



- **Name of Organization:** D-Wave Systems Inc.
- **Lead Investigator:** Dr. Geordie Rose
- **Current Team Members:** 59 employees, 50 tech staff, 21 PhDs
- Team members include former key experts from TRW/NG
SCEO, Stanford, Maryland, SUNY, Berkeley, JPL
- Design, fabrication, testing and analysis, systems engineering,
algorithms & software teams

Goal: a commercial quantum computer

Approach: a “Manhattan Project”



A phased approach to building quantum processors based on superconducting circuits

- First phase: Develop a “simple” special-purpose processor
- Superconducting adiabatic quantum optimization system
- Co-located, cover all bases
- Project is well underway with an investment in R&D of ~US\$40M over past five years
- Most advanced circuit developed comprises 128 rf-SQUID flux qubits and 22,400 Josephson junctions



- **Design:** Experienced (TRW,NG,SUNY) superconducting processor personnel, experimental physicists + condensed matter theorists
- **Fab:** Full-scale, planarized, 0.25 micron, 8-inch wafer, VLSI SC production foundry; high investment in staffing and training
- **Testing & Analysis:** Five dilution units with custom I/O, filtering and shielding
- **Software & Algorithms:** Optimization & Quantum Monte Carlo teams



Building general purpose gate model systems: What's missing from our organization that we would like others to provide

- AQO very rewarding project; would love to try to build GP-GM...
...but we don't even remotely know what to build
- **“Starting guess” top down proposals & concepts**
 - Most important: system is good fit to GP-GM; not necessarily superconducting
 - Ideas for building and testing systems of 100-1,000 devices (eg. logical qubits comprising many physical qubits & couplers, input & control system, readout system)
 - Ideas for user interfaces, programming, compiling, simulating, encoding & error correction, testing, readout, power, etc.



Contact Information

- **Name:** Dr. Geordie Rose
- **Title:** Chief Technology Officer
- **Organization:** D-Wave
- **Email address:** rose@dwavesys.com
- **Phone number:** 604-630-1428 x 103