

SEMINAR

20th January 2023

10 am

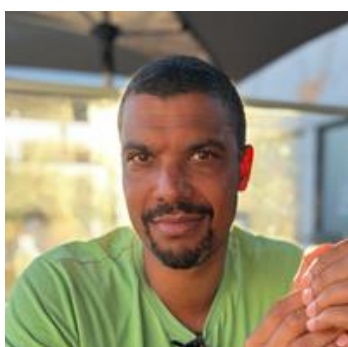
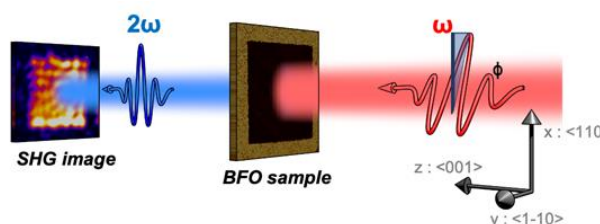
Amphitheatre C2N

Observation and manipulation of antiferromagnetic distributions in magneto-electric multiferroics

Jean-Yves Chauleau

CEA Saclay

Antiferromagnets (AF) are currently in the limelight thanks to recent breakthroughs demonstrating the efficient effect of spin currents in interacting with the AF order parameter. So far, due to the lack of net magnetization, controlling AF distributions has been rather challenging. Current-induced AF control also opens new perspectives in Terahertz magnetization dynamics. On the materials side, antiferromagnets represent most magnetic materials and some of them show several simultaneous coupled ordered phases. They are commonly called 'multiferroics'. Multiferroic materials are the focus of an intense research effort due to the significant technological interest of multifunctional materials as well as the rich fundamental physics lying in the coupling of various order parameters. Among all multiferroics, BiFeO₃ is a material of choice because its two ordering temperatures (ferroelectric FE and AF) are well above room temperature, in addition of showing one of the largest magnetoelectric coupling. One difficulty in handling multiferroics lies in the challenging assessment of their coupled FE/AF textures. Second harmonic generation (SHG) has proven to be a powerful and elegant way to image complex multiferroic textures and to disentangle the different contributions at play and in particular to image the silent AF order. In this presentation, after discussing the SHG imaging of AF domains distributions in BiFeO₃ epitaxial thin films, their ultrafast dynamics will be addressed.



Jean-Yves Chauleau is currently a permanent researcher at CEA Saclay in the "Service de Physique de l'Etat Condensé" (SPEC) where, he is, nowadays, developing a research activity in the nanomagnetism & oxides group focused on time-resolved and nonlinear optics to tackle various issues of spintronics and the physics of oxides.