

2008 Intel Science Talent Search

At a black-tie gala in Washington, D.C., Intel announced the top ten winners of the 2008 Intel Science Talent Search (Intel STS). These winners were selected from among the 40 finalists in attendance at the Intel Science Institute. This week-long event - the culmination of the competition - offered this exceptional group of young scientists and mathematicians the opportunity to present their research to esteemed judges and showcase their work at the National Academy of Sciences.

Shivani Sud - First-Place Winner

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When Shivani Sud was six years old, one of her immediate family members was diagnosed with a brain tumor. Inspired by the doctors who helped her loved one recover, Shivani set her sights on a career in medicine.

Fast forward to Intel STS 2008, where the 17-year-old senior from Durham, North Carolina, presented research focused on identifying stage II colon cancer patients at high risk for recurrence and the best therapeutic agents for treating their tumors. Whereas the standard method of characterizing tumors relies on visual information (such as size, degree of metastasis, and microscopic structure), Shivani developed a "50-gene model" which uses gene expression to link multiple genetic events that characterize various tumor types to more accurately predict the recurrence of colon cancer. Additionally, Shivani's model can be used to identify drugs that may be most effective in treating each patient.

First in her class at Charles E. Jordan High School, Shivani is a Teen Court student attorney, a Durham rescue volunteer, and performs classical and modern Indian dance. She plans to attend Princeton or Harvard, with the ultimate goal of conducting medical research.



Shivani Sud of Charles E. Jordan High School from Durham, North Carolina wins a \$100,000 scholarship.

Graham Van Schaik - Second-Place Winner

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When Graham Van Schaik's grandmother, an avid gardener, refused to let him apply a home-use pesticide because she felt ill when she previously applied it, the 17-year-old decided to investigate the chemical. When he found that the active ingredient seemed to be indicated in cases of breast cancer and neurodegenerative disease, he delved into a two-year research project on the long-term effects of exposure to pyrethroids. Graham's findings confirmed that realistic exposure to pyrethroids promotes cellular proliferation in human breast cells, an indication of cancer, and neurite retraction in rat PC12 neurons, a sign of a neurodegenerative disease like Alzheimer's.

Ranked first in his class at Spring Valley High School in Columbia, South Carolina, Graham's honors include a Best in Category Award at Intel ISEF 2007 and a President's Volunteer Service Award for founding Science Captivates Minds, a summer science camp for at-risk youth. Graham plans to pursue a career in scientific research.



Graham Van Schaik of Spring Valley High School from Columbia, South Carolina wins a \$75,000 scholarship.

Brian McCarthy - Third-Place Winner

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In his research, Brian McCarthy, 18, from Hillsboro, Oregon, investigated the viability of plastic solar cells as a new option in solar energy technology. Using interfacially polymerized combinations of porphyrins and phthalocyanines - plant-like photosynthetic materials found in nature that are photoactive and photoconducting (both properties of functioning solar cells) - he synthesized extremely thin, fragile films for potential use as solar cells and tested them using scanning electron microscopy techniques. Brian's novel polymer films responded electrically to light, indicating that they could act as solar cells and offer a less expensive option to current silicon-based solar cell technology.



Brian McCarthy of Liberty High School from Hillsboro, Oregon wins a \$50,000 scholarship.

At Hillsboro's Liberty High School, Brian is first in his class and a member of the varsity track and field team. He hopes to attend MIT or Harvard and, one day, be part of a team developing new sources of energy.

Rounding out the top 10 winners:

- **Katherine Banks - Fourth Place, \$25,000 Scholarship**
A 17-year-old Stuyvesant High School student from Brooklyn, New York, Katherine Banks delved into combinatorial geometry and developed a proof of a conjecture by S. Rabinowitz involving lattice polygons. Katie hopes to attend MIT or Cornell to pursue a career in mathematics education.
- **Eric Delgado - Fifth Place, \$25,000 Scholarship**
Eric Delgado, an 18-year-old from Bayonne High School in Bayonne, New Jersey, studied the use of novel efflux pump inhibitors (EPI) to improve the efficacy of antibiotics against multi-drug resistant bacteria. He plans to study molecular biology at Princeton University.
- **David Rosengarten - Sixth Place, \$25,000 Scholarship**
David Rosengarten's physics project involved the study of dark matter and galactic rotational curves. The 18-year-old from John L. Miller-Great Neck North High School in Great Neck, New York, plans to continue his studies at Harvard.
- **Xiaomeng "Jessica" Zeng - Seventh Place, \$20,000 Scholarship**
Xiaomeng "Jessica" Zeng, an 18-year-old from West High School in Iowa City, Iowa, studied her state's public libraries, specifically examining the relationship between government and private funding. She hopes to attend Harvard or Yale to pursue studies in pro-social behavior.
- **Philip Mocz - Eighth Place, \$20,000 Scholarship**
Philip Mocz, 18, of Mililani High School in Mililani, Hawaii, developed a novel statistical algorithm and used it to discover previously unidentified patterns in the distribution of nearby stars, challenging standard assumptions about random stellar mixing in our galaxy. Philip plans to pursue studies in astronomy, physics, and math at Harvard or Stanford.
- **Alexis Mychajliw - Ninth Place, \$20,000 Scholarship**
A 16-year-old from Paul D. Schreiber High School in Port Washington, New York, Alexis Mychajliw studied local Odonate populations (dragonflies and damselflies), tracking distribution and application to conservation policy. Alexis plans to attend Cornell.
- **Evan Mirts - Tenth Place, \$20,000 Scholarship**
Evan Mirts, an 18-year-old from Jefferson City High School in Jefferson, Missouri, used a scanning ion conductance microscope to study morphological changes in chloroplasts, key components of photosynthesis. Evan plans to further his studies at Washington University.

The remaining 30 finalists were each awarded a \$5,000 scholarship. All finalists received an Intel® Centrino® Duo mobile technology-based laptop.