# ADVANCED PHYSICS CLUB

SEPTEMBER 22, 2019

## Useful resources

The updates, homework assignments and useful links for APC can be found on SchoolNova's web page:

`https://schoolnova.org/nova/classinfo?class_id=adv_phy_club&sem_id=ay2019`

The practical information about the club and contacts can be found in the welcome letter on the same web page.

## Today's meeting

Today we solved few problems taken from the Problem of the Month contest for academic year 2014-15. The problems and their solutions can be found at

`http://sigmacamp.org/pom/problems2014`

**1.** POM, Physics, October, 5pt problem

In order to find the distance to the epicenter of an earthquake, seismologists use the fact that different waves travel at different speed. For instance, so-called P-waves (P stands for primary) travel at speed about 5000 m/s. The Secondary, so called S-waves, move slower, about 3000 m/s. Find the distance D (in km) from the epicenter of an earthquake to the seismological station where S-waves were detected 20 seconds later than P-waves.

**2.** POM, Physics, October, 10pt problem

The boat moves relative to the water at the speed which is 2 times smaller than the speed of the river. At what angle to the direction of the flow should the boat aim to cross the river so that it is taken down the river the least?

## Homework

**1.** POM, Physics, Novmeber, 5pt problem

A person stays on scales in the elevator, which is initially at rest. The elevator begins moving upwards, and first moves with a constant acceleration for two seconds. After that, it moves up with a constant speed. Before coming to rest, the elevator decelerates for 3 seconds, again with a constant acceleration.

The reading of the scales was 60 kg during acceleration, and 40 kg during deceleration. What is the mass of the person?

## For the next meeting

The next club's meeting is at 2:40pm, room P-122, on Sunday, **September 29**. We plan to discuss problems on kinematics.