

# **Fast radio bursts: the ultrastrong electromagnetic waves**

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Fast radio bursts (FRBs) are the biggest discovery in radio astronomy since the detection of pulsars. They are far brighter than pulsars and produce waves with dimensionless strength parameter exceeding unity. FRB physics is close to laser plasma and nonlinear optics, and involves a broad range of spectacular plasma phenomena. Propagation of FRBs through plasma around the source is accompanied by self-modulation and filamentation effects. Emission of FRBs inside a neutron-star magnetosphere generates powerful electron-positron fireworks. Emission of FRBs by collisionless shock waves in magnetic explosions involves a synchrotron maser mechanism. Recent advances in FRB physics and explosion of observational data are quickly shaping this new field of extreme plasma astrophysics.