Dear students, parents, teachers,

This letter is to inform you about a learning opportunity for high school students. We apologize if you receive this letter more than once.

SchoolNova at Stony Brook, the weekend enrichment program, is happy to announce that the **Advanced Physics Club (APC)** for high school students is opening its session on September 24, 2023. This year we will continue meeting on **Zoom** and will use **Discord** for communications between students and instructors in between the meetings. To receive zoom links for the meeting, students should sign up for the club by sending an email to apc@schoolnova.org. The first organizational meeting is going to take place on **September 24, 2023,** at **3:30 pm on Zoom**.

The participation in APC will be **free of charge for students.** SchoolNova with the support of the Simons Center for Geometry and Physics will cover all expenses for running the club.

This club is intended for high school students (grades 10-12) who enjoy solving challenging physics problems. It will not have a set curriculum; instead, we will be solving and discussing problems from various physics Olympiads and competitions from Physics Bowl to International Physics Olympiad (IPhO). There will also be some instructive sessions about various topics in physics, such as mechanics, thermal physics, electromagnetism, etc. We expect students to know basic physics. In the club, we will be applying this knowledge to solving elegant physics problems both simple and very challenging. The club will be run by faculty, postdocs, and students from Stony Brook University, many of whom are former participants of IPhO and other high-level competitions. You can find the Club's program for the previous academic year here: https://schoolnova.org/nova/classinfo?class_id=adv_phy_club&sem_id=ay2022

The success of the Club crucially depends on having the brightest and most motivated students as its members. There is no better way to find such students than to ask their teachers to help. If you have students who like being challenged by physics problems and would enjoy working with equally motivated peers and active physics researchers in an informal club setting, please, let them know about this opportunity!

If you or your students have additional questions, please, feel free to write to apc@schoolnova.org at any time.

Sincerely Yours,

Sasha Abanov[2], Professor
David Frenklakh[2], Ph.D. candidate
Zohar Komargodski[1,2], Professor
Sergey Syritsyn[2], Associate Professor

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*Notice that SchoolNova also runs the Advanced Math Problem Solving Club. This club has a separate web page:
https://schoolnova.org/nova/mathclub_adv
To sign up for this club, please, contact Prof. Kirillov at kirillov@schoolnova.org.
https://schoolnova.org/nova/teacherinfo?teacher_id=4

You can find more information about the **Advanced Physics Club** and SchoolNova on the following web pages
https://schoolnova.org
https://schoolnova.org/nova/physics_club
https://schoolnova.org/nova/classinfo?class_id=adv_phy_club&sem_id=ay2022 [last year's page]

Below we give a few simple physics problems on kinematics to give you and your students an idea of the problems to be discussed in club meetings.

Examples of problems on kinematics from the previous years:

1. Athletes run one behind another as one line of length l with velocity v. Towards them runs the coach with velocity $u < v$. Each athlete upon coming up to the coach instantly turns around and starts running in the opposite direction with the same speed v. What will the length of the line of athletes be after they all turn around?
2. Two long sticks intersect at an angle 2α and move in the same plane, each moving perpendicularly to itself with a velocity v. Find the velocity of their intersection point.
3. A billiard table has length a and width b. A ball is launched from the middle of the side b. At what angle to side b should the ball be launched in order to return exactly to the initial point after several collisions?