Research Objective

- **Long Term**: Order of magnitude reduction in power draw across all Soldier & squad level electronic functions
- **Near Term**: Order of magnitude reduction in power draw of the Soldier radio

Challenges

- Research thrusts across 4 areas: Materials & Devices, Circuits and Systems, Heterogeneous Integration, and Waveforms
- Stringent requirements for communication in a contested spectrum have typically resulted in large power demands – how can efficiency improve yet still meet these requirements?

ARL Facilities and Capabilities Available to Support Collaborative Research

- Full custom ASIC design flow – Cadence and Mentor Graphics
- Extensive test capabilities: Sources, scopes and network analyzers up to 110 GHz, fully automatic temperature controlled probe stations
- Digital waveform synthesis

Complementary Expertise / Facilities / Capabilities Sought in Collaboration

- Unique communication circuits – enhanced linearity, lower noise, improved efficiency
- Custom integration of diverse materials – III-V and CMOS mating, COTS to custom integration
- Novel materials enabling new communication paradigms
- Suggestions for innovative new research approaches to address energy efficiency

**Improved materials and devices**  
**Circuits and systems**  
**Heterogeneous integration of efficient devices**  
**Waveforms**