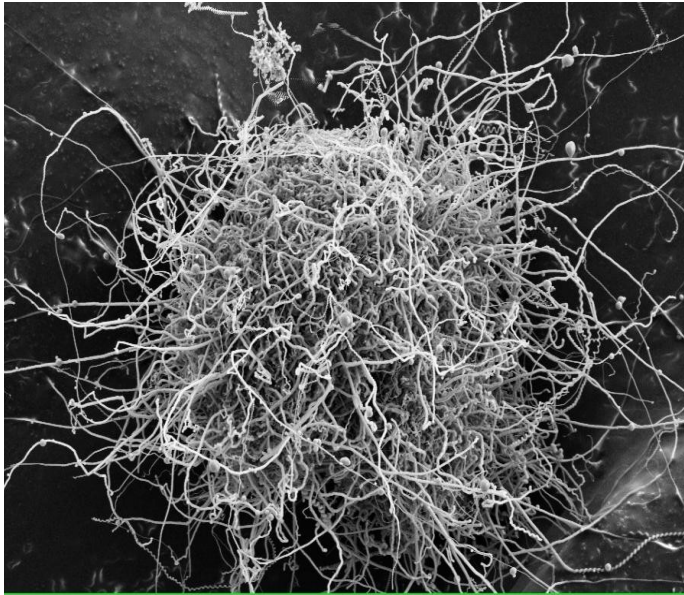


## GoNano Technologies' Nanospring<sup>™</sup> Platform

GoNano Technologies, Inc produces high surface area materials for customers and collaborators seeking transformational solutions in pollution control, catalysis, composites and sensory technologies. GoNano Technologies' versatile Nanospring platform drives advancement in applications that require nonporous high surface area. Nanosprings grow via a catalyst-mediated mechanism that is both scalable and efficient.

The low deposition temperature (350°C) at an atmospheric pressure process allows Nanospring mats to be formed on a wide variety of substrates including aluminum foil, polyimide, glass, silicon, stainless steel, fiberglass, and ceramics.



Nanosprings can be applied uniformly to flat substrates, formed within 3-dimensional structures, or coated on micron-sized particles (figure 1).

*Figure 1: Silica particle (25  $\mu\text{m}$  diameter) coated with Nanosprings allowing a 1,500x increase in active surface area.*

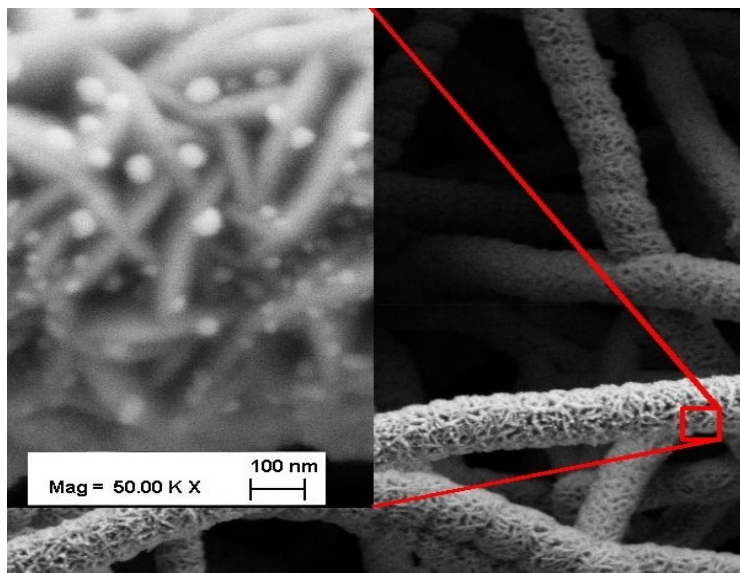
The Nanospring matrix provides an accessible surface area in excess of 350  $\text{m}^2/\text{g}$ . Nanosprings are covalently tethered to the substrate onto which they are processed and can withstand temperatures above 1000°C for 48 hours. Following the deposition process the Nanosprings can be engineered to be super-hydrophobic.

GoNano Technologies utilizes a number of well-developed processes for coating the Nanosprings with metals, metal oxides, insulators, organic, and inorganic materials. Typical coatings include: Au, Ag, Cu, Ni, Pt, Pd, ZnO, TiO<sub>2</sub>.

Figure 2 shows a hierarchical nanostructure consisting of ZnO-coated Nanosprings decorated with Cu nanoparticles (visible in the inset image). In addition, the Nanospring surface can be functionalized using a wide range of silane chemistries, which are compatible with a silica surface. Gold-nanoparticle-decorated Nanosprings can be further functionalized using thiol chemistry.

Internally, GoNano Technologies is developing Nanospring-based applications for Catalytic Converters, Continuous Flow Reactors, and Carbon Capture & Recycle<sup>™</sup>. GoNano has entered development Agreements with dozens of researchers and product development teams in academia and industry in the U.S., Asia and Europe. Through these external interactions Nanosprings are finding their way into a wide range of devices and applications.

For example, Nanosprings have been shown to enhance the strength of certain ceramic matrix composites, to provide a surface for the physisorption of molecular hydrogen, and to act as a very sensitive sensor platform for industrial applications.



*Figure 2: Nanosprings coated with nanocrystalline ZnO. The inset image shows Cu nanoparticles decorating the ZnO surface. Various materials combinations can be produced for specific catalytic processes.*

Please contact GoNano Technologies to explore how Nanosprings can be integrated into your products or process. For more information please call 208.892.2000 or visit our website at [www.gonano-technologies.com](http://www.gonano-technologies.com).