

Company Introduces Novel Nanotechnology for Revolutionizing Imaging Using T-rays

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Yissum Research Development Company of the Hebrew University of Jerusalem today announced that Professor L.D. Shvartsman and Professor B. Laikhtman, from the Racah Institute of Physics at the Hebrew University of Jerusalem, have invented a novel design of TeraHertz-ray, or T-ray, lasers.

Using nanostructures which are based on semiconductors with special properties, the novel device will have 400 times higher gain than THz quantum cascade lasers, the only coherent T-ray sources existing today , This invention will make T-ray based cameras and spectrometers practical, ushering a new era in security and medical imaging.

T-rays are [electromagnetic waves](#) with a wavelength shorter than microwave but longer than infrared. They are extremely attractive for various imaging applications due to three main reasons: they can penetrate through various substances, including clothing and even walls, they are harmless, and therefore allow a safe use for healthcare and homeland security applications and they can detect various chemicals, in particular explosives. Thus, T-ray-based devices can detect hidden weapons and explosives, as well as improve patient care and safety in healthcare facilities by allowing an unlimited number of exposures for medical examinations.

However, despite all the advantages of T-rays, they are barely used due to lack of T-ray emitters that will generate powerful, coherent and adjustable terahertz waves. The invention of Professor Laikhtman and

Professor Shvartsman overcomes these current limitations and suggests the design of effective THz lasers.

"[TeraHertz](#) rays are the imaging method of the future. They are comparable to [X-rays](#) in terms of their ability to penetrate opaque substances, but more importantly, they are harmless," said Yaacov Michlin, CEO of Yisum. "The novel method to produce efficient T-ray emitters will enable the use of this important imaging source for various applications, including security and medical applications."

Source: Hebrew University of Jerusalem ([news](#) : [web](#))

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