Vice President for External Relations &
Resource Development
סגן נשיא לקשרי חוץ ופיתוח משאבים

February 23, 2017

Mr. Stanford Rubin
Trudy Mandel Louis Charitable Trust
Loeb & Loeb LLP
10100 Santa Monica Blvd #2200
Los Angeles, CA 90067
USA

Dear Stan,

I'm delighted to forward you the enclosed report by Prof. Meir Orenstein, on the recent activities supported by the **Trudy Mandel Louis Charitable Trust Nanophotonics Research Fund.**

As you can see from the report, Prof. Orenstein and his colleagues have achieved some excellent research results, some of which may have substantial impact on MRI development.

It is always a pleasure to acknowledge the commitment and dedication of the Trudy Mandel Louis Charitable Trust. The Technion is a leader in its field as an institute of technology. It is at the cutting edge of scientific, technical and medical advancements throughout the world. Your generous contribution enables it to remain there.

Yours sincerely,

Prof. Boaz Golany
Vice President
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SS/2017

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Trudy Mandel Louis Charitable Trust

Nanophotonics Research Fund

2016 Annual Report

Report by Prof. Meir Orenstein, Head of the Program

Research Progress

This year, thanks to the generosity of the Trudy Mandel Louis Charitable Trust, important progress was made in several areas, including novel nanophotonic detectors, light emitters and sensors.

The groups of Profs. Meir Orenstein, Gad Eisenstein, Dan Ritter, David Gershoni, Nir Tessler, Gad Bahir and Gitti Frei devoted substantial research efforts towards the design implementation and measurement of novel specialized detectors and sensors – based on nanophotonic technologies. The research on GaN quantum cascade detectors on silicon that was reported on last year continued and attracted the attention of the Israeli Defense Ministry, who started funding application of this technology. In this year, we had a breakthrough in novel technology – detectors and light emitters based on nanostructure of the material InP - in the shape of flags – that are giving excellent unique characteristics.

Groups at the Technion headed by Profs. Meir Orenstein, Erez Hassman, Guy Bartal continued to develop nanostructured configurations – which are called metamaterials (beyond materials). Our superb results in this field were recognized by publications in the most prestigious scientific journals, and several applications were already demonstrated including very small instruments for measuring sugar concentration.

Sensors were another field of advancement and the groups of Profs. David Gershoni, Eyal Bucks and Meir Orenstein made substantial progress in making nanophotonic arrangements around diamond color centers – these are very small

defects in diamonds that are extremely sensitive to magnetic fields – thus can be used in miniature MRI, brain magnetic imaging etc.

To promote this research, we devoted the main part of the generous **Trudy Mandel Louis Nanophotonics Fund** to the most successful integrated work – here the research was performed by a collaboration of two or more principle investigators.

Use of the Trudy Mandel Louis Charitable Trust Grant

As reported last year, the money allocated by the fund for the first year was part of the purchase price of the electron beam lithography machine – a critical tool in the nanophotonics development. This year, 70% of the money was allocated towards assistance in collaborative research of the nanophotonics group – including the research of Profs. Dan Ritter and Meir Orenstein on detectors and light emitters based on “nanoflag” structures, Profs. Nir Tesler and Gitti Frei on integration of organic semiconductor layer on CMOS imaging chip to enable cheap imager at extended wavelength and Profs. David Gershoni and Eyal Bucks on superconductor based light detectors. 20% of the annual allocation was devoted to the establishment of scientific infrastructure of a new faculty member – Alex Hayat, who is doing advanced research in nano opto-electronics. 10% of the money was devoted to maintenance and operational costs of equipment in the Technion micro-nano fabrication facility.

THANK YOU!