Workshop:
To find the longitude with
Jupiter's satellites

<u>The goal:</u> How to measure the longitude according to Galileo's method? We are going to calculate the longitude of Oradea according to Greenwich's meridian.

<u>Method with the software "Stellarium":</u>

1) The angle of vision (FOV: field of view) is 0.24°. In the Location window choose the city of Oradea on May,7. Search what time it is when Io is behind Jupiter. (Search approximately 7 o'clock). Write it 7h….min. Search what time it is when the sun is at the south (180°). Write it (approximately at 12 o'clock), 12h…..min.

2) Now choose the town of Greenwich. Do the same experiment, what time is it when Io is behind Jupiter? Write it 7h….min, is it the same? …………
At what time the sun is at the south. Write it …h….min, is it the same? …………

3) Convert the hour in minutes:
   • When Io is behind Jupiter at Oradea ……min
   • When Io is behind Jupiter at Greenwich ……min
   • When the sun is at the south at Oradea……min
   • When the sun is at the south at Greenwich ……min

4) Make the difference between the moment when the sun is in the south and where Io is behind Jupiter at Oradea. Write it ……min, we call this measure T_1.
Start again at Greenwich. Write it ……min, we call this measure T_2.

5) Make this calculation: $T_2 - T_1 =$ ……-……=……min, we call this result T_f

6) The earth rotates (360°) around itself in 1436 min, so with a cross multiplication we can make this calculation: $(T_f * 360)/1436 =$ ……° So Oradea is at ……° of longitude.

7) You can check this result with Google Earth.