

Published in the Connecticut Post on 03/18/2005

## Chaos theory to sunspots for students

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HAMDEN - Bieu Tran and Sameer Abudulgalil, both juniors at Harding High School in Bridgeport, all but see sunspots when they close their eyes.

Through months of research, the pair compared tree ring growth and the frequency of sunspots to see if there's a relationship.

The results disproved their hypothesis, that more than 90 sunspots would lead to narrow tree rings, but helped them secure a first-place finish Thursday in the high school life-science team division of the 57th annual Connecticut Science Fair.

First-place winners in the middle school life-science team division were Stacey Berkowitz and Hannah Dreyfus of Hillel Academy in Fairfield. The seventh-graders are out to cure cancer and found blue-green algae helps halt tumor growth in bean plants that they had injected with a "plant cancer."

Both teams' projects were among a dozen first- and second-place winners selected from a field that started this week with 548 students and 434 projects from 121 schools in the state. Females this year outnumbered males in the competition, 298 to 230.

It's a competition that George Wisner, chairman of the Connecticut Science Fair Association, called increasingly sophisticated. Projects are judged on scientific thought, creativity, thoroughness, skill, clarity and teamwork.

This year's field included projects on everything from a groundbreaking DNA project by Shane E. Mulligan, a senior at Staples High School in Westport, to a chaos theory project by Harding sophomores Nichole Q. Moore and Sania A Beckford.

Using dice dropped a thousand times, Moore and Beckford found a bucket of water is what high rollers need to make higher numbers come up less than randomly.

In all, 27 students from schools in Bridgeport, Fairfield and Milford were represented in the 114 projects that made it to the final round.

Harding had seven two-student teams in the finals. Hillel Academy had six teams represented.

Bridgeport's Central High School also had two students represented, 10th-graders Camille A. Grant and Edna N. Chukwurah.

Wisner said Harding and Hillel both have incredibly dedicated science teachers — Michael Belmonte at Harding and Karen Howell at Hillel — who pursue the fair with a passion.

"He pushes us if we get stuck," Abdulgalil said of Belmonte.

"Harding may get a bum rap, but we have a whole lot of good students and good programs going on," said Ana-Laura Perez. With fellow Harding junior Johannah Zayas, Perez spent Thursday explaining how they discovered that Bridgeport has a higher exposure rate to ground ozone than Oxford, Milford or Greenwich.

Similarly, Harding sophomores Valia Alexis, 16, and Sherene J. Perrier, 15, studied bacteria counts in the Ash Creek estuary.

"We didn't want to do something that was insignificant," Alexis said.

Also concerned about the environment was Michael Shrager, 14, an eighth-grader at Hillel. He suspects epoxy levels are killing lobster in Long Island Sound.

This year saw a lot of projects concerned with alternative energy sources. David Rabbani, 14, a Fairfield eighth-grader at Hillel, decided to find an alternative source of fuel after watching reports about rising fuel costs. His biofuel production involved potatoes, corn and apples.

Also out to solve an everyday problem was Denis Whelan, 13, an eighth-grader at St. Gabriel in Milford. His Parabolos project, to build a better satellite, was borne out of poor TV reception at home.

Kylen Farrell, 13, a Bridgeport resident who attends Assumption School in Fairfield, tackled a clean smile. Hoping to keep her newly straightened teeth white, she experimented and found baking soda to be the best at reducing acid in people's mouths. The research was harder than it sounds. "So many hours, driving everywhere to people's house to get them to do my experiments, taking nights to write reports and make this board — it took a very long time," she said.

According to Wisner, four of the state's top individual high-school winners represent the state in an International Science and Engineering Fair in Phoenix, Ariz. in May.

Mulligan, the Staples senior, is one of the four and is no stranger to competition.

Already, his project "The Construction of a Self-Assembling DNA Nanohexagon Capable of Protein Storage and Release," has helped him become a semifinalist in the Siemens-Westinghouse Science Competition.

The 17-year-old has taken part in a three-year science research course at Staples, and has worked for more than a year in New York University's chemistry department.

A future chemist headed to Brown University, Mulligan envisions using his hexagon-shaped DNA to hold and deliver medicines. He was drawn to the topic because it's a field still in its infancy.

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