

The Lowcountry Regional Science and Engineering Fair (LRSEF) is the International Science and Engineering Fair (ISEF) and Broadcom MASTERS Competition affiliate for Berkeley, Charleston, Colleton, Dorchester, and Georgetown counties in South Carolina. The LRSEF is held annually in early April with registration due at the beginning-middle of March. At the LRSEF, students compete for national, regional, and local awards, as well as the opportunity to advance to the aforementioned competitions. The College of Charleston is the title sponsor for the LRSEF.

<p>Mark your Calendars Ceremony</p>	<p>Fri, March 15, 2019: Registrations due; List of Participants Tuesday, April 09, 2018: LSF Competition & Awards</p>		
<p>Reminders for 2019</p>	<ul style="list-style-type: none"> • Competition & Awards Ceremony to be held same day* • Location: College Center, Trident Technical College, 7000 Rivers Ave., Charleston • Dinner to be provided for students & 2 chaperones per school/home school association • Senior Division Team may have only 2 members 		
<p>Contents</p>	<p><i>LSF Logistics (p. 2-4)</i></p> <ul style="list-style-type: none"> • <u>Dates</u> • <u>Schedule of Events</u> • <u>Location</u> • <u>Parking</u> • <u>Awards</u> 	<p><i>LSF Rules (p. 4-8)</i></p> <ul style="list-style-type: none"> • <u>Eligibility</u> • <u>Divisions & Categories</u> • <u>Review Boards</u> • <u>Display & Safety Regulations</u> • <u>Identifying Marks</u> 	<p><i>LSF Registration (p. 9-10)</i></p> <ul style="list-style-type: none"> • <u>List of Participants</u> • <u>Registration Packets</u> • <u>Registration Fees</u> • <u>Grades 5-8</u> • <u>Grades 9-12</u>

LSF Logistics

Dates

Due to a full calendar (PASS testing, public and private school Spring Breaks, and religious holidays), the 2018 LSF competition and awards ceremony will be held on Tuesday, April 09, 2019 at the College Center at Trident Technical College (7000 Rivers Avenue, Charleston, SC 29423). We realize this date is not ideal for everyone; however, it was necessary to choose this date due to unavailability of the TD Arena at CofC.

Registration forms are due Friday, March 15, 2019. Refer to page 9 for more information.

Schedule of Events

- | | |
|--------------|--|
| 11:30 – 1:00 | Check-in and set up exhibits (enter College Center at 7000 Rivers Ave.) <ul style="list-style-type: none">- Student exhibits must be set up by 1:00 |
| 12:30 | <i>Category & Special Awards Judges meeting in the Judges' Suite at College center</i> |
| 1:00 – 3:30 | Category and Special Award Judging <ul style="list-style-type: none">- Students must remain by the exhibits for interviews |
| 3:30 – 4:00 | Break |
| 3:30 | <i>Final Interview Judges meeting in the Judges' Suite at College Center</i> |
| 4:00 | Announcement of 1 st place category winners <ul style="list-style-type: none">- These students must stay for Final Interviews <ul style="list-style-type: none">• All others may go to dinner at the specified area for food* |
| 4:15 – 6:15 | Final Interviews to determine overall winners |
| 6:00 – 7:00 | Dinner for students in Finals Judging |
| 7:00 – 8:30 | Awards Ceremony |

**The LSF will be able to provide dinner for all student participants and two chaperones per school/home school association.*

Location

The College Center at Trident Technical College is located at 7000 Rivers Avenue, Building 920, Suite 107, Charleston, SC 29423.

Directions to College Center at TTC

From Eastbound Interstate 26

Take Exit 209 to Ashley Phosphate Road. Bear right from the exit ramp and take a right on Rivers Avenue. Then, take a left on Mabeline Road; this is the Trident Tech NORTH GATE Entrance. Take the first right on Center Drive. Park in the Special Events parking lot immediately to your left off of Center Drive.

From Westbound Interstate 26

Take Exit 211B to Aviation Avenue. Bear left from the exit ramp and take a left on Rivers Avenue. Then, take a left on Mabeline Road; this is the Trident Tech NORTH GATE Entrance. Take the first right on Center Drive. Park in the Special Events parking lot immediately to your left off of Center Drive.

Reminder:

The competition & awards ceremony will be held on same day!

Attention:

Please mark your calendars for April 09, 2019.

Reminder:

Dinner to be provided!

Parking

Parking is **free**; please park your vehicle in the Special Events parking lot immediately to your left off of Center Drive.

→ Map

Complex for Economic Development

Building 920 • 7000 Rivers Avenue, North Charleston • 843.574.6111



Awards

Each student receives a signed Certificate of Participation. The following awards will be given at the LSF Awards Ceremony:

- A variety of national, regional, and local special awards
- First, Second, and Third Place Category Awards for each Division
- Overall First, Second, and Third Place for each Division
- Overall First Place Teacher Award for each Division
- Advancement to Broadcom MASTERS Competition for Middle School Students
- Advancement to ISEF for the 1st and 2nd Place Overall Winners in the Senior Division and his/her teacher; note the exception that if a team wins 1st place, only the 1st place group will be sent

LSF Rules

Eligibility

The LSF is open to public, private, and home school students in grades 5 - 12 from Berkeley, Charleston, Colleton, Dorchester, and Georgetown counties. Students are selected on the basis of excellence in their school/ home school association science fair or by the school's science department.

There is no limit to the number of projects a school or home school association can advance to the LSF.

All students must register by Friday, March 15, 2019. Please see the registration requirements on page 9.

Divisions & Categories

Projects are divided into divisions and categories based on the student's grade level and project theme.

Students in grades 5 & 6 compete against each other in the Junior 1 Division, and students in grades 7 & 8 compete in the Junior 2 Division. Students in grades 9 & 10 compete in the Senior 1 Division and grades 11 & 12 compete in the Senior 2 Division. The registration requirements are different for the Junior & Senior Divisions.

Each division is broken into 6 categories: Behavioral & Social Sciences, Biological Sciences (including Biomedical and Health Sciences), Chemistry & Biochemistry, Earth & Environmental Sciences, Engineering, Mathematics, Robotics & Systems (including Computer Science and Energy), and Physics & Astronomy. Team and Problem-Based Learning (PBL) projects may cover any discipline and will be judged with others of the same discipline. Teams and PBL groups may have up to 3 members for the Junior Divisions and 2 members for the Senior Division.

Please use the descriptions on the next page to help determine the best category for a project. In many cases, a project may fit into two different categories. The fair director reviews each project to ensure they are in the best category. A detailed project description helps determine which a category a project belongs.

New:

Based on categories provided through the International Science and Engineering Fair, the LRSEF have also changed their categories. PBL and Team projects are judged within the discipline itself.

Determining Project Categories

Behavioral & Social Sciences

- Human behavior
- Clinical, developmental, cognitive, & physiological psychology
- Sociology

(Does not include animal behavior)

Biological Sciences

- Animal sciences (development, ecology, husbandry, pathology, physiology, populations genetics, systematics)
- Plant sciences (agriculture, development, ecology, genetics, photosynthesis, physiology, systematics, evolution)
- Cellular & Molecular biology (genetics, immunology)
- Microbiology (antibiotics, antimicrobials, bacteriology, microbial genetics, virology)
- Biomedical and Health Sciences (disease diagnosis & treatment, epidemiology, physiology & pathology)
- Can include biomedical engineering and computational biology (biomedical imaging/devices, cell and tissue engineering, and bioinformatics)

Chemistry & Biochemistry

- Analytical, inorganic, organic, physical chemistry
- Metabolism
- Structural biochemistry
- Computational chemistry

Earth & Environmental Sciences

- Atmospheric Science
- Climate Science
- Environmental Effects on Ecosystems

- Geosciences (land processes, mineralogy, volcanism, and sedimentology)
- Water Science (water resources, movement, distribution, and water quality)

Engineering, Mathematics, Robotics, and Systems

- Embedded Systems (circuits, microcontrollers, optics and sensors)
- Energy (chemical and physical / alternative sources)
- Engineering Mechanics (aerospace and aeronautical, civil, and industrial)
- Environmental Engineering (bioremediation, pollution control, waste management and water resources management)
- Materials Science (ceramics, glasses, composites, polymers, and nanomaterials)
- Mathematics (algebra, analysis, geometry, number theory, and probability)
- Robotics and Intelligent Machines (biomechanics, machine learning, and robot kinematics)
- Systems Software (algorithms, cybersecurity, databases, language and operating systems, and mobile apps)

Physics & Astronomy

- Atomic, molecular and optical physics
- Astronomy and cosmology
- Biological physics
- Matter and materials
- Nuclear and particle physics
- Theoretical, computational and quantitative physics

Review Boards

Projects involving human subjects (including surveys and questionnaires), non-human vertebrates, pathogenic agents, controlled substances, recombinant DNA, or human/animal tissue must be approved by either an Internal Review Board or the Scientific Review Committee prior to experimentation.

Each school or home school association should have an **Internal Review Board (IRB)** to evaluate the potential physical or psychological risk of a project involving human subjects. All human research must be reviewed and pre-approved by the IRB before experimentation. This includes any surveys or questionnaires to be used in a project. The IRB should include:

- a science teacher,
- a school administrator,
- and one of the following: a psychologist, psychiatrist, licensed social worker, medical doctor, physician's assistant, or a registered nurse.

The **Scientific Review Committee (SRC)** is appointed by the LSF director to review and pre-approve experimental procedures for projects involving non-human vertebrates, pathogenic agents (including bacteria from the environment that is potentially pathogenic), controlled substances, recombinant DNA, and human/animal tissue to make certain they comply with the ISEF rules and any pertinent laws. Senior Division students (grades 9-12) should review the ISEF rules and forms prior to experimentation and submit any necessary paperwork to the LSF director for SRC approval. **These forms must be submitted prior to the fair review board meets in order to ensure eligibility.

➔ **ISEF rules and forms** | <https://student.societyforscience.org/international-rules-pre-college-science-research>

Display & Safety Regulations

The Exhibit Hall will be set up with six-foot tables and chairs. For the Junior Divisions, each six-foot table will hold two individual projects. The 3-foot allotted space will accommodate a standard tri-fold display board. Each team project will have a six-foot table.

Each Senior Division project will have its own six-foot table. Senior Division projects must adhere to the ISEF maximum project size requirements:

- Depth (front to back): 30 inches or 76 centimeters
- Width (side to side): 48 inches or 122 centimeters
- Height (floor to top): 108 inches or 274 centimeters (including table height of 36 inches or 91 centimeters)

Students needing electricity for their display (120/220-volt AC only) may request it during the online registration. Students are responsible for bringing their own Underwriters Laboratories-approved cord of proper load-carrying capacity, which is at least nine feet long and equipped with a standard grounded plug.

Items not allowed:

- Living organisms, including plants
- 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 as part of the exhibitor demonstration of the project.
- 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 (Exception: manufactured construction materials used in building the project or display)
- All chemicals including water (Projects may not use water in any form in a demonstration)
- All hazardous substances or devices (Example: poisons, drugs, firearms, weapons, ammunition, reloading devices, and lasers)
- Items that may have contained or been in contact with hazardous chemicals (Exception: Item may be permitted if professionally cleaned and document for such cleaning is available)
- 3-D Printers
- Dry ice or other sublimating solids
- Sharp items (for example, syringes, needles, pipettes, knives)
- Flames or highly flammable materials (including magnified light sources). A Fresnel Lens cannot be used in conjunction with a light source - it becomes an open flame.
- Batteries with open-top cells or wet cells
- Glass or glass objects unless deemed by the Display and Safety Committee to be an integral and necessary part of the project (for example, glass that is an integral part of a commercial product such as a computer screen)
- Any apparatus deemed unsafe by the Scientific Review Committee, the Display and Safety Committee, or Society for Science & the Public (Example: large vacuum tubes or dangerous ray-generating devices, empty tanks that previously contained combustible liquids or gases, pressurized tanks, etc.)
- Photographs or other visual displays of vertebrate animals in surgical techniques, dissections, or other lab procedures
- Any photograph, visual image, chart, table, and/or graph that is deemed offensive or inappropriate by the Fair Director and Judge Coordinator.

Other Information

- A project data book is not required but highly recommended.
- Project sounds, lights, odors, and other display items must not be distracting.
- The Fair Director and Judge Coordinator reserve the right to remove any project or item for safety reasons or to protect the integrity of the LSF and its rules and regulations.
- The LSF Display and Safety Regulations are based on the International Science & Engineering Fair Regulations. While planning their display, Senior Division (grades 9-12) students should review all ISEF Display & Safety Regulations.

ISEF Display & Safety Regulations | <https://student.societyforscience.org/intel-isef-display-and-safety-regulations>

Identifying Marks

Personal identifying markers such as last name and school name, including in display photographs, are not allowed on the front of the display. Students' and school names may be written on the back of the display board.

Students should not wear clothing with their school name. This rule is to eliminate potential bias on the part of the judges. Exception: The LSF will concede to school rules regarding dress. Therefore, if a participating school requires uniforms to be worn during school outings, uniforms will be permitted. However, any identifying logos or names should be covered. Opaque tape will be available.

LSF Registration

List of Participants

A List of Participants must be submitted for each participating school or home school association by or on **Friday, March 15, 2019**. This is to ensure that all participants are correctly registered.

➡ **List of Participants (Word or PDF file)** | <http://lhsm.cofc.edu/lowcountry-science-fair/lsf-document.php>

Registration Packets

The following registration packets were created for you to print, copy, and hand out to students to guide them through the registration process. Please use the appropriate packet for your students' grade level. If the school is paying the registration fee, please use the packet that states "school pays fee".

Registration Packets contain the following:

- Registration Checklist (*details all steps of the registration process*)
- Sample of Online Registration Questions
- Approval Form (*to be signed by the student, teacher, and parent/guardian*)
- Research Plan (*Junior Division only*)

➡ Junior Divisions (grades 5-8) | http://lhsm.cofc.edu/documents/LSFdocuments/JR_Division_Packet.pdf

➡ Senior Division (grades 9-12) | http://lhsm.cofc.edu/documents/LSFdocuments/SR_Division_Packet.pdf

Registration Fees

Registration fees are \$25 per individual project and \$30 per team project. Registration fees are due with the paperwork on **Friday, March 15, 2019** and are non-refundable. Checks should be made payable to the "College of Charleston". Payment online is preferred – payments can be made at https://secure.touchnet.com/C20590_ustores/web/store_main.jsp?STOREID=24.

Please note when registering a team project, each team member will receive an automated invoice for \$30. However, team members should split the cost of the fee and only send a check for his/her portion of the fee. Each team member should not pay the entire fee of \$30.

A limited number of fee waivers are available based on need. Please contact the fair director for a fee waiver form.

Registration for Students in Grades 5-8 (Junior Divisions)

Students in the Junior Divisions should complete the online registration, and submit a hard copy of the Approval Form and Research Plan along with the registration fee by or on **Friday, March 15, 2019**.

For team projects, each student should submit their own online registration and Approval Form. Research Plans may be submitted jointly. During the online registration, select "Team Project" under the Category heading and then the preferred discipline. To avoid confusion, each team member should enter the same project title and description.

The link to the online registration is <http://blogs.cofc.edu/lowcountryhall/lowcountry-science-and-engineering-fair-registration/>.

Registration Students in Grades 9-12 (Senior Division)

Students in the Senior Division should complete the online registration, and submit a hard copy of the Approval Form, ISEF Forms 1, 1A, and 1B, and any other appropriate ISEF forms along with the registration fee by or on Friday, March 15, 2019.

It is recommended that students use the ISEF Rules Wizard to identify the appropriate ISEF forms for their project.

➔ **ISEF Rules Wizard** | <https://apps2.societyforscience.org/wizard/index.asp>

For team projects, each student should submit their own online registration and Approval Form. Research Plans may be submitted jointly. During the online registration, select “Team Project” under the Category heading and then the preferred discipline. To avoid confusion, each team member should enter the same project title and description.

The link to the online registration is <http://blogs.cofc.edu/lowcountryhall/lowcountry-science-and-engineering-fair-registration/> .