

Short course (half-day): **Planar Antennas for Wireless Communications and Their Recent Advances**

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**Course Outline:** Planar antennas, including microstrip and printed antennas, metal-plate antennas, ceramic chip and dielectric resonator antennas, are generally flat in appearance and have a low profile. Such planar antennas have recently found extensive applications in mobile systems (such as 900/1800 MHz bands), wireless local area networks (WLANs, such as 2.4/5.2/5.8 GHz bands), and ultra-wideband (UWB, such as 3.1 ~ 10.6 GHz band) communications. Many innovative planar antennas for related applications such as in the internal mobile phone antennas, base-station antennas, WLAN mobile-unit (laptop, PDA) and access-point antennas, UWB antennas have been reported recently. These recent developments in planar antennas for applications in mobile, WLAN and UWB communications will be addressed. The topics for this short course will include (more than 100 related planar antenna designs will be presented):

- (1) **Internal dual-/multi-band antennas** for mobile phones, PDA phones, clamshell phones and sliding phones; the concept for **EM compatible (EMC) internal mobile phone antennas** will also be introduced.
- (2) **Base-station antennas for mobile systems**, including dual-band and/or dual-pol operations.
- (3) **WLAN mobile-unit antennas**, including dual-band and/or diversity operations; the recently developed **EMC chip antenna and the antenna mountable above the system ground plane of the mobile unit** will be discussed. The design of **system in package (SiP) with an embedded antenna** will also be presented.
- (4) **WLAN access-point antennas**, including dual-band operation, broadband CP (broadside and omnidirectional) radiation, high-gain omnidirectional radiation and diversity operation.
- (5) **UWB antennas for mobile units and access points**, including the design techniques for UWB impedance matching, improved omnidirectionality in the azimuthal radiation, pattern stability, polarization purity and band-notching.
- (6) **DTV antennas** for portable devices such as the mobile phone, PMP (portable media player), laptop computer and the like.