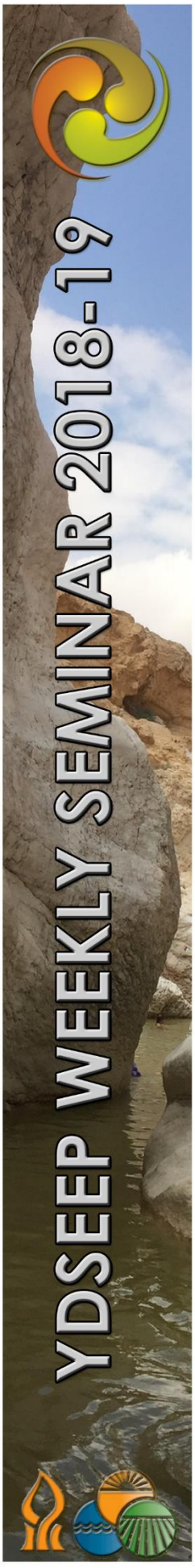

Ben-Gurion University of the Negev
Blaustein Institutes for Desert Research
The Swiss Institute for Dryland Environmental and Energy Research
Alexandre Yersin Department of Solar Energy and Environmental Physics

PHOTOVOLTAIC OPERATION OF PEROVSKITE SOLAR CELLS: WHAT WE UNDERSTAND AND DON'T YET UNDERSTAND

Eugene A. Katz, [1,2]

[1] *Dept. of Solar Energy and Environmental Physics, Swiss Institute for Dryland Environmental and Energy Research, The Jacob Blaustein Institutes for Desert Research (BIDR), Ben-Gurion University of the Negev, Sede Boker Campus 84990, Israel*

[2] *Ilse Katz Institute for Nanoscale Science & Technology, Ben-Gurion University of the Negev, Beer Sheva 84105, Israel*

Abstract:

Solar cells based on organic−inorganic hybrid perovskites have recently achieved a breakthrough
in the field of thin film photovoltaics, with high power conversion efficiencies (PCE) of over
24% for wet-processed devices. Nevertheless, these cells are still far from their full potential and their photovoltaic operation is far from detailed understanding.
I will discuss the following open questions and challenges:

1) Origin of the high open circuit voltage (Voc) of perovskite solar cells at room temperature;
2) Temperature dependence of principal photovoltaic parameters of the cells [1];
3) Contradiction between efficient photoluminescence of perovskite materials and low radiative efficiency of the cells;
4) How to improve the radiative efficiency and to achieve the Shockley–Queisser PCE theoretical limit;
5) Are the physical instabilities of photovoltaic operation of the cells (hysteresis, ultra-long photoresponse, etc) and their long-term degradation [2-3] interconnected?
6) Underlying mechanisms for reversible and irreversible degradation of perovskite solar cells [4,5];
7) How to access operational stability of perovskite cells with reversible degradation [6]?

Date & Location:

Tuesday, May 7, 2019, 11:00

Lecture room, Physics Building (ground floor)

References:

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