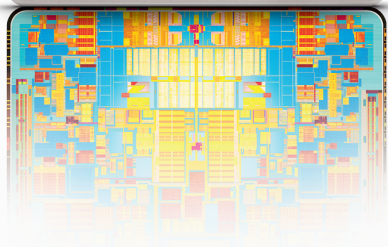


2009 Semifinalists



SCIENCE
TALENT SEARCH

A program of
 **SOCIETY
FOR SCIENCE
& THE PUBLIC**





2009 Semifinalists

The Intel Science Talent Search (Intel STS) is America's most prestigious pre-college science competition. Alumni of STS have made extraordinary contributions to science and hold many of the world's most coveted science and math honors, including seven Nobel Prizes, three National Medals of Science and three Fields Medals. The Intel Science Talent Search recognizes 300 science students and their schools as Semifinalists each year—pulling from approximately 1,600 applicants—and invites 40 student Finalists to Washington, D.C. to participate in final judging, display their work to the public, and meet with notable scientists and government leaders. Each year, Intel STS Semifinalists and Finalists compete for \$1.25 million in scholarships and awards.

The Semifinalists of the Intel Science Talent Search 2009 were chosen from among 1,608 entrants representing 495 high schools in 46 states, the District of Columbia, Puerto Rico and five overseas schools.

Each of the 300 students named a Semifinalist in the Intel STS 2009 will receive a \$1,000 award for their outstanding research. Additionally, to recognize excellence in teaching and school support of individual student research, every school will receive an award of \$1,000 for each Semifinalist named in the Intel STS 2009. This award is used to further excellence in science, math, and engineering education at the recipient school.

Colleges and universities regard the Intel STS Semifinalist award to be evidence of exceptional academic promise. Each Semifinalist is provided with a certificate of accomplishment, which may be sent with their applications for college admission and scholarships. A listing in this book, as well as official publication at www.societyforscience.org/sts, is also generally accepted as documentation of this honor.

Many Intel Science Talent Search projects are the product of a research environment in which scientist mentors dedicate themselves to the intellectual development and technical training of students. The 2009 Semifinalists, Intel, and the Society for Science & the Public acknowledge with gratitude the guidance, expertise, and patience of the experienced researchers who supported many of these projects.

From this group of 300 Intel STS 2009 Semifinalists, 40 Finalists will be chosen to attend the Intel Science Talent Institute in Washington, D.C. from March 5-10, 2009. During their trip to Washington, these Finalists will participate in a final judging process and share in \$530,000 in scholarships.

The 40 Intel STS 2009 Finalists will be announced January 28, 2009 and published in *Science News* magazine.

The list of Intel Science Talent Search 2009 Semifinalists is compiled by Society for Science & the Public and based on entry data. If a student's city of residence differs from that of the school, it also will be listed. Intel STS 2009 Semifinalists are listed by state, high school city, and high school for group reference. Please refer to pages 27-28 for an alphabetical list of the Semifinalists.

ALABAMA

Mountain Brook

Mountain Brook High School

Shaw, Katharina Stephanie, 17, Birmingham

Solving the Riddle of a Defective Transmitted HIV-1 Genome

Whitney, William Fairclough II, 18, Birmingham

Creation of a Tactile Computer Interface

ALASKA

Anchorage

Anchorage Christian Schools

Woodhouse, Brent Alan, 17, Eagle River

Characters of Induced Representations in Coxeter Groups

ARIZONA

Phoenix

Mountain Pointe High School

Zhou, Julie Yang, 17, Tempe

Chaos Theory, Fractal Dimensions, and the Human Cerebrum

Tempe

Corona del Sol High School

Ramakrishna, Smitha, 17, Chandler

Analysis of the Chemical and Biological Degradation of Sucralose in Synthetic Wastewater

CALIFORNIA

Atherton

Menlo Atherton High School

Ransohoff, Julia Dory, 17, Menlo Park

The Gender Divide: Does Donor Gender Matter for Mesenchymal Stem Cell Transplantation?

Danville

Monte Vista High School

Chakicherla, Rohan Niranjana, 17, San Ramon

Topological Features of Gene Networks in Obesity, Asthma, Autism, Diabetes and Arthritis

Encinitas

Torrey Pines High School

Song, Joongyu Daniel, 18, San Diego

Development of Novel Activity-Based Probes for Investigating the Activity of Human Cytochrome P450 Enzymes

Fremont

Mission San Jose High School

Cao, Wenting, 17

Optimization of Methane Hydrate Formation and Stability: Unlocking an Abundant Source of Alternative Energy via Organic Matter within Seawater

Huang, Edwin Wang, 13

Novel Degradable and Recyclable Polyethylene Terephthalate (PET) and its Hydrolysis Study

Mao, Marianna Yuling, 17

Gravitational Radiation from Encounters with Compact Binaries in Globular Clusters

Fresno	<u>Clovis West High School</u> <i>Tripuraneni, Niles, 17</i> A Relativistic Generalization of the Navier-Stokes Equations to Quark-Gluon Plasmas
Fullerton	<u>Troy High School</u> <i>Patel, Sachin, 17, Anaheim</i> Nano Delivers Big: A Novel Approach to Cancer Therapeutics
Irvine	<u>Arnold O. Beckman High School</u> <i>Liang, Lidia Tian, 17</i> The Role of TBX3 in the Regulation of Tumor Suppressor p14 ^{ARF} Expression in Human Liver Carcinoma Cells: Implication for the Molecular Mechanisms Involved in Liver Tumorigenesis
	<u>University High School</u> <i>Lakhanpal, Nitish, 17</i> An Investigation into the Folding of Beta Structures in a Class of Pathologically-Relevant Proteins: Computational Prediction of Secondary and Super-Secondary Structure from Primary Amino Acid Sequence
Mission Viejo	<u>Capistrano Valley High School</u> <i>Desai, Pooja S, 17, Ladera Ranch</i> Malaria Detection Method Modeling Using Microfluidics Principles
Palo Alto	<u>Castilleja School</u> <i>Mathur, Maya Brandt, 16, Woodside</i> An Uncanny Game of Trust: Social Trustworthiness of Robots Is Inferred from Subtle Anthropomorphic Facial Cues
	<u>Palo Alto High School</u> <i>Srinagesh, Hrishikesh, 17</i> Oxidized Lipids Serve as Autoantigens and Therapeutic Targets in Multiple Sclerosis
Pleasanton	<u>Foothill High School</u> <i>Mei, Jenny Yang, 17</i> Association of Leucine-Rich Repeat Kinase 2 with TIA-1 in RNA Stress Granules
Sacramento	<u>Mira Loma High School</u> <i>Nag, Divya, 17, El Dorado Hills</i> Thermal Analysis and Thermogravimetry Techniques to Quantify and Prevent Forest Fires
San Diego	<u>Canyon Crest Academy</u> <i>Abramson, Ronit Batya Roth, 17</i> Use of Epilithic Diatoms as Biological Indicators of Pharmaceutical Runoff
	<i>Zhang, Julia, 17</i> Phosphatidylserine Receptor Protein PTDSR Induces Neurite Outgrowth by Regulating Histone Methylation and Gene Expression
San Jose	<u>Bellarmine College Preparatory School</u> <i>Deshmukh, Aniruddha Sandeep, 17, Cupertino</i> Revitalizing the Coastal Sage Scrub Ecosystem in Response to Cyanide Accumulation from High Intensity Wildfires

Egbert, Nitin Kitchley, 17

Mind Mouse: A Mind-Computer Interface without Pattern Recognition Based on Biofeedback Training

The Harker School

Dabija, Dominique Irina, 17, Mountain View

Computational Methods for Identifying Functionally Important Residues Involved in Allosteric Communication Pathways

Kim, Daniel Jong-Woong, 17, Cupertino

Daily Life Tracking (DLT) System Development with Parameter Normalization Technique

Madan, Elena Divya, 17, Los Altos Hills

The Role of Wnt Signaling in the Regeneration of the Retina

Natarajan, Anand Venkat, 15, Sunnyvale

Spatial Control of Gene Expression Using CT-Guided Collimated X-rays to Modulate Transcription

Nathan, Vikram Arjun, 17

Novel Quantitative Models of Reaction Kinetics

Sikka, Denzil, 17

A Novel Approach Using Traveling Salesman Problem Lin-Kernighan Cut with Smith-Waterman Gotoh Pair-Wise Alignment to Solve the Multiple Sequence Alignment Problem

COLORADO

Boulder

Fairview High School

Petach, Anika Rose, 17

Pine Beetle Outbreaks: Remote Sensing Analysis and Symbiotic Fungus Control

Greenwood Village

Cherry Creek High School

Wu, David Junzi, 17, Aurora

Charcoal and Methanol Synthesis by the Destructive Distillation of Cellulosic Waste—Chemical Processing and Environmental Implications

CONNECTICUT

East Lyme

East Lyme High School

Ranade, Priya Gautam, 17

Computer Model for Minimizing Lethal Burden of Malignant Melanoma

North Haven

North Haven High School

Wood, Fiona Winifred, 17

Biophysically Realistic Computational Models of Temporal Encoding in Cortex

Wallingford

Choate Rosemary Hall

Choi, Stephanie, 17, Iowa City, IA

Identification of Nox2-Modifier Gene Variances on C57BL6 Mice and Hybrid SJL/C57BL6 Mice

Rajagopalan, Aditya, 17, Glastonbury

Modeling Synergistic Cellulolytic-Hemicellulolytic Enzyme Complexes for Lignocellulosic Hydrolysis

Weston

Weston High School

Fine, Rebecca Louisa, 17

Explication of the Immunology of Modular Nanoparticles Used as Vaccine Delivery Systems

DISTRICT OF COLUMBIA

Washington

Georgetown Day School

Hoffman, Benjamin Uri, 17, Gaithersburg, MD

Identification of Four New Target Genes for Malaria Vaccine Development
by Differential Gene Expression Profiling

Sidwell Friends School

Choi, Kathleen Ashley, 17, Potomac, MD

Density-Functional-Based Investigation of Atomic Hydrogen Storage on B₈₀ Boron Fullerene

FLORIDA

Key Biscayne

Maritime and Science Technology (MAST) Academy

Fowers, Alyssa Frielle, 17, Pinecrest

Social Dominance and Sexual Self-Schema as Moderators in Sexist Reactions to Female Subtypes

Sanford

Seminole High School

Shivamoggi, Rohini Bhimsen, 17, Oviedo

Identification of Gravitational Microlensing Candidates

St Augustine

Allen D. Nease High School

Georgette, Nathan Thomas, 17, Ponte Vedra Beach

Improving the Cost Effectiveness of Vaccine Preventable Disease Outbreak Response
through Novel Mathematical Methods

St Petersburg

Shorecrest Preparatory School

Rabinovich, Maxim, 17, Wimauma

The Scaling Limit of a Generalized Divisible Sandpile Model

GEORGIA

Evans

Lakeside High School

Meixiong, James, 17

Inhibition of Bax/Bak Activation by Mitochondrial Fusion: A Novel Mechanism
to Block Programmed Cell Death

McDonough

Sola Fide Home School

Dorminy, John Wilson, 17, McDonough

Iterative Encryption

HAWAII

Mililani

Mililani High School

Mocz, Lucia, 17

Cancer Diagnostics through Image Reconstruction Based on Quantum Exit Probability Theory

IDAHO

Boise

Capital High School

Knowles, Justin, 18, Meridian

Effects of Soft Breakdown in the MOSFET Dielectric on Transistor Performance

ILLINOIS

Aurora

Illinois Mathematics & Science Academy

Shao, Jianning, 16, Gilberts

A Comprehensive Mathematical Model of Tumor-Immune Dynamics

Shyu, Eric, 17, Naperville

Luminescent Cadmium Coordination Polymers with Diverse Structural Morphologies Constructed from Dicarboxylate and 4,4'-Dipyridylamine Ligands

Chicago

Lincoln Park High School

George, Terrence Louis, 17

Responses of *Zea mays* to Hypobaric and UVC—Implications for Lunar Greenhouse Utilization

Kang, Yunnan, 18

Reading Maketh a Full Man, and Woman

Rao, Elizabeth Jie, 17

Building an Animal Model for Neurodegenerative Disease, Top-43 Proteinopathy

The University of Chicago Laboratory High School

Zhao, Linda, 16

Sharp Polynomial Estimate of Integral Points in Right-Angled Simplices

Libertyville

Libertyville High School

Wu, Shiyi, 17

The Pathological Mechanism of Brain Hemorrhage in Zebrafish m413 Mutant

New Lenox

Lincoln-Way Central High School

Palgen, Jeremy David, 17, Manhattan

In vitro Magnetic Resonance Imaging (MRI) Identification and Characterization of Small Calcium Crystals for Probing Micro-Calcifications in Breast Cancer

Urbana

University High School

Wang, Richard, 17, Champaign

Rapid Activation of Rac GTPase in Living Cells by Mechanical Forces

INDIANA

Mishawaka

Penn High School

Gekhtman, Dmitri, 18, Granger

A Genetic Algorithm Approach to Parameter Determination in Quark Flavor Mixing

IOWA

Iowa City

West High School

Ye, Lena Peipei, 17, Coralville

Determination of Exact Reconstruction Regions in Composite-Circling Cone-Beam Tomography

KENTUCKY

Bowling Green

Carol Martin Gatton Academy of Mathematics and Science

Hubble, Dalton Gregory, 17, Rineyville

Fabrication of Poly-(2-Hydroxyethyl Methacrylate) by Hot Filament Chemical Vapor Deposition

Louisville

duPont Manual Magnet High School

Hsiao, Allan Jer-Yu, 17

Characterization of a Geranium Gene Promoter: Determining Trichome-specificity and Further Applications

Saint Xavier High School

Bolander, John Anthony, 17, Memphis, IN

Detecting Vortices with a Polarized Laser Beam

LOUISIANA

Bossier City

Airline High School

Cain, Cooper Daniel, 17

Syndecan-4 Is a Critical Determinant of Podocyte-Matrix Interactions and Adhesion

Shreveport

Loyola College Preparatory

Marak, Martin James, 17

Human Cytomegalovirus Manipulates Cellular Signaling Pathways of Monocytes to Promote Viral Spread within the Host

MARYLAND

Bethesda

Walt Whitman High School

Anandalingam, Kavitha Kaya, 17

Associations between FTO Genotype and Eating Behavior Phenotype in Children

Su, Mingda David, 17

Identification of Differentially Expressed Survival-Apoptosis Genes in Human Malignant Melanoma by Mitochondria-Focused cDNA Microarrays

Walter Johnson High School

Chin, Re-I, 17, Rockville

Synthesis of Precursor to [¹¹C]-labeled DHA-Taxoid for Studies of Drug Pharmacokinetics and Evaluations of DHA as a Tumor-Targeting Moiety

Ellicott City

Centennial High School

Kamel, Peter Ihab, 17

Chemical Detection of the Temperature Profile during Ablation in a Tissue-Simulating Phantom

Zheng, Henry Wang, 17

Application of Decision Fusion for Prosthetic Systems

Frederick	<u>Tuscarora High School</u> Gee, Marvin Ho-Yan, 17 Ribozye-like Non-coding RNAs Spanning Upstream and Transcribed Regions of the 45S rRNA
Gaithersburg	<u>Gaithersburg High School</u> Porter-Gill, Sikandar Singh, 17, Laytonsville The Production of Methane in a 2-Chamber Bio-Catalyzed Microbial Fuel Cell Utilizing <i>Methanosarcina barkeri</i>
Rockville	<u>Thomas Sprigg Wootton High School</u> Kong, Philip Lee, 18 Elucidating Nuclear Localization of ADAMTS13, a Secreted Thrombotic Protease
Silver Spring	<u>Montgomery Blair High School</u> An, Eric, 18, North Potomac The Identification of Time Lagged Transaction Data as a Source of Home Price Index Bias Bodine, Christopher Parker, 17, Chevy Chase Magnetization of Lunar Basins and Crater Retention Age: New Analyses of the Pre-neectarian Lunar Dynamo Fan, Jean, 17, Boyds Delineating the Role of BRF2 in Breast Cancer Pathogenesis Frolenkov, Anton, 17, Germantown Development of a Widely Distributable Computerized Continuous Performance Test Gan, Edward R., 17, Gaithersburg Quasistatic and Dynamical Behavior of Coupled Pendulums Hogge, Akimitsu, 17, Rockville Progress towards a Canonical Extension of Rado's Theorem Johri, Ansh, 17, Rockville Semi-Automated to Measure Pnuemonia Severity in Mice through Computed Tomography (CT) Scan Analysis Kannan, Sneha Trichy, 16, Potomac Synthesis of Cathepsin B Degradable Peptidic Dendrimers Sen, Debattama, 17 Agent-based Simulation of P13K/Akt Pathway Activation in Breast Cancer Shih, Benjamin, 17, Rockville CO ₂ Storage in Novel CO ₂ -H ₂ O Phases at High Pressures Tian, Sang, 18, Gaithersburg Characterization of Sheared Granular Flow Using Inelastic Hard Disks Vasudevan, Srinivas, 17, Germantown A Toy Model of the Supersymmetric Standard Model and Its Phenomenological Consequences
Walkersville	<u>Pritt Home School</u> Pritt, Mark Jacob, 17 An Application of the Scale-invariant Feature Transform to Image-based Landmark Identification

MASSACHUSETTS

Bolton	<u>Nashoba Regional High School</u> <i>Govindan, Ramesh, 17, Lancaster</i> Solar X-ray Bright Points and Magnetic Field Observations
Boston	<u>The Winsor School</u> <i>Maggs, Lara Reeves, 17, Cambridge</i> A Screen for Heterotrimeric G-proteins required for <i>C. elegans</i> Innate Immunity
Lexington	<u>Lexington High School</u> <i>Arbesfeld, Noah Maxwell, 17</i> On the Structure of Lower Central Series Quotients of a Free Associative Algebra
Sharon	<u>Sharon High School</u> <i>Richman, Ethan Brett, 17</i> Application of Gold Colloid Nanoparticles and TGF β in the Induction of T Cell Differentiation Towards T Regulatory Cells
Shrewsbury	<u>Shrewsbury High School</u> <i>Lee, Ruby, 16</i> Liquid Crystalline Polymers for Biomaterials: Click Chemistry Synthesis and Characterization

MICHIGAN

Beverly Hills	<u>Wylie E. Groves High School</u> <i>Sherman, David Alfred, 17, Bloomfield Hills</i> Matching Preclusion for the (n,k) -Bubble-Sort Graphs
Bloomfield Hills	<u>International Academy</u> <i>Yalamanchi, Pratyusha, 17, Rochester Hills</i> Antenna Miniaturization: An Investigation of Hexagonal Ferrites
Grand Rapids	<u>Catholic Central High School</u> <i>Nguyen, HongAn Thuy, 17, Wyoming</i> Upgrading Single Mode Asymmetric Recombination (SMART) for Use at the Center for High Angular Resolution Astronomy (CHARA)
Okemos	<u>Okemos High School</u> <i>Shi, Connie Rong, 16</i> A Gold Nanoparticle-Based Biosensor for <i>Salmonella enteritidis</i> Detection on Screen-printed Carbon Electrodes
Rochester Hills	<u>Stoney Creek High School</u> <i>Pandey, Rahul Kumar, 17, Rochester</i> A Microwave Metamaterial Lens with Negative Index of Refraction

MINNESOTA

Edina	<u>Edina High School</u> <i>Cherkassky, Michael Sheng, 17</i> Application of Machine Learning Methods to Medical Diagnosis
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Minneapolis

Breck School

Trusheim, Stephen Walter, 18, Chaska

Designing and Validating Novel Infection-Surveillance Methods for Methicillin-resistant *Staphylococcus aureus*

MISSOURI

Chaffee

Bluebird Academy of Art, Math, and Science

Heeb, Alex Brendan, 18

Serendipitous Discovery of Novel RNA Palindrome in the Hemagglutinin of 1918 Pandemic Influenza

Chesterfield

Parkway Central High School

Guo, Kevin, 17

Merging Radionuclides and Fluorophores: A New Paradigm in Medical Imaging

Sun, William Jayang, 17

Characterization of Golgicide A, a Highly Selective Novel Small-Molecule Inhibitor of Intracellular Transport Pathways

Columbia

David H. Hickman High School

Choe, Elizabeth Yoonjeong, 17

Phenotypic Shifts in *Salmonella typhimurium* Strain CRC 2631 after Passage through TRAMP Mouse Prostate Tumors

Cutkowsky, Ashok Krishnan, 18

Associated Primes of the Square of the Alexander Dual of Hypergraphs

Saint Joseph

Central High School

Schaaf, Renee Louise, 17

The Effect of Rumble Strip Design on Vehicle Trajectory

NEW HAMPSHIRE

Exeter

Phillips Exeter Academy

Wat, Jeanette Janyen, 17

Gender-Specific Effects of Sleep Deprivation on Cortisol and Interleukin-6

Hanover

Hanover High School

Hansen, Axel Robert, 17

Visualizing Network Anomalies for Intrusion Detection with Information Theoretic Metrics

NEW JERSEY

Flemington

Hunterdon Central High School

Raj, Nevin Vinay, 17

Characterization and Design of Broadband Semiconductor Anisotropic Metamaterials

Fort Lee

Fort Lee High School

Wang, Lucy Xinke, 17

Searching for a Backup System to Support Development of the Kidney

Hackensack

Academy for the Advancement of Science & Technology

Lee, Johanna Meehyun, 17, Old Tappan

Upregulating a Potential Decoy Receptor for Advanced Glycation Endproducts

Lee, Seung Eun, 17, Edgewater

The Decline in Human Working Memory Caused by a Deficiency in Memory Retention

Lincroft

High Technology High School

Castellano, Steven Ray, 18, Middletown

Acupressure Induced Attention in the Teenage Brain

Feldman, Jay William, 17, Red Bank

A Heat Detector Using Fiber Optic Interferometry

Gavankar, Tanay Vinay, 18, Manalapan

Utilization of Silica Nanoparticles in Shear Thickening Fluids as Liquid Ballistic Protection

Zukus, Jason, 17, Little Silver

The Use of Ion Exchange Resins in a Forward Osmosis Desalination System for the Softening of Feed Water

Livingston

Livingston High School

Kratchmarov, Radomir, 17

Plasmacytoid Dendritic Cell Nibbling and Maturation: A Novel Mechanism Linking Innate and Adaptive Immunity

Yu, Xiaojiang, 18

Simulations of Jet-Induced Supernovae: Physical Understanding through Visual Analysis

Millburn

Millburn High School

Metsky, Hayden Craig, 17

Improving Statistical Machine Translation through Template-based Phrase-table Extensions

Paramus

Frisch School

Neugut, Yael Dana, 17, Teaneck

A Study of Arsenic Metabolism and Renal Function in an Arsenic-Exposed Population in Bangladesh

Princeton Junction

West Windsor-Plainsboro High School

Ko, Jungmin, 17, Plainsboro

Purification of Organophosphate Hydrolase Supplemented with Copper Chloride via Intein-Mediated Self-Cleaving Elastin-Like Polypeptide Tag

Tenafly

Tenafly High School

Chen, Doris, 17

MHBD: A Key Factor for Neuronal Survival in Parkinson's Disease

Wanaque

Lakeland Regional High School

Piziak, Matthew Jan, 17, Ringwood

Arsenic Metabolite DMA(III): A Possible Human Carcinogen

NEW YORK

Armonk

Byram Hills High School

Kitain, Adam Lloyd, 17

Parameters for Hydrogen Production from Steam Gasification of Meat and Bone Meal in a Two-Stage, Fixed-Bed Reactor

Kosminsky, Eli Samuel, 18, Pleasantville

World of Warcraft: The Viability of Massively Multiplayer Online Role-Playing Games as Platforms for Modeling and Evaluating Perfect Competition

Pudalov, David Matt, 17

The Effect of Tones on a Procedural Learning Task

Sanders, Beryl Rebecca, 17

Determining the Correlation between Parental Expectations and Academic Achievement in Monozygotic and Dizygotic Twins

Sanders, Samantha Fara, 17

Efficient Silencing of the Bcl-2 Oncogene through the Unassisted Delivery of Antisense Oligodeoxyribonucleotides G3139 and SPC2996

Bedford

Fox Lane High School

Bruck, Ross Anthony, 17

Identification and Analysis of Immunogenic EGFR Peptides for Use as Novel Cancer Vaccines

Bellmore

John F. Kennedy High School

Driggin, Elissa Ashley, 18, Merrick

The Relationship between Eating Behaviors and Preferences for Fast Food in African-American Women

Wellington C. Mepham High School

Spiegel, Jacob Oscar, 17

The Hereditary Basis of Taste: Identification of TAS2R43 Gene

Briarcliff Manor

Briarcliff High School

Cai, Elizabeth, 17, Elmsford

An *in vitro* Method of Sprouting Angiogenesis Reveals a Relaxation for the Requirement of *VegfR2* Signaling for the Formation of Endothelial-like, PECAM-Positive Cells

Bronx

Bronx High School of Science

Chu, Timi, 17, Oakland Gardens

Parental Perceptions and Attitudes toward Obesity in Washington Heights, NY

Chuang, Jocelyn, 17, New York

Interaction of BDNF Gene and Hormones on Anxiety

Kaplan, Michael Andrew, 17, Floral Park

Computational Modeling of the Quantum Mechanical Excitations in a Light Harvesting Complex in Purple Bacteria

Li, Josepher, 17, Flushing

Developing Molecular Markers for the Unfolded Protein Response

Nicolas, Alexa Mann, 18, New York

A Cross Sectional Analysis of Voter Turnout and Social Capital

Nomani, Hafsa Qamar, 17, Flushing

Baseline Levels of Phosphorylated Proteins in Responder and Nonresponder Basophils

Rahman, Mishal Ziaur, 17

Shear Stress Increases Melanoma Migration in a 3D Model *in vitro*

Shuster, David, 17, Forest Hills

Ebp1 is Required for Cellular Proliferation of Gliomas Cells and Modulates the Rase-ERK Signaling Pathway

Sonkiya, Shreshth, 17, Flushing

The Effect of Chaotic Images on Visuo-Spatial Memory

Brooklyn

Brooklyn Technical High School

Chan, Kam Chuen, 17

The Development and Testing of a Solar Hydrogen Electric Autonomous Buoyant Micro-Power Plant Utilizing Solar Power and Hydromechanical Power (SHe⁻ ABMPP)

Roytman, Viktor, 17

The Development and Testing of a Solar Hydrogen Electric Autonomous Aeronautic Air Sampling Vehicle (sHe⁻AAAV)

Edward R. Murrow High School

Hornick-Becker, Daryl A., 17

The Visible Effect of Synaptic Activity on AMPA Receptor Internalization

Cedarhurst

Hebrew Academy of the Five Towns & Rockaway

Bandler, Rachel Chana, 17, Scarsdale

Determining the Accuracy with which Markov Chains Can Predict Human Behavior

Chappaqua

Horace Greeley High School

Schneiderman, Gayle Cara, 17

Parent Detection of Child Lies

Wu, James L., 17, Mount Kisco

Use of Correlated SNP's to Build a Maximum Entropy Classifier for Patients with 22q11 Deletion Syndrome

Cross River

John Jay High School

Greene, Abigail Sara, 17, Katonah

The Inversion Effect and Acquired Facial Recognition Deficits in Alzheimer's Disease: Functional Analogs

Dix Hills

Half Hollow Hills High School West

Desai, Kavya, 17, Huntington

The Effect of Cucumber Fruit Age and Inhibition of Ethylene Perception on Susceptibility to Infection by *Phytophthora capsici*

Klein, Matthew Scott, 17

Nuclear Reaction Rates and One-Zone Simulations of Type I X-ray Bursts

Dobbs Ferry

Dobbs Ferry High School

Lackner, Maureen, 17

Reactionless Space Propulsion with Space Tethers

East Setauket

Ward Melville High School

Gittin, David Ian, 18

Differential Requirements for Human CBF β Homologues Bro and Bgb in *Drosophila* Development

Gurevich, Michael, 17, Stony Brook

The General Anesthetic Propofol Prolongs Deactivation and Blocks Peak Current of Human Alpha1 Glycine Receptors

Karelis, Jason Andrew, 17

Mechanistic Studies of MenD, A Novel Drug Target for Methicillin-resistant *Staphylococcus aureus* (MRSA)

Khan, Hiba, 17, Lake Grove

Protease-Catalyzed Oligopeptide Synthesis

Lin, Amy Mei, 17, Stony Brook

Effect of Body Mass Index on Early Outcomes in Female Patients Following Percutaneous Coronary Intervention

Min, Jie, 17, South Setauket

Metabolic Change and FAS Expression During Adipocyte Differentiation in 3T3-L1 Cells

Osman, Naureen, 17, South Setauket

Effect of Cognitive Load and Depressive Symptoms on Heart Rate Variability

Park, Taejoong, 17, Stony Brook

Modeling of a Spark Ignition Direct Gasoline Injection Engine with T2C and Direct Water/Methanol Injection

Shah, Preya, 17, Setauket

Combating Cancer: Design and Synthesis of Dual-Warhead Tumor-Targeting Drug Conjugates

Shrock, Christine Lee, 17, Setauket

Effects of Lid Dynamics on the Binding of MDM2 to the Tumor Suppressor Protein p53: Implications for Cancer Therapeutics

Zhao, Yuanchi, 18, Stony Brook

Implementing Thermal Feedback Control of a Helium-Neon Laser for Frequency Stabilization

Elmont

Elmont Memorial High School

Waters, II, Winston Spencer, 17

Separating the Roles of HIF-1 α and HIF-2 α in Tumorigenesis through Downregulation of HIF-2 α by RNA Interference

Flushing

Townsend Harris High School

Lopez, Reynaldo, 17, East Elmhurst

A Statistical Study of the Masses of Supermassive Black Holes and Their Host Galaxies

Forest Hills

Forest Hills High School

Hamal, Pukar, 17

Investigation of Neuronal Development and Diversification in Left/Right Assymmetric Head Neurons of *Caenorhabditis elegans*; with Perspective to Stem Cell Research

Glen Head

North Shore High School

Osman, Christopher John, 18

High School and College Males' and Females' Implicit and Explicit Perceptions of Science Occupations

Great Neck

John L. Miller-Great Neck North High School

Levy, Sari Alexis, 18

Investigating Confocal Ultrasound Stimulation as an Osteogenic Stimulus: A Novel Physical Modality for Accelerating Fracture Healing and Bone Regeneration

North Shore Hebrew Academy High School

Piroozian, Daniel Abraham, 17

Seniors See the Light: Benefits of Xenon Headlights on Nighttime Driving

William A. Shine-Great Neck South High School

Cho, Jonathan Joseph, 17

Differential Expression of Liver-Specific MicroRNA Genes in Fibrotic and Normal Liver Tissues

Hastings-on-Hudson

Hastings High School

Nair, Nityan Labros, 17

Diffraction with a Twist: Forming Optical Vortices Using Spiral Zone Plates

Henrietta

Rush-Henrietta Senior High School

Amin, Jay, 17, Rochester

Characterization of Ultrashort Optical Pulses by Spectral Shearing Interferometry

Hewlett

George W. Hewlett High School

Appelbaum, Zachary, 17, Woodmere

Who R U? An Examination of Adolescent Text Messaging

Krasne, Traci Fran, 17, Woodsburch

To Intervene or Not to Intervene? Adolescent Bystanders Confront the Multifaceted Nature of Bullying

Natow, Meryl Fay, 17, Hewlett Neck

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