Gamma ray bursts, Soft gamma repeaters, and Magnetars

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Soft gamma repeaters (SGRs) have been collected in a separate group of objects which show gamma ray bursts (GRBs), being very close to them observationally. Only 4 SGRs have been discovered since 1979. They are considered as galactic objects, and 2 extragalactic giant SGR bursts were recently discovered. GRBs are identified as cosmological sources with red shifts sometimes exceeding 6. The most intriguing discovery of this year was the observation of the prompt optical light curve of the GRB 080318B, what should shed an additional light to the nature of GRBs. SGRs are interpreted as highly magnetized neutron stars – magnetars. Due to a slow rotation, the magnetic field is considered as the main source of energy in magnetars, especially for their giant bursts. Observational data on SGR giant bursts are analyzed, and the magnetar concept is criticized. An alternative model, based on nuclear processes in neutron stars, is discussed.