Name Yossi Paltiel

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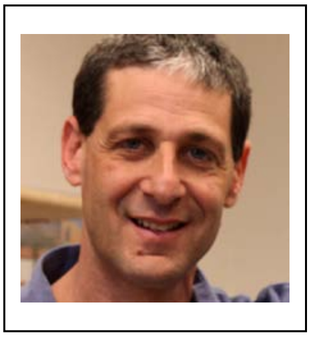

Education:

Weizmann Institute, Israel, Physics, PhD, 2002.

Weizmann Institute, Israel, Physics, M,Sc., Graduate with distinction , 1997.

Hebrew University, Israel Physics and Mathematics, BSc Graduate with distinction, 1995.

Current position

2017 to present – Full Professor, Hebrew University of Jerusalem, Israel.

2012 to 2017 – Associate Professor, Hebrew University of Jerusalem, Israel.

2009 to 2012 – Senior Lecturer, Hebrew University of Jerusalem, Israel.

Previous position

2008 - Head of the electro optical division, Compass EOS - High Tech Company, isreal.

2005-2009 - Tenure investigator, Soreq NRC National Lab, Israel.

2003-2005- Tenure track, Soreq NRC National Lab, Israel.

2002 -2003- Group leader, Chiaro Networks High Tech Company, Isreal.

Research interests:

Professor Yossi Paltiel has worked for both leading high-tech industry groups and in the academic world. He was the head of the Applied Physics Department 2013-2016. Paltiel's group’s goal is to establish a way to incorporate quantum mechanics into room temperature "classical" computation and devices reading scheme mimicking Biology and Chemistry processes. In this sense the group also works on spin interfaces using chiral molecules and materials. Professor Paltiel has published more than 130 papers in leading journals as well as issued 13 patents. Paltiel has two startup companies. The first named Valentis Nanotech founded in 2013. The company utilizes nanocellulose unique properties to produce a biodegradable transparent sheet with additional controlled optical and gas/water barrier properties. The 2nd company named Kiralis is funded in 2018 and separate enantiomers using magnetic interface interactions. Winner of the 1st place The Kaye Innovation Awards 2019. Co-Chair of the 2021 Gordon conference on Electron Spin Interactions with Chiral Molecules and Materials to take place in 2021. Group web page: https://www.qnelab.com/.

Selected publications:

1. K. B. Ghosh, O. Ben Dor, F. Tassinari, E. Capua, S. Yochelis, A. Capua, S.-H. Yang, S. S. P. Parkin, S. Sarkar, L. Kronik, L. T. Baczewski, R. Naaman, and Y. Paltiel; *Enantio-Specific Interaction of Chiral Molecules with Magnetic Substrates* Science 10.1126/science.aar4265 (2018).

2. Ron Naaman, Yossi Paltiel, David H. Waldeck; *Chiral molecules and the electron spin*; Nature Review Chemistry DOI: 10.1038/s41570-019-0087-1 (2019).

3. Hen Alpern, et al.; *Magnetic-related States and Order Parameter Induced in a Conventional Superconductor by Nonmagnetic Chiral Molecules*; Nano Letters **19**, 8, 5167-5175 (2019).

Spintronics and Superconducting Spintronics Based on Chiral Molecules

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The high level of energy dissipation associated with the present semiconductor-based integrated-circuit technology limits the devices operating frequency. In view of these problems, new concepts of computing and data storage must address the issue of energy consumption. One such concept that attracts considerable interest nowadays combines spins with electronics (spintronics). In principle, the application of spintronics should result in reducing the power consumption of electronic devices getting closer to the thermodynamic limit. Two major issues elude farther use of spintronics; material problems and the spin separation high currents.

Using the spin selectivity in electron transport through chiral molecules, termed Chiral-Induced Spin Selectivity (CISS) we can realize simple local and power efficient spintronics devices. Studying the CISS effect we found that chiral molecules, and especially helical ones, can serve as very efficient spin filters. Recently, by utilizing this effect we demonstrated a simple magnet-less spin based magnetic memory working at ambient conditions at 30nm active size [1-4]. Optical magnetic memory was presented as well [5-6]. Moreover, we show that chiral molecules induce magnetization reversal in ferromagnetic thin films with perpendicular anisotropy when adsorbed on its upper surface without the use of electrical current, reducing the need for high current for magnetization reversal [7]. To farther enhance efficiency and speed, we developed a superconducting spintronics approach [8-9].

[1] O. B. Dor *et al*, *Nat. Comm.* **4**, 2256 (2013).

[2] S. P. Mathew, *et al*, *Appl. Phys. Lett.* **105**, 242408 (2014).

[3] G. Koplvitz, *et al*, *Adv. Mat.* **29**, 1606748 (2017).

[4] H. Al Bustami, *et al. Small 1801249* (2018).

[5] O. B. Dor *et al*, *Nano Lett.*, **14**, 6042 (2014).

[6] M. Eckshtain-Levi, *et al.*, *Nat. Comm.* **7** 10744 (2016).

[7] O. B. Dor *et al.*, *Nat. Comm.* **8**, 14567 (2017).

[8] H. Alpern, *et al*, *New J. Phys.* **18**, 113048 (2016).

[9] N. Sukenik. *et al*, *Advanced Materials Technologies* **3**, 1700300 (2018).