

# THE MORNING CALL

JULY 10, 2024

WEDNESDAY

Heavy thunderstorms 93°|71°

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In the dugout between innings during Tuesday's game at Coca-Cola Park in PHOTOS

## Profound heat in Lehigh Valley

## Professor leads teens to national math win

Contest victory comes weeks after his retirement from Lehigh University

By Andreas Pelekis  
The Morning Call

Adding up a career in math

As an aficionado of mathematics, Don Davis loves to teach math and win in math. So every Sunday, Davis, 79, a recently retired Lehigh University professor, brings together 60 teenagers for math team practice.

Just weeks after retiring from teaching at Lehigh University after a 50-year tenure, Davis coached one of his teams to win the American Regional Mathematics League contest in early June. It was the fifth win for one of his math teams, and the first in over a decade.

"It's exciting to see the students' excitement when they win," Davis said. "But it's also exciting just to see how they enjoy working together."

Davis received his doctorate from Stanford in 1971 and began teaching at Lehigh three years later. He taught undergraduate and graduate classes, and led 13 students toward their own doctorates.

"I still maintain close relationships with almost all of those 13 people," he said. It typically takes graduate students six years to achieve a PhD at Lehigh, allowing Davis to bond with them.

Davis also published or contributed work to over 150 mathematics papers during his tenure. Most of his work focuses on topology, which is the section of math involved with deformed properties

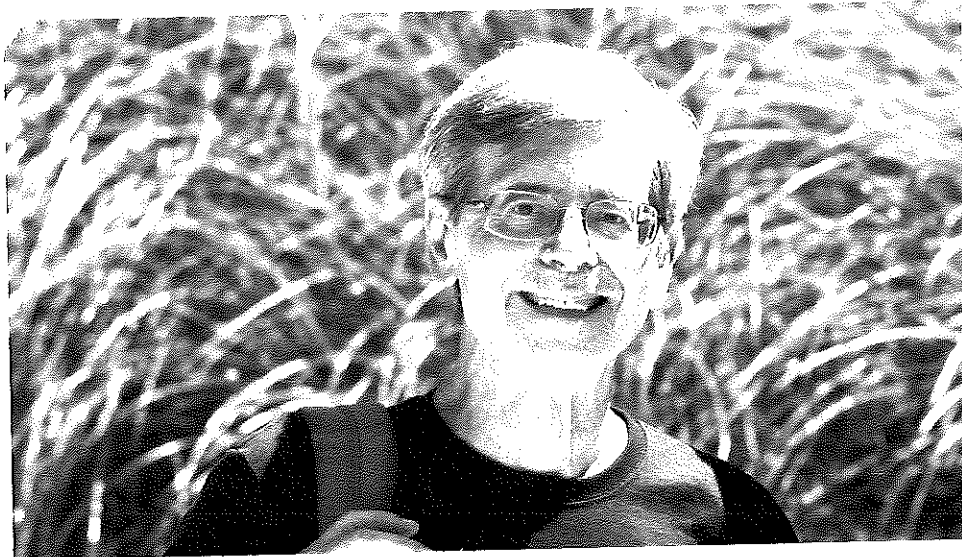
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Davis

NEWS > EDUCATION

## Weeks after retirement, Lehigh professor leads teens to national math win



Now retired, Don Davis taught at Lehigh University for 50 years, while he's coached the Lehigh Valley math team for just over 30 years. (Courtesy of Qian Huang)

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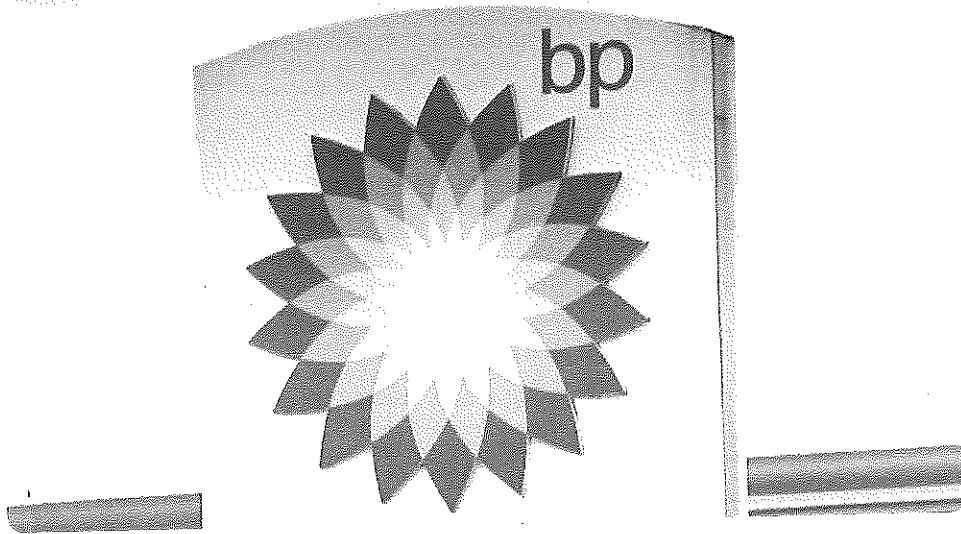
As an aficionado of mathematics, Don Davis loves to teach math and win in math. So every Sunday, Davis, 79, a recently retired Lehigh University professor, brings together 60 teenagers for math team practice.

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### **Adding up a career in math**

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Davis also published or contributed work to over 150 mathematics papers during his tenure. Most of his work focuses on topology, which is the section of math involved with deformed properties of geometric objects. One paper, “A Strong Non-Immersion Theorem for Real Projective Spaces,” appeared in the Annals of Mathematics, one of the most prestigious mathematics journals.

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He also studies differential topology, topological robotics and combinatorial number theory in his work. Davis highlighted topological robotics, which is “more accessible to the general public.”

“What we’re looking at is how to program robots to move from any configuration to any other configuration, or how can you do that?” he said.

One of Davis’ most important relationships began before the ARML team was founded. He met a then-eighth grader Paul Martino, now an entrepreneur who founded a venture capital fund, Bullpen Capital. Since 2006, Martino has donated heavily to Davis’ team.

“We have not had to charge our students any money because of Paul’s sponsorship,” Davis said.

Martino met Davis during an individual competition, four years before Davis founded the ARML team.

"I remember meeting him in that office, that was his office for most of the last 50 years," Martino said. "And every time I walk in there, I just kind of remember being an eighth-grade kid. It's been a tremendous relationship for a very long time now."

The relationship began because of a 1989 article in The Morning Call.

"I was curating an exhibit of fractal art at Lehigh. And there were always nice pictures in The Morning Call. It was because of the article in The Morning Call that Paul's mother saw the article and that's how she knew about me and called me," Davis said.

"That article doesn't happen? I don't know that Don Davis has a championship team," Martino said.

The pair's relationship has continued for over 30 years.



Davis stands with Paul Martino, right, at his retirement ceremony earlier this year. (Courtesy of Kenuo Pan)

"It's an honor to be able to write the check to him every year," Martino said.

"He's the best coach in the country, when he gets a couple good kids he produces a winning team."

Davis founded the Lehigh Valley team in 1993, and it used to be exclusively for students in the local area.

“We gradually expanded,” Davis said. As one team in Philadelphia disbanded in the 2000s, it allowed Davis to bring in more students from across the Northeast.

Now, students on the Lehigh Valley ARML team hail from the Lehigh Valley, Philadelphia, New Jersey and sometimes Delaware. Eight students are in Davis’ backyard, the Parkland School District. Other students in the Lehigh Valley come from Moravian Academy, Emmaus High School and Easton Area High School. Students range in age from sixth to 12th grade.

There are four 15-person teams that Davis manages: Fire, Ice, Lightning and Thunder. Lehigh Valley Fire, which is the A-team, won the ARML contest in June.

In practice, captains on each of the four teams lead problem sets and proofs. Davis said that it models the national contest.

“I keep track of the students’ performance on these individual questions at the practice and that’s useful information for deciding who’s going to be on [each team],” Davis said.

Davis’ practices are also fun, especially for the math enthusiast. Each practice ends with “relays” involving three people.

In each relay, the first person gets the start of a math question. The other two people get a variable or other factor in the problem and have to contribute to what becomes a more challenging, team problem.

“The first person passes the answer to the second person, and the second person uses that number plugging it in and figures out an answer and passes that on to the third person,” Davis said. “And then the third person is the one who passes an answer in.”

“The kids get to know each other so well,” he continued.

## Winning in math

More than 1,600 students worldwide participated in the ARML contest this year. The contest doesn't bring together every team in one place. Instead, four contests at regional sites in the United States occur, with the same set of mathematics questions that everyone answers.

"The 15 people on a team go together into a room and they have to work together to solve problems," Davis said of the competition. "One set of problems has numerical answers, and the other set of problems they have to write proofs."

"Some of [the questions] are pretty easy, and almost everybody gets them right. And some are so hard that hardly anybody gets them," he continued.

In 2024, Lehigh Valley Fire won with 229 points, etching out the win against the second-place San Francisco Bay Area team, which won the last three years.

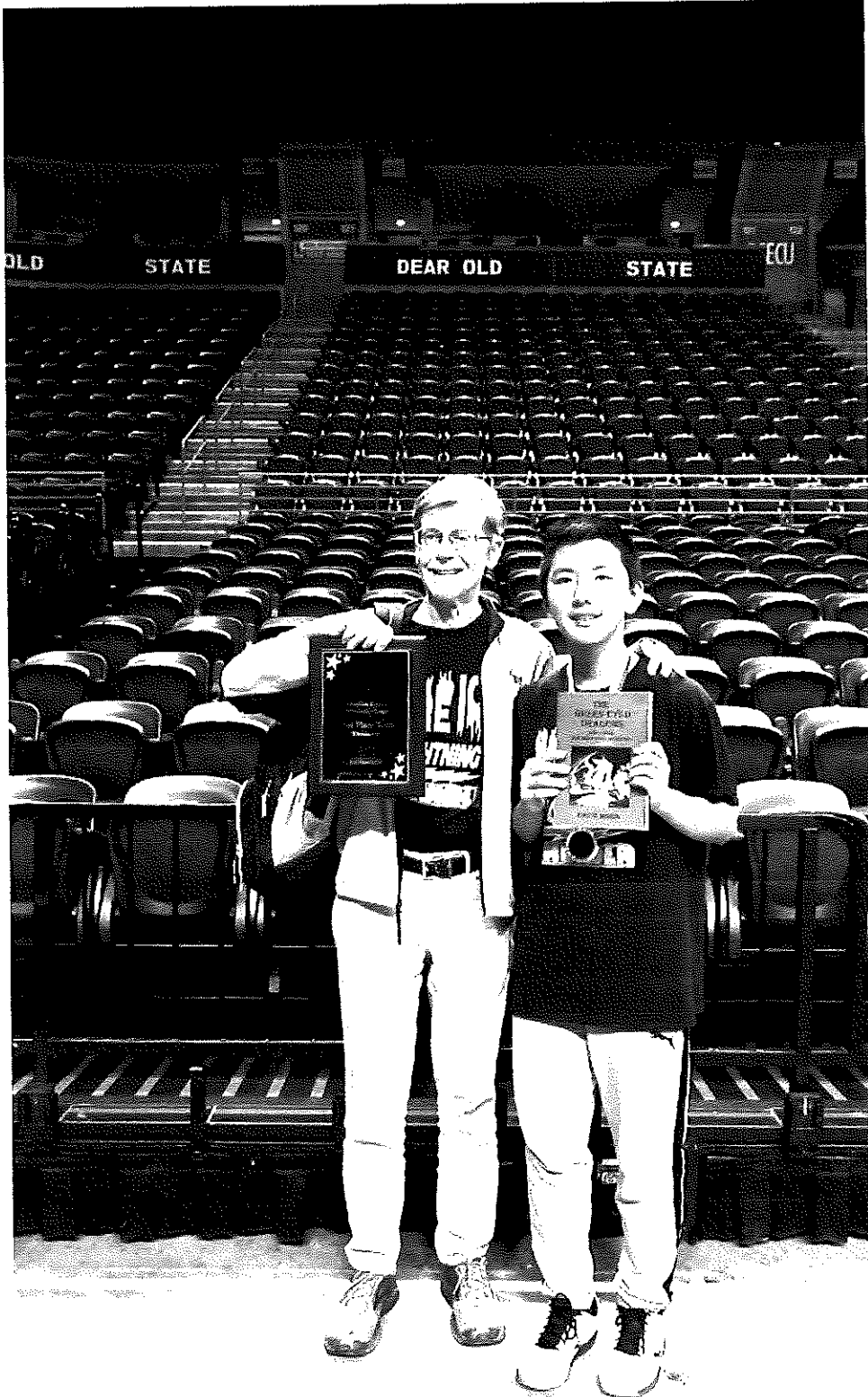
Lehigh Valley Fire last won in 2011. It also won in 2005, 2009 and 2010.

"It's very exciting for us because all the kids, they've got their phones out, and they can see this spreadsheet with the results on their phones," Davis said. After all of the problems are solved, the scores are tallied between all four regional sites.

An individual competition is also part of the ARML contest. One of Davis' students, Alexander Wang, was one of two students in the entire country to answer all 10 questions on the individual test correctly. He won the individual competition by winning in a tiebreaker, claiming a \$1,500 prize.

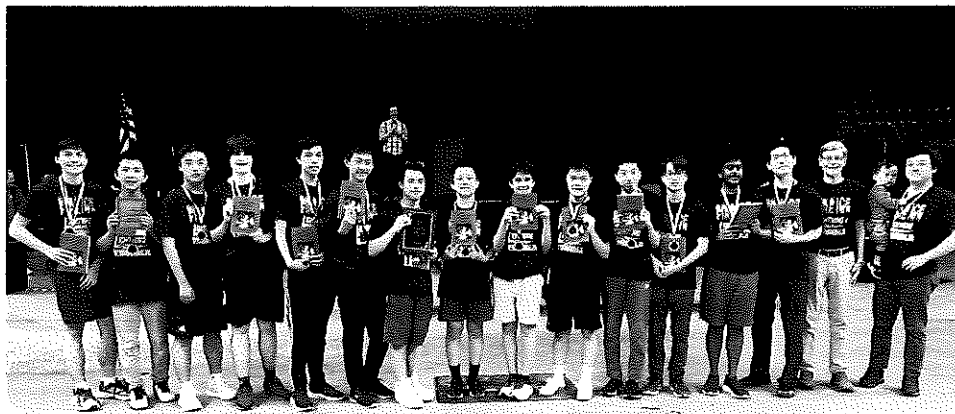
"He's arguably the best high school math student in the country," Davis said of Wang, a sophomore at Millburn High School in Essex County, New Jersey, who has been on Davis' team for four years.





After retiring from Lehigh, Davis will continue to coach the ARML team for what he hopes will be “several more years.” Davis now gets assistance from two Lehigh University professors. But he also trusts that the intelligent students will prep on their own.

“The relationships with the families are very, very important,” Davis said. He described the students as hardworking, but the parents are just as motivated to see each of the four teams succeed.



Don Davis stands with the winning Lehigh Valley team after winning the 2024 American Regions Math League contest. (Courtesy of Qian Huang)

“Their eyes light up because a lot of times [parents] don’t have the resources or knowledge to know how to get help when they have this really smart kid,” Martino said. “I would say that one of the most rewarding parts for me is always talking to the parents, making myself available.”

Martino attends some of the practices and the ARML contest; he always gives a motivational speech before the big competition. Meanwhile, Davis often attends weddings of former ARML students.

As for where many of these “really smart kids” end up, it’s often Ivy’s or major tech universities.

“Most of my students go to MIT, Princeton or Harvard,” Davis said.