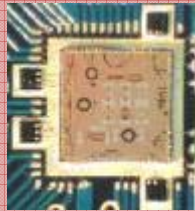


Integration of Wireless Sensor Nodes

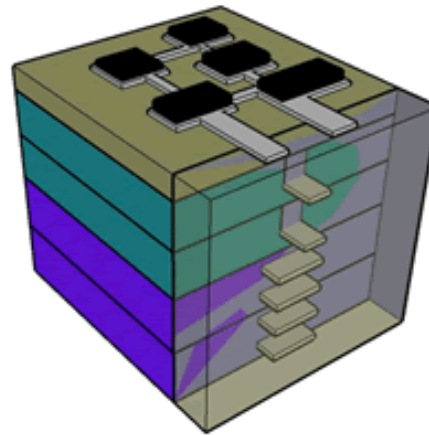
Elizabeth Reilly

Wireless Sensor Node

Low Power Radio



Power Storage



"Picocube"

Sensor



Renewable Power



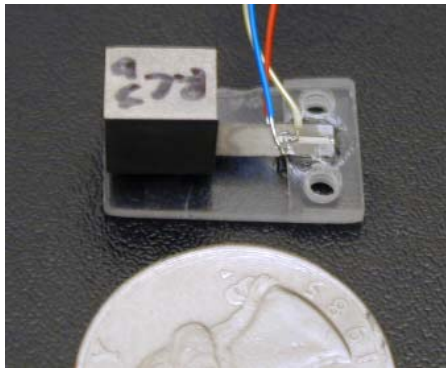
Supply

Introduction

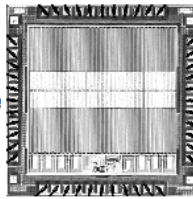
- Fabrication of radio, energy scavenging system, energy storage, and sensor first generation near completion
- Integration of individual technologies to form functioning node
 - Testing of node bench-top environment
- Future Work: Testing and integration of microscale energy scavenging device and microscale sensor

Meso Integration

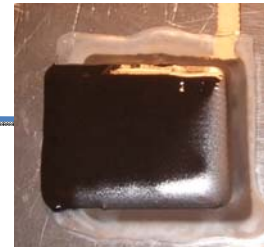
Initial integration attempt



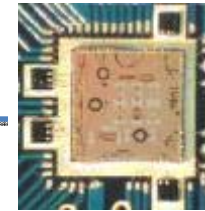
Macro Scale Energy
Piezoelectric Scavenging
System



Power
conditioning
circuitry (*F.
Burghardt*)

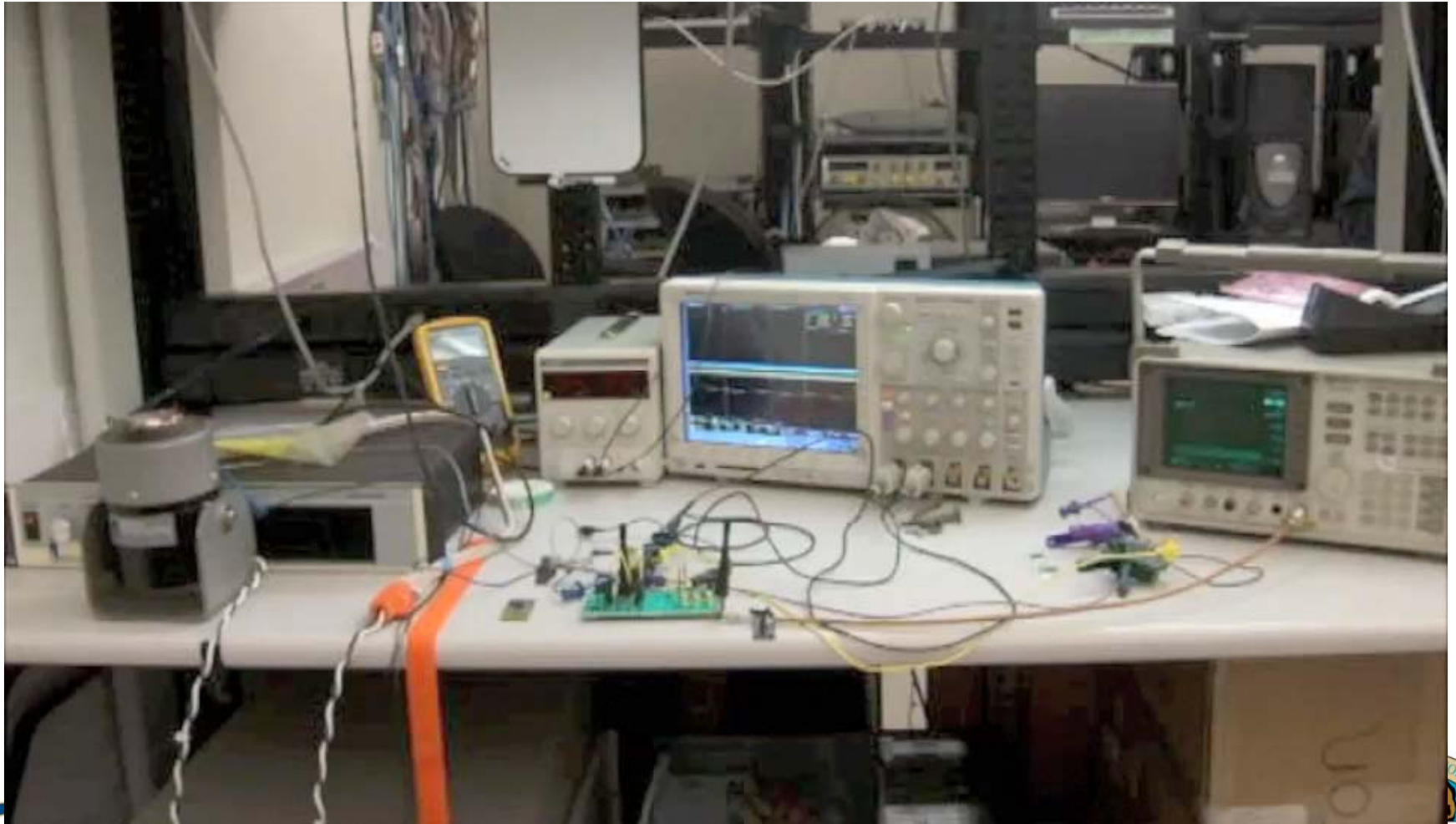


Dispenser
printed capacitor
(*C. Ho*)



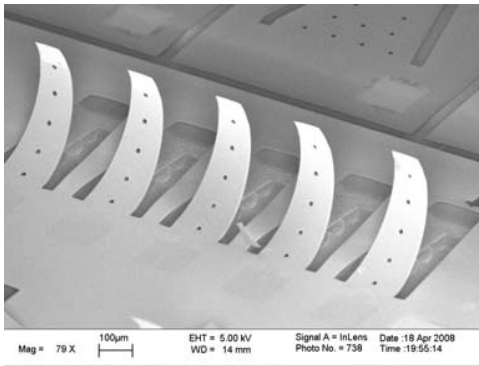
Low power radio
(*M. Mark et al*)

Demonstration

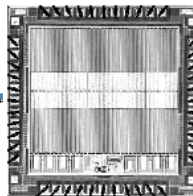


Micro Integration

Second integration attempt using microfabricated prototypes available in Spring 2009



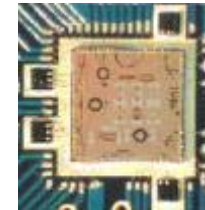
Microfabricated piezoelectric energy scavenging system
(L. Miller et al)



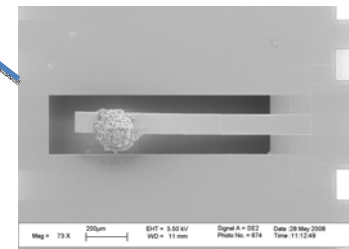
Power conditioning circuitry
(M. Seemans)



Dispenser printed capacitor
(C.Ho)



Low power radio
(M. Mark)



Microfabricated current sensor
(E. Leland)

Conclusions

- Current radio, power circuitry, and energy storage devices all functional
- 2nd generation of microscale energy scavenging system and sensor by May
- Integration of power circuitry with sensor, power storage, and mesoscale piezoelectric scavenger
- Working proof of concept mesoscale prototype
- Microscale integration starting with current generation
- Testing of devices is on going