

Workshop speaker	
Full Name	Gyungock Kim
Affiliation	ETRI
Presentation Title	Silicon photonic platforms for future computing & data communications
Biography	
<p>Gyungock Kim received the B.S. and M.S. degrees in physics education, and physics from Seoul National University, Seoul, Korea, in 1979 and 1981, respectively, and the Ph. D. degree in physics from University of Notre Dame, Notre Dame, IN, USA in 1988. From 1988 to 1991, she was a research associate in Synchrotron resource of HHMI, and a member of participating research team of NSLS in BNL, Upton, NY, USA. She also held the part-time postdoctoral position in Columbia University, New York, NY, USA, from 1990 to 1991. She joined Electronics &amp; Telecommunications Research Institute (ETRI), Daejeon, Korea in 1992, where she is currently a principal member of research staff. From 2004 to 2005, she was the director of the Optical devices research department. Since 2006, she is in charge of the silicon photonics research project of ETRI. From 2007 to 2017, she was a professor in the department of Advance device engineering, University of Science and Technology (UST), Daejeon, Korea. She has mainly investigated semiconductor quantum electronic/optoelectronic devices, ultra-high speed optoelectronic devices, and silicon photonic devices and integrated circuits.</p>	
200 words abstract	
<p>We present and discuss our major works on silicon photonics devices and PICs on either SOI platform or bulk-silicon platform, developed and fabricated solely in ETRI, and their applications. First, we overview Si-PICs for inter-chip/intra-chip optical interconnects, where Si optical modulators and Ge/Si PDs were monolithically integrated on SOI, operating up to 40~50 Gbps, and a new scheme of small-size vertically-dipped depletion-junction (VDJ) MZ modulator operating 50 Gb/s. We also present all-silicon photonic receiver and transmitter, operating up to 36 Gb/s, where Si photonic devices and CMOS ICs were hybrid-integrated.</p> <p>We introduce a bulk-Si photonic platform for practical implementation of chip-level optical interconnects (OIs), and the performance level. We have proposed a new integration scheme of single-chip photonic TRx as a bulk-Si platform for viable chip-level optical I/Os, based on a monolithic-integrated vertical photonic I/O device set including light source. We demonstrated a prototype of single-chip photonic TRx, realizing low-power chip-level OIs between chips. It can be also advantageous for 3D OIs in stacked ICs. Currently, ETRI is conducting a research on bulk-Si photonic platform for 2D/3D OIs. Success of this research can give a significant impact on practical electronic-photonic integrations. We also present high performance vertical-illumination-type Ge/Si PDs and APDs on bulk-Si, ready for practical applications.</p>	