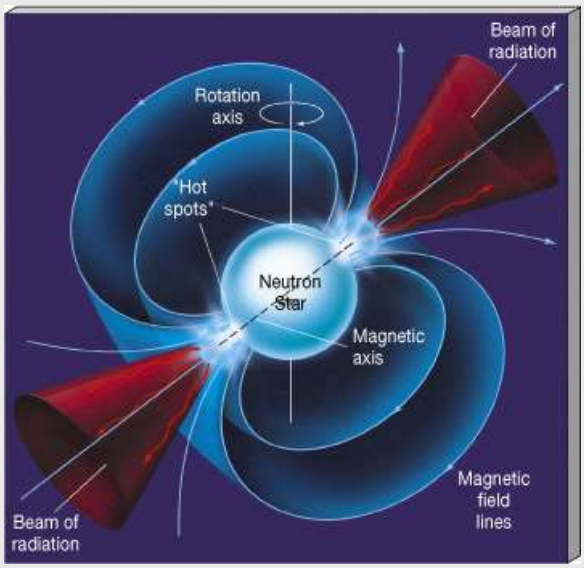
Abstract: Neutron stars are compact objects with a radius of 10 km and mass of 1.5 solar mass. They are remnants of high mass stars whose initial masses are 8 to 20 solar masses. A neutron star is born by the collapse of the core of such a star while the released neutrinos expel the outer layers of the star in a so called supernova explosion. Although a supernova explosion is very energetic, some matter may remain bound to the nascent neutron star and fall back. If this fall back matter has sufficient angular momentum it may form a disk rotating in Keplerian orbits. The interaction of this ionized disk with the magnetosphere of the neutron star (B ~108 T) could alter its spin evolution compared to the isolated evolution of a young neutron star. The viscous dissipation in the disk and irradiation of the disk by the central neutron star leads to excess emission in the optical and infrared which can be calculated and measured. I will present our studies on such fall back disks, their evolution and observational confirmation.



Biography: Prof. Dr. Yavuz EKSI graduated from Kadıköy Anadolu Lisesi (1990). He received his BS degree from the Electrical Engineering Department of ITU in 1995. Then he went on to the Physics Department of Boğaziçi University and received his MSc and PhD degrees in 1999 and 2003, respectively. He also worked as a postdoc at Sabancı University and Harvard Smithsonian Center for Astrophysics, United States. Since 2006 he has been employed as a faculty member in the Physics Department of Istanbul Technical University.