

Silicon and silicon germanium transistors with feature sizes below 100 nm have demonstrated operation in sub-terahertz and terahertz frequency ranges with potential applications in communications, Beyond 5G WIFI, sensing, and imaging. New features of ballistic electron transport in deep submicron devices must be accounted for design, modeling, and characterization of Si and SiGe transistors operating at sub-THz and THz frequencies. The key issue is the crucial role that the electron inertia and electron viscosity play at ultra-short sizes determining the frequency and decay of the plasma waves, which are the electron density oscillations in the transistor channel. This webinar will review of the state-of-the art of the Si and SiGe THz electronics and the existing and potential applications of this technology and will discuss the new device physics that is the key for developing the next generation of Si and SiGe THz devices and systems.