Within the past 15 years, significant advances in semiconductor integrated circuits have greatly reduced power consumption requirements. As such, long-studied mechanisms of transducing ambient energy processes are now viable options for replacing batteries as powering schemes for distributed sensor networks. The field of energy harvesting has grown immensely as new solutions for developing self-sustaining wireless sensor networks for applications such as structural health monitoring (SHM), precision viticulture, and biometric wearable devices are continually investigated. Due to the wide variety of energy transduction processes and the inherent multidisciplinary nature of energy harvesting as an academic field, a systemic paradigm for the capture and use of ambient energy for powering wireless sensor networks is essential towards ensuring a robust design. In this seminar, a systemic approach to defining energy capture requirements is presented along with two examples of novel energy harvesting technologies developed for applications to autonomous powering solutions for SHM sensor networks.

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