



Bar-Ilan
University

Summer Program in Nano Photonics

Optical Super Resolved Imaging
and Fluorescent Microscopy

For Outstanding Postgraduate Students

2.7.2017 - 27.7.2017



Faculty of Engineering
Department of Electrical Engineering

The summer program allows students to create a rigorous academic experience that combines one advanced course with an exciting social and cultural program at Israel's finest department of electrical engineering at Bar-Ilan University.

The program centers around one core course which carries 4 academic credits and is taught by Bar-Ilan University.



<http://www.eng.biu.ac.il/nano-photonics/>

Population and requirements:

- First level degree (B.A.) graduates in electrical engineering or physics
- Potential for advanced studies (MSc. or Ph.D.) level
- Required prior knowledge: Introduction to optics course (with final grade of at least 80)
- CV including list of courses, syllabus and final grades and two recommendation letters must be applied
- Good level of English (Ability to read and write)

Acceptance to each academic course is dependent on approval of prerequisites by Bar-Ilan.

Notice: *Excellent graduate students (MSc, PhD) are invited to apply.*

Schedule: 2.7.2017 - 27.7.2017

Four weeks, Sunday-Thursday, 9:00-16:00 (including one hour Lunch Break); **4 days a week** - at class.
One day a week enriching contemporary Israeli studies visiting study tour.

Total: 104 academic hours, 4 credits.

Program Overview:

The field of super resolution relates to the effort of developing various approaches to exceed the limitations of existing imaging system without changing its optics or its detection array and while allowing resolving finer spatial details. In this course we aim to teach large variety of super resolving approaches presenting significant improvement in spatial resolving capabilities in the transversal as well as in the axial (extension in depth of focus) dimensions. The proposed approaches to be taught involve time multiplexing, space multiplexing, wavelength multiplexing, geometric super resolving concepts and others. The teaching of the super resolved concepts will include approaches relevant for remote sensing as well as approaches for near field imaging dealing also with fluorescent nanoscopy- PALM, STORM, STED and structured illumination microscope.

Topic Covered include among other:

- Space bandwidth product adaptation technique.
- Optical super resolution exceeding the aperture limitation by usage of time, space, wavelength and angles multiplexing.
- Near field optical super resolution. Nanoparticles based nanoscopy.
- Time-Domain and Frequency-Domain Lifetime Measurement (including hands-on Lab).
- Fluorescence-Lifetime Imaging Microscopy and Anisotropy (including hands-on Lab).
- Metal-Enhanced Fluorescence (including hands-on Lab).
- Surface Plasmon-Coupled Emission.

All classes taught by **Prof. Zeev Zalevsky** and **Prof. Dror Fixler**

Notice: *Attendees should have some knowledge of fluorescence, typically in a specialized area.*

Admissions & Cost

Full Scholarship for outstanding candidates from China!

Under a unique Israeli Council of higher Education Sponsorship, excellent students from China will receive a scholarship covering full tuition costs for the program, including housing in Bar-Ilan's village near by Tel-Aviv, daily lunch at Bar-Ilan cafeteria (5 days a week) and a monthly allowance.

Optical Super Resolved Imaging and Fluorescent Microscopy

Faculty of Engineering

Contact Information and registration: Department coordinator:

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