



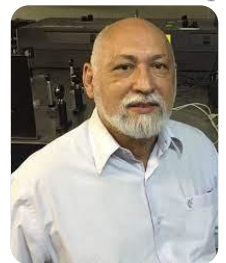
Universidade Federal de Pernambuco
DEPARTAMENTO DE FÍSICA - PÓS-GRADUAÇÃO

Colóquio (WEBINAR)

Shedding Light on Nonlinear Optics in 2D Layered Transition Metal Dichalcogenides

Anderson S. L. Gomes

Departamento de Física-UFPE



2D Layered Transition Metal Dichalcogenides (LTMDs) are bi-dimensional nanostructures consisting of atomically thin monolayers of the type MX_2 , with M representing a [transition metal](#) atom and X a [chalcogen](#) atom. Besides the well-known and studied semiconducting MoS_2 and WS_2 , semi-metallic ZrTe_2 and metallic NbS_2 are examples of 2D LTMDs. In this talk, I shall review the relevant properties of the four above-mentioned nanomaterials, highlight the fabrication methods, and will describe nonlinear optical studies covering a range of excitation regimes and different physical mechanisms explaining the nonlinear optical response. Using CW or CW/ML (>1MHz repetition rate) excitation sources with linearly or circularly polarized light, we show that the intensity dependent refractive changes are thermal in origin, $\sim 10^{-6} \text{cm}^2/\text{W}$, and lead to ring formation due to spatial self-phase modulation. Using optical sources with 1kHz repetition rate and 100fs pulse duration, we determined the intensity dependent nonlinear refractive index ($\sim 10^{-16} \text{cm}^2/\text{W}$) of electronic origin, besides, in some cases, the nonlinear absorption. We also show how ZrTe_2 can be used as a scatterer for a colloidal dye-based random laser.

02 de julho de 2021 (sexta-feira) - 16 horas

Através do Google Meet:

<https://meet.google.com/iiz-khpz-xuh>