Nanowire research at Stevens makes cover of Applied Physics Letters

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An article by Stevens Institute of Technology researchers featured as the cover page of *Applied Physics Letters* Volume 98, Issue 7 represents a step forward in techniques for the arrangement of nanowires.

Professors Dr. Chang-Hwan Choi and Dr. Eui-Hyeok (EH) Yang, and graduate students Wei Xu, Rajesh Leeladhar, and Yao-Tsan Tsai, focused on nanowires, structures that are mere nanometers in diameter but have enormous potential in nanotechnology to create tiny circuits that would make possible nanoelectronics, nanophotonics, and nanobiotechnology. Such devices could forever change the way we harness energy, communicate, and treat disease.

"This highly promising research can lead to the development of reliable nano-actuators which in turn stand to benefit fields and applications as diverse as biomaterials, nano robots, artificial muscles, and high frequency nano antenna applications and is an affirmation of the cutting edge research that is taking place in the Micro/Nano Devices Laboratory," says Dr. Constantin Chassapis, Deputy Dean of the Charles V. Schaefer, Jr. School of Engineering and Science and Department Director of Mechanical Engineering.

The precise arrangement of nanowires on a large scale is crucial for any practical application. However, many current techniques for the controllable arrangement of nanowires suffer limitations.

The article, entitled, "Evaporative self-assembly of nanowires on

superhydrophobic surfaces of nanotip latching surfaces," reports a technique that is highly effective in assembling nanowires. A colloid droplet of nanowires (i.e., nanowires dispersed in a water droplet) is placed on a nano-engineered superhydrophobic surface. As the droplet evaporates, two forces cause the nanowires to self-assemble on the specially-designed surface: hydrodynamic forces inside the droplet and capillary forces of the receding contact line of the droplet. Simple and convenient, the new self-assembly technique offers a high yield rate, improving the controlled arrangement of nanowires which may be used in nanodevices.

Provided by Stevens Institute of Technology