

## MATH-IMS Joint Pure Mathematics Colloquium Series The Chinese University of Hong Kong

*This Colloquium Series in Pure Mathematics is organized by the Department of Mathematics and the Institute of Mathematical Sciences (IMS) at The Chinese University of Hong Kong. The series focuses on all areas of pure mathematics together with theoretical developments and applications.*

**Date:** November 18, 2021 (Thursday)

**Time:** 10:00-11:00 (Hong Kong Time)

**Zoom Link:** <https://cuhk.zoom.us/j/98846779826>

### The multiple membrane problem

*Speaker: Professor Ovidiu Savin  
Columbia University*

**Abstract:** For a positive integer  $N$ , the  $N$ -membranes problem describes the equilibrium position of  $N$  ordered elastic membranes subject to forcing and boundary conditions. If the heights of the membranes are described by real functions  $u_1, u_2, \dots, u_N$ , then the problem can be understood as a system of  $N-1$  coupled obstacle problems with interacting free boundaries which can cross each other. When  $N=2$  there is only one free boundary and the problem is equivalent to the classical obstacle problem. In my talk I will review the free boundary regularity in obstacle-type problems and discuss some recent work in collaboration with Hui Yu on the multiple membrane problem.

**Bio:** Prof. Savin received his PhD in mathematics at the University of Texas, Austin in 2003 under the supervision of Prof. Luis Caffarelli. After graduation, he became a Miller postdoctoral fellow at the University of California Berkeley and he moved to Columbia University in 2006 where he currently a full professor. Prof. Savin's research interest is partial differential equations. He is well-known for his important work on the De Giorgi Conjecture about global solutions to certain semi-linear equations. He has also worked on various regularity questions for the infinity-Laplacian equation and the Monge-Ampere equation. In recognition of his fundamental contributions in PDE, Prof. Savin has received numerous awards and honors, including the Clay Liftoff Fellow in 2007, the Stampacchia Medal in 2012 and he was an invited speaker at the ICM in 2006.