Fabrication of high-resolution pressure and temperature sensing devices consisting of polymer/copolymer nanotubes and nanorods

**Description:**

Researchers at the University of Massachusetts Amherst and Yale University have recently developed a novel nanofabrication technology that provides high-resolution (up to ~106 ppi) mechanical and/or thermal sensor devices comprising individual or two-dimensional arrays of nanorods, nanotubes or nanowires. These nanoscale components are produced using polymers having excellent piezoelectric and/or pyroelectric properties, thus, exhibiting high-sensitivity responses to applied mechanical and/or thermal stimuli. This technology can be applied to a wide variety of two-dimensional sensing applications to enable high-resolution sensing currently unachievable with bulk polymer film based technologies. It can also be used for new electronic and biological applications that require mechanical and/or thermal stimuli-responsive nanoscale components or landscapes.

**Field of Application:**

- Development and fabrication of high-resolution two-dimensional or nanoscale sensors and actuators.
- Detection of two-dimensional thermal and/or mechanical signals.
- Detection of surface images requiring sub-micron resolution.

**Advantages:**

- High-resolution 2D sensing: Two-dimensional arrays of nanorods, nanotubes or nanowires integrated with electrode arrays can provide high sensor resolutions up to 106 pixels per inch.
- Nanoscale stimuli-responsive devices: The use of individual nanorods allows for the fabrication of nanoscale devices for easy and direct integration with micro/nano-systems such as MEMS and NEMS.
- Simple sensor device fabrication process.

**IP Status:** Patent Pending

**PI:** Jodie Lutkenhaus

**Licensing Contact:** Richard Andersson
richard.andersson@yale.edu