

Liu Bie Ju Centre for Mathematical Sciences  
City University of Hong Kong

## Mathematical Analysis and its Applications Colloquium

Organized by Prof. Ya Yan Lu and Prof. Roderick S. C. Wong

### Quasi-Interpolation and Wavelets with Generalised Multiquadrics

By

Professor Martin Buhmann  
Justus-Liebig University, Germany

Date : 20 April, 2017 (Thursday)  
Time : 4:30 pm to 5:30 pm  
Venue : Room B6605  
Blue Zone, Level 6, Academic 1 (AC1)  
City University of Hong Kong

#### **ABSTRACT:**

For the approximation of functions in many variables, the approach using interpolation, or quasi-interpolation, or wavelets, from the linear spaces spanned by shifts of radial basis functions is a particularly popular and successful one. The reasons for this are manifold: radial basis functions which are univariate functions composed with the Euclidean norm and then shifted by so-called centres (so we approximate from vector spaces spanned by arbitrary shifts of radially symmetric functions  $\phi(\|\cdot\|_2)$ ) are useful because they are (i) available in any dimension, (ii) able to interpolate any given data, (iii) have excellent convergence properties, (iv) are available for many different choices of such radial functions  $\phi$  (of different smoothness, minimising certain functionals, etc.).

Among these classes of radial basis functions, the multiquadrics function  $\phi(r) = \sqrt{r^2 + c^2}$  and its generalisation  $\phi(r) = (r^2 + c^2)^\gamma$  for parameters  $c$  (and different powers  $\gamma$ ) are particularly useful choices, partly because of the small errors they create when interpolating given, sufficiently smooth functions, partly due to their versatility exactly because of their parameters. We will study approximations especially with quasi-interpolation, but also with wavelets using the approximation spaces spanned by the translates of these generalised multiquadrics.

Light refreshments will be provided before the colloquium from 4:00 pm to 4:30 pm.  
Please come and join us!

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

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