

תוכנית האנרגיה ע"ש גרנד

**תכנית האנרגיה ע"ש גרנד מתכבדת להזמין להרצאה סמינריונית  
שתינתן ע"י:**

## **מיכאל אפשטיין**

**התכנית הבין-יחידתית לאנרגיה**

**בנושא:**

### **An Ignitor for Continuous Combustion of Nitrogen Based Alternative Fuels**

The increasing global energy demand coupled to the fact that fossil fuels combustion is harmful to the environment and our health, motivate the development of renewable energies. However, successful implementation of intermittent renewable energies (e.g. solar and wind) on a large scale, requires an energy storage medium. Advances in solar-based hydrogen production suggest that chemical energy storage can become an appealing solution. Chemical storage of hydrogen can be based on two elements: carbon or nitrogen, leading to carbon- or nitrogen-based fuels. On the nitrogen pathway one of the suggested fuels is aqueous Urea Ammonium Nitrate (UAN) mono-fuel .

The effect of changing the fuel heating rate on the auto-ignition temperature was investigated at pressures up to 200 bars. This was followed by the development of an ignition system that allows the effective utilization and study of UAN combustion. The constructed continuous laminar flow combustion system enabled investigation of the temperature profile inside the reactor at high pressures (i.e. up to 150 bars). The effects of pressure on the temperature profile and on the effluent compositions, which were continuously measured using a Fourier Transform Infrared Spectroscopy (FTIR) analyzer, were examined. The results from this research will be used in the future to refine previously suggested UAN combustion mechanisms via computer simulations. Furthermore, the constructed system can be used to study additional effects (e.g. flow rate and furnace temperature) and to implement a catalytic system to reduce pollutant levels.

**מנחים: פרופ' גדעון גרדר, ד"ר גנדי שטר, הפקולטה להנדסה כימית**

**במסגרת עבודת מחקר לתואר מגיסטר**

**ההרצאה תתקיים ביום ד', 7.9.16, בשעה 11:00, אולם 6, הפקולטה להנדסה כימית**