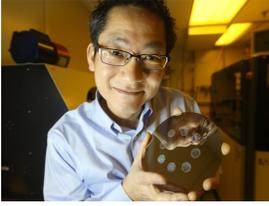


# Nanotechnology etches family memories onto pendants

**USA TODAY NETWORK** Christopher J Brooks, Rochester (N.Y.) Democrat and Chronicle 10:13 p.m. EST December 30, 2015



(Photo: Jamie Germano STAFF PHOTOGRAPHER)

ROCHESTER, N.Y. — Jim and Carla Froehler have a daily ritual in which they recap the day's events while eating dinner at their kitchen counter top.

One evening this past June, Jim sat holding his usual cup of single malt scotch. Carla nursed a glass of Chardonnay and she dove right in.

"I met someone interesting today and I want you to meet him, too."

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"Who and for why?" Jim said.

"Well, his name is Bruce Ha."

Carla explained that Ha was a former Kodak consultant with an electrical engineering background and 11 patents in polar raster writing. Ha, Carla told her husband, had devised a way of using nanotechnology (<http://on.rocne.ws/1YSV5fK>) to etch entire books, photos and other keepsakes onto tiny pendants, medallions and rings.



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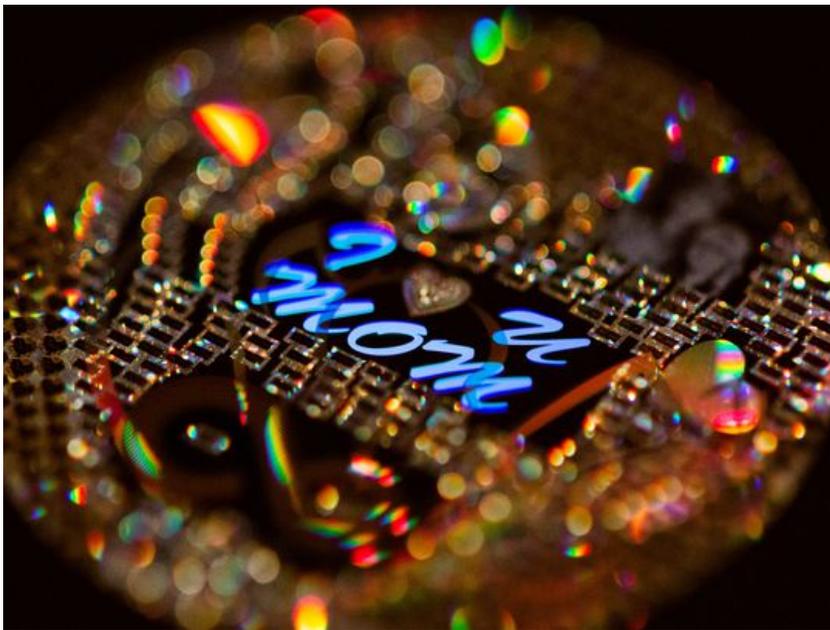
(<http://www.usatoday.com/story/tech/2013/04/26/cdc-carbon-nanotech-safety-guidelines/2110091/>)

He was looking to do a business deal.

Polar raster writing. Nanotechnology. Electrical engineering. Jim Froehler didn't fully understand it all, but said to himself, "If Carla likes it, we'll go for it."

He and Carla continued talking to Ha.

Three months later — just in time for Christmas — the Froehlers' jewelry store, People's Pottery, started selling NanoRosetta. Marketed as a permanent way to keep precious family photos and documents, the pendants are some of the store's best-selling items. Some people have ordered the entire work of William Shakespeare or the Bible. Others have blueprints for a house, birth certificates or poems.



The jewelry pieces last 10,000 years because they're predominantly made of nickel, an element that's practically indestructible. *(Photo: Provided)*

Jim Froehler said the store has sold more than 70 custom pieces and hundreds of pieces with pre-set designs.

"People realize right away that they've never seen something like this," he said.

The jewelry pieces are designed to last 10,000 years because they're predominantly made of nickel, an element that's practically indestructible.

"You can throw this in the ocean, which will destroy most things, but this will last because it doesn't corrode," Ha said. "You can even boil it."

NanoRosetta can be etched on cufflinks, trophies, rings, money clips and other wearable jewelry, Froehler said. Customers can view the etchings with a magnifying glass or a special smartphone app.



Using his engineering skills, Bruce Ha bought a special laser-printer machine from Kodak and housed at Rochester Tech Park. Ha modified the machine so that it can etch extremely fast on the smallest of spaces. Each of these tiny medallions, for example, could hold all the text of The Bible or the entire works of Shakespeare. *(Photo: Jamie Germano STAFF PHOTOGRAPHER)*

"People really like that," Froehler said about the app. "This is where technology is meeting jewelry and they really get a kick out of that."

The jewelry pieces are based on technology that Ha has tinkered with for 10 years, back when he was a Kodak scientist and the company was working on a 1 megapixel camera.

Using his engineering skills, Ha bought a special laser-printer machine from Kodak. Ha modified the machine so that it can etch extremely quickly on the smallest of spaces. The laser, Ha said, can strike 300,000 dots per inch. Your typical laser printer strikes 600 dots per inch. Because the laser is etching so quickly, Ha can finish 1,500 pages of text in one minute while the typical printer does 30 pages per minute. Ha isn't worried about someone duplicating his technology and creating knockoffs. He holds four patents on the fast-writing nano laser.

Writing on jewelry pieces isn't the first time Ha has used his technology.



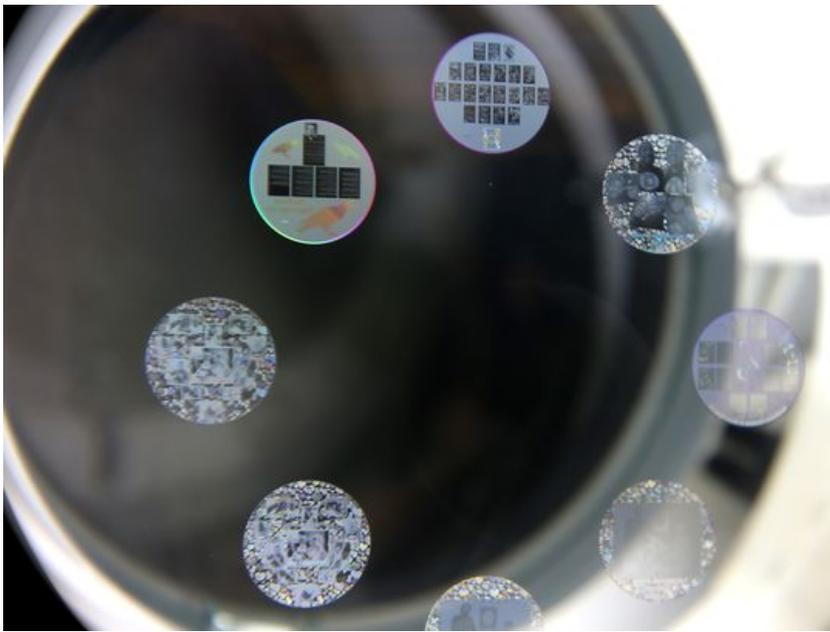
An app can be used to enlarge the data stored on NanoRosetta stored documents. (Photo: Jamie Germano STAFF PHOTOGRAPHER)

Take your Xbox game out of the case and flip it over. The shiny holographic-looking writing on the back, that's Ha's work.

Julian Yudelson has known about Ha's technology for quite some time.

Yudelson is a retired marketing professor at Rochester Institute of Technology and is now Ha's business mentor at SCORE. Yudelson said the remarkable thing about Ha's laser is that it has so many applications outside jewelry or video games.

"What he's doing now with it is the absolute lowest hanging fruit," Yudelson said. "Up until his technology, people were commonly putting digital information on small devices, but he can reduce the size of anything that you can give him on a PDF. He has companies clamoring at his door right now. He can be very, very big if he wants to."



In this photo, documents are in the middle stages of the etching process. (Photo: Jamie Germano STAFF PHOTOGRAPHER)

Yudelson has been with SCORE for 12 years and said NanoRosetta is one of the few ideas he has seen that can be successful. He said he sees Ha's work as the next evolution in the way we store information.

"We've taken entire libraries down to CDs and then to a jump drive," Yudelson said. "But even on a jump drive, you can't see what's on it without your computer."

Ha was born in Vietnam. At age 10, he and his family fled the country as political refugees on April 30, 1975 (the morning of the fall of Saigon), and eventually ended up penniless in a small town in Southern California. Ha doesn't remember much about Saigon, but he remembers that his parents had wealth. When it was time to leave, Ha remembered that his mother didn't take gold or any material riches; she took the family photos.

Seeing that, Ha said he realized that the most precious thing anyone could pass down to future generations is memories.

NanoRosetta has helped Ha save memories for his family and now he wants others to do the same.

"We want to preserve this generation forever," he said.

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