



National Science Foundation funds GoNano's CCR

GoNano's Carbon Capture & Recycle (CCR) recently earned peer-reviewed recognition when National Science Foundation awarded a Phase I Small Business Innovation Research (SBIR) grant in the amount of \$147,000 to continue developing the technology through December 2010. This competitive grant program solicited innovative developments in Nanotechnology from small companies throughout the United States.

Using a photocatalyst consisting of silica Nanospring™ coated with a combination of titanium dioxide and proprietary dopants, GoNano Technologies has successfully demonstrated conversion of CO₂ to useful and commercially valuable feedstock chemicals, including methanol, formic acid, and formaldehyde. GoNano Technologies' CCR is the only photocatalytic carbon recycling system that offers a selectable product output based on input and flow rate.



“Carbon Capture & Recycle treats carbon dioxide as feedstock for the production of marketable chemical products, transforming CO₂ from a waste product to a commodity”, said Tim Kinkeade, CEO of GoNano Technologies. “This award validates the National Science Foundation’s support of novel concept of converting an environmental waste into a salable commodity.”

The technical objectives of Phase I funding include demonstrating feasibility of the CCR technology. Phase I award offsets cost in early CCR

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development and positions GoNano Technologies well to seek additional funding for a pilot system study, in a Phase II award.

Employee Spotlight: Innovation Inspires GoNano's R&D Manager

In academia, he built a vita packed with considerable research, publications, and awards. At home, he is a devoted family man. And, at GoNano, he has been a leader to his staff, a knowledgeable resource for those seeking information inside and outside the company, and an innovator in both products and applications.



Dr. Giancarlo Corti (“GC,” for short) joined GoNano in 2008. As Manager of Research and Development, his growing team has expertise in mechanical, chemical, electrical, materials, and bio-engineering. Under his guidance, the Research Center has expanded to address a variety of applications, most notably CCR, catalytic converters, biosensors, composites, and fixed bed chemical reactors.

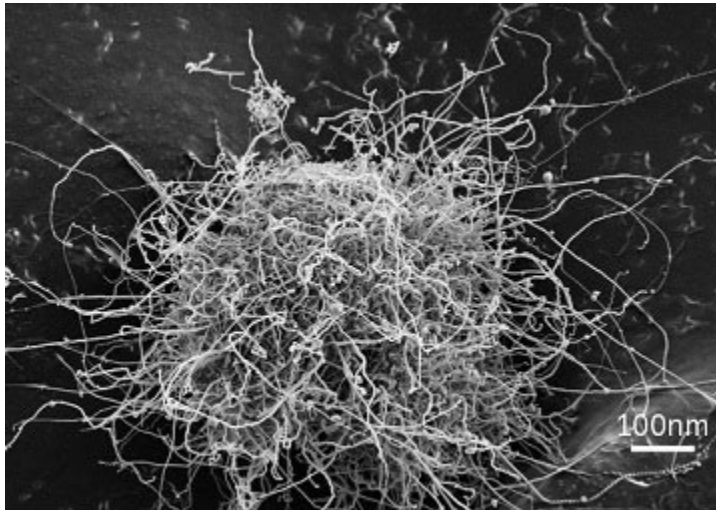
He is also often called upon to be the face of the company. Those of you who have toured the Research Center likely enjoyed GC’s hospitality and enthusiasm as he explains each step in the Nanospring production process. His characteristic soft-spoken manner and extensive technical expertise also allow him to make many customer presentations and answer their questions. He has authored many grant proposals and is leading the design and construction of the next generation of Nanospring production equipment.

He was born and raised in San Francisco de Quito, Ecuador (“Quito” for short), the nation’s capital with nearly two million residents. GC’s journey to GoNano began when he completed his Engineering degree in 1999 in his native country of Ecuador. He came to northern Idaho to earn his M.S. and doctoral degrees in Mechanical Engineering from the University of Idaho. Following graduation in 2006, he continued at the University as a Post Doc and transitioned to GoNano full time in 2008.

GC and his wife, Carla, married for four years, welcomed daughter Isabella to their family a year ago.

News clips for Technophiles: Nanosprings grown on particles create a winning combination

GoNano Technologies has developed the ability to coat micron-size particles with Nanosprings for added surface area and functionality. Nanosprings grown on particle substrates can increase surface area



A 25µm particle coated with silica Nanosprings

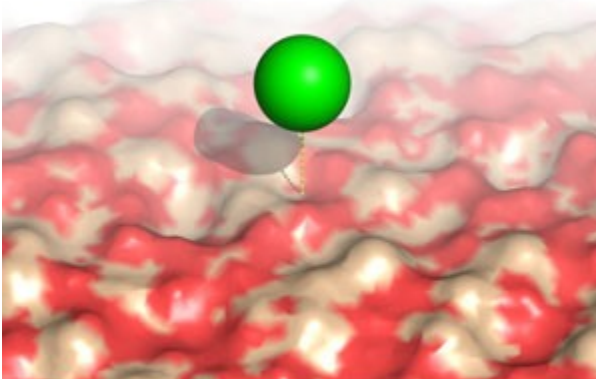
by over 400 times and provide an opportunity to alter the active chemical properties of the particles. The net result is: *A high surface area material with a tunable surface chemistry which can be biofunctionalized and/or coated with highly catalytic metal nanoparticles.*

GoNano's Research Team, led by Dr. Giancarlo Corti, developed a novel technique which enables the silica Nanosprings to chemically bond to the surface of micron size particulate matter as small as 20µm. Dr. Corti reports "The flexibility of the Nanosprings growth process allows us to create unique hierarchical structures consisting of micron-size particulate with the surface properties of high surface area nanomaterials. This novel structure is opening up new applications for GoNano."

Applications for this material combination include sensors and composites materials. GoNano is currently engaged, under Non-Disclosure Agreements, with three companies who are integrating Nanosprings on particles into their devices and processes.

IP Matters: GoNano receives Hydrogen Storage Patent

Drs. Grant Norton and David McIlroy, GoNano co-founders and co-inventors, were recently notified of the first patent issuance based on Nanosprings entitled “Apparatus with High Surface Area Nanostructures for Hydrogen Storage and Methods of Storage Hydrogen.” The patent, licensed exclusively to GoNano Technologies, provides valuable intellectual property protection and validates the unique ability of



Theoretical rendition of a hydrogen molecule (green) sitting on the surface of a Nanospring.

Photo courtesy of Prof. Marty Ytreberg, Department of Physics, University of Idaho

Nanosprings to store a significant amount of hydrogen by weight at room temperature and 20 bar of pressure.

Dr. McIlroy commented “Nanosprings have a unique bonding structure relative to other forms of silica, where the silicon atoms are in a mixed 3^+ - 4^+ ionization state. This unique electronic structure is responsible for their ability to store such large amounts of hydrogen at room temperature and low pressure. Furthermore, their unique surface chemistry appears to promote unique catalytic properties as well.”

Realization of a safe and economical hydrogen storage is the cornerstone of a hydrogen economy as an abundant energy source in mobile applications. Underground hydrogen storage to provide grid energy storage for intermittent energy sources, such as wind power, is an example of a stationary application. The ability of Nanosprings to store hydrogen at room temperature at 20 bar has been independently verified by Dr. Michael Miller of the Southwest Research Institute. His findings, in addition to those of Profs. Norton and McIlroy, will be released in a scientific publication later this year. GoNano is currently seeking corporate partners to move this technology to a commercialization reality.

GoNano in the news and upcoming events

- NSF Funding Press Release covered in several websites, most notably, CarbonReady.com and [Carbon Offset Daily Notes](http://CarbonOffsetDailyNotes.com)
- Oct 25-28: GoNano will exhibit at [Taiwan Green Industry Show](http://TaiwanGreenIndustryShow.com), present a seminar and visit customers. Taiwan office of Idaho

About GoNano

GoNano Technologies manufactures high-surface area silica Nanospring™ nanomaterials for pollution control, catalysis,

Department of Commerce is assisting with the visit

- Nov 3-4: Dr. Grant Norton will attend the [Royal Society of Chemistry and Society of Chemical Industry Symposium in UK on Continuous Flow Chemistry](#). GoNano is submitting an abstract for a poster

composites and sensory technologies. For more information on how GoNano Technologies can enhance your product, or to become a strategic partner, call 208 892 2000 or email sales@gonano-9.com

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