Laser Induced Controllable Forming of Nanowires

A fast, scalable laser shock pressure method allows for tunable shaping of large quantities of nanowires, enabling customized electrical and optical properties for next-generation miniature devices and flexible electronics.

One-dimensional nanomaterials, such as nanowires, are of great interest to researchers due to their unique mechanical, electrical, and optical properties. Having the ability to change the shape of nanowires provides the means for fundamental study in strain engineering, electronic transport, mechanical properties, etc. Unfortunately, current techniques cannot perform complicated shape changes and are only capable of treating one nanowire at a time.

Researchers at Purdue University have developed a technique to shape large quantities of nanowires through the use of laser shock pressure. This method can be used for conformal shaping, uniform bending, cutting, and lateral compression. Having the ability to create nanowires with tunable shapes allows for the accommodation of various surface structure requirements such as flexible electronics. Changing the shape of nanowires can also change their electrical, chemical, and optical properties; therefore, creating many opportunities for developing new generations of miniature devices such as electronics.

Advantages:

-One step fast process

-Multiple forming results

-Scalable and tunable

-Tunable electrical and optical properties

Potential Applications:

-Plasmonic devices

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Category

Semiconductors/Fabrication & Process Technologies
Materials Science & Nanotechnology/Nanomaterials & Nanostructures
Materials Science & Nanotechnology/Advanced Functional Materials

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Further information

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-Metal nanowires

-Strain engineering of semiconductor nanowires

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