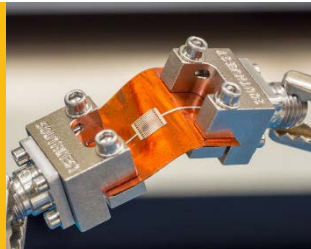


## ATHENA Group – Prof. Manos Tentzeris [www.athena.gatech.edu](http://www.athena.gatech.edu)

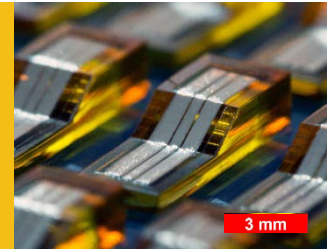
The ATHENA group at Georgia Tech explores the development of novel technologies for the next generation of wireless RF and mm-wave applications in telecom, defense, space, automotive, and sensing areas through robust low-cost additive manufacturing methods.

### Low-cost Nanomaterial- Enabled Sensors and Switches



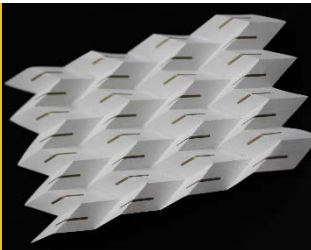
- Selectively functionalized CNT/graphene-based gas sensors for real-time environment monitoring (image above)
- CNT-based RF switches for flexible, fully-printed phased arrays

### Printed “Smart” 3D Wireless Packaging



- 3D ramped interconnects for application-specific wireless packages (image above)
- Mm-wave system-in-package solutions with antenna array integration and microfluidic-based thermal management

### Reconfigurable 4D Origami- Inspired Structures



- Tunable frequency selective surfaces using 3D miura folding with paper (image above)
- Compressible/stretchable 3D antennas with liquid metal conductors and 3D scaffolding
- Unique wideband mathematically-inspired 3D fractal-based antennas

### Long-Range RFID and Energy Harvesting



- Km-range passive “smart-skin” RFID sensors with mm-wave reflectarray (image above)
- Wearable UHF energy harvesting systems for wireless on-body IoT devices
- Heterogeneous power scavenging through wireless, solar, and piezo integration