Talk title: **Towards Smart and Reconfigurable Environment: Intelligent Reflecting Surface Aided Wireless Network**

Abstract: In this talk, we introduce a new wireless research paradigm by leveraging a massive number of low-cost, passive, reflecting elements with controllable amplitude and phase, named intelligent reflecting surface (IRS), which is able to smartly change the wireless signal propagation to achieve 3D beamforming and interference suppression. We first illustrate the main applications of IRS in realizing spectrum and energy efficient as well as secure and sustainable wireless networks in the future, and highlight its main advantages as compared to other existing technologies such as massive MIMO and active relay. We then present the signal models of IRS by taking into account its hardware implementation constraints in practice. Next, we focus on discussing the main design challenges in IRS-aided wireless networks, including joint active and passive beamforming optimization, channel estimation, and IRS deployment. Finally, we show the practical performance gains of IRS in a multiuser wireless system and draw useful insights.

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