



Russell Berrie Nanotechnology Institute
Technion - Israel Institute of Technology



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▶ "Thin-film flexible electronics "

**Wednesday,
02 March, 2016**

12:00 refreshments
12:30 lecture

Wang Auditorium

The Dalia Maydan Building
Faculty of Materials Science and Engineering

RBNI
Monthly
Seminar
Series
2016



TECHNION
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Thin-film flexible electronics

Thin-film semiconductor devices can be processed on arbitrary substrates, such as glass, flexible plastic sheet, or on top of Silicon CMOS. We will discuss the use of this technology platform in opto-electronics, healthcare and IoT applications.

A large driver for thin-film semiconductors are active-matrix flat panel displays. Flexible displays are becoming a reality, and with them, the technologies to make high performance thin film transistors and OLEDs on large flexible plastic sheet. We will overview some key enabling technologies involving amorphous oxide semiconductors and flexible OLEDs.

Similar technologies are suitable to realize active-matrix photodetector arrays on glass or plastic substrates, amongst others for curved X-ray imagers. We use in that application organic photodetectors.

The thin-film electronic platform also allows to integrate active devices in printed circuit boards, chip packages, and in the backend of CMOS. We are exploring thin-film photodetectors sensitive to near-infrared, integrable as thin-film devices on standard CMOS camera's to expand the sensitivity of these camera's beyond 1 micron wavelength.

High-performance thin-film transistors on plastic substrates allow to design mechanically flexible electronic circuits. We explore the use of such circuits in applications such as NFC tags and skin patches.

Finally, we will discuss our developments towards solid-state rechargeable batteries on structured metal foils. A thin solid-state electrolyte layer is designed to enable ultra-fast charging, while the large micro-structured surface area will lead to a competitive energy density.