MOVING AT THE SPEED OF BRIGHT

Intel Science Talent Search 2014 Rules and Entry Instructions

Intel STS 2013 finalists on the Capitol steps in Washington, D.C.

The Intel Science Talent Search (Intel STS) is the nation's most prestigious pre-college science competition, providing an important forum for original research that is recognized and reviewed by a national jury of professional scientists. Alumni have made extraordinary contributions to science and have earned many of the world's most distinguished science and math honors, including seven Nobel Prizes, four National Medals of Science and two Fields Medals. Annually, over 1,700 high school seniors from around the country accept the challenge of conducting independent science, math or engineering research and completing an entry for the Intel Science Talent Search. The Intel Science Talent Search recognizes 300 student semifinalists and their schools each year 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 awards.

Intel Science Talent Search
Awards

Since 1942, Society for Science & the Public (SSP) has offered the world-renowned Science Talent Search. Each year, this nationwide competition—the nation's oldest and most highly regarded pre-college science competition—encourages talented U.S. high school seniors to pursue independent research in science, math, engineering and medicine.

SEMIFINALIST AWARDS

Each of the 300 students named a semifinalist in the Intel Science Talent Search will receive a $1,000 award for his or her outstanding science research. Awards are mailed to Intel STS semifinalists in late spring, upon submission of a W9 Request for Taxpayer Number and Certification form to SSP.

SCHOOL AWARDS

The Intel Science Talent Search School Award recognizes excellence in teaching, and school support of individual student research. Each school will receive an award of $1,000 for each semifinalist named in the Intel Science Talent Search. The award is to contribute to excellence in science, math and/or engineering education at the recipient school. In the case of home schooling, the award will be given to an affiliated school or school district of the home school after consultation with the Intel STS program manager. Awards are mailed to the school in the spring after submission of the School Award Program application and a W9 Request for Taxpayer Identification Number and Certification form to SSP.

FINALIST AWARDS

FIRST PLACE
$100,000

SECOND PLACE
$75,000

THIRD PLACE
$50,000

FOURTH PLACE
$40,000

FIFTH PLACE
$30,000

SIXTH PLACE
$25,000

SEVENTH PLACE
$25,000

EIGHTH PLACE
$20,000

NINTH PLACE
$20,000

TENTH PLACE
$20,000

30 FINALISTS
$7,500

Intel Science Talent Search
Process & Preparation

STUDENT ENTRY

Entries in the Intel Science Talent Search are submitted online, with the exception of school transcripts, which may be mailed in hard copy or submitted online with the High School Report. Components of the application are managed as follows:

1. Responses to short answer and essay questions are entered directly into the online application.

2. The Research Report, Institutional Review Board approval (for human subjects), and International Animal Care and Use Committee approval (for non-human vertebrate animal exceptions) are uploaded by entrants as Word documents or pdfs.

3. Requests for educator recommendations, project recommendations, and high school reports are sent via e-mail by the online recommendation system at the request of the entrant. Recommenders receive a unique PIN and password to complete and submit forms online. Counselors may upload transcripts on the high school report or mail a hard copy to SSP at the student's request. Students are still responsible for the timely receipt of transcipts.

4. To submit a hard copy official transcript it must be provided in a sealed envelope signed by a counselor or administrator. Transcripts should be RECEIVED by 8:00 p.m. Eastern time on November 6, 2013 at:

   Society for Science & the Public
   Re: Intel STS Transcripts
   1719 N Street, NW
   Washington, D.C. 20036

IMPORTANT DATES

Application Opening: August 1, 2013
www.societyforscience.org/sts

Transcript and Recommendation Due Date:
November 6, 2013 at 8:00 p.m. Eastern time
Transcripts and recommendations should be received by SSP (not just requested) by this date and time.

Technical Support Deadline:
November 12, 2013 at 8:00 p.m. Eastern time
Students submitting a technical support request by this date and time and having an e-mail and ticket number as evidence are guaranteed that the specific problem reported will be resolved before the Application Receipt Deadline. SSP cannot guarantee that requests for technical assistance will be resolved if submitted after this date and time. Entrants should submit early on November 12 in case they experience difficulties and it becomes necessary to submit a technical support ticket.

Application Deadline:
November 13, 2013 at 8:00 p.m. Eastern time
All parts of the application must be received by SSP by this date and time, including transcripts and recommendations. Recommendations must be submitted by the recommendation provider by this date and time; this is not a deadline for student requests.

SELECTION PROCESS

After reviewing entries for completeness, accuracy, and rules violations, all portions of every submission are evaluated by three or more doctoral scientists, mathematicians, and/or engineers in the appropriate scientific discipline. The greatest weight is given to the Research Report. Top entries are further reviewed by an additional judging panel of doctoral scientists, who select 300 semifinalists and 40 finalists.

ANNOUNCEMENTS

Entrants are encouraged to check the Intel STS website, *www.societyforscience.org/sts,* frequently for announcements during the summer and fall of 2013. Semifinalists will be announced on this website on January 8. Finalists will be announced on January 22.

INTEL SCIENCE TALENT INSTITUTE

The 40 Intel Science Talent Search finalists will receive an all-expense paid trip to Washington, D.C., to attend the Intel Science Talent Institute from March 6–12, 2014. The visit will include final in-depth judging, visits to historic sites and cultural institutions, and meetings with national leaders and prominent scientists and engineers.

Intel STS finalists will exhibit their research to the public and will have the opportunity to exchange ideas and insights with each other, as well as with illustrious members of the scientific research community. Participation in the Intel Science Talent Institute is a requirement of the competition.

The Intel Science Talent Institute culminates in a black-tie gala honoring the forty finalists, to be held March 11, 2014. The evening will conclude with the announcement of the top ten award winners. ◆

Intel Science Talent Search
Rules & Regulations

ELIGIBILITY REQUIREMENTS

1. a. Any student who is enrolled in and attending his or her last year of secondary school (public, private, parochial, or home school) in the United States, Puerto Rico, Guam, the U.S. Virgin Islands, American Samoa, Wake and Midway Islands, or the Marianas; ***or***
   b. Any United States citizen enrolled in his or her senior or 12th grade year of secondary school attending:
      i. a Department of Defense Dependents School or an accredited overseas American or International School; ***or***
      ii. a foreign school as an exchange student; ***or***
      iii. a foreign school because his/her parent(s) are temporarily working and living abroad.

   Proof of citizenship is required for 1b (above).

2. Entrants must be completing high school courses required for college applications and must not have entered any previous STS.

3. Sons and daughters of Society for Science & the Public employees, Trustees, Intel Science Talent Search evaluators or judges are not eligible to enter the Intel Science Talent Search.

4. Only one entry per student.

ENTRY RULES

1. Each student must attest to the following statement before submitting an application:

   I certify that all the information provided is correct to the best of my knowledge and I certify that the Research Report I am submitting is my own individual work, not that of a student team, nor does it represent the work of others. I agree to accept the decision of the judges as final and understand that my application and Research Report will not be returned to me but shall become the sole property of Intel STS/SSP. I also agree to permit Intel STS/SSP to use all information contained in my application in any way it deems appropriate for publicity purposes. I certify that I have read and fully understood all rules and eligibility requirements found in the Intel STS Rules & Entry Instructions and that I have complied with all rules and meet the eligibility for submitting this Intel STS entry. I further understand that scientific fraud, misconduct or violation of the rules and/or eligibility requirements may result in disqualification and forfeiture of any awards and that SSP reserves the right in such cases to bar future participation in SSP programs.

2. SSP uses Turnitin for Admissions to authenticate the Intel Science Talent Search entries including essays, research reports and recommendation letters. Every report is individually reviewed by the software and any questionable cases receive a second review by an Intel Science Talent Search Rules Advisor to determine whether the entry is in violation of Intel STS rules and guidelines. For more information about Turnitin for Admissions, visit: https://www.turnitin.com/static/products/turnAdmissions.php

3. Research conducted as part of a student team project is not eligible for Intel STS. This includes any research or portion of research regardless of whether it has or will be submitted to any competition. Even if the student was a primary member of a team or conducted one portion of the research, it must still be considered a part of that team project, and is not eligible for Intel STS. Students may not "split" a team project and enter it in Intel STS as individuals.

4. The practice of mentor/adult compensation based on a student's results in the Intel STS is prohibited. Any such compensation will render the student entry ineligible for consideration and will be grounds for the revocation of any award already made.

5. The Research Report, including text, and all appendices, tables/charts, etc., may not exceed 20 pages total. Title page, abstract, and bibliography pages do not count in the 20-page limit. Any pages provided that exceed 20 will not be read or considered. Students should select a report format/style that is appropriate for their discipline.

6. Each entry must include the following:

   a. Application: with "submitted" status, including a complete Research Report and IRB/IACUC approval where required.

   b. Educator Recommendation(s): completed online by the person with the most knowledge of the student in an academic setting and of his or her scientific potential.

c. Project Recommendation: completed online by the person closest to the student's research. The head of a lab should only complete this if he or she worked with the student closely.

d. High School Report: completed online by a counselor or administrator.

e. Official school transcript (s): mailed to SSP or uploaded on the High School Report, and received before the Application Deadline.

7. No projects involving live non-human vertebrate animal experimentation will be eligible.

Live vertebrates are defined as any live, non-human vertebrate, mammalian embryo or fetus, bird or reptile eggs within three days (72 hours) of hatching, and all other vertebrates at hatching or birth.

Excluded from the above rule are:

a. Projects involving animals in their natural environment that are non-invasive and non-intrusive studies (e.g., observational, behavioral) that do not affect an animal's health or well-being by causing stress, discomfort or pain, and in which the student's contact with the animal(s) is restricted to supervised handling and husbandry procedures that meet Institutional Animal Care and Use Committee (IACUC) (www.aalas.org; www.aphis.usda.gov) standards at registered research institutions, and which conform to federal regulations protecting animal well-being and researcher safety.

OR

b. Projects being conducted in a registered institution or laboratory where animal experimentation is taking place and in which the student will only have physical contact with the animal(s) under the handling and husbandry conditions stated above; and

i. the student works with non-living material (e.g., tissue, blood) that has been supplied to them by the supervising scientist; **and**

ii. the animal(s) involved is/are not sacrificed solely for the student's project; **and**

iii. the project the student designs and implements begins with non-living material. (No procedures, invasive or otherwise, were conducted on live vertebrate animals for the student-designed project); **and**

iv. the student was not involved in the collection of data, directly or indirectly (through media or video), using invasive or intrusive experimentation that causes more than momentary pain or distress to the vertebrate animal(s).

In both cases a and b described above, documentation of IACUC approval, proper permissions, and licenses must be provided with the application.

8. Projects involving HUMAN PARTICIPANTS, including surveys or human tissue samples, must adhere to the following rules:

Based upon the Code of Federal Regulations (45 CFR 46), the definition of a human participant is a living individual about whom an investigator conducting research obtains (1) data or samples through intervention or interaction with individual(s), or (2) identifiable private information.

a. Student researchers must write a research plan that should include a description of research participants, recruitment procedures, research methodology, assessment of risks and benefits of the research, procedures for minimizing physical, psychological and privacy risks to participants and procedures for obtaining informed consent. See the SSP Risk Assessment Guide at www.societyforscience.org/sts/riskassess.

b. The research plan must be reviewed and approved by an Institutional Review Board (IRB) before the student may begin recruiting and/or interacting with human participants. After initial IRB approval, a student with any proposed changes to the research plan must repeat the approval process before experimentation/data collection resumes.

i. If research is conducted in a high school, it is the responsibility of the student researcher to receive properly documented IRB approval before beginning the study (see IRB guidelines below.)

ii. If research is conducted at a federally regulated research institution (e.g., university, medical center, NIH, correctional institution, etc.), the research plan must be reviewed and approved by that institution's IRB and proper documentation must be provided.

c. The research study must be in compliance with all privacy and HIPAA laws when they apply to the project. Students are prohibited from administering medications and performing invasive medical procedures on human participants. The IRB must confirm that the student is not violating the Medical Practice Act of the particular state or territory in which

he/she is conducting the research.

d. Research participants must voluntarily give informed consent/assent, and in cases where the research subject is a minor, parental permission may be required. The IRB determines whether written documentation of consent/assent/permission is necessary.

e. Student researchers may NOT publish or display information in a report that identifies the human participants directly or through identifiers linked to the participants (including photographs), without written consent (Public Health Service Act, 42, USC 241 (d)).

f. All standardized tests that are not in the public domain must be administered, scored and interpreted by a qualified professional as required by the instrument publisher. Any and all use and distribution of the test must be in accordance with the publisher's requirements including procurement of legal copies of the instrument.

g. Some studies involving human data or human tissue samples are not considered human participants projects and are exempt from IRB review and approval. These include:

   i. Studies in which the data or tissue samples are preexisting and publicly available.

   ii. Behavioral observations of unrestricted, public settings in which a) the researcher has no interaction with the individuals being observed and b) the researcher does not manipulate the environment and c) the researcher does not record any personally identifiable data.

   iii. Research in which the student receives data or tissue samples in a de-identified/anonymous format. The professional providing the data or tissue samples must certify, in writing, that the data or tissue samples have been appropriately de-identified in compliance with all privacy and HIPAA laws.

INSTITUTIONAL REVIEW BOARD

An Institutional Review Board (IRB) is an independent committee that, according to federal regulations (45-CFR-46), evaluates the potential physical and/or psychological risk of research involving human participants. All proposed human research must be reviewed and approved by an IRB before experimentation begins. This includes any surveys or questionnaires to be used.

School-level IRBs must consist of a minimum of three members. A school-level IRB must include: (1) a science teacher not involved with project(s) being reviewed, (2) a school administrator (preferably a principal or vice principal) and (3) one of the following who is knowledgeable and capable of evaluating the physical and/or psychological risk involved in a given study: a physician, psychiatrist, physician's assistant, registered nurse, psychologist, or licensed social worker who is not involved with the project being reviewed. No member of an IRB may be personally related to the student researcher.

Teachers and advisors who oversee a specific project must not serve on the IRB reviewing that project. An improperly-constituted IRB invalidates the approval of a project. IRBs must secure additional alternate members to ensure the eligibility of the projects being reviewed.

IRBs exist at federally registered institutions (e.g., universities, medical centers, NIH, correctional facilities). The IRB must initially review and approve all proposed research conducted at, or sponsored by, that institution.

RISK ASSESSMENT

Once a study population is chosen, the student researcher must assess any potential physical and/or psychological risks. In evaluating risk, students and IRBs must follow the federal definition of minimal risk:

No more than minimal risk exists when the probability and magnitude of harm or discomfort anticipated in the research are not greater (in and of themselves) than those ordinarily encountered in DAILY LIFE or during performance of routine physical or psychological examinations or tests.

The following risk groups require additional safeguards because they may be vulnerable to coercion or undue influence:

1. Any member of a group that is naturally at-risk (*e.g.*, pregnant women, individuals with diseases such as cancer, asthma, diabetes, cardiac disorders, psychiatric disorders, dyslexia, AIDS, etc.).
2. Special vulnerable groups that are covered by federal regulations (*e.g.* children/minors, prisoners, pregnant women, mentally disabled persons, or economically or educationally disadvantaged persons).

The following are examples of activities that contain more than minimal risk:

1. Physical
   a. Exercise other than ordinarily encountered in DAILY LIFE by that subject.
   b. Ingestion of any substance or exposure to any

potentially hazardous materials.

2. Psychological
   a. Any activity (e.g. survey, questionnaire, viewing of stimuli) or experimental condition that could potentially result in **emotional stress**. For example, answering questions related to personal experiences such as sexual, physical or child abuse, divorce and/or psychological well-being (e.g. depression, anxiety, suicide) is considered more than minimal risk. Additionally, research activities that involve exposing participants to stimuli or experimental conditions that could potentially result in emotional stress must also be considered more than minimal risk. Examples include violent or distressing video images, distressing written materials or activities that could potentially result in feelings of depression, anxiety, or low self-esteem in participants.
   b. Any activity that could potentially result in negative consequences for the subject due to invasion of privacy or breech of confidentiality. When research activities involve collection of personal information (e.g. history of abuse, drug use, opinions, fingerprints) or health-related data (genetic material, blood, tissue) the researcher must consider risks related to invasion of privacy and possible breech of confidentiality. Ways to reduce these risks include collecting data anonymously or developing data collection procedures that make it impossible to link any identifying information (e.g. subject's name) with his/her responses or data.

INFORMED CONSENT

Informed consent provides information to the subject about the risks and benefits associated with participation in the research study and allows the subject to make an independent, educated decision about whether or not to participate. Informed consent is an ongoing process, not a single event that ends with a signature on a page. It must not involve coercion or deception.

Documentation of informed consent is required:

1. When the IRB determines that a research study involves physical or psychological activities with more than minimal risk;
2. When the IRB determines that the project could potentially result in emotional stress to a research subject;
3. When the IRB determines that the research participants belong to a risk group.

ADDITIONAL RESOURCES

Additional resources are available regarding human participants research guidelines.

The recommended online training prior to planning any human subject study, for students, new high school IRBs, and new IRB members is at:

http:/ohsr.od.nih.gov

A Risk Assessment Guide for IRBs is at:

www.societyforscience.org/sts/riskassess

The Office for Human Research Protections details national guidelines from which Intel STS rules are derived and may be viewed at:

hhs.gov/ohrp/humansubjects/guidance/basics.htm

Bioethics resources are at:

http://bioethics.od.nih.gov/.

ACADEMIC INTEGRITY

The Intel Science Talent Search, like colleges and universities across the nation, expects that students hold themselves to rigorous ethical standards, both academic and personal. Responsibility for integrity in scholarship is inherently the scholar's, including the student scholar.

Students must be responsible for all aspects of their work's authenticity: the research, the application, and all other documentation. The required signature box asks the entrant to attest to every statement, and by their signature, claim each one to be true or understood. It also attests that material submitted is exclusively the work of the applicant in substance and in presentation. Note that it additionally attests that no mentor of an Intel STS applicant may be compensated based on an applicant's performance in the Intel STS. The responsibility and privilege to present independent work in conformity with Intel STS rules rests with the student, with the guidance of faculty and adult advisors.

If a determination is made at any point that an entrant has violated rules and/or misrepresented work or attribution thereof, SSP reserves the right to disqualify the entry, withhold and/or withdraw monetary awards and/or exclude the entrant from participating in SSP programs.

INTELLECTUAL PROPERTY

Independent research for the Intel STS may produce findings that are the Intellectual Property (IP) of the entrant. Participation in the Intel STS requires disclosure of methods and results; they will be made available to the public. If entrants are concerned about the protection of IP, they are urged to consider these issues with their supervising scientist and qualified adult advisors to make an informed decision before entering the Intel STS. The exhibition, posting, and judging process will not be modified in deference to journal embargoes or other considerations.

CONDITIONS OF AWARDS

All awards less than $20,000 will be paid in the year they are awarded, if the student has provided the necessary documentation to process payment. Awards not disbursed within two years of the award date will be subject to forfeiture.

For individual awards greater than or equal to $20,000, annual payments will be made. The awardee must be an undergraduate or graduate student in good standing to receive payment. Payments must begin no later than 6 years after the award is made and must conclude within 8 years of matriculation from high school. Initial payments will commence once the student has provided the necessary documentation to provide payment. Awards not disbursed within the dates noted above will be subject to forfeiture.

SSP may approve, at its discretion, the extension of the payment schedules noted above if the student provides a request in writing detailing his or her individual circumstances. SSP reserves the right to deny any such request.

Internal Revenue Service (IRS) regulations require that SSP file IRS Form 1099 for Miscellaneous Income for recipients of award monies which total $600 or more during a calendar year. Award recipients will receive their copy of Form 1099 from SSP in January of the year following the year award payments are made. ◆

Intel Science Talent Search *Categories*

Entrants must select one category from the list below; this will determine the expertise of the initial review only. Semifinalists and finalists are selected without regard to the category, and winners may not be selected proportionally across categories. Consultation with teachers or mentors is encouraged to determine the best category for each entry.

Animal Sciences (AS): Study of animals—ornithology, ichthyology, herpetology, entomology, animal ecology, paleontology, cellular physiology, circadian rhythms, animal husbandry, cytology, histology, animal physiology, invertebrate neurophysiology, studies of invertebrates, etc.

Behavioral and Social Sciences (BE): Human and animal behavior, social and community relationships—psychology, sociology, anthropology, archaeology, ethology, ethnology, linguistics, learning, perception, urban problems, public opinion surveys, educational testing, etc.

Biochemistry (BI): Chemistry of life processes—molecular biology, molecular genetics, enzymes, photosynthesis, blood chemistry, protein chemistry, food chemistry, hormones, etc.

Bioengineering (BN): Engineering principles applied to biology or medicine, such as bodily aids or replacements, medical/diagnostic devices, and drugs or other therapies using engineering to address a biological problem.

Bioinformatics and Genomics (BG): Computer applications in biological sciences—their use and aid in the study of the composition/structure of biomolecules; computational biology; DNA microarray studies; sequence analysis of DNA or other biomolecules; analysis of human or other genomes, etc.

Chemistry (CH): Study of nature and composition of matter and laws governing it—physical chemistry, organic chemistry (other than biochemistry), inorganic chemistry, plastics, fuels, pesticides, metallurgy, soil chemistry, etc.

Computer Science (CS): Study and development of computer hardware, software engineering, internet networking and communications, graphics (including human interface), simulations/virtual reality or computational science (including data structures, encryption, coding and information theory), etc.

Earth and Planetary Science (EP): Geology, mineralogy, physiography, cryosphere, ocean sciences, geomagnetism, hydrology, meteorology, climatology, speleology, seismology, tectonics, volcanology, and planetary science, etc.

Engineering (EN): Technology; projects that directly apply scientific principles to manufacturing and practical uses—civil, mechanical, aeronautical, chemical, and electrical engineering; electronic, sound, automotive, marine, heating and refrigeration, transportation, environmental engineering, etc.

Environmental Science (EV): Study of pollution from air, water or land sources and their control or remediation; ecology, etc.

Mathematics (MA): Development of formal logical systems or various numerical and algebraic computations, and the application of these principles—calculus, geometry, abstract algebra, number theory, statistics, complex analysis, probability, etc.

Medicine and Health (ME): Study of diseases and health of humans and animals—pharmacology, physiology, pathology, ophthalmology, oncology, cardiology, nephrology, endocrinology, pediatrics, dermatology, allergies, speech and hearing, nutrition, dentistry, etc.

Microbiology (MI): Biology of microorganisms—bacteriology, virology, protozoology, fungi, bacterial genetics, yeast, etc.

Materials Science (MS): The structure, engineering properties, processing, and innovative uses of metals/alloys, polymers, ceramics, glasses, electronic materials, biomedical materials, composites, and other innovative materials at scales ranging from the atomic to the macroscopic, etc.

Physics (PH): Theories, principles, and laws governing energy and the effect of energy on matter—solid state, optics, acoustics, particle, nuclear, atomic, plasma, superconductivity, fluid and gas dynamics, thermodynamics, magnetism, quantum mechanics, biophysics, etc. Study of celestial bodies, their positions, motions, nature and evolution—astronomy, atrometry, celestial mechanics, etc.

Plant Sciences (PS): Study of plant life—agriculture, agronomy, horticulture, forestry, plant taxonomy, plant physiology, plant pathology, plant genetics, hydroponics, algae, etc.

Space Science (SS): Study of celestial bodies, their positions, motions, nature and evolution—astronomy, astrometry, celestial mechanics, etc. ◆

Intel Science Talent Search
The Research Report

The research report is evidence of research ability, scientific originality, and creative thinking. It is an opportunity to demonstrate competence in planning and completing a project in science, mathematics, or engineering. Students must have completed an independent scientific investigation and have results to report. Investigations not yet completed, literature reviews, and essays are not eligible for this competition.

There is no time limit on the period over which research is performed. Some entrants spend years developing the work that is eventually submitted; others will have spent a few intensive months. Each entrant may submit only one entry and Research Report on one topic.

The research report must be in at least 11pt., legible font, with at least 1.5 line spacing, and 1" margins on all sides.

The research report, limited to 20 pages, must include:

- Title Page (1st page, not in 20-page limit) containing no contact information (phone #, email, address, etc.)
- Abstract (2nd page, not in 20-page limit)
- Short introduction describing the background and purpose of the work
- Experimental section including methods and results
- Concluding discussion of results and implications
- Bibliographic references for all sources consulted with internal citations (not in 20-page limit)
- *Note: The file size upload limit for the research report, including all illustrations, photos, tables, diagrams, charts, drawings, and/or maps embedded in the report, is 2MB. See the research report upload page in the online application for more information.*

Please do not include the following in the research report:

- Library research or a history of literature beyond the short introduction
- Detailed explanations of experiments and procedures of other researchers that preceded the project.
- Lengthy autobiographical information or personal history

Entrants are encouraged to seek every possible resource: books, journals, experts in the field, adult advisors. Refer to research journals in your subject area for examples of report formats to guide your own format. Any pages submitted beyond the 20-page limit will not be read or considered.

Intel STS recognizes the independent research of student investigators. Work submitted by the student scientist should be of her or his own design and execution, and presented in her or his own words. Frequently Intel STS applicants do research within the context of the laboratory and/or in collaboration with others outside of a laboratory in which they work or that is related to that of those with whom they are working. This is expected, since science is a cumulative process, each finding built on previous ones. However, full disclosure of any research or person that has influenced the applicant's work is required. Furthermore, the research report must accurately reflect the work of only the student researcher. While students may seek review of their content and presentation of the research report, both the content and writing should be the work of the applicant. Adults reviewing research reports should suggest areas for improvement, but not provide the student with replacement text or rewrite any portion of the entry. Note that no mentor of an Intel STS applicant may be compensated based on an applicant's performance in the Intel STS. It is acceptable for students to pay or be paid for research experiences.

The research report must be uploaded online as a Word document or a pdf. This upload is limited to 2MB. ◆

DEADLINE FOR <u>RECEIPT</u> OF ALL MATERIALS:

WEDNESDAY, NOVEMBER 13, 2013

8:00 p.m. Eastern time

Intel Science Talent Search
Transcripts and Recommendations

MAILING TRANSCRIPTS

Official school transcripts are the only portion of the application accepted via mail. Transcripts may not be sent via fax or e-mail, but can be sent in hard copy or uploaded with the High School Report. If mailing, entrants should send a signed, sealed, official school transcript from the registrar at their school and mail it to the address below. Entrants are encouraged to send the transcript as early as possible; they should not wait until they are ready to submit the online portion. The timely receipt of the transcript is the responsibility of the student. All transcripts should be received by the Transcript and Recommendation Due Date - November 6, 2013 at 8:00 p.m. Eastern time.

The receipt status of transcripts will be posted to student accounts within 3 business days of receipt. Please mail transcripts to:

Society for Science & the Public
Re: Intel STS Transcripts
1719 N Street, NW
Washington, D.C. 20036-2801

No transcripts will be accepted after the Application Deadline on November 13, 2013 at 8:00 p.m. ET, except those with proof of a delivery guarantee by a nationally known carrier. Entrants are urged strongly to use a nationally reputable delivery service that guarantees on-time delivery and provides a receipt tracking service.

Note: Registered or Certified U.S. Mail is for tracking purposes only, and is not the same as overnight/priority mail. Priority mail through the U.S. Postal Service is a 2–3 day estimate, not a guarantee. Not all postal overnight or guaranteed services are available from/to all locations; they serve primarily only major markets on specific schedules. Any delivery guarantee must be obtained by the entrant in writing from the carrier to be considered to satisfy the exception to the deadline receipt as stated above.

PREVIEW OF EDUCATOR RECOMMENDATION

Do NOT complete these questions by hand. These are the questions that your teacher or other educator will answer on the educator recommendation that will be completed IN THE ONLINE SYSTEM. Each applicant must submit at least one educator recommendation. Questions #1–#3 will be answered in an uploaded letter of recommendation.

1. How long have you known this student and in what capacity? How does this student compare to students you currently teach and also to those you have known during your teaching career? (uploaded in letter)

2. Please address, with specific examples if possible, the student's character and integrity. (uploaded in letter)

3. Please describe your knowledge of the extracurricular involvement and leadership this student has demonstrated among his/her peers. (uploaded in letter)

4. Please summarize your observations and experience with this student that address his/her future promise as a scientist, mathematician or engineer. Relevant topics include (but are not limited to) scientific attitude, curiosity, initiative, originality of thought, collegiality, and work ethic. *(1,000 character count maximum)*

5. Please explain your level of knowledge regarding the submitted research project and/or any other research projects conducted by this student during his/her high school career. If you are or were involved, can you attest that the application and research project submitted in this application properly reflect his/her own work? If you were not involved and have no knowledge of the work, please state so here. *(1,000 character count maximum)*

PREVIEW OF PROJECT RECOMMENDATION

Do not complete these questions by hand. These are the questions your project recommender will answer in the online recommendation system. One project recommendation is required for all applicants. The person who is most familiar with the research will complete this form online. Questions #1–#9 can be answered in text boxes or a letter or recommendation can be uploaded. Questions #10– #13 must be answered in response boxes on the website.

1. **Briefly explain how the student first became known to you.** (e.g. personal relationship, summer program, high school partnership, direct communication from student, required or elective high school course). (1,000 characters) **Is the student related to you or your colleagues?** (son, niece, cousin, etc.) If so, please explain the relationship.

2. **Please describe the nature of your involvement with the student's research.** What role did you serve for the student? What type of guidance did you provide? (1,000 characters)

3. **How did the student get the idea for his/her project?** Was the project assigned; picked from a list of possible research topics; result from discussion with a scientist; arise from work in which the student was engaged; suggested by the student? (1,000 characters)

4. **What was the duration and intensity of the student's research experience?** Number of weeks, months or years; full-time vs. part-time; resident vs. non-resident, etc. (500 characters)

5. **Provide a brief description of your laboratory/research environment and what the student's role was within this group.** (size, number of scientists or students, research levels (post-doc, doctoral, undergraduate, high school) (1,000 characters)

6. **If there were other high school students in your research group, please explain the interaction of this student with others.** Name any students who performed research that was similar to this student and explain how this student's work was different and independent from others. (1,000 characters)

7. **For what aspects of the research can you give credit to the student as being his or her own unique contribution?** (400 characters each)
   a) Purpose of the Experiment
   b) Procedural Design
   c) Data Collection
   d) Processing/Analysis of Data
   e) Drawing Conclusions

8. **What did the student do that showed creativity and ingenuity?** Based on your knowledge of the student, please provide examples of how this student demonstrates future promise as a scientist. Was he/she creative in his/her science, or creative for a high school student? What is your impression of his/her knowledge of experimental design, construction or use of equipment, evaluation of data, etc.? (1,000 characters)

9. **Please provide any additional information that will help to articulate the work of this student.** (1,000 characters)

10. **Did the student's project involve non-intrusive, non-invasive research on live non-human vertebrate animals?** If yes, please describe the student's training to work with animals, the supervision under which the work took place, and the student's overall interaction with the animals. (800 characters)

11. **Was the student provided with tissue from a non-human vertebrate animal study?** If yes, please provide the title of the IACUC-approved study, the IACUC approval number and date of approval (where required/and or applicable). Please describe the interaction the student had with live animals. (800 characters)

12. **Did the student's research involve a human subjects study being conducted at your institution, either behavioral or tissue?** If yes, please provide the IRB approval number and date of approval. Please describe the student's interaction with the human subjects and/or the student's specific role in the larger study. (800 characters)

13. **Did you provide the student with de-identified human data?** (checkbox)

PREVIEW OF SECONDARY SCHOOL REPORT

Do not complete these questions by hand. The entrant will request that his or her school counselor or an administrator complete this form in the online recommendation system.

1. How many students are in this student's senior class? _____

2. What is the student's estimated senior class rank? _____ We do not rank students _____

3. What is the approximate average graduation rate of your school over the past 2–3 years? (Compare the number of first year students entering your school to the number who graduate.) _____

4. Approximately what percentage of your graduates attend four-year colleges? _____

5. Please check all that apply:

_____ Public School
_____ Private School
_____ Home School
_____ Magnet Program:

Is the student part of this magnet program? _____

_____ International Baccalaureate
_____ Advanced Placement courses offered
_____ AP courses offered in math & sciences

STANDARDIZED TEST SCORES

SAT I

Highest Critical Reading Score: _____ Test Date: _____

Highest Mathematics Score: _____ Test Date: _____

Highest Writing Score: _____ Test Date: _____

SAT II *(4 spaces will be available)*

1. Date: _____ Subject: _____ Score: _____

ACT (highest scores received in each category)

English: _____Test Date: _____ Mathematics: _____ Test Date: _____

Reading : _____ Test Date: _____ Science: _____ Test Date: _____

Composite: _____ Test Date: _____

AP Course Test Scores (*8 spaces will be available)*

(Emphasis should be given to math and science courses.)

1. Date: _____ Subject: _____ Score: _____

Other Tests

Test Date _____
Test Name _____
Test Description _____
Test Scores _____

Student's expected graduation date: _____ (students are eligible only in tbeir last year of secondary school)

Intel STS Institutional Review Board (IRB) Approval Form

Required for all research involving human subjects. (Institutional Form or Intel ISEF form may be substituted.)

Student's Name: _____ Title of Project: _____

Adult Sponsor: _____ Contact Phone/Email: _____

To be completed by Student Researcher in collaboration with the Adult Sponsor/Designated Supervisor/Qualified Scientist:

1. ☐ I have submitted my Research Plan which addresses ALL areas indicated in the Human Subjects Section of the Research Plan Instructions.
2. ☐ I have attached any surveys or questionnaires I will be using in my project.
3. ☐ I have attached an informed consent that I would use if required by the IRB.
4. ☐ Yes ☐ No Are you working with a Qualified Scientist?
   Name: _____ Degree: _____
   Email Address/Phone Number: _____
   Experience/Training as it relates to this project: _____

To be completed by Institutional Review Board (IRB) after review of the research plan. The submitted Research Plan must address all areas indicated on the Human Subjects section of the Research Plan Instructions.

Check one of the following:

☐ Research project requires revisions and is **NOT approved** at this time. IRB will attach document indicating concerns and/or requested revisions.

☐ Research project is **Approved** with the following conditions below: (All 5 must be answered)

1. Risk Level (check one) : ☐ Minimal Risk ☐ More than Minimal Risk
2. Qualified Scientist (QS) Required: ☐ Yes ☐ No
3. Written Minor Assent required for minor subjects:
   ☐ Yes ☐ No ☐ Not applicable (No minors in this study)
4. Written Parental Permission required for minor subjects:
   ☐ Yes ☐ No ☐ Not applicable (No minors in this study)
5. Written Informed Consent required for subjects 18 years or older:
   ☐ Yes ☐ No ☐ Not applicable (No subjects 18 yrs or older in this study)

IRB SIGNATURES (All 3 signatures required) None of these individuals may be the adult sponsor, designated supervisor, qualified scientist or related to (e.g., mother, father of) the student (conflict of interest).

I attest that I have reviewed the student's project and agree with the above IRB determinations.

Medical or Mental Health Professional (a psychologist, psychiatrist, medical doctor, licensed social worker, licensed clinical professional counselor, physician's assistant, or registered nurse)

Printed Name	Degree/Professional License
Signature	Date of Approval

School Administrator

Printed Name	Degree
Signature	Date of Approval

Educator (not involved with the project)

Printed Name	Degree
Signature	Date of Approval

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Sample Informed Consent Form

Instructions to the Student Researcher: An informed consent/assent/permission form should be developed in consultation with the Adult Sponsor, Designated Supervisor or Qualified Scientist.
This form is used to provide information to the research participant (or parent/guardian) and to document written informed consent, minor assent, and/or parental permission.

- When written documentation is required, the researcher keeps the original, signed form.
- Students may use this sample form or may copy ALL elements of it into a new document.
- If the form is serving to document parental permission, a copy of any survey or questionnaire must be attached.

Student Researcher:

Title of Project:

I am asking for your voluntary participation in my science fair project. Please read the following information about the project. If you would like to participate, please sign in the appropriate box below.

Purpose of the project:

If you participate, you will be asked to:

Time required for participation:
Risks:

Benefits:

How confidentiality will be maintained:

If you have any questions about this study, feel free to contact:

Adult Sponsor: _____ Phone/email: _____

Voluntary Participation:

Participation in this study is completely voluntary. If you decide not to participate there will not be any negative consequences. Please be aware that if you decide to participate, you may stop participating at any time and you may decide not to answer any specific question.

By signing this form I am attesting that I have read and understand the information above and I freely give my consent/ assent to participate or permission for my child to participate.

Adult Informed Consent or Minor Assent Date Reviewed & Signed: _____

Printed Name of Research Subject: _____ Signature:_____

Parental/Guardian Permission (if applicable) Date Reviewed & Signed: _____

Parent/Guardian Printed Name: _____ Signature:_____

Alumni

Nobel Prize

STS YEAR		HONOR, YEAR
1944	Mottelson, Ben R.	Physics, 1975
1947	Cooper, Leon N.	Physics, 1972
1949	Gilbert, Walter	Chemistry, 1980
1950	Glashow, Sheldon L.	Physics, 1979
1955	Hoffmann, Roald	Chemistry, 1981
1967	Wilczek, Frank A.	Physics, 2004
1968	Tsien, Roger	Chemistry, 2008

Fields Medal

STS YEAR		HONOR, YEAR
1950	Cohen, Paul J.	Mathematics, 1966
1953	Mumford, David B.	Mathematics, 1974

National Medal of Science

STS YEAR		HONOR, YEAR
1948	Breslow, Ronald	1991
1950	Cohen, Paul J.	1967
1953	Mumford, David	2010
1955	Hoffmann, Roald	1983

National Medal of Technology

STS YEAR		HONOR, YEAR
1965	Kurzweil, Raymond C.	1999

MacArthur Fellowship

STS YEAR		HONOR, YEAR
1948	Berry, Richard S.	1983
1958	Richardson, Jane S.	1985
1960	Winfree, Arthur T.	1984
1961	Axelrod, Robert	1987
1964	Lovins, Amory B.	1993
1967	Wilczek, Frank A.	1982
1972	Coleman, Robert	1987
1974	Lander, Eric	1987
1974	Mumford, David B.	1987
1984	Schrag, Daniel P.	2000
1990	Agrawala, Maneesh	2009

Albert Lasker Basic Medical Research Award

STS YEAR		HONOR, YEAR
1949	Gilbert, Walter	1979
1956	Hood, Leroy E.	1987

Elected to the National Academy of Engineering

STS YEAR		AFFILIATION
1943	Rechtin, Eberhardt	Aerospace Corporation
1949	Goldman, Alan J.	Johns Hopkins University
1952	Armstrong, John A.	IBM Corporation
1964	Sproull, Robert F.	Sun Microsystems
1974	Leighton, F. Thomson	Massachusetts Institute of Technology

Elected to the National Academy of Sciences

STS YEAR		AFFILIATION
1943	Rosenblatt, Murray	University of California, San Diego
1945	Clark, George W.	Massassachusetts Institute of Technology
1945	Sessler, Andrew M.	Lawrence Berkeley Laboratory
1945	Streitwieser, Andrew	Harvard University
1945	Tinkham, Michael	Harvard University
1947	Cooper, Leon N.	Brown University
1947	Felsenfeld, Gary	National Institutes of Health
1947	Karplus, Martin	Harvard University
1948	Berry, R. Stephen	University of Chicago
1948	Breslow, Ronald	Columbia University
1948	Martin, Paul C.	Harvard University
1949	Gilbert, Walter	Harvard University
1950	Cohen, Paul J.	Stanford University
1950	Glashow, Sheldon Lee	Harvard University
1950	Sternberg, Saul	University of Pennsylvania
1952	Richards, Paul L.	University of California
1953	Mumford, David B.	Brown University
1954	Crothers, Donald M.	Yale University
1954	Davidson, Eric H.	California Institute of Technology
1955	Hoffmann, Roald	Cornell University
1956	Chilton, Mary Dell	CIBA-GEIGY
1956	Hood, Leroy	California Institute of Technology
1956	Solovay, Robert M.	University of California, Berkeley
1957	Adler, Stephen L.	Institute for Advanced Study
1958	Halperin, Bertrand I.	Harvard University
1958	Richardson, Jane S.	Duke University
1960	Hochster, Melvin	University of Michigan
1960	Mather, John N.	Princeton University
1961	Axelrod, Robert	University of Michigan
1967	Wilczek, Frank A.	Massachusetts Institute of Technology
1974	Lander, Eric	The Broad Institute

Sloan Research Fellows

Fifty-six alumni have been named Sloan Research Fellows.

Searching for Alumni

Do you know a former Science Talent Search finalist or semifinalist from either the Intel or Westinghouse years? Society for Science & the Public is developing an alumni program to create a national network of past participants of the Science Talent Search. If you or someone you know was an STS finalist or semifinalist, please contact Society for Science & the Public at alumni@societyforscience.org.

Intel Corporation

The foundation of tomorrow's innovation is education. That's why making quality education available to more students around the world—with the help of technology—has inspired Intel's commitment to education for 40 years. We do more than make contributions. Intel gets directly involved in developing and helping to change policy, training teachers, offering free curricula, providing kids with a place to explore technology, and encouraging young innovators. Intel believes that students at all levels everywhere deserve to have the skills they need to become part of the next generation of innovators.

In the last decade, Intel has invested more than $1 billion, and Intel employees have donated over 3 million hours, toward improving education in over 70 countries, regions, and territories. We are actively involved in education programs, advocacy, and technology access to help tomorrow's innovators. The Intel International Science and Engineering Fair and Intel Science Talent Search encourage students to tackle challenging scientific questions and develop the skills needed to solve the problems of tomorrow.

www.intel.com/education

Society for Science & the Public

Society for Science & the Public (SSP) is one of the oldest nonprofit organizations in the U.S. dedicated to public engagement in science and science education. Established in 1921, SSP is a membership society and a leading advocate for the understanding and appreciation of science and the vital role it plays in human advancement.

Through its acclaimed education competitions and its award-winning magazines, *Science News* and *Science News for Kids,* SSP is committed to inform, educate, and inspire.

www.societyforscience.org

To learn more about the Intel Science Talent Search, visit:

www.societyforscience.org/sts

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