

The Radio Transient Sky

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Abstract

Radio transients are known on time scales from nanoseconds to years, from sources in the Galaxy and beyond, and with either coherent or incoherent emission mechanisms. Observations of this wide variety of sources are relevant to many of the highest profile questions in astronomy and astrophysics. As illustrations of the breadth of the radio transient sky, both coherent and incoherent radio emission has long been known from stars and stellar remnants and has informed topics ranging from stellar evolution to Galactic structure to relativistic jet dynamics to tests of fundamental physics. Coherent radio emission is now also known from brown dwarfs, and there are active programs to find similar emissions from extrasolar planets. Outside of the Galaxy, incoherent radio counterparts to supernovae, tidal disruption events, and gamma-ray bursts is well known and have contributed to topics such as understanding the cosmic star formation rate and the formation of relativistic jets. Excitingly, coherent radio bursts that appear to be at cosmological distances were recently discovered. I provide a survey of the radio transient sky, illustrating both how radio transients are part of the Hot-Wired Sky and are likely to help drive the Hot-Wiring. Part of this research was carried out at the Jet Propulsion Laboratory, California Institute of Technology, under a contract with the National Aeronautics and Space Administration.