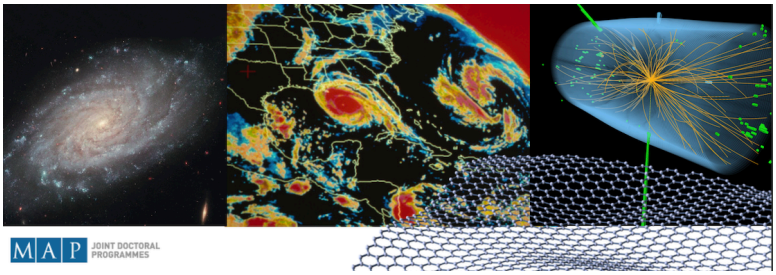

Contribution ID: **127** Type: **Contributed Talk (20 minutes)**

Room temperature photon emitters in hexagonal boron nitride films grown by atmospheric-pressure chemical vapor deposition

Friday 11 October 2024 09:35 (20 minutes)

Hexagonal boron nitride (h-BN) is a promising two-dimensional material due to its properties, such as high thermal conductivity and excellent thermochemical stability (1). h-BN can host numerous optically structural defects (2,3). The production of h-BN films on Cu foil using an ammonia borane (NH3BH3) precursor is investigated. The growth is performed via atmospheric-pressure chemical vapor deposition (APCVD), with two heating zones under a mixture (Ar:H2) flow rate of (95:5) sccm. h-BN films are then transferred onto SiO2/Si, sapphire, and glass substrates via a wet chemical method. According to X-ray photoelectron spectroscopy studies, the preliminary tests performed for low and high flux of argon used during the AB pre-treatment show similar surface chemical compositions in the produced h-BN films. A large-area h-BN film (1 cm2) with a thickness of 7 nm is confirmed by atomic force microscopy and X-ray reflectivity experiments. The optical properties of h-BN films are derived from the analysis of the transmittance and reflectance curves. The band-gaps estimated are between 3.58 and 4.55 eV. Fluorescent spots observed in h-BN thin films in the wavelength range of 520 to 690 nm exhibit a blinking effect with “ON” and “OFF” states (Figure 1). These studies will enable the optimization of h-BN growth, aiming to get high-quality h-BN for future optoelectronic applications.

Which topic best fits your talk?

Condensed Matter Physics and Nanomaterials

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