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The Hong Kong University of Science and Technology

Department of Mathematics

Departmental Colloquium

**Solution, optimization and design methods for periodic
and non-periodic electromagnetic
metamaterial structures**

by

Prof. Oscar P. Bruno
Caltech

Abstract

This talk presents a variety of methodologies developed recently for the solution of Maxwell's equations, with application to the analysis, optimization, and design of periodic and non-periodic metamaterial structures. In particular, novel integral-equation solvers will be discussed which can rapidly produce accurate solutions to Maxwell's equations for general two- and three-dimensional structures. Associated optimization methods will be demonstrated. The Windowed Green Function method (WGF) and its powerful capabilities as a scattering isolator, with applications to multi-layered media, waveguiding problems, and periodic problems, will be presented. The difficulties arising from the existence of Wood anomalies in the context of periodic structures, which have previously hindered treatment of bi-periodic problems in three-dimensional space, will also be mentioned and addressed. The newest fast, three-dimensional Wood-anomaly-capable solvers will be described, and they will be demonstrated with a variety of numerical results.

Date: ***Wednesday, 6 June 2018***
Time: ***3:00p.m. - 4:00p.m.***
Venue: ***Room 5508, Academic Building***
(near Lifts 25&26), HKUST

All are welcome!