1167-35-40 **Dennis Kriventsov*** (dnk34@math.rutgers.edu). *Optimal regularity for an obstacle problem with log singularity.*

I will present an optimal regularity result for solutions to the semilinear equation

$$\Delta u = (-\log u^+)1_{\{u>0\}} - (-\log u^-)1_{\{u<0\}}.$$

In particular, solutions have log-Lipschitz derivatives. This problem has similar structure to the classical two-phase obstacle problem (and has the same blow-up limits), but the right-hand side's unfavorable monotonicity in u obstructs most arguments from carrying over. The method I describe is based on a careful analysis of Weiss-type energies in this setting.

This is based on joint work with Henrik Shahgholian. (Received February 08, 2021)