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Where Scientists Are Made

By: LINDA SASLOW

"NERDS rule!" Phyllis Serfaty proclaimed proudly after she learned earlier this month that eight of her students at Paul D. Schreiber High School in Port Washington were named semifinalists in the Intel Science Talent Search.

This year, Long Island's nerds truly ruled. Of the 300 high school seniors chosen as semifinalists in the national competition, sometimes called the Junior Nobel Prize, 82 were from the Island. Thirty-two public and three private schools on the Island had at least one semifinalist; Ward Melville High School in East Setauket had 12, tying it with a regional magnet school in Maryland for the most in the nation.

On Wednesday, when the roster was winnowed down to 40 finalists, 8 were from Island schools, including 2 from Ward Melville and 1 from Schreiber. The 10 winners of the competition, with a top prize of $100,000, will be announced March 14.

It was good year for the Island's young scientists, but not an unusual one. Year after year, the Intel roster is heavy with semifinalists and finalists from Nassau and Suffolk schools. How and why has Long Island come to own the Intels?

Start with demographics. As a region, Long Island has more than its share of well-educated professional parents who emphasize high achievement for their children and who support enrichment programs in the schools. And many of those parents may be nerds themselves, working at the Island's academic or research institutions or in its technology or defense industries.

Long Island is also home to a culture of fairly intense competitiveness when it comes to college admissions, with parents and students alike always looking for an edge. That culture drives growing participation in competitive events like the Intel Science Talent Search.

The growing demand has led school districts to employ teachers and advisers specifically for science research, like Ms. Serfaty in Port Washington. And it has led many of the Island's colleges, universities and laboratories to create mentor programs for Intel candidates.

Perhaps the most potent factor, though, is the warm spotlight of positive publicity. After a few schools on the Island scored big successes in the Intel contest and were lauded for it, other districts moved to set up or expand science programs.

The contest has become an important marker of many school districts' reputations for

excellence. "When parents look at school districts for their children," Ms. Serfaty said, "the two questions they ask most frequently are 'Where do the kids go to college?' and 'How many Intel winners have they had?' "

Interest in scientific research has also been spurred by the growth of the Long Island Science and Engineering Fair. Last year, about 450 students from 50 schools participated in the fair, held annually since 1986.

The seeds of the Intel culture on Long Island were sown by a pioneering teacher, Melanie Krieger. In the 1980's, Ms. Krieger developed one of the Island's first high school science research programs at Ward Melville and coached nearly 100 Intel semifinalists and finalists.

She left the school in 1998 to set up a similar program at Plainview-Old Bethpage John F. Kennedy High School. She has since retired from teaching, but remains president of the science fair, and she has published a book about how to excel in science competitions.

"It was through her efforts that science research was created as a subspecialty for teachers on Long Island," said Paul Lichtman, the director of the science research program at Uniondale High School. "She made it a cottage industry and created a new job description for many of us."

When Ms. Krieger left Ward Melville, the school hired a university professor, George Baldo, to run its research program. He doubled its size and continued its success, aided by the school's proximity to Stony Brook University, less than two miles away.

The university's mentor program pairs high school students from Ward Melville and elsewhere with professors to work on original research in science and math; 28 of this year's semifinalists, about a third of the Island's total, worked with mentors at Stony Brook, including 4 of the 8 who were named finalists.

"We have here what could be considered a professional learning community," Dr. Baldo said. "The involvement of the district and many sectors of the community breeds an atmosphere that encourages many exciting opportunities for our students."

But while sophisticated research programs at academic powerhouses like Lawrence High School, Ward Melville and Schreiber produced Intel success stories in bunches this year, many other semifinalists on the Island live in more workaday school districts that lack the budget for elaborate programs.

For example, Gavin Lund, 17, is a senior at Comsewogue High School in Port Jefferson Station, where the science research program consists of an elective class during the school day that doesn't cost the district any more to offer than any other science class, the principal, Joe Rella, said. Semifinalists and their schools each get a $1,000 prize from the contest; Mr. Rella said the school would use its prize money to supplement the class's budget.

Mr. Lund's project is on wireless sensor technology; he worked on it with a Stony Brook mentor, Petar Djuric, an associate professor of electrical and computer engineering.

"I was reluctant to accept a high school student in my lab, because few students at that age have the level of skills and training necessary to do the kind of work I do," Professor Djuric said. "But Gavin impressed me by accepting the challenge of preparing himself to work with me. While I provided him with the topic for his Intel project and gave him advice, the credit goes to him for his motivation and his efforts."

Long Island high school students also work with mentors at Hofstra University, the C. W. Post Campus of Long Island University, Suffolk Community College, Brookhaven National Laboratory, Cold Spring Harbor Laboratory and North Shore University Hospital. Some are also working at institutions in New York City.

The Hofstra Summer Science Research Program has produced two Intel semifinalists in each of its first four years. "Last year we had more than 100 applicants for 20 positions," said Nanette Wachter, the program's director and an associate professor of chemistry. "We're only limited by the number of faculty members that we have available to accommodate the number of students seeking these opportunities to work in a lab or out in the field.

"When I talk to professors upstate, I realize that there is not the same demand for high school science mentors as there is on Long Island. The wealth of job opportunities for professionals in the metropolitan area has led many families to the Island, which has created a large pool of talented and gifted students applying to the best colleges all over the country. With greater emphasis on academic achievement, public schools have gotten better, and everyone is benefiting from this cycle."

At Schreiber High, Ms. Serfaty said, students drove the creation of the science research program in 1983 when a group of them approached a teacher for help entering the competition, which was then known under the name of its previous sponsor, Westinghouse.

"We have been fortunate to be surrounded by many research institutions," Ms. Serfaty said, "and our community has many individuals in the research field who were very generous in bringing students into their labs.

"With the help of community grants and donations from companies, we have not had to dig deeper into our pockets than what was allocated in the budget as part of our science department. In our school, being a science research nerd has become a culture."

By contrast, at schools like Centereach High School that do not have an advanced research program, motivated students are dependent on outside support.

Before Irina V. Zaitseva, 17, was selected this year, Centereach had not had a finalist in

the contest since the late 1980's, nor a semifinalist in eight years.

"My dad works at Stony Brook and encouraged me to enter the Intel competition," she said. "Last summer, I heard a lecture about how sunscreen prevents sunburn but not skin cancer and became interested in the subject. I found a mentor and worked all summer at the university on the project."

Uniondale High's research program differs from most by specializing in one area -- agricultural sciences, including plant physiology, ecology and horticulture -- and using in-house mentors rather than relying on outsiders.

"The program has tremendously helped the P.R. of the district," said Dr. Lichtman, the director. "In a competitive academic environment, science research is one way to set students apart from other kids applying to the same competitive universities.

"When we developed the program, I wanted to pick a discipline that wasn't too popular, and that would allow students a ticket to a place that they otherwise might not get to. Five years ago, we had 11 students in the program, and this year there are 75."

Uniondale had one semifinalist this year: Miguel Angel Bustos, 18, whose project's topic was the reduction of phosphate and nitrate pollutants in surface water.

Another unusual feature of Uniondale's approach is that it makes room for non-nerds as well -- "students who don't have such high grades but can become managers in the program," Dr. Lichtman said. "Everyone feels proud to be part of a science research program that has put Uniondale on the map."

'My Child Is an Intel Finalist at '

Here are Long Island's eight Intel finalists, their schools and projects (which they could explain better than we could).

SANFORD H. CALHOUN, Merrick

Brittany N. Russo -- Seeing through the ears. (Behavioral science)

CentereacH

Irina V. Zaitseva -- Stability of sunscreen to UV radiation and reduction of photocatalytic activity of titanium dioxide. (Chemistry)

JOHN F. KENNEDY, BELLMORE

Adam R. Solomon -- The effects of age on brown-dwarf spectral features in the near-infrared. (Astronomy)

Jerrold A. Lieblich -- When the brain doesn't hear what the mind does: A lexical approach to Mc-Gurk adaptation. (Psychology)

Harley Huiyu Zhang -- The role of general relativity in core collapse of spherically symmetric supernovae. (Astrophysics)

Northport

Eric A. Meyerowitz -- Probing the confirmation and dynamics of allatostatin neuropeptides: A structural model for functional differences. (Biochemistry)

PAUL D. SCHREIBER, Port Washington

Carmiel E. Schickler -- Creating a conflict alert system: Leadership change, violence and the cycle of relative power. (Sociology)

Syosset

Diane Jeehea Choi -- Measuring passive love: Amae and Japanese uniqueness. (Sociology)