



Professor Axel Scherer

Axel Scherer is the Bernard A. Neches professor of electrical engineering, applied physics and physics at Caltech. He received his PhD from the New Mexico Institute of Mining and Technology in 1985 and subsequently worked at Bellcore on the microfabrication of optoelectronic devices. In 1993, he joined Caltech and formed a nanofabrication research effort centered on optical, magnetic, electronic and microfluidic devices.

Professor Scherer's research effort includes the development and application of new microfabrication and design methods. In the past, Professor Scherer has pioneered the development of vertical cavity lasers. He successfully packaged these devices into the first large addressable arrays. Professor Scherer's group also developed electromagnetic design tools for the definition of high Q optical microcavities and pioneered silicon opto-electronic devices in the silicon on insulator materials system. Moreover, Professor Scherer's group miniaturized spectrometers and integrated fluidics into optical devices, and pioneered silicon photonics in the late 1990s, founding Luxtera in 2001. Fundamentally new structures, such as the photonic bandgap nanocavities created by three-dimensional microfabrication in Professor Scherer's laboratory have led to the first demonstration of strong coupling between single quantum dots and optical microcavities. This work has resulted in some of the world's smallest lasers, modulators and waveguides, as well as very high efficiency solid state light emitters based on metal surface plasmons. Professor Scherer has co-authored over 250 publications and holds over 50 patents on microfabrication and design of devices. In his research group, design and fabrication techniques are presently applied towards the miniaturization of integrated microfluidic valves and pumps with optical micro- and nano-devices for nanophotonics and nanobiotechnology.