A new generation of metasurface antennas

"Metasurface" (MTS) denotes a surface constituted at microwave frequency by PCB or 3D printed elements small in terms of wavelengths that collectively exhibits equivalent homogeneous boundary conditions to any interacting electromagnetic fields. MTSs have had and are having a strong impact in Antenna applications. In the years 2000-2010 MTS for antennas were essentially uniform in space and realized by periodic printed elements. This was the first generation of MTS. In the second generation (2010-2020), MTS for antennas was constructed in such a way to change boundary conditions in space and control the scattered field. Today we are facing a transition to the third generation of MTS antennas, where MTSs change boundary conditions in space and time, opening new perspectives in 5G communications and beyond. In this presentation, the evolution of MTS antennas is described, with new ideas and examples on future communication scenarios.