

# UNDERGRADUATE SUMMER RESEARCH PROGRAM PROPOSAL

- Project title

**Circularly Polarized MIMO Antennas for High Data Rate 5G/6G Communications**

- Faculty advisor

**Tutku Karacolak**

- Project Description

The goal of this project is to design wideband antenna systems for high data rate 5G/6G communications. Our approach will be integration of multiple input and multiple output (MIMO) technology with circular polarization. MIMO antennas are currently used in almost all 5G/6G wireless devices utilizing multiple data streams to increase the data rate within the limited bandwidth and power levels. Circularly polarized (CP) antennas ensure consistent signal strength providing reliable communication. Together, CP-MIMO antennas create an optimal solution for applications such as the Internet of Things (IoT) and emerging 5G/6G technologies.

- Deliverables

Antenna prototypes are expected to be designed and fabricated at the end of the project.

- Time requirements

200 hours (Flexible M-F, 9:00-5:00 May 16 thru Aug 5)

- Required skills and knowledge

Interest in applied electromagnetics, antenna design, and wireless communications.  
Must have completed ECE 370 successfully.

- Preferred qualifications

Experience in Computer Aided Design.