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June 19, 2011

## No. 1 Number Coach

Lehigh U. professor quietly builds high-school mathematics dynasty

By Ryan Brown

Forget David and Goliath.

At this year's American Regions Mathematics League tournament—a national championship for high-school mathematicians—it came down to a battle of Goliath versus Bigger Goliath.

First there was the team from Pennsylvania's Lehigh Valley, the back-to-back defending national champions and heavy favorites to take a third title.

But Lehigh had entered the final round of questions in the competition behind on points,



Tom Leong

Don Davis (center), a Lehigh U. mathematics professor, huddles with members of his winning team at a national high-school math championship this month.

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and even the most seasoned members of the squad had reason to be intimidated by the team leading the scoreboard, an all-star cast from the New England boarding school Phillips Exeter that included five of the top 12 high-school mathematicians in the country.

Lehigh's coach, Donald M. Davis, was realistic as he prepared his team, the Fire, for the final event.

"I told my team, 'Go out there and do your best, and we ought to be able to get second place,'" says Mr. Davis, a math professor at Lehigh University.

But he had spoken too soon. In the high-stakes final, a relay round in which each student's answer builds on a previous solution provided by a teammate, Exeter wilted, and Lehigh rose to its third national championship in as many years.

For Mr. Davis, however, that three-peat is only the latest in a long series of coaching victories. Over the past two decades, the scholar has done something that won't add a single line to his CV: He has built his small corner of eastern Pennsylvania into a powerhouse for competitive high-school math. His students regularly burn teams representing entire states or large cities in regional and national competitions. Math whizzes as young as 11 now travel up to 80 miles to try out for his five squads.

His strategy, he says, isn't particularly novel. His teams, each of which has 15 members, spend their Sunday afternoons slogging through difficult math problems at group practices and the rest of the week poring over the solutions. Of course, Mr. Davis does have his own cache of personal tricks, which he politely declines to disclose, saying only that in his experience, "success breeds more success."

Although he is best known in the high-school math world for winning big competitions, Mr. Davis's achievements as a coach go beyond the numbers. As he knows firsthand, being a teenage math prodigy isn't exactly your standard-issue path to high-school popularity. So from his perch as coach he works to build community among his students, many of whom had never met other students who could match their math chops before they joined his team. Over snacks and proofs at weekly practices and on long bus rides to and from competitions, the students on his teams bond over their shared love for all things numerical.

The camaraderie of Mr. Davis's teams is perhaps the reason they also took another crown at this year's American Regions tournament—first place in the annual song contest. Their math-themed medley of pop songs included an extensive riff on Sir Mix-a-Lot's "Baby Got Back," including the lyrics, "I write good proofs and I cannot lie/you other brothers can't deny/for circle problems I can angle chase/when that round thing's in my face/I get full credit/ there you go I said it."

Ben Zauzmer, a Harvard-bound graduate of Upper Dublin High School and a member of the

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national championship team, says the group's closeness gave its members an edge in the competition as well. Lehigh probably couldn't match Exeter in sheer brainpower, he guesses, but the fact that he and several of his teammates had been doing math relays together for six years helped them edge out the New Hampshire squad.

Long-term dedication is a trait Mr. Davis models for his students. Each week after his high-school teams practice and before he returns to his job teaching and publishing at Lehigh, he comments on each of the proofs members of his teams submit, some 75 in all. And he has made a habit of welcoming onto his teams anyone who can hack it in competition, regardless of how easy they are to coach. One of his star competitors in recent years has been a boy with Asperger's, who came to the team "totally out of control," Mr. Davis says, and whom he had to coach not only in advanced mathematics but also in social prowess.

"He realizes that being good at math and being a good person can and should go hand in hand," Mr. Zauzmer says of his coach.

Off the high-school math circuit, Mr. Davis also keeps up with several offbeat hobbies, including crunching baseball statistics, maintaining his collection of several hundred beer bottles, and running long distances—very long distances. By his own count—and there is reason to believe that Mr. Davis is pretty good at counting—he has run more than 83,000 miles since 1977, just over a third of the distance between the Earth and the moon.

"Just talking to him is an experience," Mr. Zauzmer says. "You always accidentally stumble upon a subject where it feels like he's the world's most knowledgeable expert."

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