

Company Overview

HYPRES is at the epicenter of next generation, energy-efficient superconductor supercomputer and quantum computer development. Its physicists, engineers and world's premier commercial chip foundry are supporting a number of federally-sponsored and commercially-funded innovative development initiatives. The company is making important contributions in superconductor logic and memory and is commercially producing superconducting ICs in its uniquely-equipped foundry, the only commercial superconductor foundry in the world.

The company is known for its superior ability to design and produce superconductor devices and systems by quickly turning ideas into designs and designs into products. HYPRES is also recognized throughout the industry for its expertise in packaging cryogenic electronics in energy-efficient, easy-to-use systems. It has built a stellar reputation on its ability to produce high performance hybrid systems by integrating ultra-high speed superconductor devices with conventional semiconductor electronics. For more than three decades, HYPRES has delivered more variety and complexity of superconducting ICs than any other organization.

- **High Performance Computing**—With the fastest and most energy-efficient digital ICs available anywhere, HYPRES innovation is at the heart of tomorrow's high energy-efficient computing systems. The company and its partners are currently developing:
 - ✓ Energy-efficient computing systems
 - ✓ Integrated energy-efficient processors and dense, fast superconductor spintronic memory
 - ✓ Ultra-low power circuits for qubit control & readout for quantum computing
 - ✓ Highest performance energy-efficient single flux quantum logic
- **RF Systems**—HYPRES' Advanced Digital-RF Receiver systems are being fielded for a number of US government customers for a variety of applications, including SIGINT, EW and SATCOM. They feature ultra-wideband, high dynamic range, multi-channel, multi-band operation using superconductor Analog-to-Digital Converter technology.
 - ✓ Advanced Digital-RF Receiver (ADR) – Government-tested (TRL 7) units with standard interfaces
 - ✓ Integrated Cryogenic Electronics Testbed (ICE-T) – Robust test platform for laboratories
 - ✓ Cryogenic Analog RF Module (CARM) – Small, antenna-mounted amplifier units for SATCOM and other RF applications
 - ✓ Superconductor Analog-to-Digital Converters (ADCs) – Family of integrated circuits tailored for different applications (Cryogenic Detector Array Readout, Wideband Spectrum Capture)
 - ✓ Mixed-signal Application-specific Integrated circuits (ASICs) with ultrafast digital and high-quality analog circuits
- **Instrumentation**—The leader in developing digital superconductor electronics for metrology and biomedical applications, HYPRES is known worldwide for its signature product, the Primary Voltage Standard (PVS) calibration system, produced in partnership with NIST. The system defines the Volt. The company also is:
 - ✓ Producing the new rugged, mobile PVS system designed to US Army specifications
 - ✓ Developing the first very high resolution and compact mobile Digital MRI system for military and civilian use
 - ✓ Active in developing SQUID magnetometers for biomedical imaging as well as nuclear and high-energy physics applications
- **Foundry**—HYPRES is the premier commercial foundry for digital superconducting IC R&D and production. It features a complete fabrication facility with a full complement of thin-film nanofabrication capabilities, including planarized multi layers, photolithography, and cryogenic device testing. The company also provides on-site foundry services to startup tenants and others developing new nanofabrication processes.
 - ✓ Customized services that provide training and assistance for customers
 - ✓ A patented process producing multi-layered circuits with a variety of high critical current density options, including 10 kA/cm², 4.5 kA/cm², 100 A/cm², 30 A/cm²
 - ✓ Provides non-superconducting fabrication services

