Tel Aviv University Center
for Nanoscience and Nanotechnology
Tel Aviv University

The Wolfson Applied
Materials Research Center

The Chaoul Center for
Nanoscale Systems

NANONEWS

January 2023

New Equipment

Facing our new and high-end Nanocenter, we are continuously upgrading our fabrication and characterization fleet. Our goal is to enter the new facility as the most advanced Nanotechnology Center to enable TAU PI's outstanding research.

MA/BA6

Latest generation photolithography systems

Our old mask aligner tools were upgraded and the first MA6 Gen4 arrived to the Nano cleanroom just before the holidays, and students' training has been ongoing since Sukkot. The second tool was installed in the engineering cleanroom last week.

Suss Micro Tech's MA/BA6 Gen 4 series is the latest generation of mask aligners for academia and R&D. In addition to LED light sources, both devices have auto-alignment capabilities. Safety is improved by an integral UV shield. By adding dose control and predefined exposure recipes, the user interface makes photolithography faster and easier for inexperienced user.

AFM

Two new AFM systems have been purchased recently. The manufacturer is Park, represented in Israel by AVBA company. It is expected that the tools will be installed by the end of Q1 2023.
Park NX10 platform is equipped with the most innovative features, such as true non-contact AFM that prolongs tip life while preserving your sample, and a comprehensive range of scanning modes so you can collect a wide array of data types accurately and efficiently.
Park NX12 is aimed at molecular engineering studies, including biological samples, cells, and soft materials analysis. The AFM is equipped with an optic microscope, liquid cell for wet samples analysis, and temperature controller.

New Equipment

TEM & SEM

We have made significant progress in replacing our microscopy fleet and will be able to offer a greater range of materials characterization research capabilities.

Scanning Electron Microscope (Apreo by ThermoFisher) - Angular-Polarized-Time resolved Cathode Luminescence on low temp; SEM including laser triggering at e-beam source and sample positions. The system arrived last week and it is in installation process.

A new scanning and transmission electron microscope (Talos by ThermoFisher) arrived on December and will be installed soon. This is a versatile, high throughput, extremely user-friendly, new generation instrument that delivers atomic resolution analysis in both TEM and STEM mode.

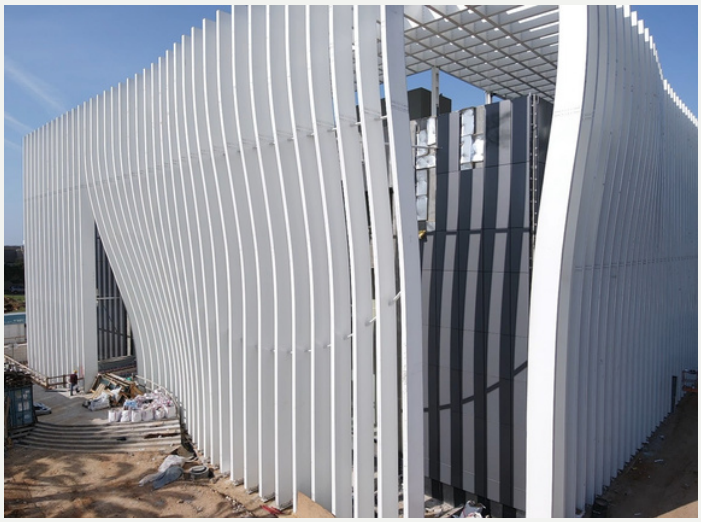
Nanocenter Research Capabilities Recap

SPECTROPHOTOMETER PERKINELMER LAMBDA 1050+

PerkinElmer LAMBDA 1050+ UV/Vis/NIR spectrophotometers are designed to offer the highest performance and flexibility to analyze a wide range of sample types, including analysis of coatings, high performance glass, solar, and advanced materials and components in both research and manufacturing. It meets and often exceeds industry standards for ultra-high performance, flexibility, and convenience. The latest generation of LAMBDA 1050+ spectrophotometers are designed to offer faster scan rates, instrument setup and better response times than ever before to maximize your productivity. It provides fullrange UV/Vis/NIR coverage from 175 nm to 3300 nm.

New Building status

The steel structural frame of the building has been completed. Installation of facilities, construction of clean rooms, and construction of labs are the current activities.
The Nanocenter Tool Design Layout has been completed, and we have moved onto the Tool Detailed Design phase. The next step on our roadmap is to develop a detailed microschedule for tools relocation. The construction is expected to be completed by summer 2023.



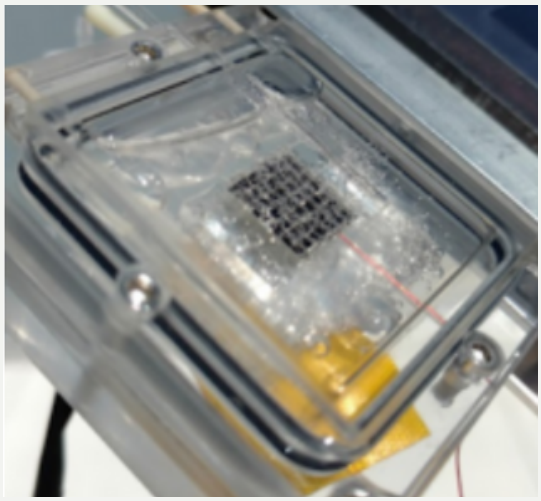
Nanotechnology Research

SOLAR FUEL GENERATOR INCLUDING A CATALYTIC MESH

Dr. Gideon Segev, together with team members from Lawrence Berkeley Laboratories, developed a solar cell for hydrogen production using photo-electrolysis, a completely green hydrogen production method that honored him the prestigious 2022 R&D 100 award.

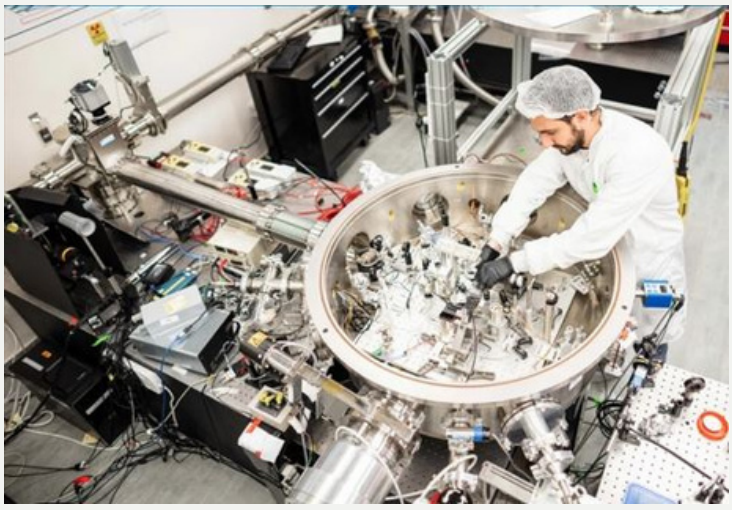
Green hydrogen is a clean, renewable alternative to hydrogen that is today produced from fossil fuel sources. This invention generates limitless quantities of green hydrogen, using only sunlight and water and producing only oxygen as a byproduct. Its standalone, modular nature promises to bring the benefits of clean hydrogen everywhere, even where there is no electrical grid or large scale manufacturing infrastructure as is required by current electrolyzer technology.

https://newscenter.lbl.gov/2022/08/23/rd-100-awards-honor-seven-berkeley-lab-innovations/



Solar fuel generator device. (Credit: Karl Walczak

A NUCLEAR FUSION RESEARCH INSTITUTE, DESIGNED TO PRODUCE GREEN ENERGY, WILL BE ESTABLISHED IN ISRAEL IN 2023



The fusion technology is a prominent alternative in the field of energy production, and it is possible that it could be used in the future as a solution to the climate crisis. Dr. Yishai Pomeranz and Israeli researchers, will try to develop innovative methods at the institute to deal with the challenges on the way to fusion-based power plants

https://www.haaretz.co.il/science/2022-12-19/ty-article/.premium/00000185-2b24-dd96-af85-3bbce3d40000?utm_source=App_Share&utm_medium=iOS_Native

Nano Community Events

OASIS 8 CONFERENCE

TAU Center for Nanoscience & Nanotechnology participated in the OASIS conference in Tel Aviv, where we exhibited our patterning, material analysis and imaging capabilities.
OASIS8 was dedicated to the fields of micro and nano-optics; optics in medicine and biology; electro-optics in industry; optical engineering; electro-optics in defense; spectroscopic and optical sensing; electro-optics devices and more.

HANUKKA- NANOBEAR

We had our quarterly Nano-Beer and also a toast to celebrate the lighting of the 4th Hanuka candle.

Nano Community Events

“SEEING BIG”

To raise awareness about microscopy among the young generation, we hosted a group of elementary school students from the school 'Levy Eshkol' in Lod as part of the project "Seeing big" (volunteer project) under the Israeli Society for Microscopy.

Congratulations to Nastia on the birth of her new baby girl

visit us at :