



中心系列讲座 ICQM Weekly Seminar Series

Forbidden Light: Shaping Molecular Electroluminescence at the Nanoscale

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Time: 4:00pm, May. 18, 2011 (Wednesday)

时间: 2011年5月17日 (周二) 下午4:00

Venue: Room 607, Conference Room A, Science Building 5

地点: 理科五号楼607会议室

Abstract

Control of radiative properties of functional polyatomic molecules near metals is a key issue in nano-photonics, and is particularly important for light manipulation at the nanoscale and the development of plasmonic devices. Up to date, light emissions in these systems are restricted by Kasha's rule, namely the fluorescence is always from the lowest vibrational level of the excited state. In this talk, we shall report a experimental study of electrically driven molecular fluorescence of porphyrins in a highly confined nanogap (<3 nm) constructed by a metal tip and metal substrate. Striking high-energy hot luminescence directly from highly excited vibrational states is observed. By spectrally tuning the frequency of the nanogap plasmon to resonate with different molecular transitions, dramatic spectral modifications and even energyforbidden upconversion luminescence are obtained. Our observations demonstrate that, the strong near-fields of local nanogap plasmons behave like a strong coherent optical source with tunable energy and can be used to actively control the radiative channels of molecular emitters via intense resonance enhancement on both excitation and emission. Sub-molecular resolved photon mapping of tip induced plasmonic emission that beats the diffraction limit will also be demonstrated.

报告人简介

董振超, 中国科学技术大学教授、博士生导师。1983年毕业于四川大学, 1987年在厦门大学获硕士学位, 1990年在中科院福建物质结构研究所获理学博士学位。1992年到美国Iowa州立大学从事博士后研究, 1996年到日本国家材料科学研究所工作, 先后被聘为主任研究官、主干研究员、课题组负责人。2004年被引进到中国科技大学工作, 现为合肥微尺度物质科学国家实验室原子分子科学部主任, 中国真空学会常务副秘书长。曾入选教育部“新世纪优秀人才支持计划”和中科院“百人计划”。主要从事纳米科技和单分子光电子学研究。已发表SCI论文120余篇, 参与编写学术专著4部, 多次受邀在包括美国化学学会、国际真空大会在内的国内外学术会议上做邀请报告。有6篇第一作者文章分别发表在Nature Photonics、Phys. Rev. Lett. J. Am. Chem. Soc.和Angew. Chem.上, 论文被他人引用千余次(H因子=21)。曾担任《结构化学》、《信息与电子工程》等杂志的编委, 2010年获得中国科学技术协会颁发的“全国优秀科技工作者”荣誉称号。