1145-35-1578 **Nicola Garofalo**, **Arshak Petrosyan** and **Mariana Smit Vega Garcia***
(mariana.smitvegagarcia@wwu.edu). *Recent developments in the thin obstacle problem.*

The study of the classical obstacle problem began in the 60's with the pioneering works of G. Stampacchia, H. Lewy and J. L. Lions. During the past five decades, it has led to beautiful and deep developments in the calculus of variations and geometric partial differential equations. One of its crowning achievements has been the development, due to L. Caffarelli, of the theory of free boundaries. In broad terms free boundaries appear when the solution to a problem consists of a pair: a function (often satisfying a partial differential equation), and a set associated to this function. Nowadays the obstacle problem continues to offer many challenges and its study is as active as ever. In particular, over the past years there has been some interesting progress the thin obstacle problem, also called Signorini problem. In this talk, I will overview the thin obstacle problem and describe a few methods used to tackle two fundamental questions: what is the optimal regularity of the solution, and what can be said about the free boundary. The proofs are based on Almgren, Weiss and Monneau type monotonicity formulas. (Received September 23, 2018)