You can choose the most interesting tasks from the 7 proposed ones. You can either use the list of questions as a plan for your answer or you can answer the questions separately. Contribute a reasonable number of examples and explanations.

Task 1.
There is a constellation named Coma Berenices in the northern sky. What kind of constellation is it? What does the word Coma mean here? Does it have something to do with medical term "coma"? Or maybe with comets?

Task 2.
Astronomers decided to send an automatic spacecraft to measure some Solar system objects' surface temperature. They believed that the temperature would decrease while the distance from the Sun was increasing. However they got these results:

Mercury	Venus	Earth	Moon	Mars
-100°C	464°C	28°C	-143°C	-124°C
Jupiter	Saturn	Uranus	Neptune	Pluto
1100°C	-175°C	-198°C	-200°C	-223°C

Try to explain these results. Note: the spacecraft does one measurement at a random spot on the object's surface or near it.

Task 3.
How often can the Earth going under the horizon be seen from the surface of the Moon? Where exactly on the Moon can it be seen better? Has anybody seen this?

Task 4.
Imagine that you observe orbital space station from the Earth. Does time for astronauts on the station (from your perspective) go differently than it goes for you? If so, then what are the differences? Does time go slower or faster for the astronauts on the station themselves? Do they notice this difference? If they do, how long should they be on the station to notice it?

Task 5.
Ijen is an unusual active volcano. Flows on the slopes during eruption are not red but blue. After the eruption the slopes are covered with yellow

crust. Why does this volcano produce substance with such unusual colour? What does the yellow crust consist of? What else can be found on the slopes after eruption? What features can the place where Ijen is situated have? What positive and negative consequences can Ijen's eruption have for the people living nearby?

Task 6.
One of Marvel comics states that Thor's hammer Mjölnir is made of the dying star's matter. Name pros and cons of this theory.
Note: In Norse mythology, Mjölnir is the hammer of Thor, a major Norse god associated with thunder. It is very heavy and can produce lightning. When it is deliberately thrown by Thor, it will return to his hand despite any intervening obstacles or distance. When it has been dropped or set aside, it takes a fixed position, from which it cannot be moved except by a 'worthy' individual. It can also be used for travelling to another worlds.

Task 7.
Find mistakes in the text. Make a list of wrong facts appearing in the text. Correct each mistake by writing what should be changed in the text for it to become correct, how and why should it be changed.

The Cassini spacecraft entered Saturn's atmosphere and ended its mission on September 15, 2017. It didn't reach the planet's surface. It has been functioning since 1997 and has been investigating Saturn and its moons for a bit more than 13 years. Cassini has made a lot of discoveries during this time and thus it has become one of the most successful space expeditions. The spacecraft is named after Saturn rings' discoverer. No wonder that its main goal is studying the rings. The silicon dust turned out to be the rings' main component. Second place goes to carbon dioxide ice. Cassini also found that the rings are not flat. Some kind of waves and arches can be formed within the rings' structure. Hydrodynamic instabilities known as spokes were also found in the rings by Cassini. The spokes were assumed to be the structures formed because of the solar wind. Cassini also happened to found seven new Saturn moons "hiding" between the rings. One of these moons is Enceladus which surface is fully covered with thin water ice crust. Sometimes after Enceladus' collisions with asteroids geysers spraying liquid water are formed on its surface. Another Cassini's goal was studying Titan, the largest of Solar system's moons. This is the only moon with thick atmosphere in the Solar system. Pressure of the atmosphere near the

Titan's surface turned out to be slightly less than the Earth atmosphere pressure. Titan's surface isn't seen from the space because it is obscured by a thick layer of white clouds. Cassini had the Huygens probe to overcome this inconvenience. The probe found liquid rivers and lakes on Titan's surface, which became its greatest discovery. Enormous waves caused by Saturn's tidal forces were found later. The next Cassini's goal was studying how Saturn's atmosphere changes through the year. The spacecraft had been working for 2 Saturnian years. During this period a cogwheel shaped polar storm was found.

Don't forget to **sign** your work (please, write the card number, your last name, school and grade) before **submitting** the work. You do not have to submit the sheet with the tasks. The tasks, their solutions and the results of the competition will be published at *http://turlom.olimpiada.ru* after November 20.