



Department of Mathematics  
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# Colloquium

## *Recovering a polyhedral obstacle by a few backscattering measurements*

*Professor Jingzhi Li*

*Southern University of Science and Technology, China*

### Abstract

In this talk, we present an inverse scattering scheme of recovering a polyhedral obstacle in 2D and 3D, by only a few high-frequency acoustic backscattering measurements. The obstacle could be sound-soft or sound-hard. It is shown that the modulus of the far-field pattern in the backscattering aperture possesses a certain local maximum behavior, from which one can determine the exterior normal directions of the front sides/faces. Then by using the phaseless backscattering data corresponding to a few incident plane waves with suitably chosen incident directions, one can determine the exterior unit normal vector of each side/face of the obstacle. After the determination of the exterior unit normals, the recovery is reduced to a finite-dimensional problem of determining a location point of the obstacle and the distance of each side/face away from the location point. For the latter reconstruction, we need to make use of the far-field data with phases. Numerical experiments are also presented to illustrate the effectiveness of the proposed scheme.

Date: October 25, 2016 (Tuesday)  
Time: 4:00pm ~ 5:00pm  
Venue: Room 219, Lady Shaw Building,  
The Chinese University of Hong Kong, Shatin

*All are Welcome*