# סמינריון

הנך מוזמן/ת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ה' 15.12.16 (טו' בכסלו, תשע"ז), בבניין דן-קאהן, קומה 0, באודיטוריום 1 בשעה 14:30.

**יוצא**: גאיס אריק

**מנחה**: פרופ"מ סאס מתיו

**על הנושא:**

## Orders of magnitude hydraulic permeability increase and performance characterization of flow-through desalination electrodes

The seminar will be given in English

**להלן תקציר ההרצאה:**

The world is facing an ever-increasing demand for clean water, and approaches to combating water scarcity include technological development to increase water treatment efficiency and widen the pool of available water resources. A promising emerging technology is capacitive deionization (CDI), a research field that has witnessed considerable development in the previous decade. At its core, the CDI process utilizes a cell with two porous electrodes (usually carbon-based) electrically isolated by a separator. A constant voltage or current is applied between the electrodes while salty feedwater flows through the cell, which causes ion electromigration into the electrode pores while the desalted water flows out of the cell.

In the flow-through electrodes (FTE) architecture, feedwater passes directly through the electrodes' porous structure. FTE architecture offers fast desalination and a compact cell design, but flow pressures tend to be high due to the generally low permeability of porous electrode media, limiting the available selection of electrode materials to those with large, micron-scale macropores. A promising solution is presented via the laser perforation of flow channels into commercial CDI electrode material, which dramatically increases electrode permeability while maintaining desalination performance. Additionally, data from the FTE architecture has not yet been compared to a theoretical model which realistically describes electric double layers in the porous electrodes, so until now it was not known whether CDI performance in this architecture can be reasonably predicted. In this presentation, the collection and analysis of CDI data for a range of charging voltages as an integral part of a successful model-to-data comparison are described. The demonstrated electrode permeability increase and modeling data collection constitute meaningful advances in the progress of CDI FTE research.

בברכה,

*פרופ"א שמואל אוסובסקי*

מרכז הסמינרים