

## סמינריון

הנך מוזמנת להרצאה סמינריונית של הפקולטה להנדסת מכונות, שתתקיים ביום ה' 17.11.16 (טז' בחשוון, תשע"ז), בבניין דן-קאהן, קומה 0, אודיטוריום 1, 14:30.

ירצה: לאוניד פריימן

מנחה: פרופ' ח' גלעד יוסיפון

על הנושא:

### **Heat transfer enhancement in counter-flow-heat-exchanger for use in micro fabricated Joule-Thomson cryocooler**

The seminar will be given in Hebrew

#### להלן תקציר ההרצאה:

We studied the performance of micro Joule-Thomson ( $\mu$ JT) cooler, with integrated, micro counter flow heat exchanger ( $\mu$ CFHE) having internal structural pins and operating by nitrogen gas. Geometry of the  $\mu$ CFHE and fluid mass flow rate, were optimized to produce maximum cooling power under limitation of device inner pressure drop. The nitrogen is entering the cooler having inlet pressure of 2300 [psi] at room temperature and atmospheric pressure at the outlet. Heat transfer problem was solved by NTU method, using heat transfer coefficients obtained from experimentally derived correlations. Computational fluid dynamics (CFD) analysis results were validated by approximate solution and compared against experimental data obtained by experimental study conducted on glass made micro cooler. The device was produced by pieces and assembled, using photolithographic manufacturing technology and thermal bonding processes. It was found that, predictions made by using CFD based numerical analysis are in good agreement with measured experimental data, producing very little error.

בברכה,

פרופ' ח' גלעד יוסיפון

מרכז הסמינרים