"New silicon photonic components enabled by MEMS technology"

Abstract
Silicon photonics is the study and application of integrated optical systems which use silicon as an optical medium, usually by confining light in optical waveguides etched into the surface of silicon-on-insulator (SOI) wafers. Microelectromechanical systems (MEMS) refers to the technology of mechanics on the microscale actuated by electrostatic actuators. Due to the low power requirements of electrostatic actuation, MEMS components are very power efficient, making them well suited for dense integration and mobile operation. MEMS components are conventionally also implemented in silicon, and due to the success of the silicon MEMS platform, MEMS sensors such as accelerometers, gyros, and microphones are now standard in every smartphone. By combining these two successful technologies in a single SOI wafer, new active photonic components with extremely low power consumption can be made. We discuss our recent experimental work on tunable filters, tunable fiber-to-chip couplers, and thermal emitters and detectors enabled by the marriage of silicon MEMS and silicon photonics.

Short bio:
Kristinn B. Gylfason is an assistant professor of Micro and Nanosystems at KTH Royal Institute of Technology, Stockholm, Sweden. He received the title of Docent in Micro- and Nanosystems and the PhD degree in Electrical Engineering from KTH in 2015 and 2010, respectively, and the BSc and MSc degrees in Electrical Engineering from the University of Iceland in 2001 and 2003, respectively. From 2003 through 2005 he was with Lyfjathroun Biopharmaceuticals, Iceland, and in 2005 he received the Steinmaur Foundation nanotechnology graduate study scholarship. He received the Göran Gustafsson Young Researcher Price as well as the largest Young Researcher grant awarded by the Swedish Research Council to KTH in 2011. During spring 2013 Kristinn was a visiting post-doctoral scholar at the Photonics Group, Ghent University, Belgium. His research involves photonic nanodevices for biomedical and communications applications.