Texas Tech University. Department of Mathematics and Statistics. Colloquium.

Parabolic Obstacle-Type Problems

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ABSTRACT. Many problems in physics, biology, finance, industry and other areas can be described by partial differential equations that exhibit apriori unknown sets such as moving boundaries, interfaces, etc. The study of such sets, also known as free boundaries, often plays central role in the understanding of such problems.

In this talk we present a short survey on the special class of the parabolic free boundary problems, which is called the obstacle-type problems. We discuss the different aspects of evolution obstacle-type problems near a fixed boundary, such as the optimal regularity of solutions, the study of blow-ups, and the regularity of the free boundary.

The lecture is based on works in collaboration with Nina Uraltseva, Henrik Shagholian and Norayr Matevosyan.