

## mm-Wave and Fiber-optics Design in FD-SOI CMOS Technologies

**Abstract:** This lecture will cover the main features of FD-SOI CMOS technology and how to efficiently use its unique features and suitable circuit topologies for mm-wave and broadband SoCs. I will overview the impact of the back-gate bias and temperature on the measured I-V, transconductance,  $f_T$ , and  $f_{MAX}$  characteristics and compare the maximum available gain, MAG, of FDSOI MOSFETs with those of planar bulk CMOS and SiGe BiCMOS transistors through measurements up to 325 GHz. Next, biasing, sizing and step-by-step design examples will be provided for VCO, doubler, switches, PA, large swing optical modulator drivers and quasi-CML circuit topologies and layouts that make efficient use of the back-gate bias to overcome the limitations associated with the low breakdown voltage of 20nm and 12nm FDSOI CMOS technologies.