エクストリームフォトニクスセミナー
Extreme Photonics Seminar

Language: Japanese

日時: 平成21年11月 24日(火)
15:00 ～ 17:00, November 24th(Tue), 2009

場所: 研究交流棟5階会議室 W524
Cooperation Center, 5F Meeting Room, W524

題目: **レーザープラズマX線源を用いた密着型軟X線顕微法による ネズミの精巣ライディッヒ細胞の瞬間撮像**
"Single shot imaging of Leydig cells of Rat testicles by contact x-ray microscopy with a laser plasma x-ray source"

講師: 加道 雅孝 氏 (日本原子力研究開発機構 量子ビーム応用研究部門)
Dr. Masataka KADO (Japan Atomic Energy Agency, Quantum Beam Science Directorate)

要旨: Contact x-ray microscopy employed with a bright laser plasma x-ray source is a powerful tool to capture an x-ray image of wet biological specimen with high spatial resolution. Single shot x-ray imaging prevent degradation of the spatial resolution due to Brownian motion of molecules which compose biological specimens. Wet Leydig cells of Rat testicles have been observed by contact x-ray microscopy. Nd:glass laser system with 10J output energy in 600ps pulse duration is used to generate laser plasma x-ray sources. The x-ray images are compared with fluorescent images taken by a confocal laser microscope and organelles such as Actin filaments are identified. Other biological specimens such as mouse macrophages and sliced cerebral cortical cells of mouse brain have been also observed.

題目: **フェムト秒レーザーが引き起こす、物質変化をデザインする TDDFTシミュレーション**
"Application of TDDFT-simulation for designing material change by femtosecond laser shot"

講師: 宮本 良之 氏 (NEC ナノエレクトロニクス研究所)
Dr. Yoshiyuki MIYAMOTO (NEC, Nano Electronics Research Laboratories)

要旨: I will introduce the first-principles approach on laser-induced non-equilibrium phenomena based on the time-dependent density functional theory (TDDFT), and shows application to structural changes in nano-carbon materials. The femtosecond laser shot give rise a strong electric field shined on material which causes significant structural change immediately after electronic excitation. Such situation cannot be explained by conventional theory which treats electronic excitation and structural change individually. Using TDDFT, we can treat real-time propagation of electron wave functions being combined with classical molecular dynamics of ions within an approximated force field. This approach has been done in many systems and I will show radiation of pulse laser on graphite surface and nanotubes to seek for unprecedented structures.

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