Time-dependent singularities for a semilinear heat equation with absorption

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In this talk, we consider solutions with time-dependent singularities for a semilinear heat equation with a superlinear absorption term. Here, by time-dependent singularity, we mean a singularity with respect to the space variable whose position depends on the time variable. It is shown that if the power of the nonlinearity is in some range, there is no time-dependent singular solution. On the other hand, in other range, two types of time-dependent singular solutions exist. One behaves like the fundamental solution of the Laplace equation near the singular point. The other one behaves like the positive singular steady state.

This is a joint work with Eiji Yanagida.