# 数学与系统科学研究院

## 计算数学所学术报告

**报告人：** **Prof. Ke Chen**

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## 报告题目：

**On fast multilevel algorithms for non linear variational imaging models**

**邀请人：** 陈志明研究员

**报告时间：** 2008 年 11 月 24 日(周一)

上午 10:30—11:30

**报告地点：** 科技综合楼三层 311

计算数学所报告厅

## Abstract:

In recent years, the interdisciplinary field of imaging science has been experiencing an explosive growth in research activities including more models being developed, more publications generated, and above all wider applications attempted. In this talk I shall first give an overview of the various imaging work carried out in our Liverpool group, some with collaborations with UCLA (T F Chan), CUHK (R H Chan) and Bergen (X C Tai) and several colleagues from other departments in Liverpool. Then I shall focus on two pieces of recent work, denoising and segmentation respectively:

(i) Image denoising has been a research topic deeply investigated within the last two decades. Even algorithmically the well–known ROF model (1992) can be solved efficiently. However less work has been done on models using high order regularization. I shall describe our first and successful attempt to develop a working

multilevel algorithm for a 4th order nonlinear denoising model, and our work on solving the combined denoising and deblurring problem, different from the reformulation approach by M N Ng and W T Yin (2008) et al.

(ii) the image active contour model by Chan–Vese (2001) can be solved efficiently both by a geometric multigrid method and by an optimization based multilevel method. Surprisingly the new multilevel methods can find a solution closer to the global minimize than the existing unilevel methods.

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