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Proposal Abstract:

The observed radio emission from white dwarfs (WDs) has been restricted to binary systems powered by accretion. No radio signal of any kind from isolated WDs has been detected so far. A significant fraction of the WD population seems to originate from double WD mergers, generally expected to possess high magnetic fields and rapid rotation rates, which are also the properties of neutron star pulsars. These properties have triggered theoretical suggestions that WD pulsars could contribute to the population of electron-positron cosmic rays, generate gamma-rays, and explain radio emission from some exotic sources. Recent discoveries of a highly magnetized, rapidly spinning WD, J2211+1136 (P=70 s, B=1.5 x 10^7 G), and an extremely slow radio pulsar (P=76 s, B=1.4 × 10^14 G), which share a surprisingly similar capability to generate coherent radio emission, suggest an intriguing possibility that J2211+1136 may also be a radio pulsar. To verify it, we propose to conduct a 4-hour, single pulse mode observation of J2211+1136 with the FAST telescope to search for a pulsed radio emission from this star. If successful, this would be a discovery of the first WD radio pulsar with many exciting astrophysical consequences.