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Let There Be (Computerized) Light

An interview with Professor Amr Helmy
Quantum Photonics Engineer, University of Toronto

What is photonics?

The basic sort of idea of what photonics is, for a lay person, is basically the field which harnesses the power of light, and its basic components, being the photons, and it actually utilizes its capabilities to benefit societal and other means, in the fields of perhaps telecommunications, environmental monitoring, health, and other fields; security as well.

What does your research focus on specifically?

So my personal interest in research and my passion is actually to be able to take the capabilities that have been built around labs, but then the idea is to be able to miniaturize them and put them down on a little chip that can be battery powered, sitting in your cell phone or could be hooked up to your sort of tablet to provide you with a better monitoring of your vital signs, or monitor environmental toxins, or otherwise, just by using the power of the phone itself and very little else. So these are more the medium term achievements. On the longer term achievements, because we are able to utilize the photons on the extreme nanoscale – tens of nanometers – which means you could do that a thousand times on the cross-section of your hair, we are able to treat the photon as an individual indivisible component, if you will, and then we can profit from its quantum properties. So you would be able to take the technology through this miniaturization to where it is most delicately needed.