

---

# Vibration-To-Electric Energy Conversion

---

## Personnel

J. O. Mur-Miranda (J. H. Lang and A. P. Chandrakasan)

## Sponsorship

Un-sponsored

The goal of this project is to develop an energy scavenger that can convert ambient vibration energy into electric energy for general-purpose use. The energy scavenger employs a microelectromechanical spring-mass resonator to drive a variable capacitor which serves as the energy converter. Since the power available from ambient vibrations is generally very limited, the control, power and load electronics which drive and follow the energy converter must be designed accordingly.

To date, the microelectromechanical resonator and variable capacitor have been designed, and fabrication is underway. Additionally, very-low-power control and power electronics have been designed, fabricated and successfully tested. The design and test results indicate that, under reasonable vibration scenarios, the energy scavenger could convert approximately  $20 \mu\text{W}$  of power, and deliver 50% of that power to a load. Such an energy scavenger might therefore be used to power autonomous sensors, for example.