



For Favour of posting

**The Hong Kong University of Science and Technology**

**Department of Mathematics**

**Seminar on PDE**

**Regularity of the singular set in the fully  
nonlinear obstacle problem**

by

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**Abstract**

Obstacle problem is one of the well-studied free boundary problems. When the operator is the Laplacian, it is known that the free boundary consists of two parts: the regular part and the singular part. The regular part is an analytic hypersurface, and the singular part is covered by  $C1$ -manifolds with various dimensions.

While the tools for the study of the regular part is robust enough that the theory has been generalized to many other free boundary problems, up to now all developments on the singular part rely on monotonicity formulae. Such formulae are only expected for the Laplacian and linear operators with very regular coefficients. Consequently, very little is known about the singular set when the operator is not the Laplacian.

In this talk we describe a new method to study the singular set in the obstacle problem. This method does not depend on monotonicity formulae and works for fully nonlinear elliptic operators. The result we get matches the best-known result for the case of Laplacian.

This is based on joint work with Ovidiu Savin.

**Date:           Tuesday, 25 June 2019**

**Time:           3:00p.m. - 4:00p.m.**

**Venue:         Room 3472, Academic Building  
(near Lifts 25 - 26), HKUST**

***All are welcome!***