Purdue University researchers have developed a solution phase method to synthesize three new dumbbell-like nanowire heterostructures. After obtaining the well-defined nanowires, precursor solutions are injected and octahedrals selectively grow at both ends of the nanowires to form the dumbbell structures.

The thermoelectric figures of merit are improved by reducing thermal conductivities due to a combination of the interface scattering effect and size confinement effect compared with the conventional nanowires.

This breakthrough could lead to significantly better thermoelectric materials in the future. This method can also be extended to other nanowire heterostructure synthesis by simply changing the precursor solution to create other thermoelectric materials.

**Domain:**
- Electrical Engineering

**Advantages:**
- Lower thermal conductivity
- Many applications

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**INNOVATOR BIOGRAPHY**

Dr. Yue Wu received his PhD in 2006 from Harvard and moved to UC-Berkeley as Miller Research Fellow. His research focused on the development of non-toxic and abundant materials for semiconductor nanocrystal-based solar cells. In August 2009, he joined School of Chemical Engineering at Purdue University as an assistant professor.