Spring, 2025

Issue 59

Long Island Physics Teachers Association Newsletter

Important Dates	
Regents Physics Exam	Tues Jun 24
End of year BBQ	Mon, June 30

Check the LIPTA website ***www.lipta.org*** for any updated information.

President's Message

Once again, change is coming to the physics curriculum—but before we sigh and brace ourselves, let's take a moment to look on the bright side. Without periodic updates, many of us might find ourselves in a rut, teaching the same topics in the same way for decades. Change can be uncomfortable, but it also pushes us to reflect, grow, and revitalize our teaching practices.

This year's AP Physics C exams brought no major surprises. Many students described the tests, both Mechanics and Electricity & Magnetism, as "easy," which we all know can be a double-edged sword. Still, we're hopeful the AP Readers will see that same clarity in students' responses when they sit down to grade.

In AP Physics 1, the curriculum updates gave us the chance to revisit a long-overlooked favorite (favorite for some of us): fluids. My favorite activity was having the students predict where water would land, when spewing from a hole in a 2 liter bottle. It certainly brought energy to the classroom. Students once again reported that the AP1 exam felt manageable. That said, their post-exam reflections revealed a few shaky explanations—familiar territory for those of us used to comparing "what students say" with "what students meant."

The most significant shift is coming in Regents Physics, with changes that aim to bring the curriculum in line with NYSSLS. The focus is now on phenomena-based learning, with less emphasis on traditional note-taking and more on student-driven engagement. The new approach encourages students to investigate real-world events and apply physics concepts to things they actually care about. This, in turn, is helping me modify my approach to teaching the AP Physics classes too. Alongside this, the new required investigations in Regents Physics offer an exciting opportunity for consistency across the state. The released question clusters reflect this direction—each one anchored in a meaningful phenomenon, with an increased emphasis on reading comprehension. Still, the content remains familiar, so it's more of a reframing than a total overhaul.

To help support teachers through these transitions, LIPTA has several great events on the horizon. The Fall 2025 conference will focus entirely on the new investigations, helping teachers explore how to implement them effectively. The Spring 2026 conference will feature strategies for teaching the new optics unit, along with another round of the popular NYSSLS lightning session, first introduced in Spring 2025.

We know change can be challenging. Many of us go through the classic stages—denial, frustration, resignation. Hopefully, you've made it past those and are somewhere in the "acceptance" zone. The final phase is commitment—and that's where we're here to help. Whether you're diving into the new materials or just sticking your toe in, LIPTA is here to support you. We'll continue to share resources, updates, and workshop opportunities as they become available. You're not in this alone.

Physics is changing, and that's okay—because so are we.

STEP UP

https://engage.aps.org/stepup/curriculum/everyday

In the last LIPTA newsletter we wrote about STEP UP, which was created by several physics organizations to try to increase the number of physics undergraduates by increasing the number of females and minorities. Their suggestions are good for everybody, and these suggestions could increase the number of students in all of science and technology, not just in physics.

STEP UP reminds us to support and encourage students individually, promoting self-confidence through explicit reinforcement of their abilities. Some students tend to have less self-confidence in physics.

One action that you can take is:

- Direct students (particularly those with fewer opportunities) to clubs, camps, internships, or other programs not solely physics-oriented that would benefit them.

You might say: "I heard about a new summer program at a local university for students interested in quantum physics. Based on the questions you've asked in class, I think you might really love it. I'm happy to be your recommender if you choose to apply."

Students may not be aware of programs they may qualify for, but if they are aware, they also may not apply if their chances to be accepted are low. Like practicing for job interviews and refining resumes, even unsuccessful program applications are beneficial for students to experience.

STEP UP (Supporting Teachers to Encourage the Pursuit of Undergraduate Physics) material is based upon work supported by the National Science Foundation.

Need CTLE credits?

- ♦ Fall and Spring Conferences (3 credit hours for each conference)
- ♦ AP/IB Physics Exam Analysis (3 credit hours)

CTLE Certificates are available.

Diving into the New Curriculum

by Tania Entwistle

The April 5th Spring Conference gave participants a chance to continue examining the coming changes to the Regents Physics curriculum. After a chance for old friends to catch up and new friends to meet over breakfast, the morning began with a welcome by LIPTA President Dr. Gillian Winters, followed by Rich Slesinski who welcomed us to Syosset High School. About 55 teachers eager to understand NYSSLS content attended.

The first presentation was a volley of demonstrations by Manhasset physics teacher Barbara Speight and retired physics teacher Joanne Schwager, designed to bring optics phenomena to life with inexpensive and easily available materials. What size mirror do you need to see your whole body? How can you show critical angle using a laser and fluorescent marker? How does a periscope work? How can you use soda cans to measure focal point? How can an optics kit be used for labs? And Barbara gave a sneak peek at sample questions for the Regents….

After a break for refreshments, the NYSSLS Lightning Round began. Five brave souls attacked topics that provoked lively questions and discussion.

* Andrew Walsh from Commack High School asked us all to think about how to create enduring understandings in our students. What would you hope that your students will remember 10 years from now? Andrew maintains that physics is the easiest science to create examples and the optics demonstrations offered some nice opportunities.

* Sabrina (Sara) Whitaker from Farmingdale described the Physics Cluster Writing Process. Her Master Teachers group has put in a surprising amount of time and will continue to develop templates for five to six questions for a cluster. She gave the example with concepts of forces and motion. She showed how brainstorming a phenomena, collecting data, and using Crosscutting Concepts (CCCs) can be employed to analyze a skateboard trick.

* Spencer Milito from Longwood High School talked about using the website *Universe and More* to introduce the unit on energy. Data from a Great Adventure packet allowed students to make energy bar charts for certain heights and on an inclined plane. Thinking about work as a change in mechanical energy is important to understanding energy transformation.

* Brian Palermo from East Rockaway High School talked about using data to get students to develop skills like problem-solving. Small groups of students get sets of data and are encouraged to communicate and look for patterns. Brian maintains that this a better way for students to learn than just giving an equation.

* Carissa Guilano from Mineola High School gave lots of suggestions for using phenomena in class. Observing things like a Newton's Cradle, feather on the moon, and a bed of nails encourages more relevant and deeper understanding. *The Wonder of Science* and *NGSS phenomena* were suggested. Developing the skill of asking questions from the phenomena and sharing the these questions are critical.

Thanks to all the presenters for creating an enthusiastic and interesting experience for our group! All presentations will be available at lipta.org>About>Videos, or on our Facebook group, *Long Island Physics Teachers Association*.

Do you have any comments, information, or tips to share for future newsletters? Send it via email to: *keogh@lipta.org*

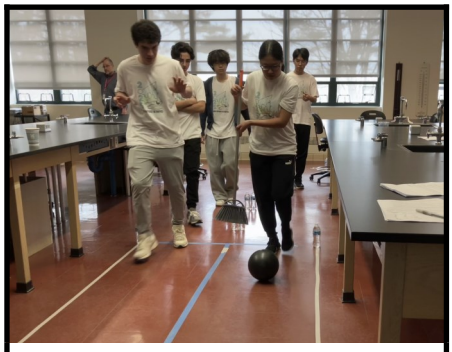
Physics Olympics 2025

The 39th annual Long Island Physics Olympics was held on Thursday, March 20th at Farmingdale State College. Fifteen schools from across Long Island competed in five events. Great Neck North earned the top spot, just edging out Jericho by one point. Third place went to Smithtown East and fourth place to Syosset.

Great Neck North won the first-place trophy for the *Fermi Quiz* in which teams use limited information and no calculator to arrive at a rough estimate — in powers of ten— for a quantity that is difficult or nearly impossible to determine precisely. One question this year asked students to estimate the number of steps that a runner would take in the NYC marathon (10^9 or 9).

Making measurements for Slow Roller

The *Slow Roller* was again included in this year's competition, though it was slightly tweaked from last year. This year, teams had to determine the starting position of the slower of two rolling objects such that the faster one would overtake the slower at a position prescribed by the judges. Syosset won first place in this event.
Torque of the Town was another modified event, requiring students to determine the mass of an altered measuring stick using the principle of torque. Teamwork was excellent in this event, and many teams had an error margin under 1%, but Roslyn took top honors with a measurement only 0.3 grams off the actual value.



Running through Bowling for Glory

Bowling for Glory required students to guide a 16 pound bowling ball, using only the bristles of a very flimsy broom, through an obstacle course that included a slalom section and no touch zones. It was a relay race with all members of the team involved, and a good lesson in inertia! Smithtown East won this race.

"Hot seat" competitors for Physics Bowl

The most nerve-wracking of the events is the *Physics Bowl* which requires teams to compete head to head in heats. The first team to reach 20 points in their round earns a seat in the finals. This year, Jericho took top honors.

The T-shirt contest was won by Division Avenue with their projectile motion theme.

Anyone interested in becoming involved with preparations for next year's Physics Olympics should contact Justin King at king@lipta.org. The planning committee begins meetings in the fall.

Did You Know …

by Harry Stuckey

In our last issue, we reviewed the development of kinetic energy and introduced the contributions of a French noblewoman. Gabrielle Émilie le Tonnelier de Breteuil, Marquise du Châtelet-Lomont, or simply Émilie du Châtelet, was born in 1706 to Louis Nicholas le Tonnelier, Baron de Breteuil, and Gabrielle Anne de Froullay. Recognizing that his daughter was a precocious child, Louis-Nicholas arranged training in fencing and riding as well as tutoring in various subjects. Émilie became fluent in Latin, Italian, Greek, and German and later translated plays and philosophy writings into French. She was also educated in mathematics, literature, and science. As a teenager, she used her math skills to develop successful gambling strategies so she could buy books.

At age 18, she entered an arranged marriage to Marquis Florent-Claude du Châtelet-Lomont. After bearing three children, Émilie and her husband agreed to live separate lives while maintaining one household. At age 26, she was able to resume her studies, concentrating on mathematics and natural philosophy (what we call physical science). She was mentored by some of France's best scholars and became proficient in algebra and calculus. As she reentered society, Émilie developed a personal relationship with the philosopher Voltaire and eventually invited him to live at her country house where he became her long-time companion and lover. By all accounts, they had great mutual liking and respect.

Voltaire acknowledged her contributions to his 1738 *Elements of the Philosophy of Newton,* and its optics chapters were similar to her essays on the subject. They both entered a Paris Academy essay contest on the nature of fire, each receiving honorable mention. In 1740, Émilie published her magnum opus, *Institutions de Physique (Foundations of Physics).* Presented as a text for her 13-year-old son, it included new ideas in physics and philosophy, but more importantly sought to reconcile ideas from leading thinkers of the time. In it she supplied the metaphysical basis for the Newtonian physics she espoused.

In 1749, Émilie completed a translation of Newton's *Principia* from Latin into French along with her commentary on the work, which comprised much of its volume 2. To accomplish this, she had to master calculus and read other works on experimental physics to provide more accurate information than Newton's original work, which did have errors. She also included her own ideas on conservation of energy. It is estimated that she was one of about 20 people in the 1700s who understood the math and the physics and could apply it to other works. Émilie's corrections also helped build support for Newton's theories. Contributing both to the 18th Century scientific revolution in France and the acceptance of Newton's work in Europe, it is still the standard translation of the *Principia* into French. Unfortunately, Émilie did not live to see the publication of her translation and its impact. In 1748, she began an affair with the poet Jean François de Saint-Lambert and became pregnant. The translation was completed shortly before her death at the age of 42, which followed the birth of a daughter in 1749. Who knows what else this remarkable woman might have accomplished had her life not been so tragically cut short.

Congratulations to fellow physics teachers Samantha Gordon of Wantagh UFSD and Rob Krakehl of Manhasset HS, who both received the 2024 Local Teacher of the Year award from Physics Teacher Education Coalition (PhysTEC). This award honors outstanding high school physics educators who are making a lasting impact on students and the future of physics.

Come celebrate the end of another successful school year!

LIPTA BBQ
Monday, June 30
3PM-6PM
Setauket, NY

Free for all current LIPTA members.
Please RSVP at lipta.org so enough food can be provided.
Location information will be emailed prior to the event to all registered persons.

Magnificent Multipliers

(adapted from Stories from Physics Chap 5)

Prefix	Multiplier	Suggested collection	Proposed New Unit
atto	10^{-18}	10^{-18} boys	1 attaboy
femto	10^{-15}	10^{-15} bismols	1 femtobismol
pico	10^{-12}	10^{-12} boos	1 picoboo
nano	10^{-9}	10^{-9} goats	1 nanogoat
micro	10^{-6}	10^{-6} scopes	1 microscope
milli	10^{-3}	10^{-3} cents	1 millicent
Kilo	10^{3}	2 x 10^{3} mockingbirds	2 Kilomockingbird
Mega	10^{6}	10^{6} phones	1 Megaphone
Giga	10^{9}	10^{9} los	1 Gigalo
Tera	10^{12}	10^{12} bulls	1 Terabull
Peta	10^{15}	10^{15} dogs	1 Petadog
Exo	10^{18}	10^{18} skeletons	1 Exoskeleton