

## Finalists of the 57th Annual Westinghouse Science Talent Search

Designed to discover and develop scientific, mathematical and engineering ability among high school seniors, the Science Talent Search has been conducted annually by Science Service in partnership with the Westinghouse Foundation for 57 years.

The 40 Finalists of the 57th Science Talent Search, among whom \$205,000 in scholarships will be distributed, represent about 2.5 percent of those who completed entries in this scientific and educational competition.

These 10 females and 30 males are awarded an all-expense-paid trip to Washington, D.C. to attend the Science Talent Institute, March 4 through 9, 1998. Here, ten of the Finalists will be selected by the board of judges to receive one of the following four-year scholarships: one \$40,000 (\$10,000 per year), one \$30,000 (\$7,500 per year), one \$20,000 (\$5,000 per year), three \$15,000 (3,750 per year), four \$10,000 (\$2,500 per year). The remaining 30 contestants will be given scholarships of \$1,000 each.

The Finalists are 16 to 19 years of age and come from 37 cities in 15 states. They were picked by the judges from among 1,581 contestants who completed their entries by writing a report on their scientific research and submitting it along with an official entry form and supporting documents. Completed entries were received from 44 states, the District of Columbia, Puerto Rico and four international schools in Taiwan, Germany, Korea and Canada.

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This listing of Science Talent Search Finalists is compiled by Science Service based on information provided by each student participant. The student's name, age, home address, school, city of school and project title follow. If the student's home town differs from that of her/his school, it will be noted in the home address.

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### ARIZONA Tempe

Corona Del Sol High School  
Shah, Ravi Vikram (17) 1726 East Knox Road 85284  
*Nucleotide Excision DNA Repair: Novel Implications in Therapy Resistance in Human Malignant Gliomas*

### CALIFORNIA Corona

Corona High School  
Kromsky, Ann (17) 1158 Willits Drive 91720-3842  
*Computational Model of Child Memory: Memory Acquisition Without Biological Constraints*

### North Hollywood

North Hollywood High School  
Marsden, James Greg (17) 7060 Helmsdale Road, West Hills 91307  
*Environmental Impact of Treated Sewage Into the Ocean by its Effects on Plankton Population*

### Sacramento

Rio Americano High School  
Ramachandran, Sohini (15) 8541 Dominique Court, Fair Oaks 95628  
*Homo sapiens and Arabidopsis thaliana: Mathematical and Computer Intensive Studies of Geographic Molecular Variation*

### Villa Park

Villa Park High School  
Shaw, Jeremy Walter (17) 3312 East Mandeville Place, Orange 92867  
*Depth Perception and Binocular Rivalry*

### COLORADO Colorado Springs

William J. Palmer High School  
Matthews, Heather Margaret (17) 1926 Wood Avenue 80907  
*Wisdom of the Wetlands: Two-Year Study Comparison of Created and Natural Wetlands*

### DELAWARE Wilmington

Salesianum School  
Huang, Calvin K. (17) 5 Larchmont Court, Hockessin 19707  
*Desulfurization of Coal by an Enhanced Sonochemical Process*

### FLORIDA Fort Myers

Canterbury School  
Tanner, Carey Marie (16) 12750 Yacht Club Circle 33919  
*Design of Translucent, High-Efficiency Photoelectrochemical Solar Cells Based on Multiple Dye Sensitization of TiO<sub>2</sub> Films*

### Miami

Gulliver Preparatory School  
Fitzgerald, Kimberly Anne (18) 15215 S.W. 78th Court 33157  
*Chromosomal Accessibility of Pre-B Cell Receptor and Immunoglobulin Genes*

### North Miami Beach

North Miami Beach Senior High School  
Seider, Aaron M. (17) 210 174th Street, Apartment 1607, Miami Beach 33160  
*Entropy Based Climatological Tropical Cyclone Prediction Model*

### ILLINOIS Aurora

Illinois Math & Science Academy  
Schedler, Travis Jeremy (17) 102 South Parrish Lane, Carbondale 62901  
*Construction and Properties of Set-Theoretical Solutions to the Quantum Yang-Baxter Equation*

### INDIANA Indianapolis

Park-Tudor School  
Mihelich, Christopher Colin (16) 10998 Spring Mill Lane, Carmel 46032-8865  
*Structure of a Polynomial Quotient Ring Involving Symmetric Polynomials*

### MARYLAND Bethesda

Walt Whitman High School  
Doran, Kirk (17) 8544 Brickyard Road, Potomac 20854  
*Computer Implementation of a Generalized Lattice Model to Simulate the Thermodynamics and Kinetics of Protein Folding: Cooperative Folding and Secondary Structure*

### Columbia

Oakland Mills High School  
Greene, Josh Evan (16) 7123 Smooth Path 21045  
*Wavelet Analysis of Long Gamma-Ray Burst Temporal Profiles*

Wilde Lake High School  
Guharay, Sabyasachi (17) 4618 Learned Sage, Ellicott City 21042  
*Correlations in Genetic Sequences Across the Three Domains of Life*

### Silver Spring

Montgomery Blair High School  
Wildstrom, David Jacob (17) 10300 Parkwood Drive, Kensington 20895  
*Modular Congruence Classes in the Hurwitz Domain*

### MICHIGAN Beverly Hills

Detroit Country Day School  
Kim, Cheryl Kyung (16) 4683 Ravine Drive, Bloomfield Hills 48301  
*Dietary Nitrite Formation: Isolation of Bacteria With Nitrate Reductase Formation*

MINNESOTA  
Rochester

Mayo High School  
Greenleaf, William J. (18) 1068 Plummer Lane 55902  
*Artificial Cavitation Nuclei Significantly Enhance Acoustically Induced Transfection*

NEW MEXICO  
Albuquerque

Eldorado High School  
Levine, Stephanie Lynn (18) 12529 Indian Trail, N.E. 87112  
*Removal of Radioactive Uranium Wastes From Contaminated Water Environments*

NEW YORK  
Cedarhurst

Lawrence High School  
Lee, Grace Yew-Mih (17) 246 Mott Avenue, Inwood 11096  
*Plant-Derived Sterols and Animal Steroids on Neurogenesis of Cultured Olfactory Neuroepithelium *in vitro**

Rotbard, Keith Jarred (17) 742 Vandam Street, North Woodmere 11581  
*Localization of Natriuretic Peptides in the Gastrointestinal Tract*

Dewitt

Jamesville-Dewitt High School  
Abraham, Mark Evan (17) 3 Short Road, Fayetteville 13066  
*SEM - Based Physico-Chemical Characterization of Indoor and Outdoor Submicrometer Particulate Aerosols: Public Health Implications*

Dix Hills

Half Hollow Hills High School  
Talwalkar, Ameet Shirrang (17) 46 Round Tree Drive, Melville 11747  
*Mathematical Model for the Integration of Visual and Auditory Information*

Great Neck

Great Neck South High School  
Hwang, Jeremy C. (17) 51 Beverly Road 11021  
*Modeling Cricket Auditory Communication: Neural Circuit Dynamics Underlying Behavior*

John L. Miller Great Neck North High School  
Smolow, Michael Joseph (17) 8 Imperial Court 11023  
*Predators of *Galerucella californiensis* and Their Potential Impact of Biological Control of Purple Loosestrife *Lythrum salicaria**

New York

Collegiate High School  
Conrad, Parker Rouse (17) 1120 Fifth Avenue 10128  
*Changes in Functional Receptors on the Post-Synaptic Neuron During the Maturation of an Identified Synapse*

Stuyvesant High School  
Anttila-Hughes, Jesse Keith (17) 2743 Edgehill Avenue, Bronx 10463  
*Computer Model of the Transmission of an Action Potential at the Neuro-Muscular Synapse in a Myasthenia Graves Patient*

Old Westbury

The Wheatley School  
Kelner, Jonathan Adam (17) 11 Windsor Drive 11568  
*Universality of the Near-Zero Microscopic Eigenvalue Spectrum of Random Matrix Ensembles of Infinite Variance*

Setauket

Ward Melville High School  
Gerson, Christopher Michael (17) 25 Annandale Road, Stony Brook 11790  
*Analog Modeling of Oblique Margin Strain*

Lau, Grace Ann (17) 11 Settlers Way 11733  
*Protease-Antiprotease Interactions and the Use of Green Tea as an Elastase Inhibitor*

Law, Clyde (17) 32 College Drive, Stony Brook 11790  
*Compressibility of Nuclear Matter Through the Elliptic Flow of Protons in Relativistic Heavy Ion Collisions*

Petersen, Thomas (16) 1 Nob Hill Court 11733  
*Dynamics of Polymers in Free-Standing Thin Films*

Spring Valley

Ramapo Senior High School  
Grishaj, Mark Anthony (17) 16 Dixwell Road 7A, New City 10956  
*Agrobacterium-Induced Transformation With PSAG12-IPT Recombinant Gene Results in Self-Activation of Cytokinin Production in Senescing Leaves of *Nicotiana tabacum**

Syosset

Syosset High School  
Tobias, Steven Mark (17) 6 Winthrop Road, Plainview 11803  
*Investigation to Enhance the Sensor Response in Ferromagnetic Tunnel Junctions Using  $Ni_{43}Fe_{55}$*

OKLAHOMA  
Norman

Norman High School  
Lee, Michael Yanche (17) 1800 Cedar Hill 73072  
*Algebraic Generalizations of Van der Waerden's Theorem on Arithmetic Progressions*

TEXAS  
Denton

Texas Academy of Math & Science  
Goodwill, Patrick William (17) 4120 New Forest Drive, Plano 75093  
*Development of a Novel Silicon/Diamond Sensor for Trace Metallic Contaminant Detection in Wafer Processing Chemicals*

McKinney

McKinney High School  
Tinnin, Stephen Alexander (18) 5625 Baylor Drive, Bartlesville, OK 74006  
*Changes in Development: Sperm Activity, and Parthenogenesis Across a  $10^5$  Pesticide Exposure Range in *Lytechinus variegatus* Gametes*

VIRGINIA  
Alexandria

Thomas Jefferson High School for Science and Technology  
Bracher, Paul Julius (17) 7019 Haycock Road, Falls Church 22043  
*Para-Benzoylate Counterion Structure on the Critical Micelle Concentration of Tetradecyltrimethylammonium (TTA<sup>+</sup>)*

Marcus, David Hayes (17) 5192 Kimscott Court, Annandale 22003  
*Investigation of Heat Dissipation in Ultra-Dense Computer Architectures*

Matyskiela, Mary Ellen (18) 11132 Flora Lee Drive, Fairfax Station 22039  
*Mineral Redistribution by Refluxing Water in Artificial Fractures*