

综合报告会

# Lecture

国家数学与交叉科学中心

Time: 4:00-5:00 pm, November 2

Venue: Institute of Computational Mathematics, Room 311

## *MRA based wavelet frame and applications*



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*Invited Speaker: International Congress of Mathematicians, Hyderabad, 2010*

### ***Abstract:***

One of the major driving forces in the area of applied and computational harmonic analysis during the last two decades is the development and the analysis of redundant systems that produce sparse approximations for classes of functions of interest. Such redundant systems include wavelet frames, ridgelets, curvelets and shearlets, to name a few. This talk focuses on tight wavelet frames that are derived from multiresolution analysis and their applications in imaging. The pillar of this theory is the unitary extension principle and its various generalizations, hence we will first give a brief survey on the development of extension principles. The extension principles allow for systematic constructions of wavelet frames that can be tailored to, and effectively used in, various problems in imaging science. We will discuss some of these applications of wavelet frames. The discussion will include frame-based image analysis and restorations, image inpainting, image denosing, image deblurring and blind deblurring, image decomposition, segmentation and CT image reconstruction.