Micro Power Sources: Objectives

Objective: Develop low mass/volume power sources, in concert with the development of low power electronics/MEMS devices.

Example Applications:
- Autonomous/Distributed Sensing
- Rad-hard CMOS memory
- Isolation of analog sensors from digital noise
- Distributed power: point-of-use

Benefits to NASA:
- Affords greater level of integration
- Allows for redundancy ⇒ reliability ⇒ safety
- Changes paradigm of spacecraft architecture
  - Power woven into the entirety of the vehicle

U. C. Berkeley optical transmitter array on a coin cell
(http://robotics.eecs.berkeley.edu/%7Epister/SmartDust/)
Thin Film/Micro-Battery

- Superior charge retention for long cruise missions
- Superior cyclability
- Fully integratable
- Robust to temperature extremes
- Leak-proof
Thin Film/Micro-Battery

Batteries on chip with CMOS: 20,000 batteries on a 4" wafer with (50-100 μm)^2. Cells in parallel/series arrangement for gefa current.

![Diagram of battery cells]