

第 61 回化学コロキウムのお知らせ

日時: 平成 17 年 8 月 24 日(水) 午後 3:00 ~ 5:00

場所: 大学院講義室 302

演者: Paul T. Callaghan 教授 (MacDiarmid Institute for Advanced Materials and Nanotechnology, Victoria University of Wellington, New Zealand)

演題: Rheo-NMR-microscopy: Localizing the Physics of Soft Matter

Abstract: A central problem in the physics of soft matter concerns the molecular basis of complex mechanical properties, and especially the response of the material to deformation and deformational flow. The key to addressing central questions concerning the role of molecular organization and dynamics in macroscopic constitutive behaviour, lies in the use of spectroscopic techniques that are capable of accessing information at the molecular level during deformational flow. Examples include optical birefringence and dichroism measurements, neutron and X-ray scattering, and most recently, nuclear magnetic resonance. An overview of the NMR methods will be given, along with some examples of flow measurement in different deformation geometries. Velocity imaging has proven useful in elucidating tubeless siphon flow, shear banding, fracture, yield stress phenomena, and shear-induced polymer chain alignment while spectroscopy is answering new questions about molecular organization and ordering. Already Rheo-NMR has thrown up some interesting effects. These include anomalous polymer deformation under shear, dynamics of shear-induced isotropic to nematic phase transitions in wormlike micelles, and correlations between stress fluctuations, shear banding fluctuations, and fluctuations in the orientational order of surfactant molecules.

Callaghan 教授は、ソフトマターや多孔質物質の構造や分子運動に関する NMR の方法論開発で名高い方で、最近は磁気イメージングを用いて速度場を可視化することにより、レオロジー研究の新しい側面を精力的に開拓されています。来る 8 月 22-26 日に宇都宮で開催される The 8th International Conference on Magnetic Resonance Microscopy の招待講演者として来日されるため、本学にお招きしました。

連絡先: 理学研究科化学専攻 加藤 直 (内 3435) kato-tadashi@c.metro-u.ac.jp