Reconfigurable RF integrated circuits are an attractive feature to sustain the increasing number of standards and functionalities of modern mobile devices. While back-end circuits in a radio transceiver (e.g., baseband analog, IF and digital) can be reconfigured using MOSFET switches, front-end circuits require high performance switches since resonant narrowband circuits require high quality factor inductors and capacitors. Phase-change-materials (PCM)-based RF switches have been proposed as high-performance RF switches due to their excellent transmission properties, small footprint, low power consumption, and non-volatility, which make them great contenders for reconfigurable RF applications.

Project Description:

In this project, a dual-band patch antenna controlled by PCM-based RF switches will be designed and evaluated. These antennas are fundamental features in phased-arrays, which are necessary in 5G RF systems. The project is based on advanced research. The implementation will be done in HFSS and/or ADS.

Schedule:
- Study of the basics of patch antennas and PCM RF switches.
- Evaluation of different topologies to integrate the PCM switches to reconfigure the antenna.
- Design, implementation and evaluation of the dual band patch antenna.

Course Requirements:
Linear circuits, Waves & Distributed systems, RFIC (recommended)

Contact info: Nicolás Wainstein    mail: nicolasw@campus