

Department of Mathematics  
City University of Hong Kong

## Colloquium

Organised by Prof. P. G. Ciarlet and Prof. F. Cucker

### Optimal Numerical Approximation of Piecewise-smooth Functions on $R$

by

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University of Warsaw, Poland

**Abstract** : We consider the problem of  $\Omega$ -weighted  $L_p$ -approximation of piecewise  $r$ -smooth functions defined in the whole real line  $R$ . We assume that the singular points are unknown. The approximations are constructed based on  $n$  function values that can be collected adaptively. We give a necessary and sufficient condition for the weight  $\Omega$  that allows approximations of order  $n^{-r}$ . While for globally smooth functions the optimal designs are nonadaptive, for piecewise smooth functions one has to use adaptive sampling to locate and well approximate in vicinity of the singular points. The analysis is done in the worst case and asymptotic settings.

Date : 31 March 2010 (Wednesday)  
Time : 4:30pm – 5:30pm  
Venue : Room B6605 (College Conference Room)  
Blue Zone, Level 6  
Academic Building  
City University of Hong Kong

(Tea, coffee and cookies will be provided at the Faculty Conference Room in B6605 before the colloquium from 4:00 to 4:30pm. Please come and join us.)

**\*\* All interested are welcome \*\***

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