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*Higher regularity of the free boundary for the fractional obstacle problem*

In the obstacle problem for the fractional Laplacian  $(-\Delta)^s$ ,  $s \in (0, 1)$ , Caffarelli, Salsa, and Silvestre showed that the free boundary is  $C^{1,\alpha}$  near regular points. In this talk, based on joint work with Y. Jhaveri, we show that the free boundary is smooth at regular points provided the obstacle is smooth. The main idea of the proof is to establish a so-called higher order boundary Harnack principle as recently developed by De Silva and Savin.