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From Beverly Hills to Santa Barbara: Mericos Foundation Supports Gallium Nitride Research

Santa Barbara, Calif. -- The Mericos Foundation, headquartered in Pasadena, Calif., has given the College of Engineering at the University of California at Santa Barbara \$700,000 to support gallium nitride research. Gallium nitride is currently the focus of one of the hottest areas of semiconductor research aimed at designing materials and making devices from those materials which harness the most energetic particles of visible light or photons.

At the center of that effort to make blue LEDs (Light Emitting Diodes) and the blue laser is Japanese scientist Shuji Nakamura, who has just accepted a faculty appointment at UCSB's top-ranked Materials Science Department. Said Matthew Tirrell, Dean of Engineering, "The Mericos grant, bolstered by other contributions, will help Santa Barbara to outfit for Nakamura a state-of-the-art gallium nitride lab on campus. We are deeply appreciative of the Foundation's generous and timely response to our request for support."

Gallium nitride researchers at UCSB and elsewhere, according to Tirrell, tend to fall into one of two types?material makers or device makers. "Not only," Tirrell noted, "does Nakamura do both, but doing both has enabled him to achieve stunning research breakthroughs."

Having pioneered a new technique for growing gallium nitride crystals, Nakamura used that technique to make the first blue LED by adding traces of another material, indium, to the gallium nitride crystals. By adding more indium, he then made the first truly green LED (leading to creation of huge full panel color displays now in use at sporting events and rock concerts).

Nakamura next coated his blue LED with a novel phosphor, thereby reaching a milestone in optoelectronic research with the creation of a white light emitting diode, likely to replace the incandescent light bulb invented by Edison in the 19th century. Incandescent lights squander most of their energy by putting out more heat than light. White LEDs will use 20 to 50 percent less energy to make light than the conventional incandescent bulb.

In addition to blue, green and white LEDs, Nakamura has also used gallium nitride to create the first blue laser. That invention translates into the very real possibility of a 35-fold increase in the amount of information that can be contained on a CD or DVD.

"The timing of the Mericos gift supporting gallium nitride research at UCSB could not have been better," said Chancellor Henry Yang. "The prospect of the gift was crucial to our successful efforts to recruit Shuji Nakamura, and the prospect of Nakamura's joining our top-notch gallium nitride group at UCSB was very appealing to the Mericos Foundation."

This is not the first time that the Mericos Foundation has made a substantial gift to this University, Yang noted. Back in the mid-1980s, the Foundation endowed a chair in honor of family progenitor Mericos Whittier. Herbert Kroemer, one of the principal originators of compound semiconductor technology and a professor of electrical and computer engineering, was appointed to that chair.

"Crystal growers," said Yang, "call the initial placement of the seed that leads to the desired crystalline structure the 'nucleation site.' Endowing the Whittier chair created a nucleation site for optoelectronic research at Santa Barbara. This new gift is like a catalyst for making a superb research group the best. UCSB is very grateful to the Mericos Foundation for the gift. I want to add special thanks to Joanne Whitter Blokker and her son, Jeff, who have acted so graciously and ably as UCSB emissaries to the Mericos Foundation."

Jeff Blokker, who holds both 1980 BS and 1984 MS degrees in electrical engineering from UCSB, concurs with Chancellor Yang about the timeliness of the Mericos gift. "This support from the Mericos Foundation for gallium nitride research represents," said Blokker, "one of those rare Zen moments when everything comes together in the right place at the right time. On the one hand, a pressing priority for the Foundation is to donate money for educational purposes in the Santa Barbara area. On the other hand, here is the University scrambling to put together the support for gallium nitride research that will attract the leading researcher of a generation. And the window of opportunity for bringing the two successfully together was small, measured in days not months."

What Blokker, who is the great-grandson of Mericos Whittier, does not dwell on in his depiction of that Zen moment is his own pivotal role. All he did, said Blokker, was to put the grant proposal before the Mericos Foundation board. "I'm not able to do anything but propose," he maintained.

What made Blokker's proposition compelling was his background. Twenty years ago when he was a student at UCSB, Blokker worked on gallium arsenide (the material that preceded gallium nitride as the center of wide-band-gap semiconductor research). "I was on the outside of the research group, one of the graduate students who did support work. I got one layer on," he recalls of his efforts to grow gallium arsenide crystals. "I put that layer on and got it to stick. The trick is to get it to stick. Everyone who did this work had a technique, and like many a good pastry chef we didn't share techniques," Blokker recalled.

So Blokker's graduate student experiences at UCSB made him enough of a gallium semiconductor initiate to enable him to appreciate Nakamura's mastery of technique and to speak authoritatively on Nakamura and gallium nitride to the Mericos Foundation.

Blokker decided in 1984 to put getting a PhD in electrical engineering on the back burner. So he took an MS degree and a leave of absence from UCSB and entered into a partnership to form a company, first named Blokker and Associates and subsequently CableSoft, now located in Ojai, Calif.

What CableSoft does for its clients is provide software it has tailor-made to analyze stock market transactions tick by tick. With the capacity to analyze 200 transactions per second, said Blokker, "We are typically 100 times faster than our competitors." The clients for CableSoft products are professional day traders—the pros who are the market makers executing large blocks of trades, rather than the consumer day traders, who have achieved fame (if not notoriety) of late. An example of what the software does for its users is the detection of large blocks of trades. The idea is to be alerted to the possibility that someone is, for instance, selling a large block of stock, which will lower the price, so that an even larger block can be obtained at the lower price.

It is no wonder that someone in Blokker's business should be alert to and appreciative of the opportunities that are a function of timing.

Back at the beginning of the last century, well before the advent of semiconductors and software, what drew Mericos (Max) Whittier from Maine to California was oil.

Whittier and his business associates were extremely successful prospectors, eventually bringing in billion-barrel fields in the vicinity of Taft. In the meantime, Whittier and partners Charlie Canfield and Burton Green had paid \$670,000 for the Rodeo de la Argus, a large tract of land on the then outskirts of Los Angeles, but after drilling 30 "dusters," their efforts to detect oil there proved futile. So they decided to turn the land into a planned development, one of the first to sport architect-designed roads and in-ground services for plumbing and electricity. They even built a hotel there in 1912 to attract visitors and prospective sub-division buyers. That hotel is the Beverly Hills Hotel, and the tract itself, Beverly Hills.

Mericos Whittier's eldest son, Donald, preferring pastoral Santa Barbara to urban Los Angeles, moved to the South Coast. Among other philanthropic contributions to Santa Barbara, he was responsible for extending the railroad at the Santa Barbara Zoo. The Mericos Foundation was established in conjunction with the estate of Donald Whittier, who is the father of Joanne Whittier Blokker, Jeff's mother.

She said, "What pleases me about this \$700,000 grant to UCSB is the good fit with my father's wishes. He loved Santa Barbara for its natural beauty and the low-key tenor of social interaction, and he put a high value on supporting education including engineering, technology, and science. With this grant the Mericos Foundation is fulfilling its mission."

Images



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