

Abstract: We construct a globally defined radially symmetric positive solution to

$$u_t = \Delta u + u^5, \quad \text{in } \mathbb{R}^3 \times (0, \infty),$$

with $\lim_{r \rightarrow \infty} r^\gamma u(r, 0) = A > 0$, for some $\gamma > 1$. We show that, as $t \rightarrow \infty$,

$$\|u(r, t)\|_\infty \sim t^{\frac{\gamma-1}{2}}, \quad \text{if } 1 < \gamma < 2, \quad \|u(r, t)\|_\infty \sim \sqrt{t}, \quad \text{if } \gamma > 2,$$

and

$$\|u(r, t)\|_\infty \sim \sqrt{t}(\ln t)^{-1}, \quad \text{if } \gamma = 2.$$

This is a joint work with Manuel del Pino and Juncheng Wei.