



Davidson Fellow Sheel Ganatra

(\$10,000 Scholarship Recipient)



Personal Info

Sheel Ganatra

Age: 17

Newark, Delaware

School, College and Career Plans

A recent graduate of the Charter School of Wilmington, Sheel will be entering Harvard University in the fall where he will study Mathematics, Computer Science and Physics. Sheel plans to earn a Ph.D. and become a college professor or research mathematician.

Davidson Fellows Submission (*Mathematics*)

In his project, *Escaping a Forest of Circular Mirrors: A Topological Analysis of Phase Spaces*, Sheel proved a conjecture in combinatorial geometry. During his work which focused on a set of finitely disjoint circular mirrors in a plane, Sheel answered whether or not one light ray from a source at any point in the plane could escape. The highlight of Sheel's research lies not only in his solution, but also in his methods as he presents a novel approach to the problem using topology, the study of the abstract shape of space. In taking a creative new approach to a ten-year-old, unresolved problem, Sheel opened a number of avenues for further research and his results have broad implications in the study of illumination and the abstract shape of space.

Biography

Born in Wilmington, Delaware, Sheel has a strong interest in mathematics, with secondary interests in computer science and physics. Mathematics has held a high level of appeal for Sheel since he was young, but it has been in the past few years that he has seriously considered becoming a professor in the field.

Sheel has worked on a number of advanced mathematics projects including: *On the Skein Relationship in the Construction of New Knot Polynomial Invariants*; *Traffic Flow Theory and Transportation Networks*; and *Basins of Attraction for a Grass-Weed Dynamical System*. In 2000, Sheel designed a security device using sequential circuitry and logic gates. He named this project, *Sequential Circuitry in a Digital Security Device*.

Fluent in the Gujarati dialect of India, Sheel also continues to learn Hindi, Spanish and Mandarin. Sheel participated in a variety of high school activities including the Indian youth group, ultimate Frisbee, and the Math Team. Sheel is enthusiastic about learning new things and looks forward to entering Harvard in the fall.

Please see next page.

The Davidson Institute for Talent Development

9665 Gateway Drive, Suite B | Reno, NV 89521 | Ph: 775-852-3483 | Fax: 775-852-2184



Davidson Fellow Sheel Ganatra

(Cont.)

Honors/Awards

- 2002 Davidson Fellow (September)
- 2002 USA Mathematical Talent Search (USAMTS), Gold Medal Winner
- 2002, 2001 Math League Press, National Individual First Place both years. The school's team placed first in the nation both years
- 2002, 2001 National Merit, Finalist
- 2002, 2001 Siemens-Westinghouse Science and Technology Competition, Regional Finalist and Semifinalist
- 2001 HiMCM (national mathematical modeling contest), as Team Captain he received a "National Outstanding" designation for one of the top-10 papers; as co-captain he received a "Regional Outstanding" award
- 2001, 2000 National Science Olympiad, Finalist
- Harvard University's Clay Mathematics Institute Seminars, one of 12 selected nationally
- USA Computing Olympiad – U.S. Open, Third Place
- USA Mathematics Olympiad, Qualifier
- USA Today Academic, Second Team

Community Activities

Sheel is a proud member of the Indo-American Youth Association and has worked on the "Two Duniyas" project, which will be on display in at the Delaware State Museum. He also enjoys volunteering at St. Francis Hospital.

An Eagle Scout, Sheel received his Eagle Rank in May 1998.

Before graduating, Sheel served as the president and founder of his high school's Environmental Club, was the head of can recycling through the SAVE Club and was co-founder of the Tutor Club.

In the summer of 2000, Sheel traveled to the Ramakrishna Mission in Singapore where he volunteered to paint the walls of the boy's dormitory and created a display showing the history of the Mission, its current state and future plans.

###

The Davidson Institute for Talent Development

9665 Gateway Drive, Suite B | Reno, NV 89521 | Ph: 775-852-3483 | Fax: 775-852-2184