

# An Astrophysical Explanation For The Great Silence

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An astrophysical model is proposed to answer Fermi's question. Gamma-ray bursts have the correct rates of occurrence and plausibly the correct energetics to have consequences for the evolution of life on a galactic scale. If one assumes that they are in fact lethal to land based life throughout the galaxy, one has a mechanism that prevents the rise of intelligence until the mean time between bursts is comparable to the timescale for the evolution of intelligence. Astrophysically plausible models suggest the present mean time between bursts to be  $\sim 10^8$  years, and evolutionarily plausible models suggest the rise of intelligence takes  $\sim 10^8$ . Hence, this model suggests that the Galaxy is currently undergoing a phase transition between an equilibrium state devoid of intelligent life to a different equilibrium state where it is full of intelligent life.