

1. Research Title: Reconfigurable RF Technology for Multifunction Apertures**2. Individual Sponsor:**

Tony K. Quach
AFRL/Rydi, BLDG 600
2241 Avionics Circle
WPAFB, OH 45433
Phone: 937-528-8903
Tony.Quach@wpafb.af.mil

3. Academic Area/Field and Education Level: Electrical/Computer Engineering / RFIC and System Architecture Design (MS or Ph.D. level)

4. Objectives: Investigate reconfigurable RF technologies that significantly advance phased-array systems in terms of frequency agility, power scaling, and waveform diversity. Novel system architectures and circuit topologies are sought that enable diverse waveforms to be simultaneously transmitted and received (STAR) from the same aperture; spanning radar, communication and EW systems.

5. Description: The development of military phased-array systems follows legacy design approaches where systems and circuits are optimized for a specific application and requirements. However, the cost of realizing new technologies for future generation phased-array systems is becoming prohibitive due to long development cycle with electronic obsolescence. Projects are sought to investigate system and circuit design techniques that realize reconfigurable RF technologies to produce a single transceiver applicable for a wide range of applications suitable for radar, communication, and electronic warfare functionality. Research may include system architecture exploration for reconfigurable/adaptable RF capabilities; reconfigurable RF components investigation based on tunable RF building blocks; and system/component characterization. Interests also include RFIC design across the semiconductor technology spectrum. Digital circuits and efficient algorithm for autonomous reconfigurable RF components and systems are desirable. AFRL will provide access to III-V and advanced silicon design kits and support with characterization.

6. Research Classification/Restrictions: This research is unclassified.

7. Eligible Research Institutions:

Universities (DAGSI)

AFIT (only)

USAFA