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Bernard Gil, born 1957, is Director of Research of Exceptional Class at CNRS. He is an experimentalist working on light-matter interaction processes in III-V and II-VI semiconductor compounds. After some years spent working on cubic semiconductors, he shifted his interest in 1994 to wurtzite wide bandgap semiconductors for understanding the emission of light in compact solid-state diodes based on nitrides. Since 2015 he is more intensively focused to boron nitride and other two-dimensional semiconductors of the III-VI family, namely InSe, GaSe and GaTe. Gil contributed to the organization of tens of international events and contributed to the launching of several series semiconductor conferences: Int. Conf. on Nitride Sem., Int. Workshop on Nitride Sem., Phys. of Light Matt.Coupling in Nanostructures, ... Gil is Doctor Honoris Causa of the Saint Petersburg Univ. and of the Meijo Univ.of Nagoya. He was awarded the Welker Prize (wikipedia.org/wiki/Welker_Award) in 2018.

Intrinsic and Extrinsic Light Matter Interaction Processes in Hexagonal Boron Nitride

Boron nitride is a fascinating material, today found to be particularly useful for conceiving advanced optoelectronic devices as well for hyper-lensing applications in the far infra-red thanks to the marked hyperbolic nature of the phonon-polariton [1], to antiviral applications in line with its efficient emission of an ultraviolet radiation at wavelengths near 200 nm [2], the condition for optimal sterilization from aggressive pathological biological agents that are under the lime lights of the information. Boron nitride is also an excellent platform for quantum technologies with a lot of efficient single photon emitters [2,3]. The fundamental bandgap of this semiconductor exhibits a cross over from indirect between **~K** valence state and **M** conduction state to a direct one at **K,** from a bulk stacking to a single monolayer [4-7]. The exceptional radiative recombination rate of about 50% at room temperature, comparable to what is found for the direct wide bandgap semiconductor ZnO [8] is partly correlated to the efficient exciton-phonon interaction [9-12]. Besides many photoluminescence studies, complementary reflectance and transmission experiments have recently revealed a huge oscillator strength (and thus a particularly broad Reststrahlen band) for the optical transition at the energy of the direct bandgap of BN. This seems to be related to the high internal quantum efficiency alluded to earlier [13].

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