סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות שתתקיים ביום ה׳   08.04.21

(כ״ו בניסן, תשפ״א), בשעה 13:45 באמצעות הזום :

https://technion.zoom.us/j/97482266956

מרצה :   מיכל שימנוביץ׳

מנחה :   פרופ׳ח כרמל רוטשילד

על הנושא:

Generalized Kirchhoff law in non-equilibrium conditions

The seminar will be given in English

תקציר ההרצאה :

Kirchhoff's law for thermal radiation is one of the few most fundamental thermodynamic principles for radiation. It states that the absorptivity, α, and emissivity, ε, of any material are equal if the material is in thermodynamic equilibrium; $\varepsilon = \alpha$. However, at non-equilibrium conditions, these two properties have not yet been related. Non-equilibrium or non-thermal emission, such as photoluminescence (PL), is characterized by photon absorption followed by photon emission. The ability of a material to photoluminescent is given by the quantum efficiency (QE), defined as the ratio between the photon emission and absorption rates, and similarly to emissivity, depends on the radiative and non-radiative rates of the material.

Here I show the generalization of Kirchhoff's law for non-equilibrium emission relating emissivity and QE for any material stating $\varepsilon = \alpha \times (1 - QE)$. I will present our theoretical derivation and experimental evidence.

Our generalization of the Kirchhoff's law for non-equilibrium radiation has broad implications on light and energy harvesting systems by describing the upper limit of any emission.

בברכה,

שלומ״ח אמי סאס
מרכז הסמינרים