33rd Annual Greater Capital Region Science and Engineering Fair (GCRSEF)
Saturday, March 18, 2023

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REGISTRATION DEADLINE: January 25, 2023

GCRSEF Board

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Fran Lohnes, Saratoga Springs High School: **Senior Division Registrar, SRC Committee**
Donna Mooney: **Secretary, Junior Division Registrar, SRC Committee**
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Joan Wagner, Eastern Section of STANYS, **Director/President**
Christine Zhao, M.D., Ph.D.: **Regeneron, SRC Committee**

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Introduction

Science fairs provide a vehicle by which talented science, mathematics and engineering students can be recognized for their achievements just as athletes are recognized in sporting events. When students do original research, they better understand the nature of science while developing their critical thinking skills, an essential goal of the science standards. Importantly, they are provided with a venue to network with other students who share their interests. As a result of this experience, many of these students go on to pursue STEM careers.

This is the 33rd year of the Regeneron Greater Capital Region Science and Engineering Fair, an affiliate of the Regeneron International Science and Engineering Fair (ISEF) and the STANYS State Science Congress. STANYS State Science Congress is sponsored by the Science Teachers Association of New York State (STANYS). Top projects from the Senior Division (grades 9–12) will be chosen to compete in Regeneron ISEF and the STANYS State Science Congress. Top projects from the Junior Division (grades 6-8) will be chosen to compete in the STANYS State Science Congress and the new National ML competition sponsored by Thermo Fisher Scientific.

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REQUIRED FORMS

The following Regional Forms and other pertinent information can be found on the Science Fair website.

Regeneron ISEF FORMS:

For all international Rules and Guidelines and **forms** visit the SOCIETY FOR SCIENCE website or the GCRSEF website.

To insure you submit all required forms with your project use the **RULES WIZARD**

Junior and Senior Division Forms Required for Registration (Deadline January 25, 2023)

- Teacher Registration Form (online)
- Student Registration Form (online)
- Regional SRC/IRB Registration Form B: (GCRSEF website) Completed by School, when applicable
- Media and Press Release Form (GCRSEF website)
- Checklist for Adult Sponsor Form 1 (International Science Fair website and GCRSEF website)
- Student Checklist Form 1A (International Science Fair website and GCRSEF website)
- Research Plan (Directions are described on Form 1A)
- Approval 1B (International Science Fair website and GCRSEF website)
- Additional ISEF Forms may be required of your project. See RULES WIZARD

Required Abstract for Day of Competition

- 21 Category Abstract Form Ten copies will be brought to the science fair. One copy will be placed in a non-glass frame and the remainder will be placed by the Poster story-board. DO NOT PLACE THE ABSTRACT ON THE POSTER.

REGISTRATION

All students registering a project must submit completed forms exactly as requested. **Incomplete forms will not be processed**. All forms downloaded from websites are in interactive PDF format**. No hand-written forms** will be accepted!

Sponsoring Teachers:

- Sponsoring teachers must register before a student can register:
- Make sure students create an account on the Science Fair website.
- Make sure students upload their forms to the Science Fair website by January 25, 2023.
- Send **Registration Payment Form** with the **registration fee ($40.00 per student**) made out to GCRSEF, Inc. as follows:
  - Send Junior Division Registration to Mrs. Donna Mooney, Junior Division Registrar, 228 Spring Avenue, Troy, NY 12180.
  - Send Senior Division Registration to Mrs. Fran Lohnes, Saratoga Springs High School, 1 Bluestreak Blvd, Saratoga Springs, NY 12866.
  - Students will not be registered for the fair until payment is received. Postmark deadline is January 25, 2023
- SRC/IRB Regional Form B must be included when applicable.

Questions about junior division, email Donna Mooney at gcrsefjuniordivisionregistrar@gmail.com or call: (518) 225-2858.

Questions about senior division email Fran Lohnes at gcrsefseniordivisionregistrar@gmail.com or call: (518) 409-6216.

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SRC/IRB APPROVAL

To provide for prior approval for projects listed below, each school district is responsible for forming a local review panel (See p. 9 of this brochure).

The following projects require SRC/IRB approval **BEFORE** research begins. Please review the ISEF rules book, which can be downloaded from both the GCRSEF website and ISEF website

- *Human subjects* including surveys (Requires IRB approval. It is recommended that schools combine the SRC and IRB into one committee called the SRC/IRB Committee). (See p. 10-11 of this brochure for more information). Download this information from the GCRSEF SRC/IRB Committee: GCRSEF SRC Guidance For Human Subjects Projects

- *Potentially hazardous biological agents (rDNA technologies, human or animal fresh tissues, blood, or body fluids).*

- *Vertebrate animals*

- *Controlled substances, devices, equipment*:
    - Chemicals (*i.e.*, hazardous, flammable, explosive or highly toxic; carcinogens; mutagens and all pesticides).
    - Equipment *(i.e.*, welders; lasers; voltage greater than 220 volts).
    - Firearms
    - Radioactive substances
    - Radiation (*i.e.*, x-ray or nuclear; unshielded ionizing radiation of 100- 400 nm wavelength).

FAIR FINALIST INFORMATION

WHO MAY ENTER: Students in grades 6 – 12 may enter if attending a school in one of the 15 counties listed below. This includes all schools, public and private, and any home-schooled students in the counties of Albany, Columbia, Fulton, Greene, Hamilton, Montgomery, Orange, Rensselaer, Rockland, Saratoga, Schenectady, Schoharie, Ulster, Warren, and Washington.

JUDGING: Students will be judged only on laboratory experiment/data collection performed over the past 12 continuous months. See ISEF rules for longitudinal studies and continuation studies. A copy of the Judging criteria is available on the GCRSEF website.

TEACHER SPONSOR and ADULT MENTOR: Every student must have a *teacher sponsor* in the school where the student is enrolled. The teacher sponsor helps to ensure all required forms are submitted by the student. The Teacher sponsor should review the student's presentation materials. Parents/guardians, friends, or any other adult cannot be a teacher sponsor unless the student is home-schooled. HOWEVER, any qualified adult may act as a mentor for the student. The *mentor* is the person who is directly involved with the student and his/her research and may be a parent. The adult mentor is responsible for the safety of the student at all times. Please note when completing ISEF Form 1, the ADULT SPONSOR should be the name of the teacher NOT the mentor.

PRIOR APPROVAL: Participants working on projects dealing with human subjects (including surveys), vertebrates, potentially hazardous biological agents and controlled substances must have prior approval. These projects must submit SRC/IRB Regional Form B. See **Page 6** of this brochure for more information.

STUDENTS MUST DO ALL WORK: Sponsors and mentors may help in planning and advising, but parents, teachers, or friends may not actually design, conduct, or build the project. Abuses of this rule will result in disqualification. All students are expected to be able to answer questions regarding the design and development of every phase of their project.

A student may not display a group project from a previous competition as an individual project.

A research project that is a new phase of a previously entered project must include a copy of Continuation Form 7.
Borrowed or purchased displays or collections are not permitted. All collections must have a label describing how, where, and when they were assembled and must be protected by safety glass or screen.

Presentation Information

SAFETY: Any visitor must easily and safely operate animated or push buttons exhibits. Use shields (wire, plastic, or safety glass) around any hot substances. Any exhibit using harmful, poisonous, or explosive materials, or electrical apparatus under potentially dangerous conditions will not be accepted under any circumstances. **The following is not allowed in the exhibits**:

- Aquariums, live plants, or live animals are not acceptable.
- Telescopes mounted on tripods must be securely anchored to a wooden or plywood base not larger than 48 in (121.9 cm) by 30 in (76.2 cm) and must not protrude beyond the mounting base.
- No glass
- Soil, sand, rock, cement and/or waste samples, even if permanently encased in a slab of acrylic
- Taxidermy specimens or parts
- Preserved vertebrate or invertebrate animals
- Human or animal food
- Human/animal parts or body fluids (for example, blood, urine)
- Plant materials (living, dead, or preserved) that are in their raw, unprocessed, or non-manufactured state
- All chemicals including water. Absolutely no liquids can be utilized in the Project Display

- All hazardous substances or devices (Example: poisons, drugs, firearms, weapons, ammunition, reloading devices, grease/oil and sublimating solids such as dry ice)
- Items that may have contained or been in contact with hazardous chemicals (Exception: Item may be permitted if professionally cleaned and documentation for such cleaning is available). Filters including microbial) may not be displayed unless the Display & Safety Committee can reasonably determine that the device was cleaned or was never used (please include receipts in your notebooks and/or logbooks)
- Sharp items (for example, syringes, needles, pipettes, knives)
- Flames and highly flammable materials
- Batteries with open-top cells or wet cells
- Drones or any flight-capable apparatus unless the propulsion power source removed.
- 3D Printers unless the power source is removed.
- Inadequately insulated apparatus capable of producing dangerous temperatures are not permitted
- Any apparatus with belts, pulleys, chains, or moving parts with tension or pinch points that are not appropriately shielded
- Any display items that are deemed distracting (i.e. sounds, lights, odors, etc.)

CONTENTS OF EXHIBITS

- Posters displaying research results must be anchored on a **self-contained, free-standing storyboard (supplied by the student)** that can be placed at your assigned station. **Electronic storyboards are not permitted. Please note, tripods are not provided**.
- Student name MUST be on the **top right corner** of the poster board. Do not place your project number on the poster.
- ACCOMPLISHMENTS, ACKNOWLEDGEMENTS, AFFILIATIONS, i.e. school, college, university or research center name, ADDRESSES, PHONE OR FAX NUMBERS, ARE NOT PERMITTED ON THE STORYBOARD!
- **PROJECT NUMBER:** The registrars will send out project numbers to all registered students about two weeks before the science fair is held.
- **PROJECT CARD NUMBER AND HOLDER:** Each exhibit station will be provided a project card number and holder to be clipped to the top center of the poster so the project number is clearly in view. The holders with numbers must be returned to the box outside the Room of the exhibit.
- **SIZE:** No exhibit may exceed 48 in (121.9 cm) from side to side, 30 in (76.2 cm) from back to front, and 108 in (274 cm) in height (from floor including height of table). All exhibits will be placed on laboratory tables provided in the exhibit room. **For this regional ISEF fair, no poster board can be greater than 72 inches in height since it must be placed on a lab table. Projects with posters larger than this size will be disqualified from the competition.**
- PHOTOGRAPHS: Photographs pertaining to the project are encouraged! Only the student researcher may appear in those photographs unless legal permission is provided. **Provide the name of person or organization responsible for each picture**. (See Page 27 of 2023 ISEF Rule book. This can be downloaded from the regional website). If the student researcher generated all of the photos, then only one credit line on the poster board or by the poster is needed to acknowledge this.
- **ABSTRACT**: Use **Official 21 Category Abstract Form**. It can be downloaded from **GCRSEF website.** Make ten copies of your abstract. One copy of the abstract must be placed in a non-glass picture frame by the storyboard. **It cannot be on the storyboard.** Place remaining 9copies of your abstract by the storyboard.
- **LAB NOTEBOOK**: Place Your Lab Notebook by your exhibit poster. **This is very important to the judges.**
- **FORMS**: A copy of all submitted forms must be placed in front of poster in a folder titled, *Science Fair Forms*. Students are to retain all original copies of their forms.
- **RESEARCH PAPER**: One copy of the research paper is placed by poster. It must be word-processed on 8.5 by 11.0 in. paper. The recommended length for the senior division is 5 to 10 pages, and 3 to 5 pages for the junior division. Graphs, pictures and diagrams do not count as written pages. The cover page should contain the title of your project as well as your name and assigned project number. A copy of the abstract, on the official abstract form follows the cover page. For detailed information on how to

begin your research and write a paper and abstract see: "**Handbook download**" from regional website: <www.gcrsef.org>.

ORAL PRESENTATION: You will be required to present a short summary (up to 5 minutes for an overview of project, i.e., research goals, procedure, and conclusions) to the judges, which will be followed by questions from the judges.

JUDGING: Specific details about judging protocols are forthcoming. THE DECISIONS OF THE JUDGES ARE FINAL AND NONREVIEWABLE.

STANDARDS: The Planning Committee of the Greater Capital Region Science and Engineering Fair reserves the right to disqualify any exhibit on the day of the Fair for work that is unsuitable in subject matter or treatment that is potentially dangerous or that violates any rules of the fair. Exhibits that lack any of the necessary paperwork or required signatures will be disqualified!

HELPFUL HINTS: Have your teacher sponsor provide you a copy of this Regional Student Brochure or download it from GCRSEF website. Make sure to download a copy of the ISEF 2023 rules from the ISEF website or our regional website.

INSPECTION OF EXHIBITS: Projects will be inspected for safety and any rule infringement. Students and sponsoring teachers will be notified if a project did not pass inspection and will be provided with the information needed to pass inspection and be able to participate in the fair.

STUDENTS SEEKING PATENTS: If you plan to obtain a patent on your research, make sure the rights to your ownership is protected. Your lab notebook can serve as a legal document. Have it notarized if you plan to file for a Patent. Patent information can be found here:
United States Patent and Trade Office
Customer Service: 1-800-786-9199 (toll-free);
571-272-1000 (local); 571-272-9950 (TTY)
https://www.uspto.gov/
https://www.uspto.gov/patents-getting-started/patent-basics/types-patent-applications/utility-patent/process-obtaining

AWARDS
Grand prize finalists in the Junior and Senior Division may be eligible to compete (with all expenses paid) in the ***STANYS State Science Congress*** hosted at Milton J. Rubenstein Museum of Science & Technology (MOST) in Syracuse, NY, (June (TBA) 2023).

The top three senior division projects will be invited to compete at the **74th *Regeneron International Science and Engineering Fair*** (May 13-19, 2023, Dallas, Texas).

The top 4-6 junior division projects will be invited to compete in the **Thermo Fisher Scientific Competition.** The top 300 Masters will be announced on (TBA) and then 30 finalists will be awarded an all-expense paid trip to Washington, DC to compete in the finalist week from (Date TBA).

Many prizes and special awards will be presented to winners in both divisions, including cash awards, as well as a Rensselaer $50,000 Scholarship in the senior division.

FORMING A LOCAL SRC/IRB Committee (Form B)

Q. WHEN MUST STUDENT RESEARCH BE LOCALLY REVIEWED?

A. ALWAYS! Some will require the approval of a local SRC Committee (Regional Form B) while others will need approval of the sponsoring teacher (Checklist for Adult Sponsor 1).

Q. WHAT STUDENT RESEARCH PROJECTS MUST BE REVIEWED BY an SRC/IRB COMMITTEE?

A. Any research projects involving human subjects (including surveys), vertebrate animals, potentially hazardous biological agents, and controlled substances must be reviewed. Research conducted by pre-college students at a Regulated Research Institution (e.g., university, college, medical center, government lab, correctional institution) must be reviewed and approved by that institution's IRB. A copy of the IRB approval for the entire project (which must include the research procedures/measures the student is using) and/or an official letter from the IRB attesting to approval is required. A letter from the mentor is not sufficient documentation of IRB review and approval. This is in addition to Form C: Regulated Research Institutional/Industrial Setting Form.

Q. WHEN SHOULD A LOCAL SCHOOL DISTRICT BEGIN TO ORGANIZE A REVIEW COMMITTEE?

A. IMMEDIATELY! Each September or October, local school districts should officially appoint a panel to review and approve student research projects that require approval.

Q. WHAT IS THIS REVIEW PANEL CALLED?

A. There are two types of review panels:

1. A general review panel, the **Scientific Review Committee (SRC),** examines projects for the following:
    a. Evidence of literature search
    b. Evidence of proper supervision
    c. Use of accepted and appropriate research techniques
    d. Completed forms, signatures and dates showing maximum of one-year duration of research and appropriate pre-approval dates (when needed)
    e. Evidence of search for alternatives to animal use
    f. Humane treatment of animals
    g. Compliance with rules and laws governing human and animal research
    h. Compliance with rules regarding potentially hazardous biological agents, controlled substances and hazardous substances and devices
    i. Documentation of substantial expansion for continuation projects
    j. Compliance with the ISEF ethics statement

The Fair's Regional Scientific Review Committee will review all projects entered in the Greater Capital Region Science and Engineering Fair. Participants and sponsors will be notified of any missing or incomplete forms.

2. A second review panel, the **Institutional Review Board (IRB),** is a committee used to evaluate projects that involve human subjects. Such oversight is mandated by federal law to assess potential physical or psychological risks that may be associated with proposed research involving human subjects, as well as to evaluate the methodology the student will use to protect study subjects' private, personal or sensitive information. All proposed human research must be reviewed and approved prior to experimentation! This includes the research plan as well as any questionnaires or surveys used in the project.

A local school or school district can combine both the SRC and IRB into ONE review panel as long as all prerequisites for both panels are met.

Q. WHO SHOULD SERVE ON A LOCAL SRC/IRB COMMITTEE?

A. In order to combine both review panels (SRC and IRB) into one local SRC/IRB committee, a minimum of four persons with the following credentials must be members:

1. A biomedical scientist (Ph.D., M.D., D.V.M., D.D.S., or D.O.)
2. A science teacher (the teacher supervising the student may NOT serve on the panel)
3. A school administrator
4. And one of the following: a medical doctor, physician's assistant, registered nurse, psychiatrist, psychologist, or licensed social worker, Pharm D.
5. If the project involves human behavior, a psychologist, psychiatrist, or individual with human behavioral training must serve on the panel. If students are using non-human vertebrate animals, a veterinarian, or an individual with training in animal care should serve on the panel. SEE ISEF RULES, pp 8-14.

Q. WHAT IS Regional SRC/IRB FORM B?

A. This form is required for all projects that require prior approval. **Form B** can be downloaded from the regional website. (gcrsef.org)

Q. WHERE CAN I GET HELP? WHERE DO I START? HOW DO I GET MORE INFORMATION?

A. If a sponsor teacher needs help forming a local SRC/IRB, you can call Joan Wagner at (518) 505-7507, email at gcrsef@gmail.com.

Every student participating should download and read a copy of this Fair brochure to ensure they are following all GCRSEF rules.