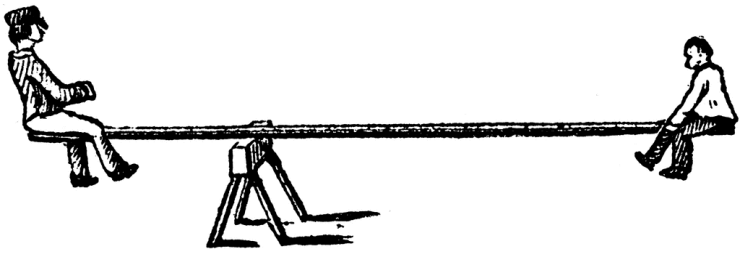
Thirty-Ninth
Annual
PHYSICS OLYMPICS



Thursday, March 20, 2025
8:30 AM - 1:00 PM
Farmingdale State College
Lupton Hall

Sponsored by **Long Island Physics Teachers Association**

Hosted by Farmingdale State College

Registration for 2025 Physics Olympics

Registration:

- Register your 5-student team at www.lipta.org.
- A maximum of 5 students may attend. Spectators are not allowed.
- Each advisor and student participant must turn in a **signed** Photo Release form upon arrival to the event.

Confirmation:

- You will receive a confirmation email after you successfully register.
- Check www.lipta.org to make sure that you are on the official list of participants ***before the event*.**

Registration deadline: March 12, 2025. Only teams registered by this date may participate. There is a maximum of 18 teams, so register early!

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Please enter the names of expected participants by March 12, 2025 at www.lipta.org.

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Fee for the Physics Olympics:

Members	$125*
Non-members	$140* (includes one year membership)
	*includes 2 pizzas and soda

Send a check or PO to our address: **LIPTA**
419 Renee Drive
Bayport, NY 11705

Or pay online by credit card or Paypal at www.lipta.org
Need an invoice? Email us a request at treasurer@lipta.org

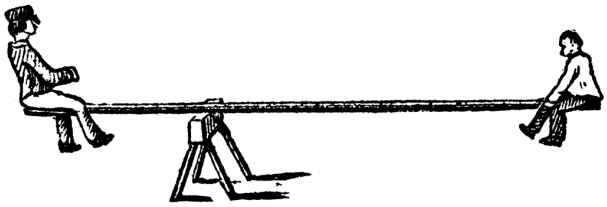
Physics Olympics Information:
Date: **Thursday**, March 20, 2025
Address: Farmingdale State College, 2350 Broadhollow Road, Farmingdale, NY 11735
Building: Lupton Hall
Registration: 8:30 a.m.
Event Start time: 9:00 a.m.
Awards: 12:45 p.m.

Text Justin King at 631-241-5404 or email king@lipta.org for more information.

The Rules

The events for the 2025 Physics Olympics are:

The Physics Bowl	Fermi Questions	Slow Roller
		

Bowling for Glory	The Torque of the Town
	

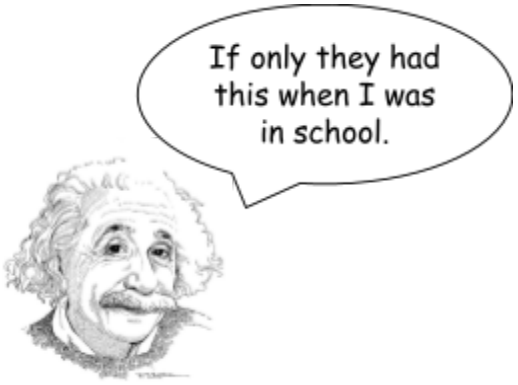
1. Each school may send a single team of no more than 5 students. Additional students and spectators cannot be accommodated. Violation of this rule will result in disqualification of the team.
2. All participants and advisors must turn in a signed photo release form, copy enclosed.
3. Each team must have a faculty advisor. Faculty advisors will judge the events. At least two judges will judge each event. Judges will not evaluate their own school's team.
4. Each event is timed. Teams that arrive late for an event will forfeit that event.
5. Teams should bring scientific or graphing calculators for the Physics Bowl, and are encouraged to wear team T-shirts. Equipment, including calculators, for other events are limited to what is provided by the judges at each event, as outlined in these rules.
6. Accessing the internet is prohibited during competition; students are not allowed to use phones during events.
7. For each event, the total number of points for 1st place will equal the number of teams present. For example, if there are 16 teams competing:

1st place = 16 points
2nd place = 15 points
3rd place = 14 points

The last place team will score 1 point. Tying teams will split points equally for the places in question.

8. If two teams tie in overall points, their placement in the Physics Bowl will be the tiebreaker for overall standing.
9. Trophies will be awarded to the top three teams in each event and to the four teams that accumulate the most points overall.
10. A certificate will be awarded to the team with the best physics T-shirts, as determined by the judging panel of experts. The T-shirt award will *not* count towards the overall trophy.
11. All judges' decisions regarding events are final. The wording of each challenge in this year's event book has been carefully prepared to define each task as precisely as possible. It is expected that all participants will produce solutions which comply with the task as defined. Normal physical interpretations will be applied to all the terminology used in defining the tasks. Those solutions which, in the opinion of the judges, do not comply with the spirit or intent of the event will be disqualified. General questions regarding the events may be directed to the coordinators of the Physics Olympics. The coordinators will accept inquiries that may help them to prepare for unusually good solutions to the problem.
12. Students are required to remain with their team and in the designated areas at all times.
13. Any concerns regarding inappropriate behavior and/or conduct, including any form of harassment, must be brought to the attention of a LIPTA exec board member. Members will be present at the Physics Olympics or may be contacted at exec@lipta.org.
14. Text or email Justin King at 631-241-5404 or king@lipta.org if you have any questions.

The Schedule



1. Events begin at 9:00 a.m.
2. Park in Student Lot #9, across the Great Lawn from Lupton Hall. Look for LIPTA signage.
3. Teams may pick up their materials between 8:30 and 9:00 a.m.
4. Team registration includes lunch (2 pizzas + soda).
5. Morning refreshments and lunch will be provided to faculty and students.
6. Trophies will be awarded at 12:45 p.m.

Acknowledgement of Student Safety Protocols and Photo Release Form

Photo Release

Please sign below to grant permission for photographs and video taken during the Physics Olympics event to be used by Long Island Physics Teachers Association (LIPTA) for publication on the LIPTA website and in the LIPTA newsletter.

Student Safety Protocols

For the safety and well-being of all students, team members are required to remain together in designated areas at all times. To ensure a safe environment, there will be a minimum of two LIPTA board members and/or teacher volunteers present in each room or gathering space at all times.

Any participant (student, teacher volunteer, or LIPTA board member) with safety concerns or knowledge of an inappropriate incident should immediately contact the Physics Olympics Coordinator, Justin King, or LIPTA President, Gillian Winters, so we can address the issue promptly and ensure the continued safety of all students.

Please sign below to acknowledge these protocols and agree to abide by them while attending the Physics Olympics.

School name: _____

_____	_____	_____
Participant (print)	Signature	Date
_____	_____	_____
Parent/guardian name if participant is under 18 yrs	Signature	Date

★ 1 signed photo release form is required for each participating student and faculty advisor.

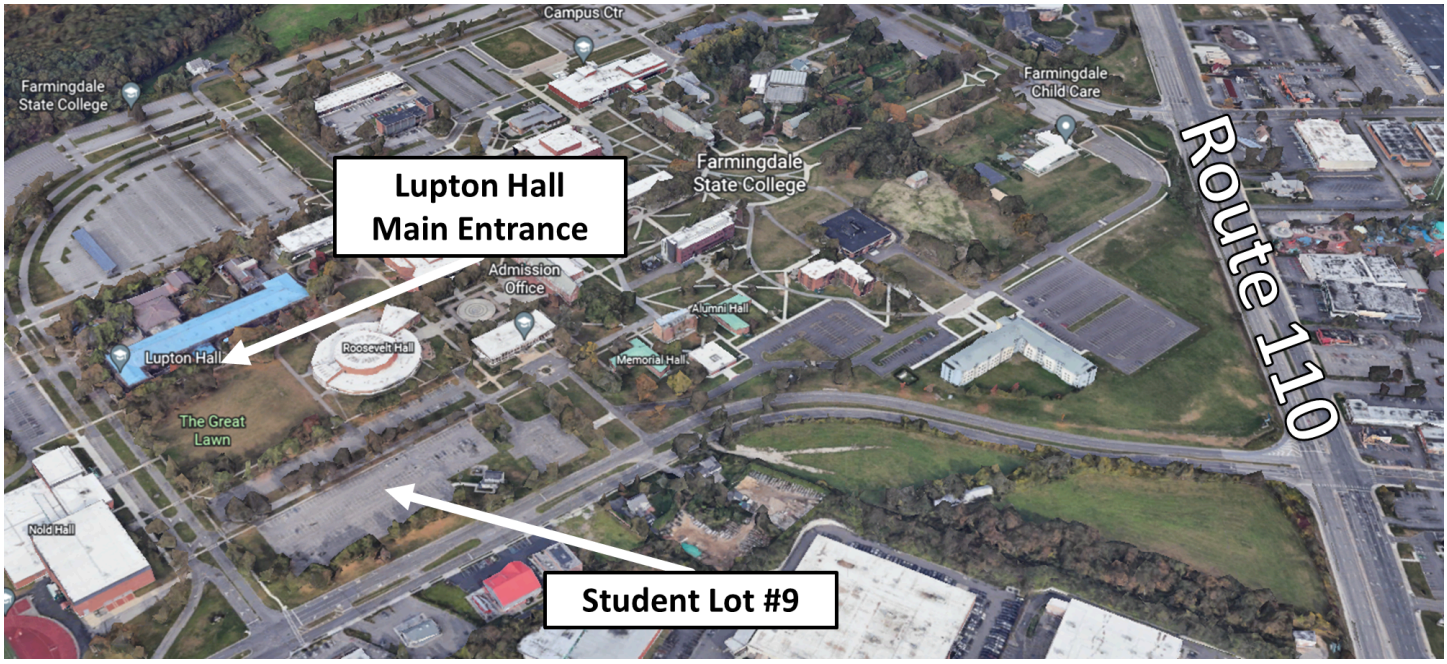
Duplicate for each participant (5 students and faculty advisor)
Additional forms can be obtained at www.lipta.org

T-shirt Contest

Do you have a phlair for physics phashion? Show us your finest at the LI Physics Olympics. Our panel of experts will recognize, with a certificate, the team with the best physics T-shirts!

- Judging will be based solely on physics content; professional printing is not necessary.
- For a team to qualify for this contest, the team's t-shirts must all have the same design.

Farmingdale State College



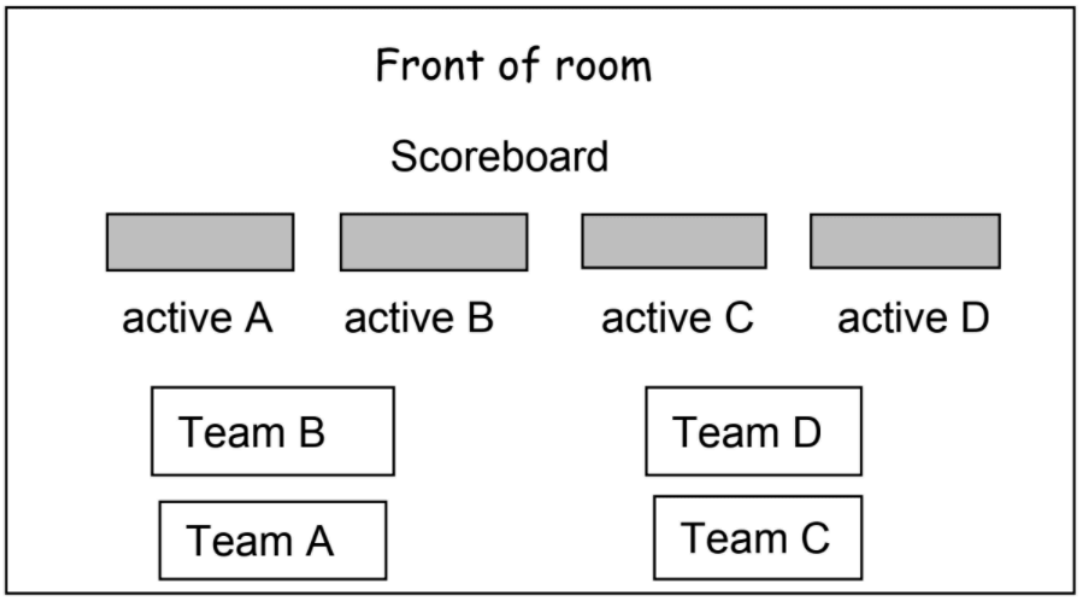
Physics Bowl

Objective:

To be the first team to score twenty points. First round winners will compete in the trophy round.

Rules:

1. All members of the team will participate. Three of the five members will be designated to rotate into the “active player” seat.
2. All questions will be multiple choice and based on the Regents Physics core mechanics syllabus. In the trophy round some questions will be at the honors level. Regents reference tables and paper will be provided. Scientific or graphing calculators may be brought and used.
3. One member of each team, the “active player”, will sit at the shaded location, facing away from teammates. (See diagram)
4. The first “active player” to submit an answer will earn one point for the correct answer or lose two points for a wrong answer. The other “active players” will each earn one point for a correct answer, with no penalty for a wrong answer.
5. The teammates of the “active player” who answers correctly will have the opportunity to try for a bonus point. To earn a bonus point, the remaining team members must answer the question correctly without help from the active player. Only one person may speak for the team. There is no penalty for an incorrect answer.
6. After each question, one of the three designated “active players” will rotate into the shaded location and will become the “active player” for the round.
7. The first team to reach twenty points will advance to the trophy round.



Fermi Questions

Objective:

To estimate quantities which are either difficult or impossible to measure directly.

Rules:

1. Each team will be provided with a list of Fermi questions.

   An example of a Fermi question is:

   How many drops of water are there in the Long Island Sound?

2. Answers are to be given to the nearest order of magnitude.

   Example: Acceptable answer: 10^3

   Unacceptable answer: 2×10^3

3. One point will be deducted for each answer which is not in acceptable form.
4. Questions must be answered in the allowed time.
5. Only one set of answers may be submitted by a team.
6. Calculators and other electronic devices are not permitted.
7. Reference materials are not permitted.
8. No work needs to be shown.
9. Each answer which agrees with the accepted answer will be awarded 10 points. One point will be subtracted for each order of magnitude different from the accepted value, to a minimum of 0 points.

Tiebreaker: The time to complete the event will serve as a tiebreaker.

Time limit: 15 minutes.

Bowling for Glory

Objective:

To maneuver a bowling ball through a set course in as little time as possible using only a broom and your knowledge of physics.

Rules:

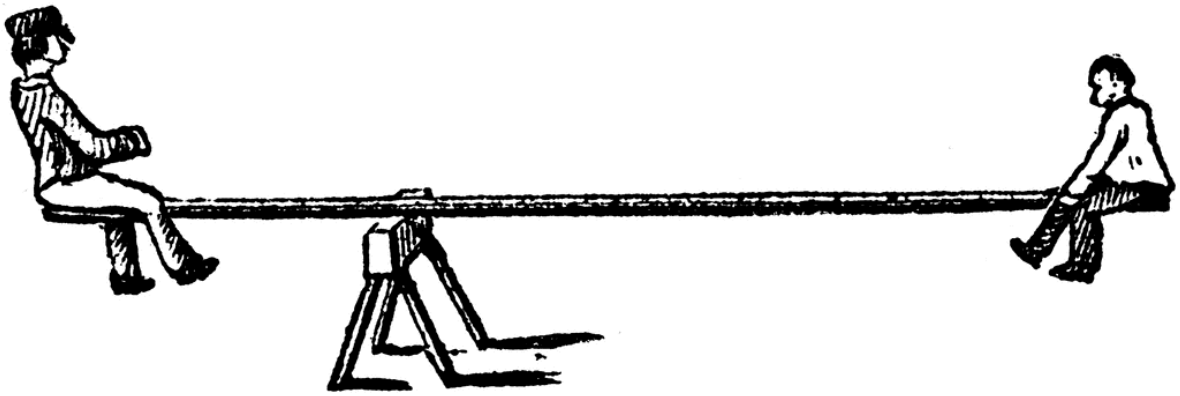
1. Every member of the team will participate in a relay sequence.
2. A course will be laid out on the floor, using masking tape, cones, and water bottles partially filled with water as route markers. The course may include straight sections, slalom sections, right angle turns, a circular section, and "no touch" zones. The ball will start and must end within a designated handoff zone.
3. The ball starts from rest in the handoff zone, and the run begins on the mark of the Timing Judge.
4. The first student guides the ball through the course, returning to the handoff zone.
5. Only when the bowling ball is within the handoff zone - though not necessarily at rest - the first student will pass the broom to the second student.
6. The second student will repeat the course, passing the broom to the third student, and so on, once the bowling ball is within the handoff zone.
7. When the fifth student guides the bowling ball into the handoff zone they must bring the ball to a complete stop, at which point the Timing Judge will stop the clock.

8. The following time penalties will be added to a teams run time:
    a. 20 seconds each time any student touches the ball with anything other than the bristles of the broom
    b. 10 seconds each time a bottle marker is knocked over
    c. 5 seconds each time a bottle marker is touched or moved
    d. 5 seconds each time the ball touches any cone, wall, door, cabinet, chair, or table in the room
    e. 5 seconds each time the ball is touched inside a "no touch" zone; 10 seconds for continuous rather than instantaneous contact
    f. 5 seconds each time the bowling ball passes over a side boundary of a "no touch" zone. In addition, the ball must be brought back to the beginning of the zone (using only the broom bristles) and made to exit at the end line
9. The team's final time will be the sum of their run time and any penalties they accrued during the run. The lowest final time wins.
10. Teams that don't complete the entire relay within the time limit will have a run time of 7 minutes and will be placed by final time below all teams that finished within the time limit.

Tiebreaker: In the event of identical final times, the team with the fewer number of penalties (regardless of type) will be the winner.

Time limit: 7 minutes.

The Torque of the Town



Objective:

To determine the mass of an altered measuring stick using torque.

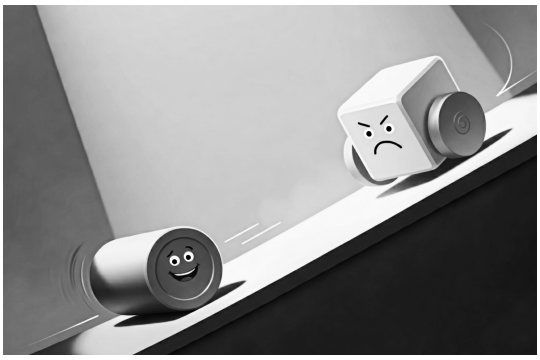
Rules:

1. The timer begins when the team receives its final instructions. Teams are given an altered measuring stick, scientific calculator, known mass and scoresheet.
2. The team will use the edge of a table to act as a fulcrum to balance the measuring stick.
3. Using the principle of torque, the team will determine the mass of the measuring stick to the nearest tenth of a gram.
4. Teams will be required to hand in the scoresheet which must include calculations and/or explanations that were used.
5. The timer stops when the team hands in the scoresheet paper.
6. The score will be based on the team's percentage of error with the known mass. Teams that show no appropriate work on their worksheet will be ranked below all other teams and will tie for last place.

Tiebreaker: The shortest time will serve as a tiebreaker.

Time limit: 15 minutes.

Slow Roller



Objective:

To determine the starting position of the slower of two objects rolling down parallel tracks, such that the faster of the two objects will overtake the slower at a position prescribed by the judges.

Rules:

1. Each team will be stationed at a pair of inclines and given two objects that roll with different accelerations. Objects have been designed to roll slowly.
2. Each team will be supplied with a stopwatch, a meter stick, a calculator and dry erase markers. Students may use the dry erase markers to temporarily make marks on the inclines. The team's time will start when they are given these supplies.
3. After all data is collected, students will return both objects to the judges and then will be told the starting position of the faster object and the prescribed overtaking position.
4. The team will determine the starting position of the slower object. They will let the judges know when they are done, at which point their time will be stopped.
5. The judges will return the objects and team members will place the faster object at the designated position and the slower object at the position they determined.
6. After a countdown, team members will release the objects simultaneously. Judges will observe the objects as they roll and note the actual overtaking position
7. Teams will be scored as follow:
    a. If the faster object overtakes the slower object before the prescribed position, the team's score will be the difference between the actual overtaking position and the prescribed overtaking position, measured to the nearest millimeter.
    b. If the faster object overtakes the slower object after the prescribed position, the team's score will be ***twice*** the difference between the actual overtaking position and the prescribed overtaking position, measured to the nearest millimeter.
8. The lowest score wins.

Tiebreaker: The shortest time will serve as a tiebreaker.

Time limit: 15 minutes.

3D print files for the rolling objects and stands can be found here: https://bit.ly/LIPTA-slow-roller