

## 総合研究機構 分子連関相乗系研究部門 セミナーのお知らせ

講演者 : Kenneth D.M. Harris 教授  
(連合王国 カーディフ大学)

講演題目 : Towards an Understanding of Molecular Solids:  
Challenges, Strategies and Solutions

講演要旨 : 別紙のとおり

日時 : 2014年7月9日(水)16時から

場所 : 東京理科大学 野田キャンパス  
総合研究棟 (10号館) 2階会議室

### 【ご案内】

Harris 教授は粉末 X 線回折像から構造解析をする genetic algorithm を開発したことで有名ですが、近年は固体 NMR を用いた溶液からの結晶化過程の観察手法を開発するなど、他分野にわたり先駆的な研究を行っています。論文もこれまでに約 360 報を出し、活発に研究を行っておられます。6 月半ばに奈良で開催された結晶成長の国際学会、CGOM11 を機に来日されておられます。またとない機会ですので、皆様ぜひ、ご参加ください。

世話人 総合研究機構 黒田玲子  
内線 73-4629

# Towards an Understanding of Molecular Solids: Challenges, Strategies and Solutions

Kenneth D.M. Harris

School of Chemistry, Cardiff University, Park Place, Cardiff CF10 3AT, Wales  
*HarrisKDM@cardiff.ac.uk*

The lecture will highlight some contemporary challenges in understanding the properties of molecular solids, and will focus on strategies that may be implemented in the quest to find solutions to these challenges.

In many respects, solid host-guest materials based on one-dimensional tunnel host structures (exemplified by urea and thiourea inclusion compounds) are ideal model systems for exploring and understanding fundamental properties of direct relevance to other classes of materials. In this regard, our recent research has exploited solid inclusion compounds as model materials for: (i) understanding and controlling crystal growth processes, (ii) exploring molecular diffusion in the solid state, and (iii) demonstrating and applying the phenomena of X-ray dichroism and X-ray birefringence. The lecture will present an overview of several inter-related aspects of our research on these materials. The lecture will also highlight recent research on other topics from the field of molecular solids, including fundamental aspects of crystallization processes, the development of solid-state NMR techniques for *in-situ* studies of crystallization, fundamentals of polymorphism, and the design of organic molecular quasicrystals.

The lecture will be organized in the following sections:

- (a) fundamental and applied aspects of solid inclusion compounds [1,2],
- (b) new insights on crystallization processes by confocal Raman microspectrometry [3,4],
- (c) *in-situ* solid-state NMR studies of crystallization from solution [5-7],
- (d) the design of molecular quasicrystals [8,9], and
- (e) the phenomenon of X-ray birefringence [10] and exploitation of this phenomenon as the basis of a new X-ray imaging technique [11] that represents the X-ray analogue of the polarizing optical microscope.

## References

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