

Exceptional service in the national interest

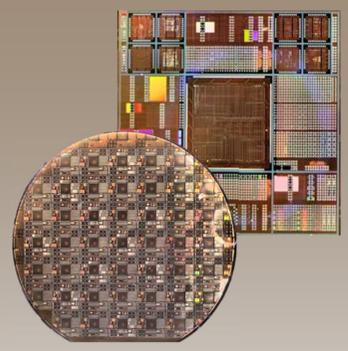


DARPA WIRED Proposers Day Sandia Capabilities

<http://www.sandia.gov/mstc>

Trusted Microelectronics

- Custom & Structured ASIC Design & Fab
- CMOS Multi-Project Wafer program
 - Rad-hard mixed signal SOI CMOS
 - ISO 9001:2000, high-rel. production
- Trusted Design Services
 - DMEA 1A Certification of Trust
 - Internal & external foundries to 14 nm
- III-V microelectronics production

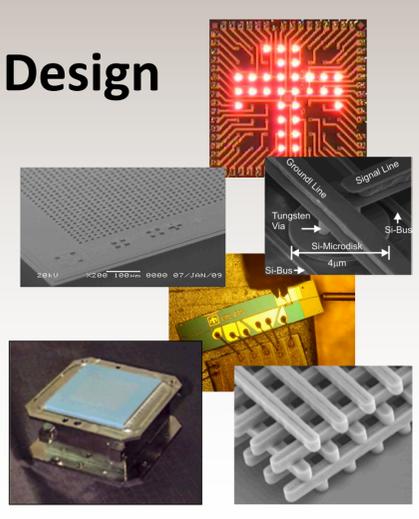


Microsystem Facilities

- MESA: 65,000 ft² Facility for silicon, III-V & Advanced Materials
 - Si & III-V microelectronics R&D and production
 - III-V and Si photonics, MEMS, and Si R&D prototyping
 - nBn, GaN, graphene, memristor process & device R&D
 - RF MEMS oscillators/switches and wafer-level packaging
 - Heterogeneous integration and novel packaging
- CINT: Center for Integrated Nanotechnologies
 - National user facility devoted to nanoscale science
 - Multi-disciplinary scientific community
- Unique Failure Analysis Capabilities

Trusted Mixed Signal ASIC Design

- Application Specific Integrated Circuit (ASIC) Development & Production
 - Design
 - In-house fabrication
 - Packaging and test
 - Qualification
- Advanced Verification Methodologies
- Process Design Kit (PDK) Development
- Custom IP Development
- CAD Tool Development & Expertise



Photonics and Materials

- Extensive compound semiconductor capabilities
 - 10 epitaxial reactors (MBE & MOCVD)
 - GaAs, GaSb, InP, GaN and all related materials
 - LEDs, VCSELs, PICs, modulators, SWIR/MWIR/LWIR FPAs
- Advanced novel materials capabilities
 - Conducting oxides, aluminum nitride, graphene, Ge
 - Time-resolved lifetime, responsivity, XRD, Hall, AFM, CV...
- 20+ years in III-V & silicon photonics R&D

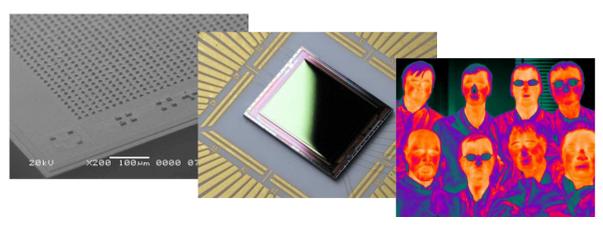
Potential WIRED Roles

Sandia is a DOE National Laboratory committed to development and production of microsystem components and technologies. We enter CRADAs with industry, and routinely team on BAA responses and collaborative R&D, ultimately transferring technology developments to industrial partners for production.

Key areas of contribution: Advanced materials & process development, custom ROIC design & fabrication, photonics/plasmonics R&D, physics modeling & simulation, and FPA prototyping & characterization.

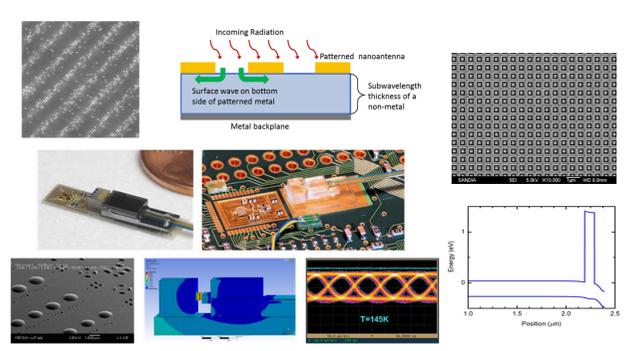
Custom ROICs and Fabrication Processes

- Specializing in design and realization of unconventional readout circuitry
 - Ultra high speed
 - Event driven
 - Very deep well
 - Fab in-house & advanced foundries
- Extensive testing, FA capability, packaging, and novel integration processes



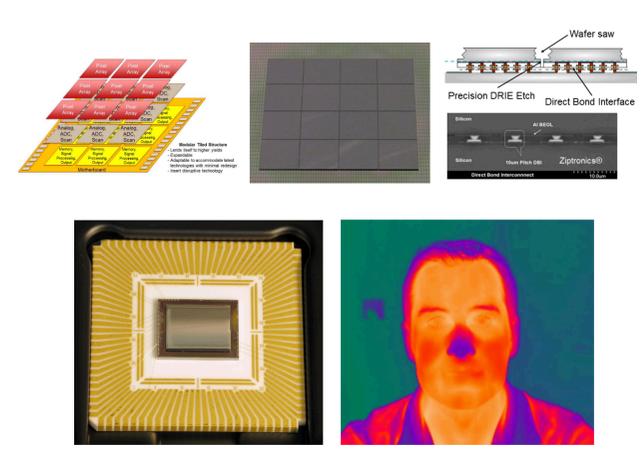
Photonic Devices and Materials

- Expertise in photonics R&D, particularly new device concepts and novel materials
 - nBn, plasmonics, SLS, LWIR rectennas
 - Conducting ceramics, graphene, BN
 - Extreme environment photonics

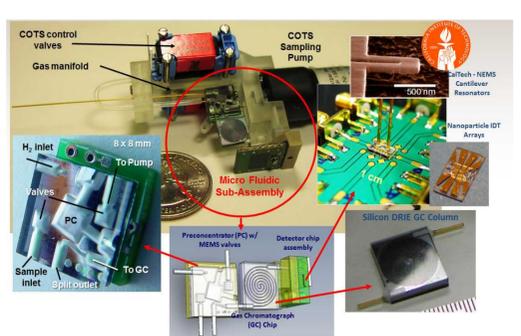


Advanced Sensor Development

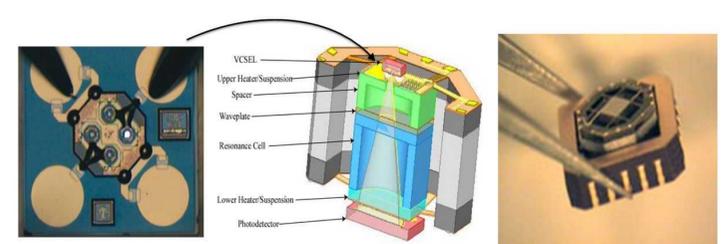
- Complete design, fabrication, and fielding of custom sensors and systems
 - Space and ground-based designs
 - ROIC, detector, packaging innovation
 - Plasmonic enhancement, hyperspectral and hypertemporal FPAs, x-ray imagers



DARPA Tech Development



Micro Gas Analyzer – DARPA Phase 4



Chip-Scale Atomic Clock – DARPA Phase 4
Successful tech transfer to commercial production



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