

Professor Eli YABLONOVITCH

Citation

Prof Eli Yablonovitch is an ambidextrous scientist who is equally adept in handling science and commerce. He may be better known to the world as a distinguished professor at UC Berkeley, but he is also a co-founder of Luxtera Inc., a California-based manufacturer of electronic components, which was selected as one of the World's 50 Most Innovative Companies in 2010 by *MIT Technology Review* for having demonstrated its superiority at inventing technology in building a better business and a better tomorrow.

Prof Yablonovitch was no stranger to industry. After graduating from Harvard with a PhD in Applied Physics, he worked for two years at Bell Telephone Laboratories followed by a stint as a professor at Harvard. He joined Exxon in 1979 to do research on photovoltaic solar energy. Five years later, he became a Distinguished Member of Staff at Bell Communications Research and Director of Solid-State Physics Research. He is now Director of the NSF Center for Energy Efficient Electronics Science, a multi-university center based at Berkeley, where he holds the James & Katherine Lau Chair in Engineering.

Prof Yablonovitch has had profound influence on both industry and academia. He was one of the two applied physicists who invented the field of photonic crystals in 1987. In fact, he is a rare scientist who has an invention named after him, 'Yablonovite', a 3-dimension structure that exhibited a full photonic bandgap that he and his team created. For this achievement, he is revered as one of the fathers of the Photonic Band Gap

Concept and is credited with coining the term 'photonic crystal'. Among other things, he was also responsible for developing a technique that is now applied to the majority of semiconductor lasers fabricated throughout the world, including telecommunications lasers, laser pointers and DVD players.

He is a man of diverse scientific interests. His current research in quantum computing and quantum communication is ushering in a revolutionary change, in which electrons in semiconductors will store quantum states which can be used to harness astronomical volumes of information. In this hi-tech age, things are getting smaller, with the tiniest features of the chip getting to the molecular level, and things are also getting faster, and of course everything is becoming wireless. For those with an interest in high speed optical communications and high efficiency light-emitting diodes and nano-cavity lasers, Prof Yablonovitch is your man. His work is where the industry's future is.

Throughout his career, he has been wrestling with one of the main global issues: energy, specifically solar cells as an alternative source of energy. Prof Yablonovitch began his solar cell research as far back as 1979, when the US was reeling from the oil shock of 1973. He looked for and found the ideal material for making solar cells. In his photovoltaic research, he has introduced a light-trapping factor, sometimes called the 'Yablonovitch Limit', that is used commercially in nearly all solar panels. His research work led him to co-found Alta Devices,

whose goal is to create solar cells of the highest efficiency at the lowest cost. In his continuous quest, Prof Yablonovitch is of the view that for solar efficiency to reach its utmost limit, light extraction physics has to be designed into solar cells. This has led to new solar cell efficiency records being broken.

For his many contributions Prof Yablonovitch has been showered with honors throughout his career. He is a Fellow of the IEEE, the Optical Society of America and the American Physical Society. He is also a Member of the National Academy of Engineering and the National Academy of Sciences. He is the recipient of the Adolf Lomb Medal, the W Streifer Scientific Achievement Award, the R W Wood Prize, the Julius Springer Prize and the Mountbatten Medal, and an honorary doctorate from the Royal Institute of Technology in Stockholm, Sweden. This list, lengthening by the year, is by no means exhaustive. Today we honor a world-leading scientist whose innovative excellence is equaled only by the breadth of research interest. His eyes are trained on the widening horizons of scientific promise, and his ear is kept to the ground of industrial needs and urgency.

Mr Chancellor, on behalf of the Council of the Hong Kong University of Science and Technology, I have the high honor of presenting to you Prof Eli Yablonovitch, James & Katherine Lau Chair in Engineering and Professor of Electrical Engineering and Computer Sciences at UC Berkeley, for the award of Doctor of Engineering *honoris causa*.