



FAKULTA MATEMATIKY,  
FYZIKY A INFORMATIKY  
Univerzita Komenského  
v Bratislave

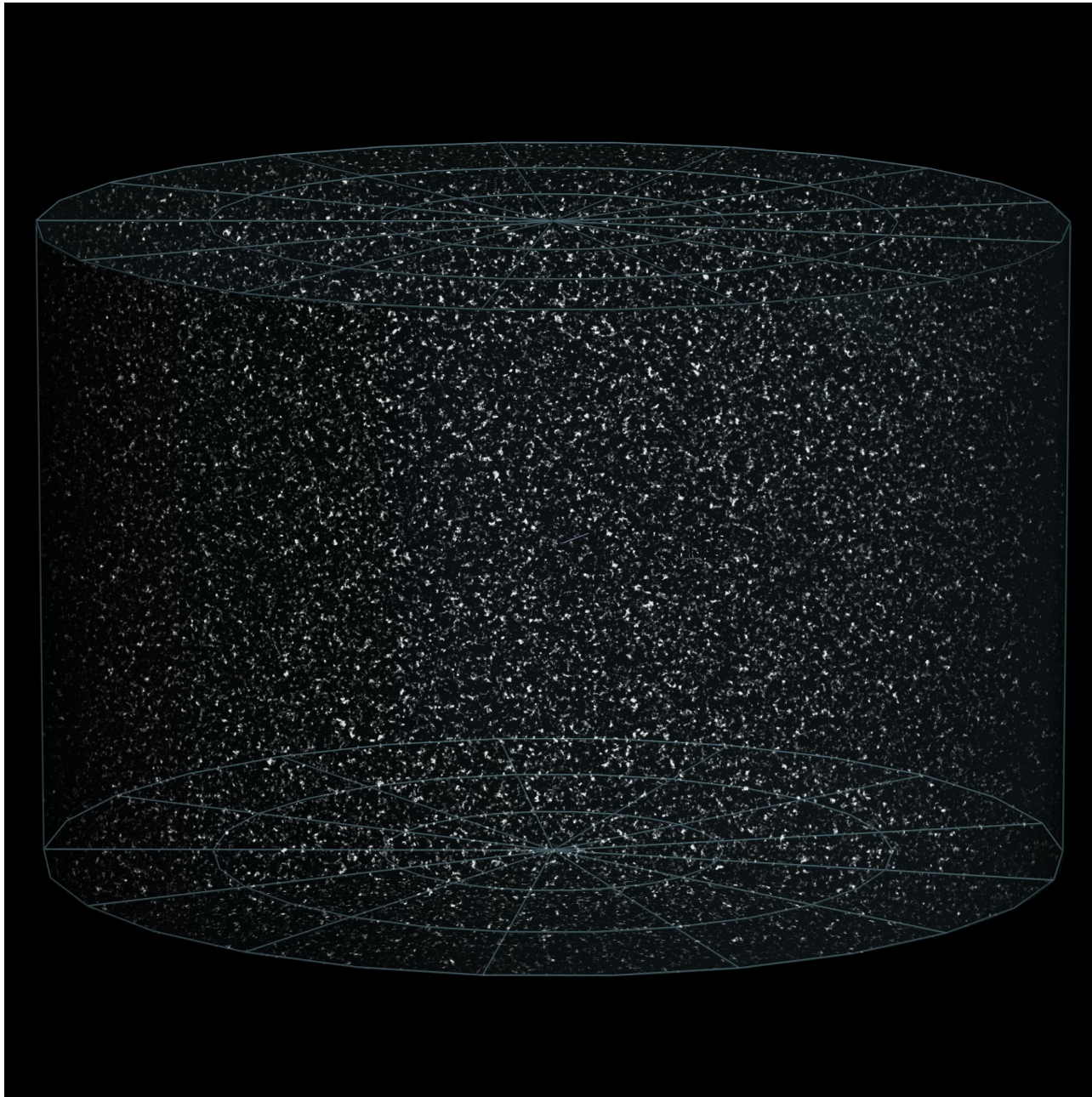
# Odkiaľ vieme, ako vyzerá vesmír?

**Juraj Tekel**

Katedra teoretickej fyziky



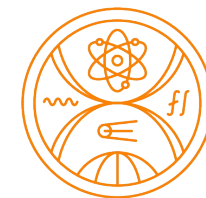
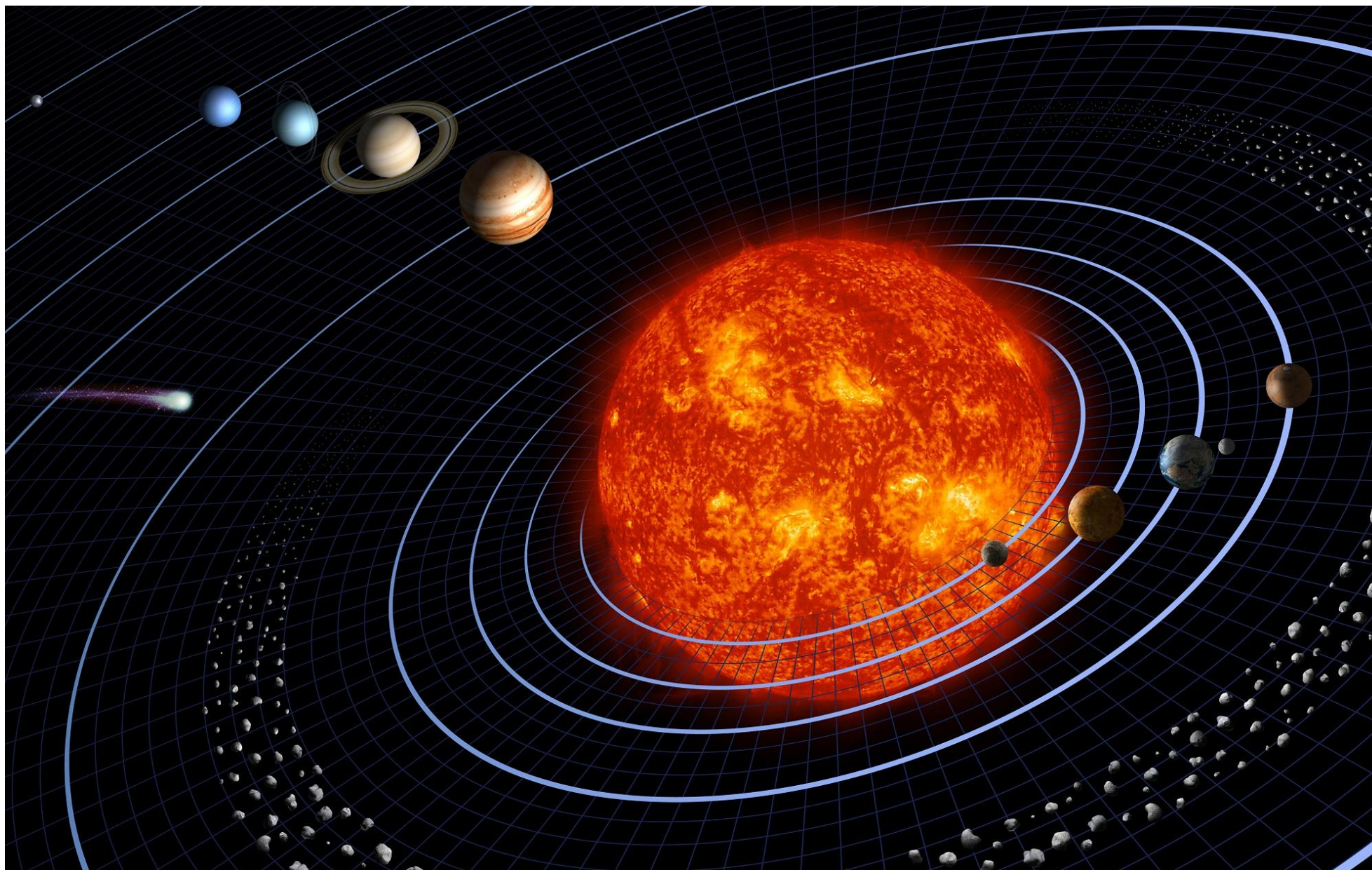
2. 6. 2023, Vedatour, Kláštor, Rožňava





obr.: wiki commons





Slniečná sústava  
na okraji galaxie,  
ktorých je  
nespočetne veľa,  
v rozpínajúcom sa  
vesmíre,  
ktorý zrýchľuje.



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1687



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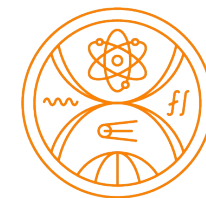
1904

1917

1929

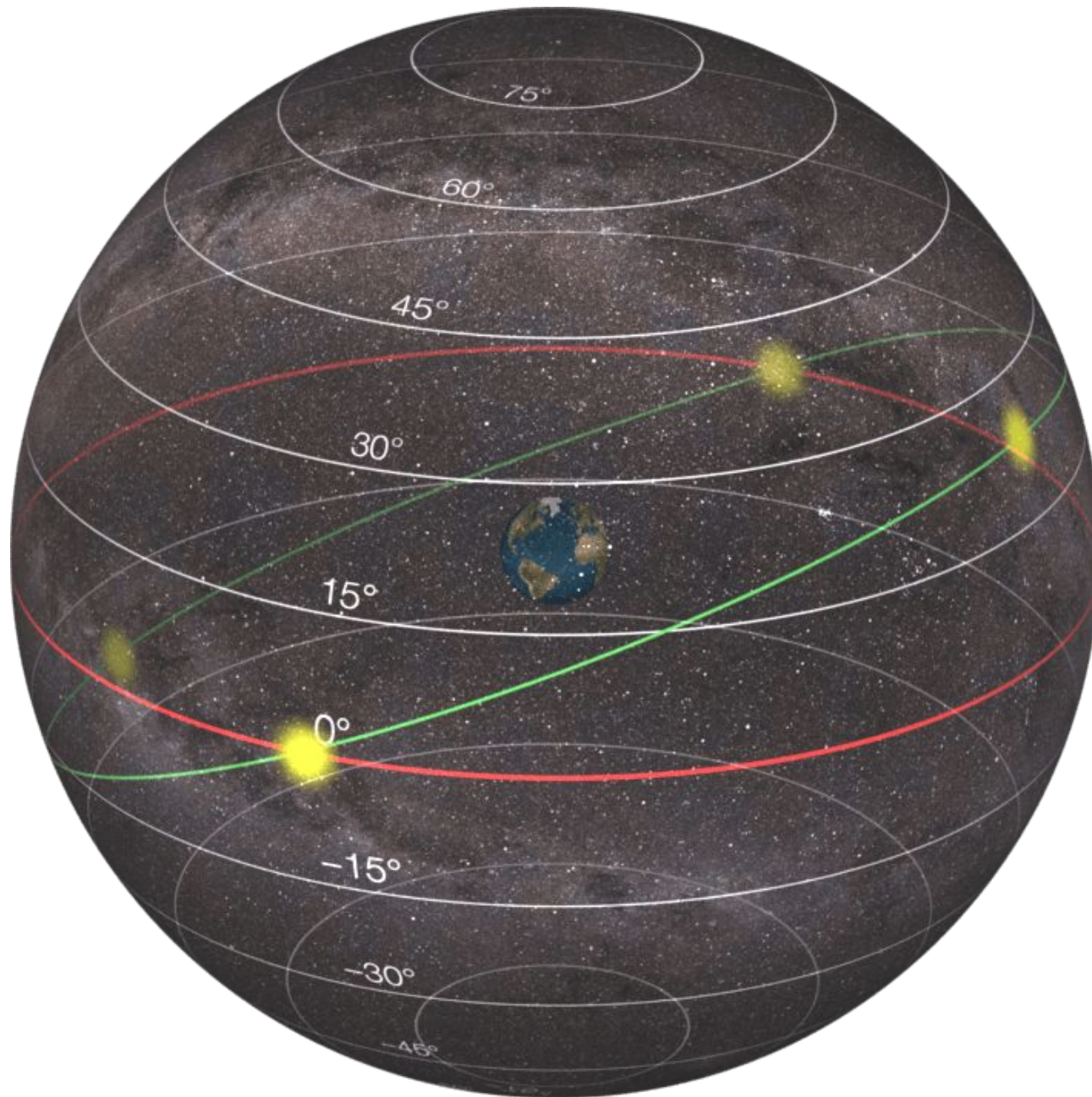
1998



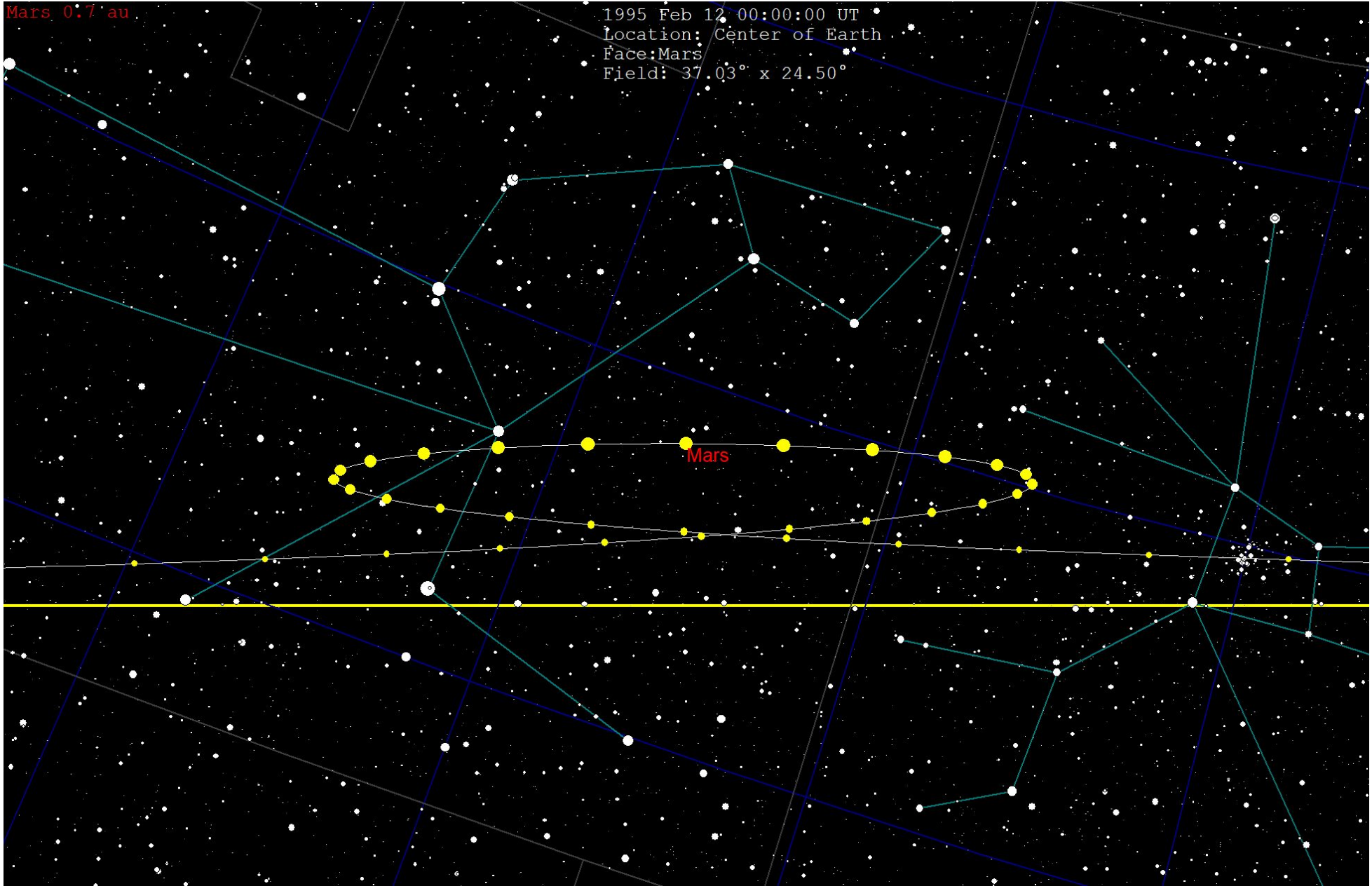


# Slnečná sústava

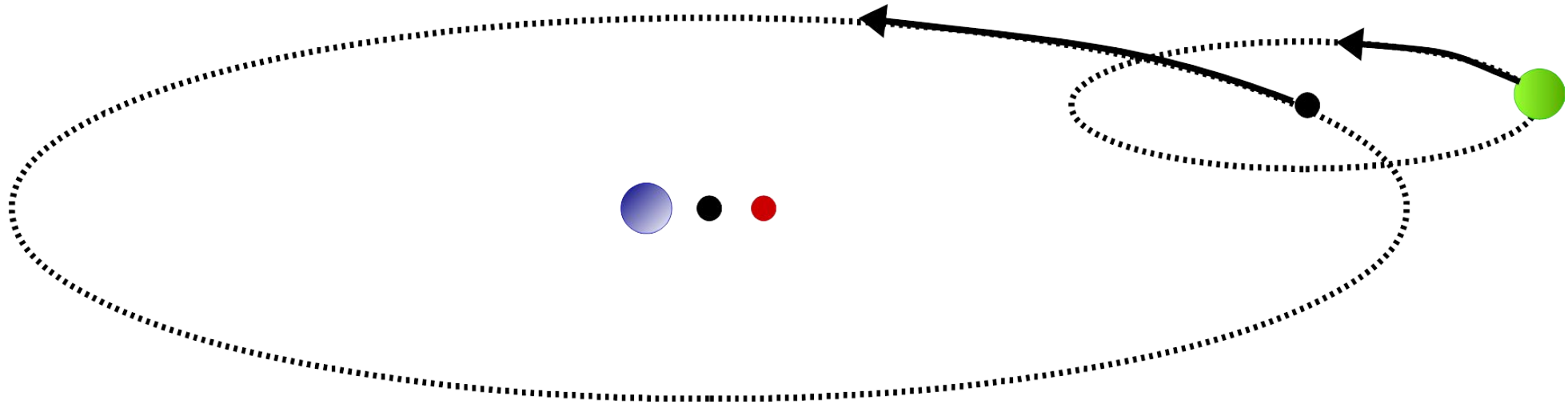


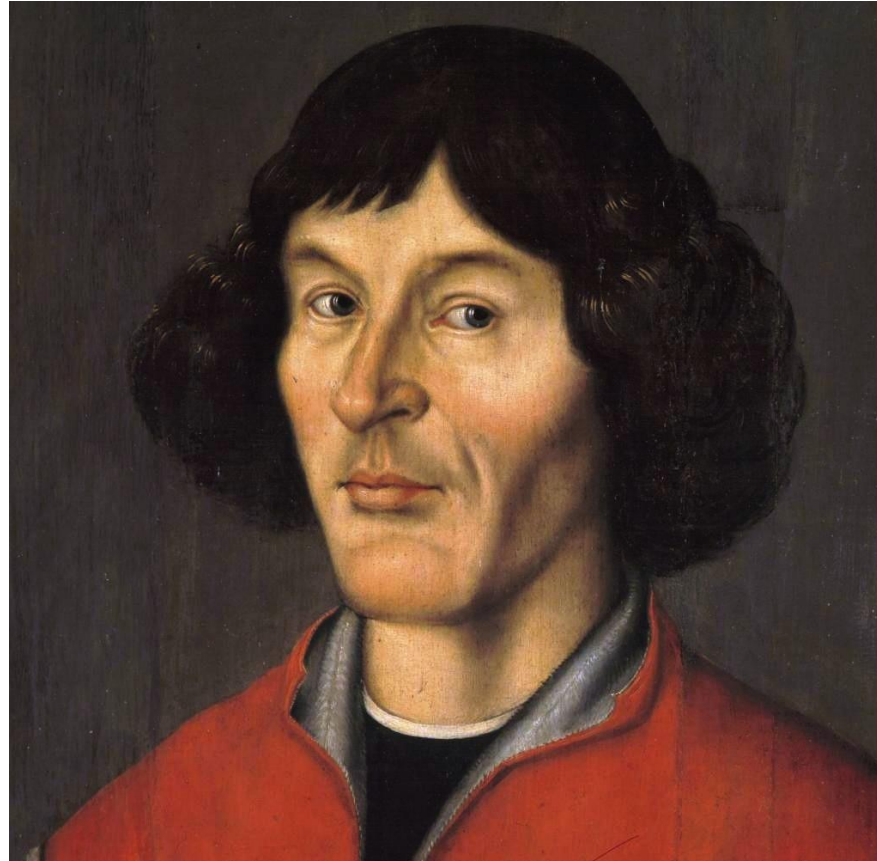






obr.: Tom Ruen, wiki commons



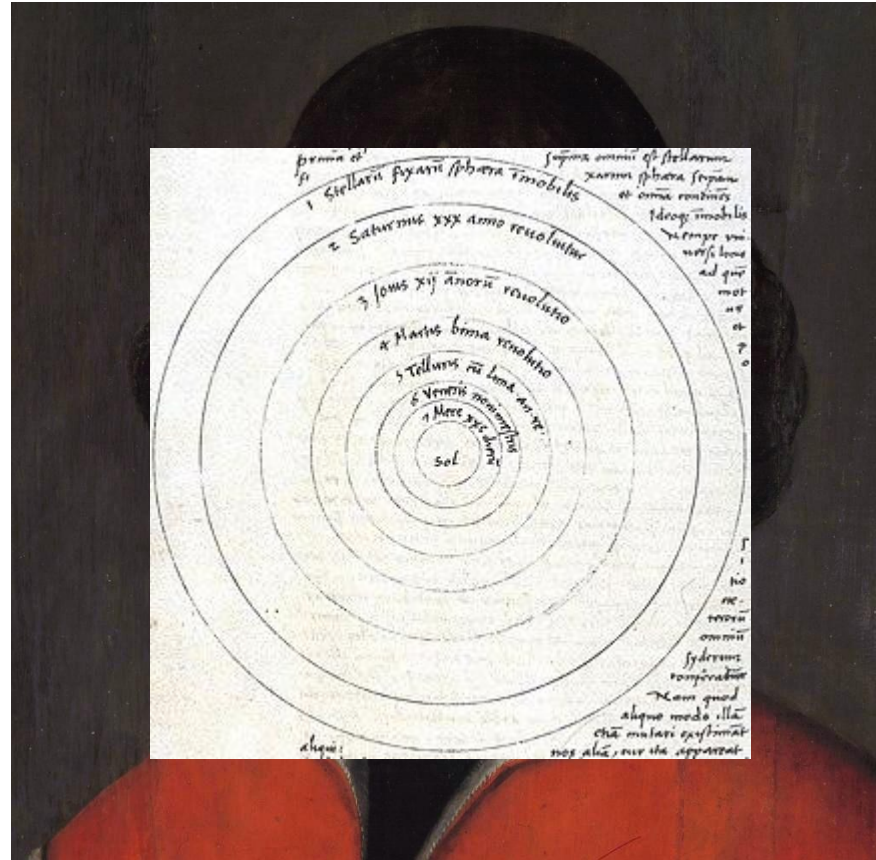


Mikołaj Kopernik

1473 – 1543

*De revolutionibus orbium coelestium*, 1543





Mikołaj Kopernik

1473 – 1543

*De revolutionibus orbium coelestium*, 1543



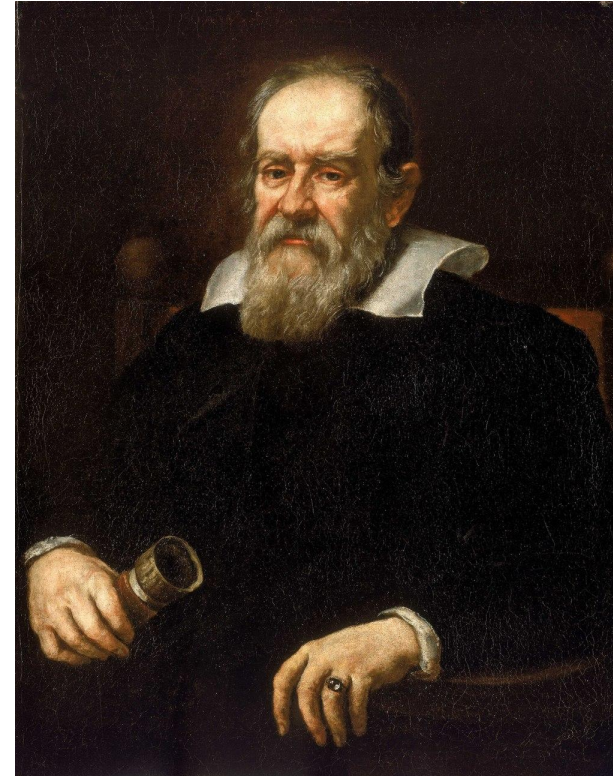




Tycho Brahe  
1546 – 1601



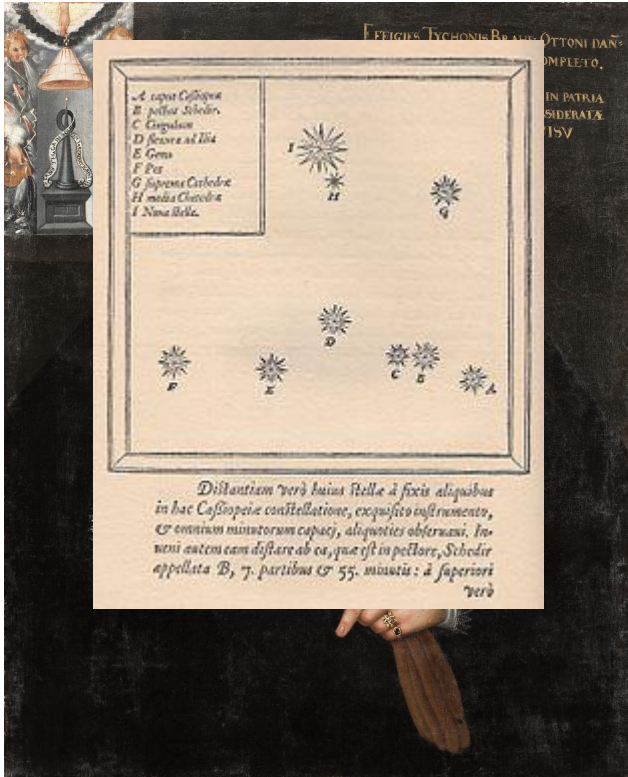
Johannes Kepler  
1571 – 1630



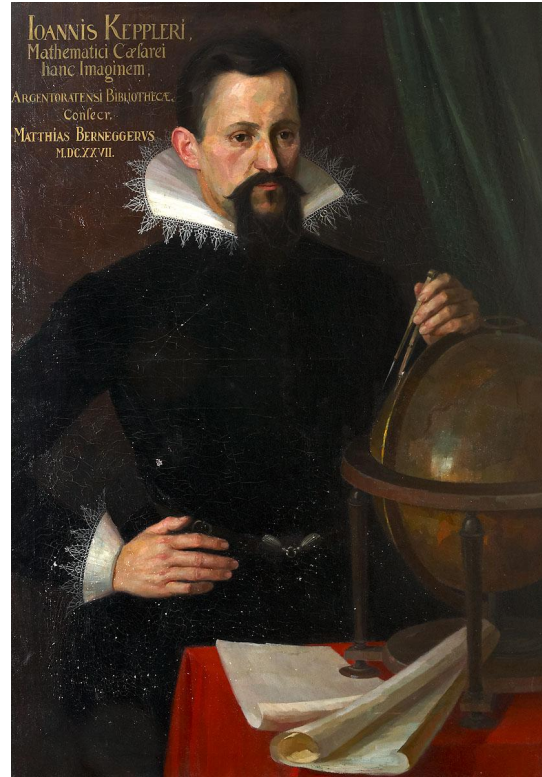
Galileo Galilei  
164 – 1642



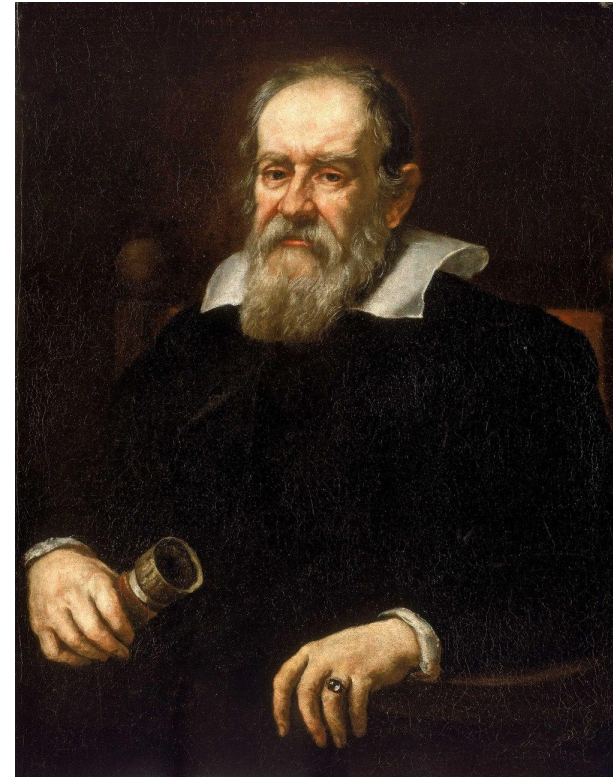




Tycho Brahe  
1546 – 1601



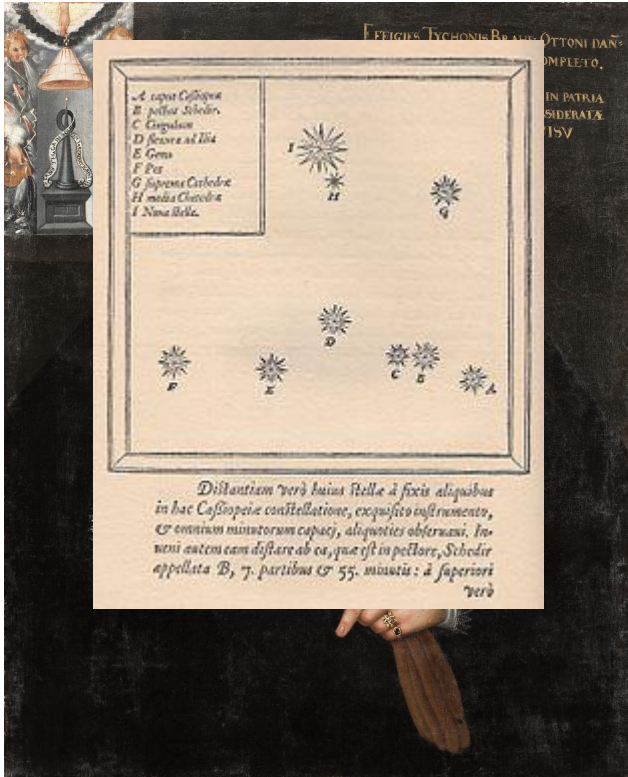
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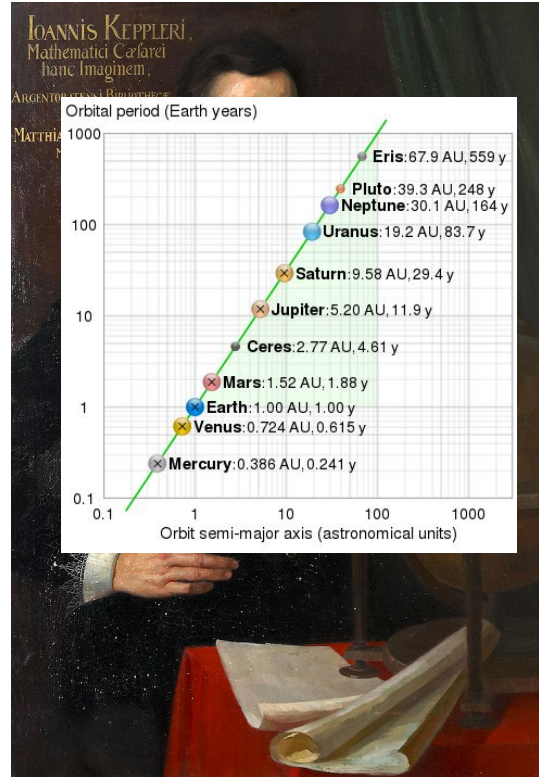
Galileo Galilei  
164 – 1642



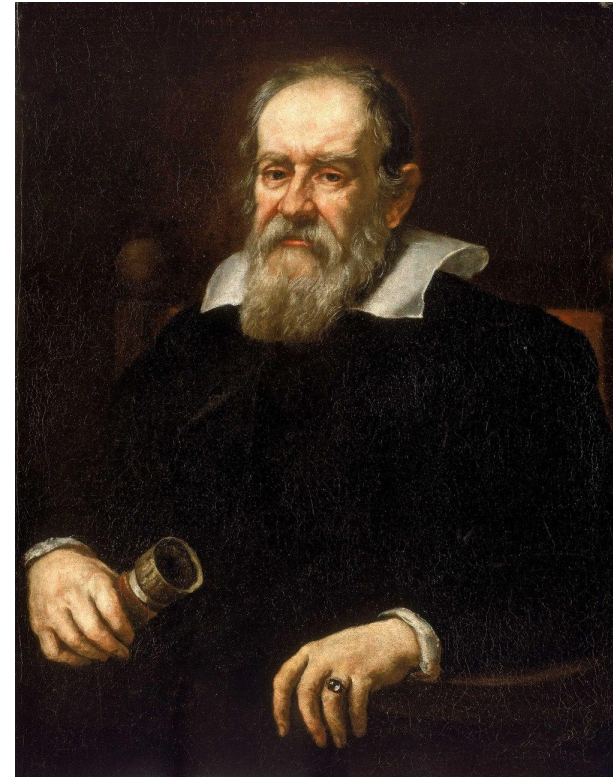




Tycho Brahe  
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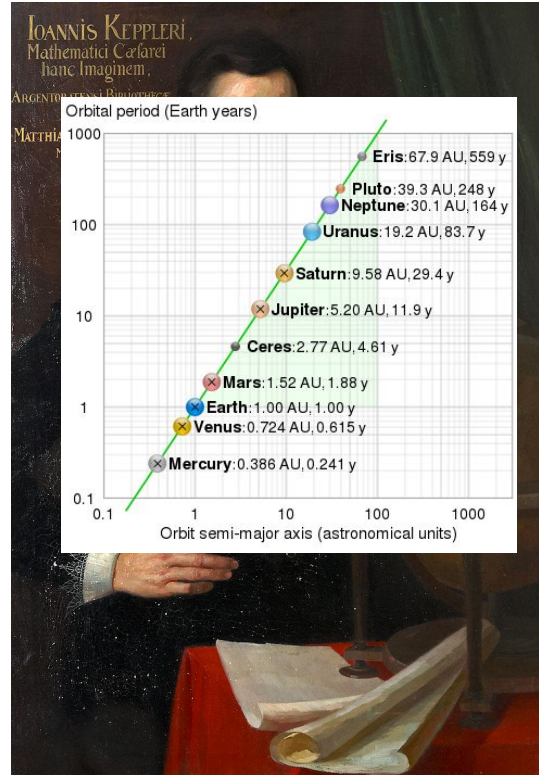


Galileo Galilei  
164 – 1642

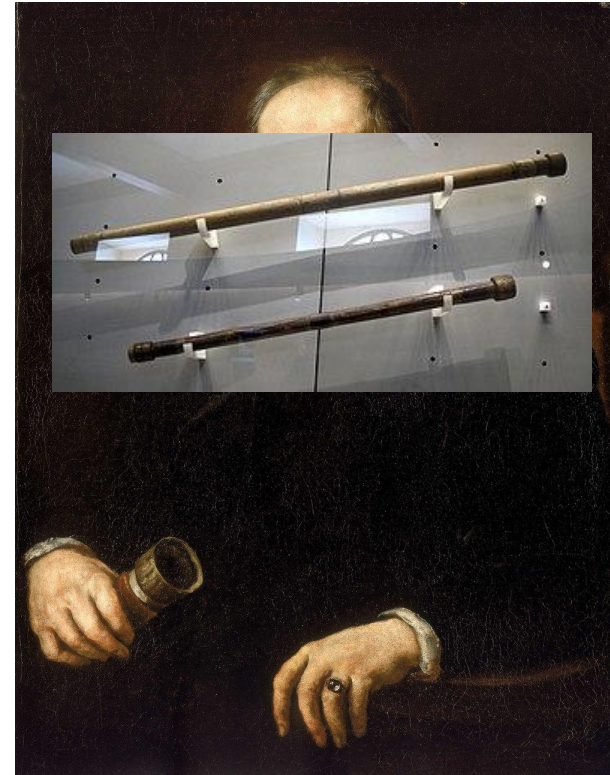




Tycho Brahe  
1546 – 1601



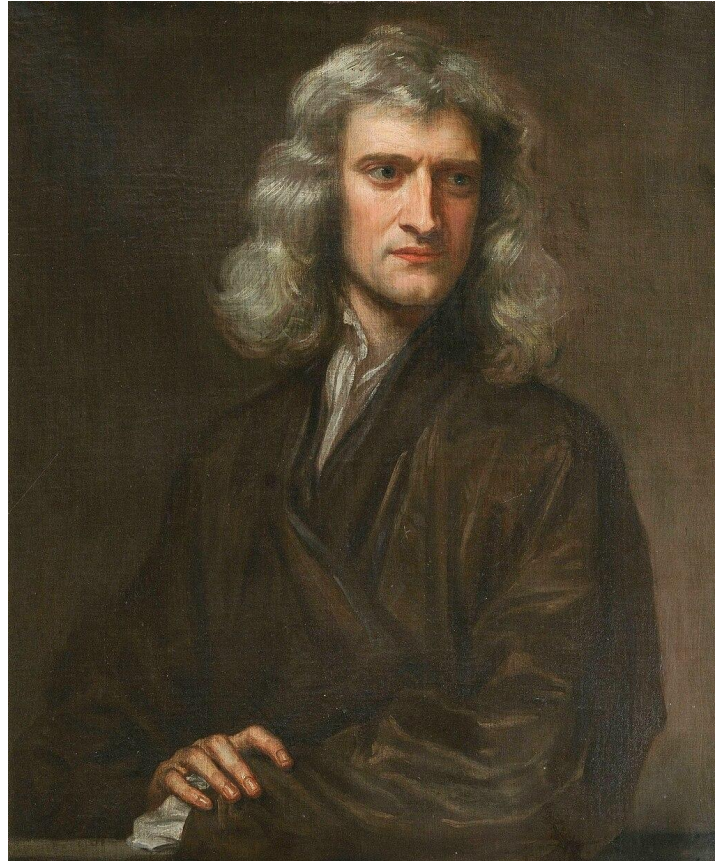
Johannes Kepler  
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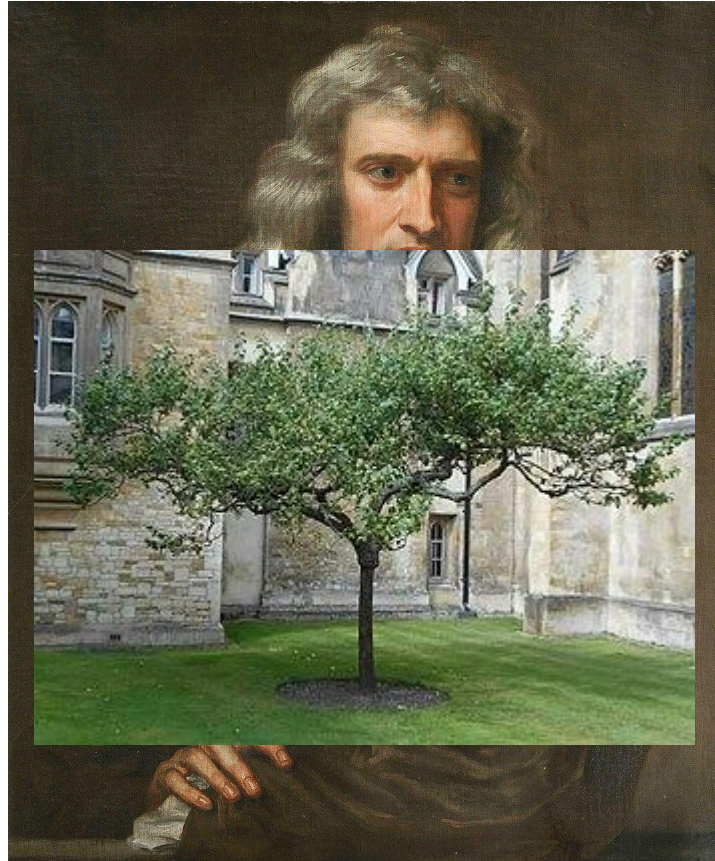


Isaac Newton

1642 – 1726

*Mathematical Principles of Natural Philosophy, 1687*

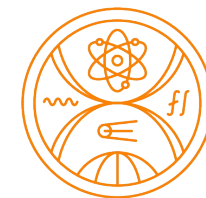
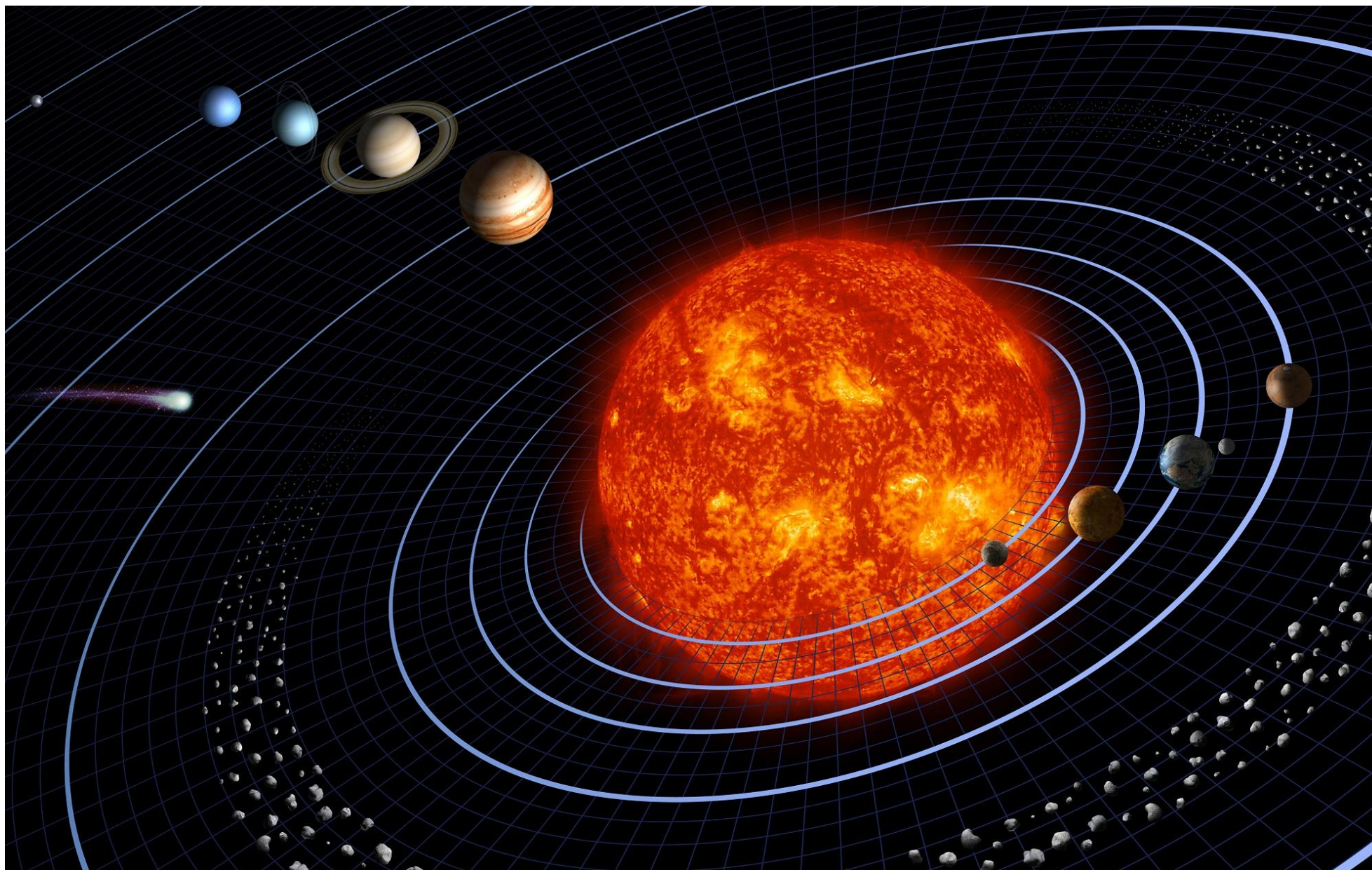




Isaac Newton  
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*Mathematical Principles of Natural Philosophy, 1687*









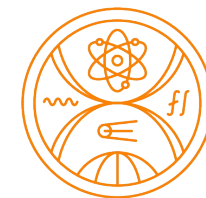
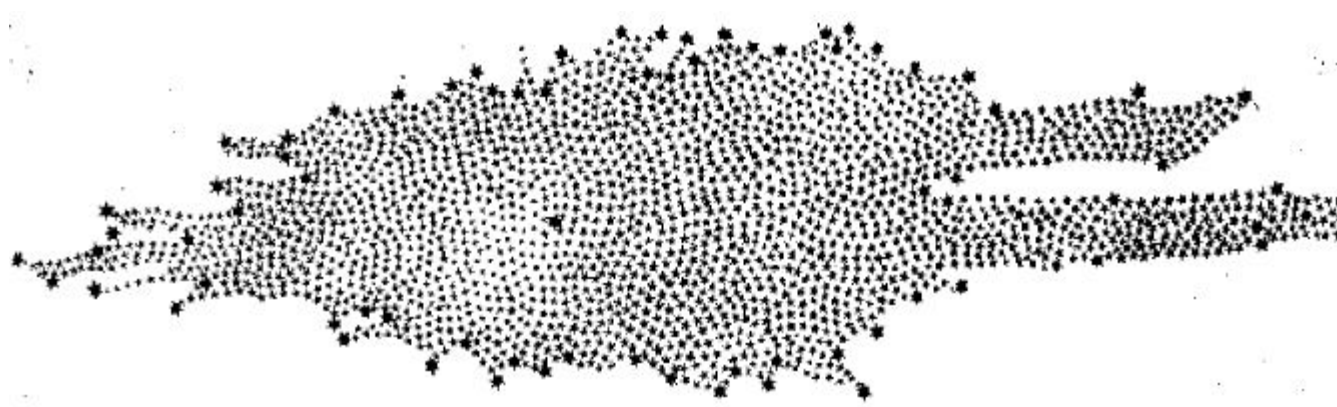
# Mliečna cesta



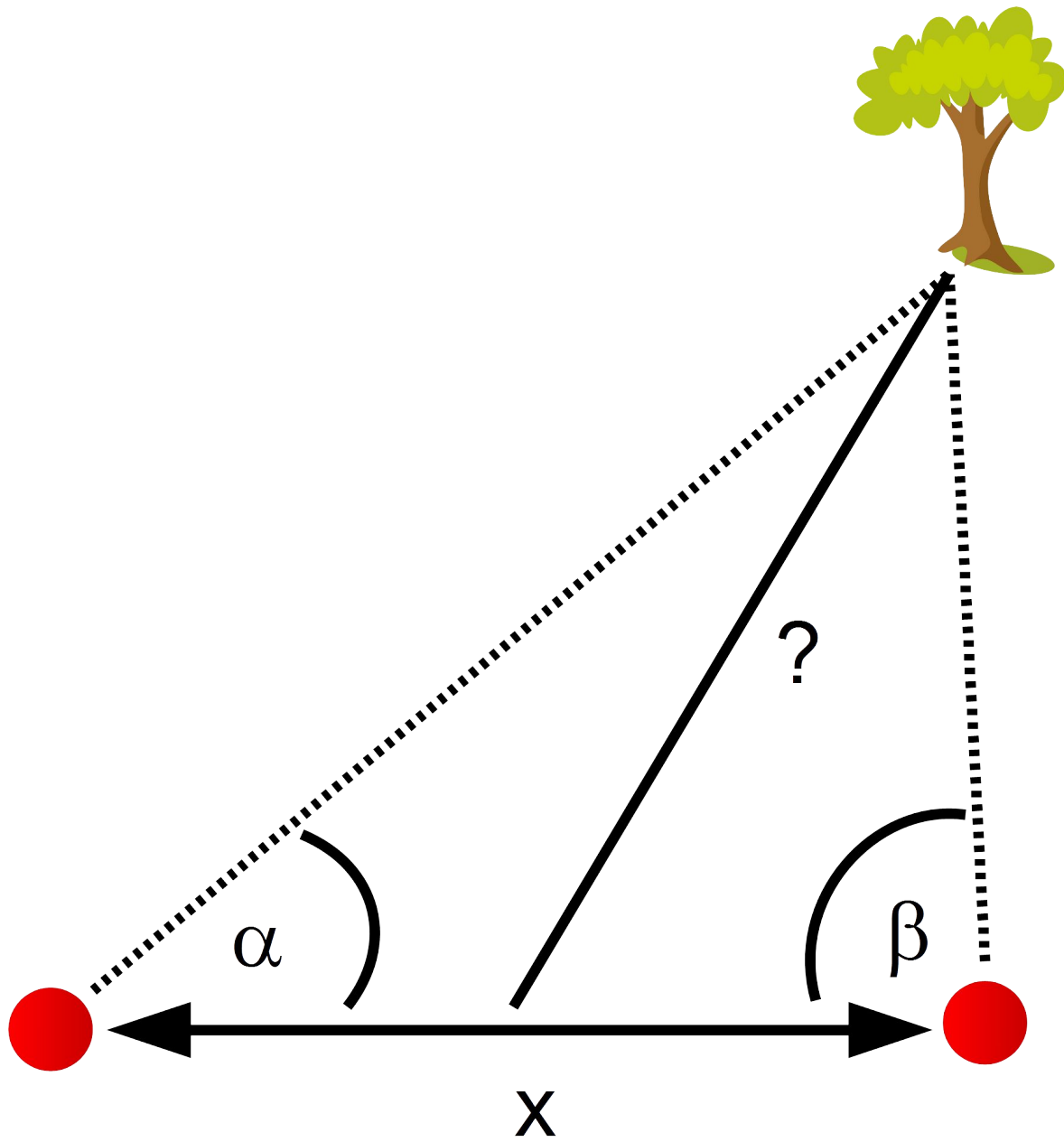


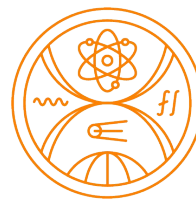
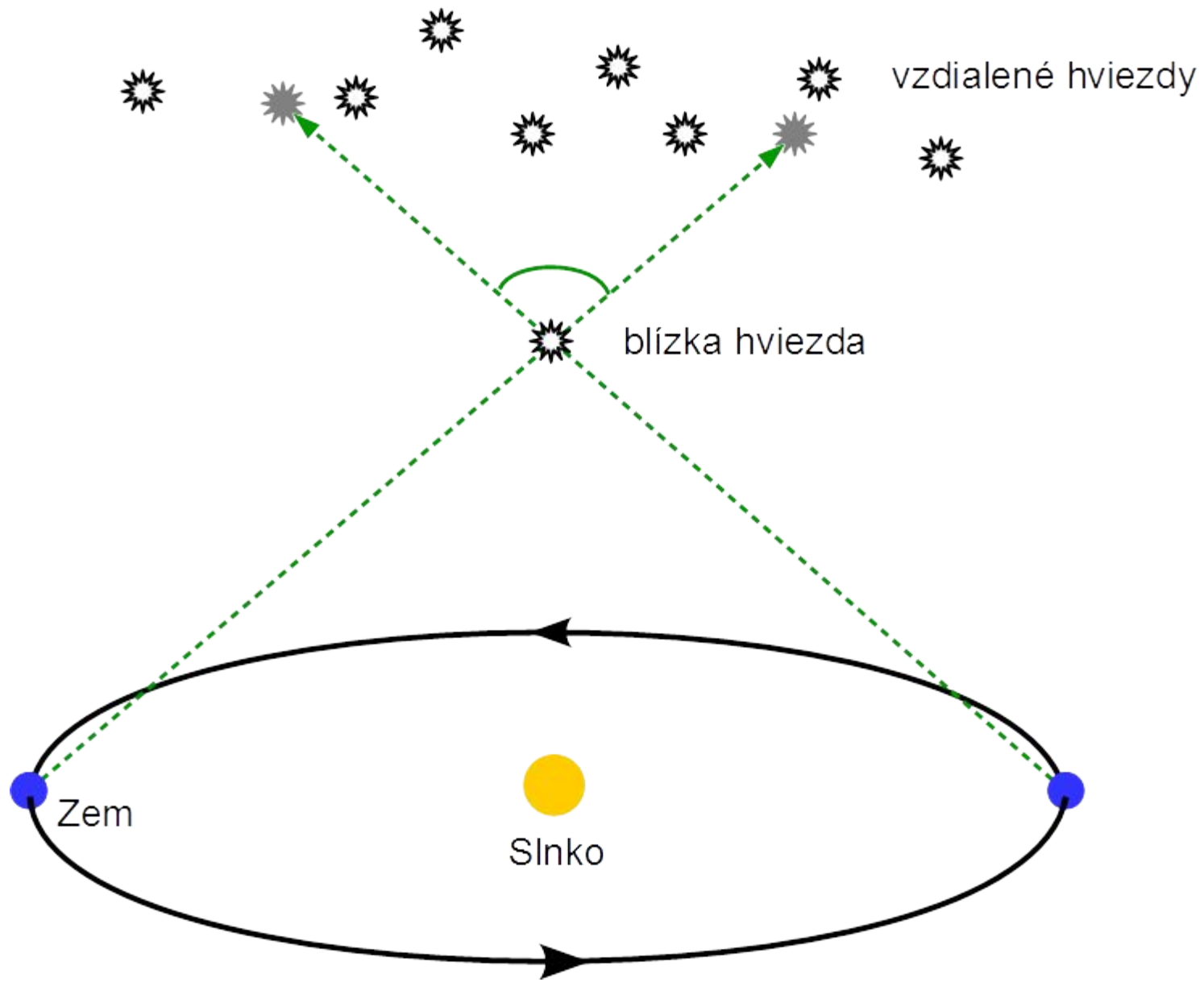
obr.: Lucien Chavan, wiki commons

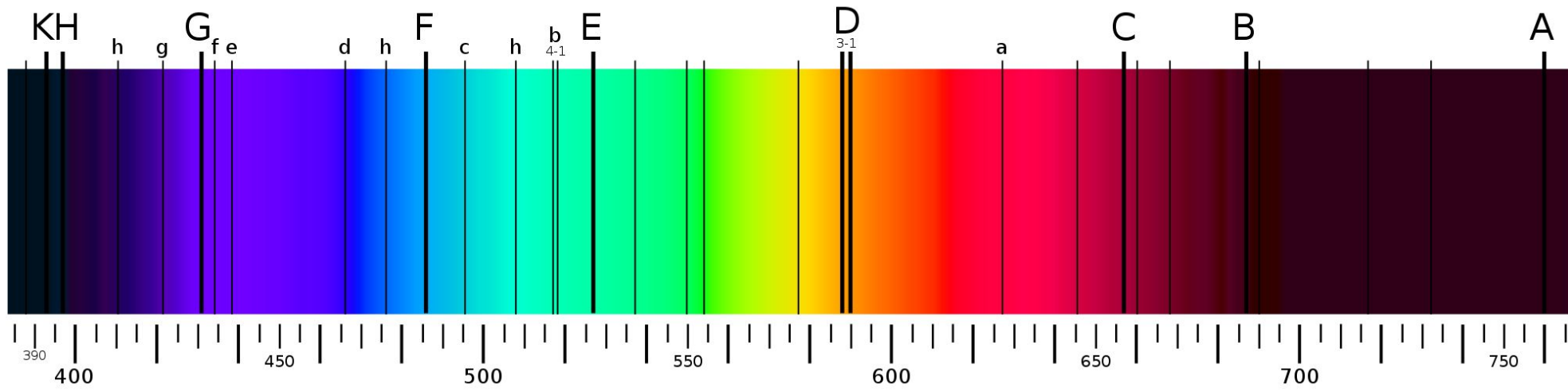








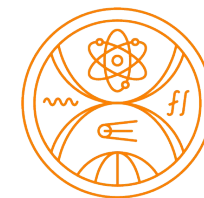






<b>H</b>																	<b>He</b>
<b>Li</b>	<b>Be</b>											<b>B</b>	<b>C</b>	<b>N</b>	<b>O</b>	<b>F</b>	<b>Ne</b>
<b>Na</b>	<b>Mg</b>											<b>Al</b>	<b>Si</b>	<b>P</b>	<b>S</b>	<b>Cl</b>	<b>Ar</b>
<b>K</b>	<b>Ca</b>	<b>Sc</b>	<b>Ti</b>	<b>V</b>	<b>Cr</b>	<b>Mn</b>	<b>Fe</b>	<b>Co</b>	<b>Ni</b>	<b>Cu</b>	<b>Zn</b>	<b>Ga</b>	<b>Ge</b>	<b>As</b>	<b>Se</b>	<b>Br</b>	<b>Kr</b>
<b>Rb</b>	<b>Sr</b>	<b>Y</b>	<b>Zr</b>	<b>Nb</b>	<b>Mo</b>	<b>Tc</b>	<b>Ru</b>	<b>Rh</b>	<b>Pd</b>	<b>Ag</b>	<b>Cd</b>	<b>In</b>	<b>Sn</b>	<b>Sb</b>	<b>Te</b>	<b>I</b>	<b>Xe</b>
<b>Cs</b>	<b>Ba</b>		<b>Hf</b>	<b>Ta</b>	<b>W</b>	<b>Re</b>	<b>Os</b>	<b>Ir</b>	<b>Pt</b>	<b>Au</b>	<b>Hg</b>	<b>Tl</b>	<b>Pb</b>	<b>Bi</b>	<b>Po</b>	<b>At</b>	<b>Rn</b>
<b>Fr</b>	<b>Ra</b>																

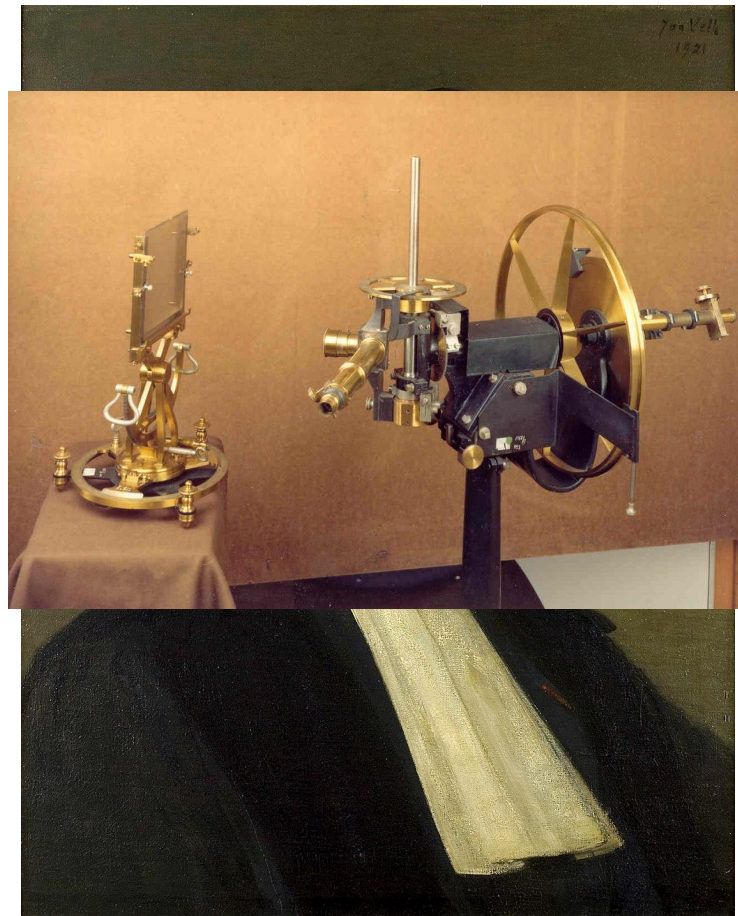
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<b>Ac</b>	<b>Th</b>	<b>Pa</b>	<b>U</b>	<b>Np</b>	<b>Pu</b>	<b>Am</b>	<b>Cm</b>	<b>Bk</b>	<b>Cf</b>	<b>Es</b>	<b>Fm</b>	<b>Md</b>	<b>No</b>	<b>Lr</b>





Jacobus Kapteyn  
1851 – 1922





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1851 – 1922





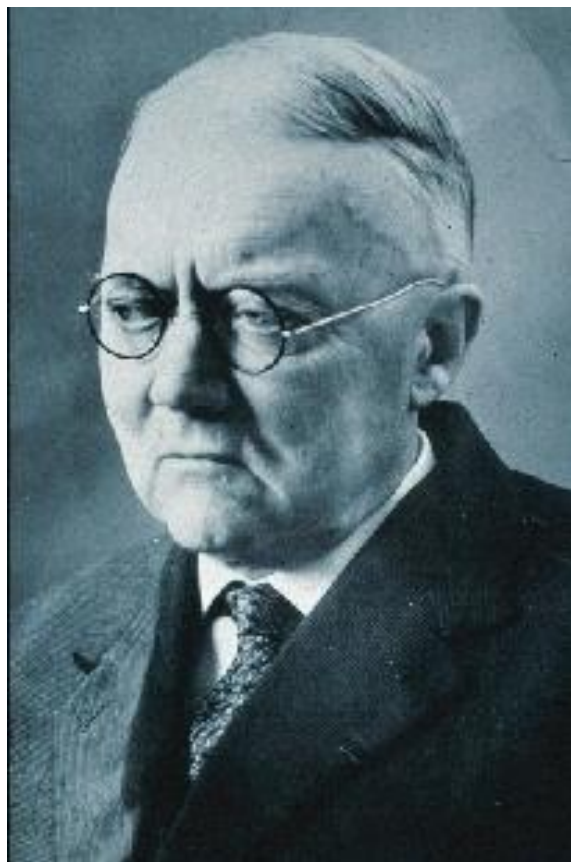


# Iné galaxie





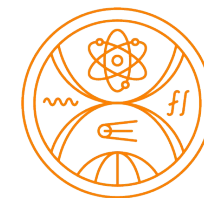


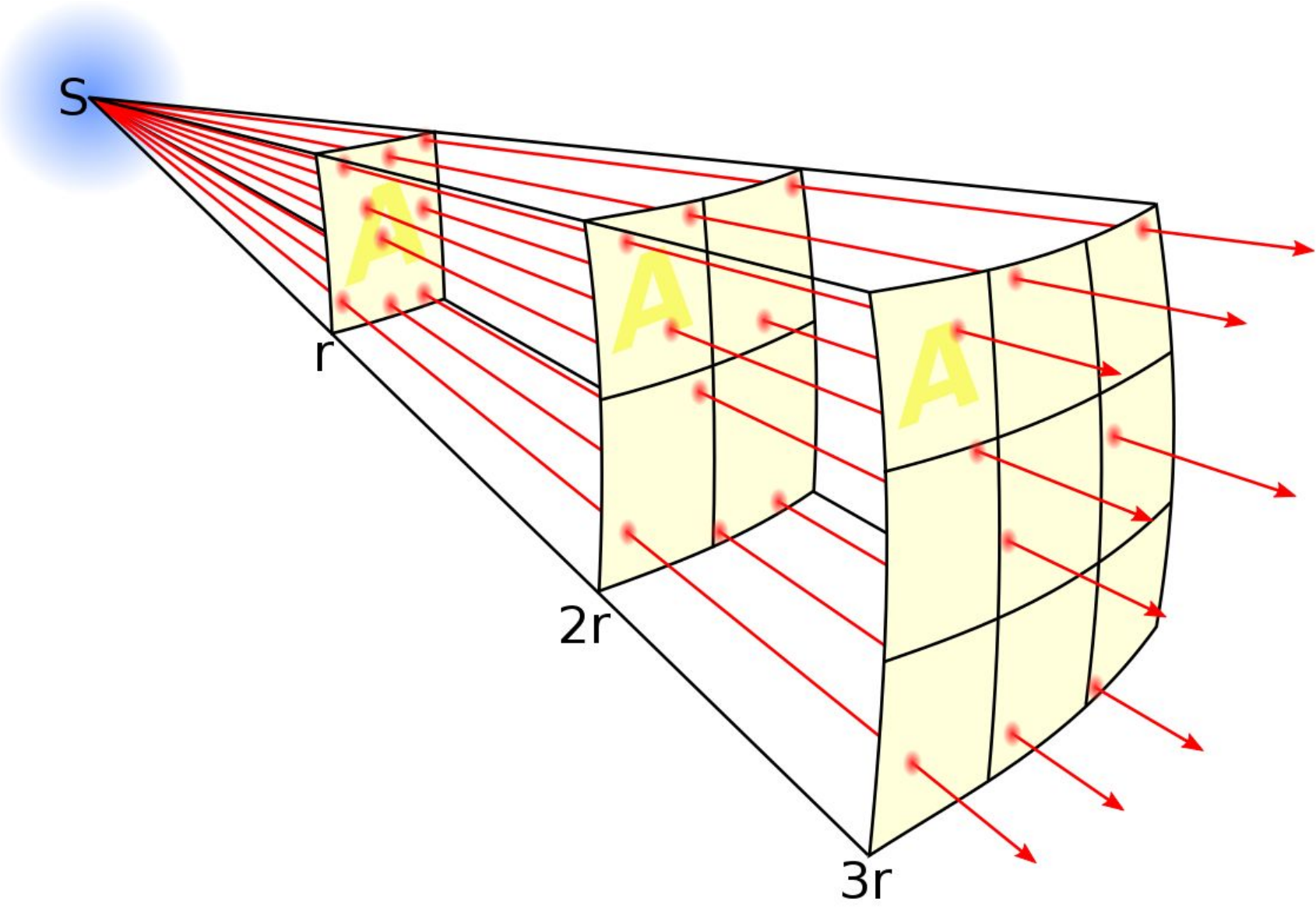


Ernst Öpik  
1893 – 1985



Heber Doust Curtis  
1872 – 1942











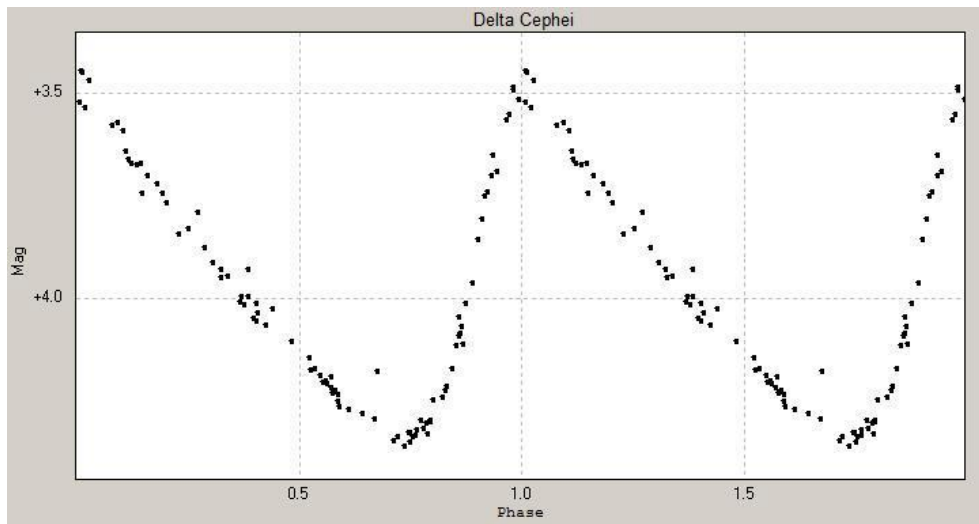


Edwin Hubble  
1889 – 1953



Henrietta Swan Leavitt  
1868 – 1921





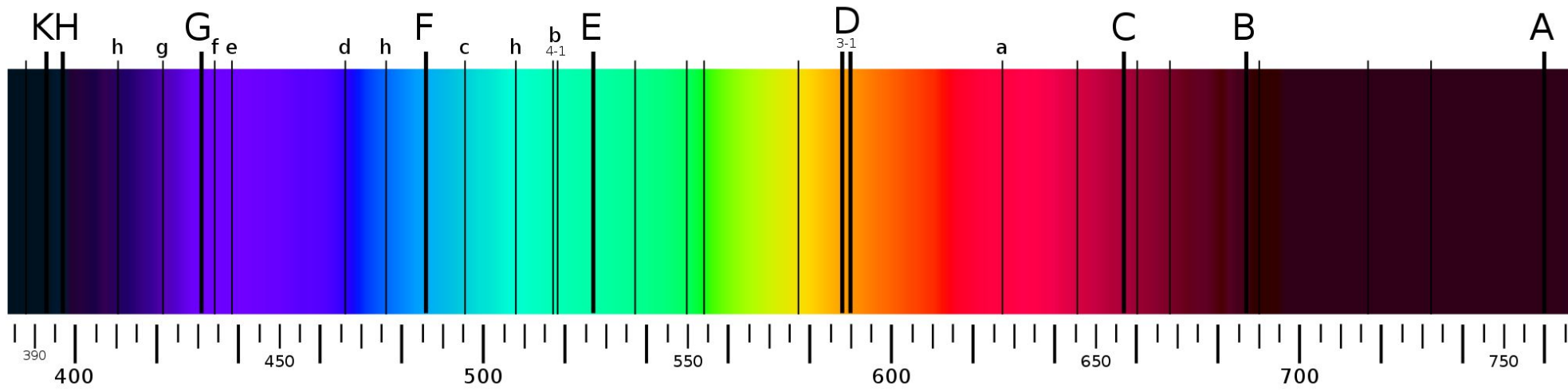


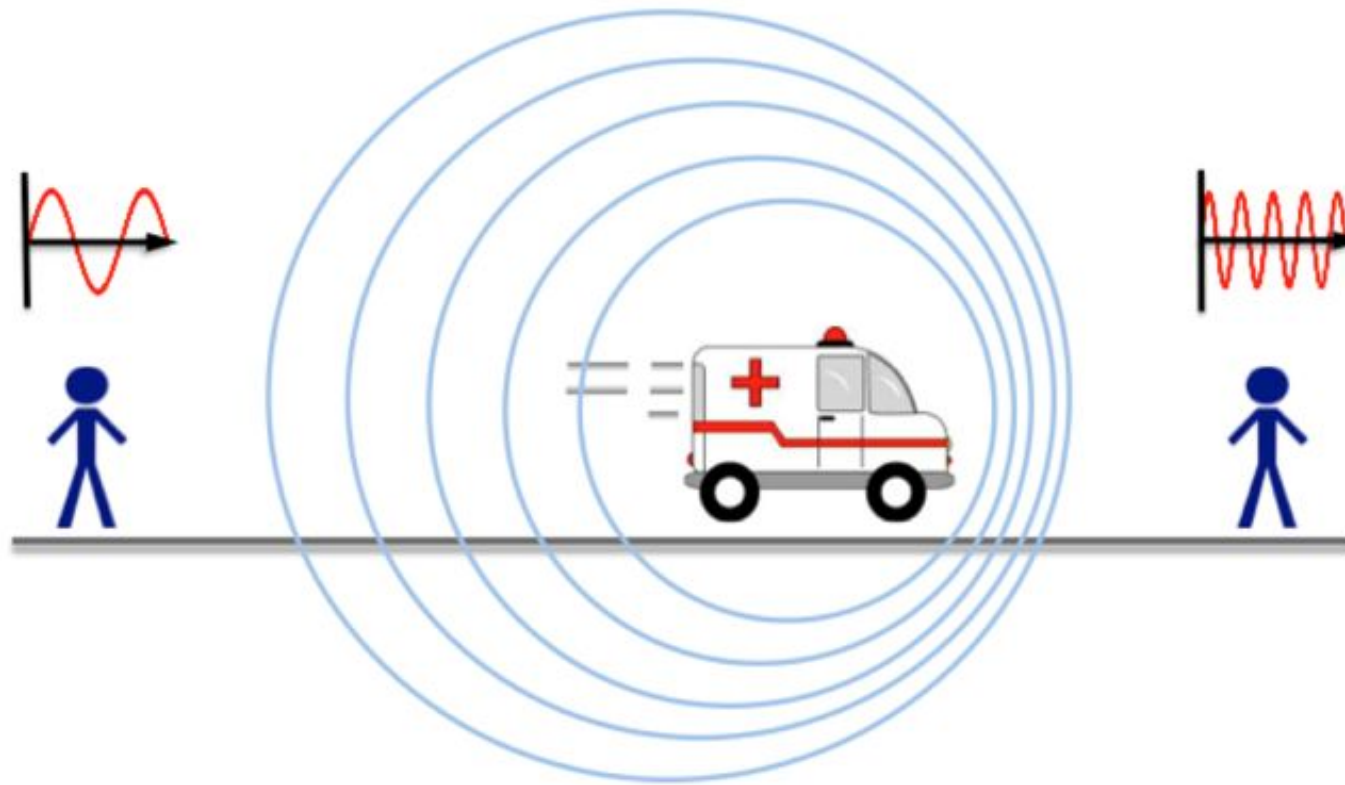




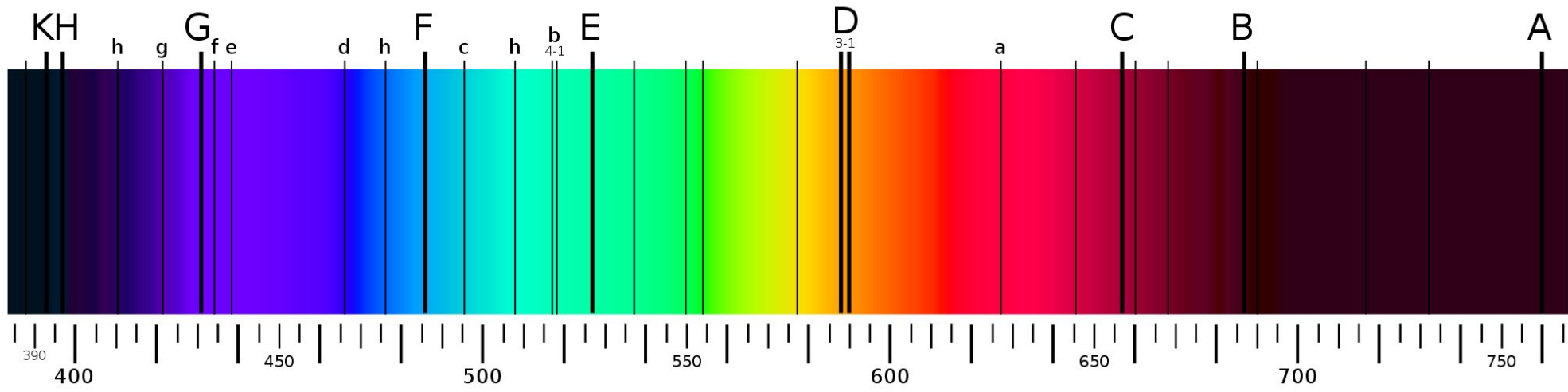
# Rozmpínanie vesmíru

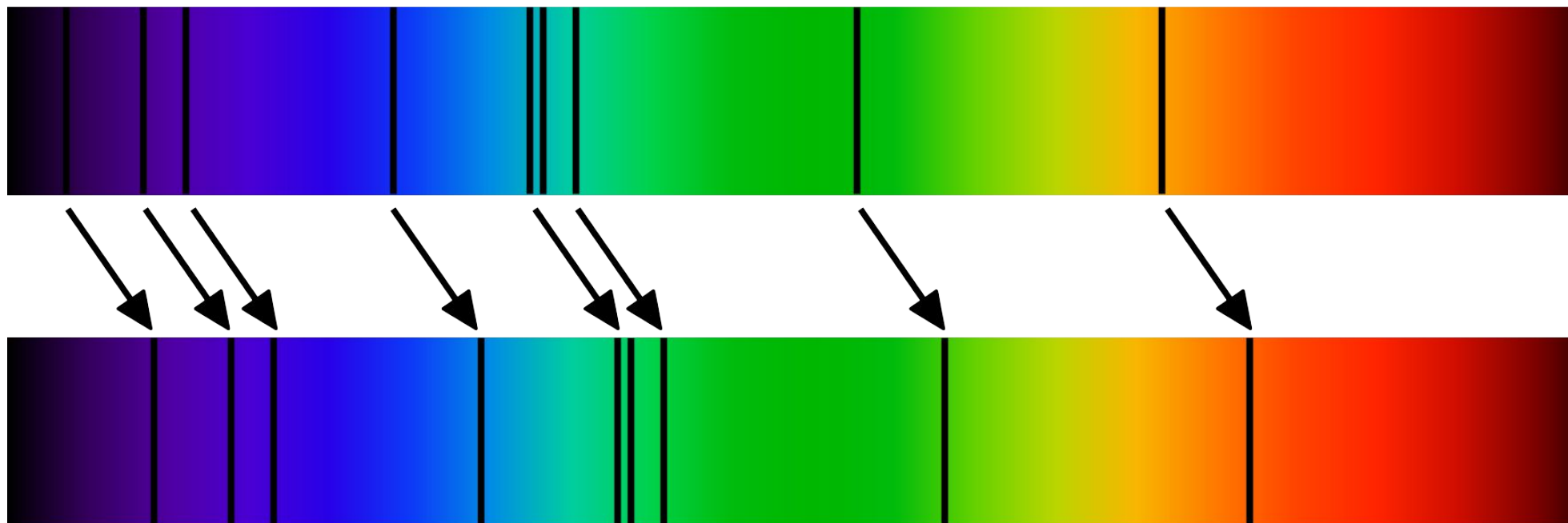
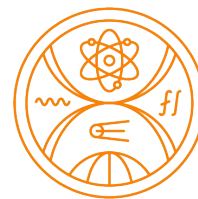














Vesto M. Slipher  
1875 – 1969

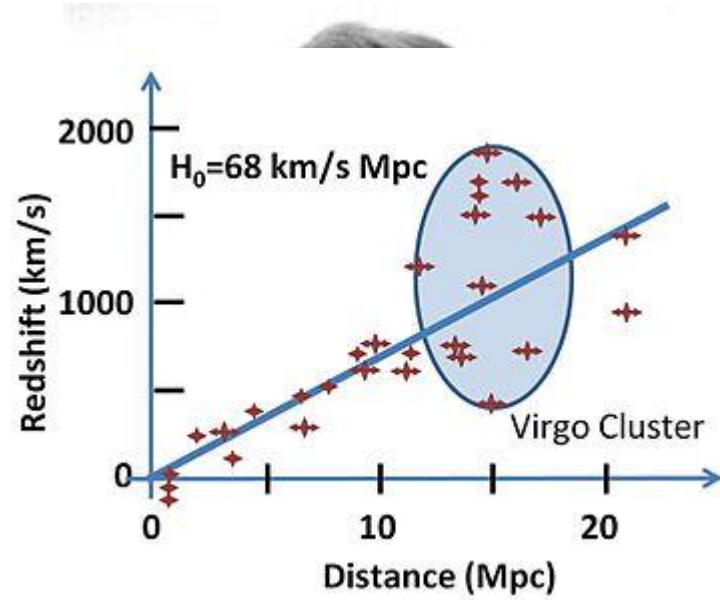






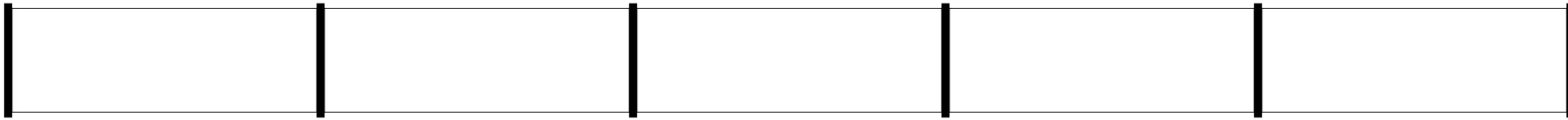
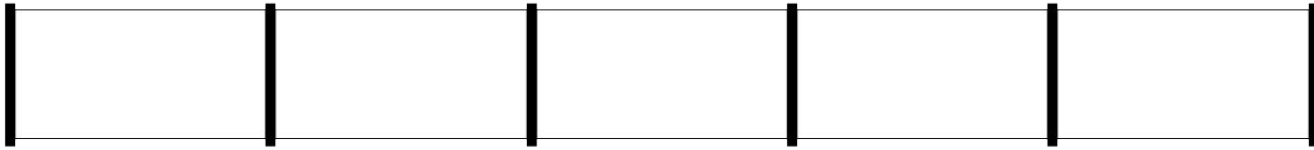
Edwin Hubble  
1889 – 1953





Edwin Hubble  
1889 – 1953









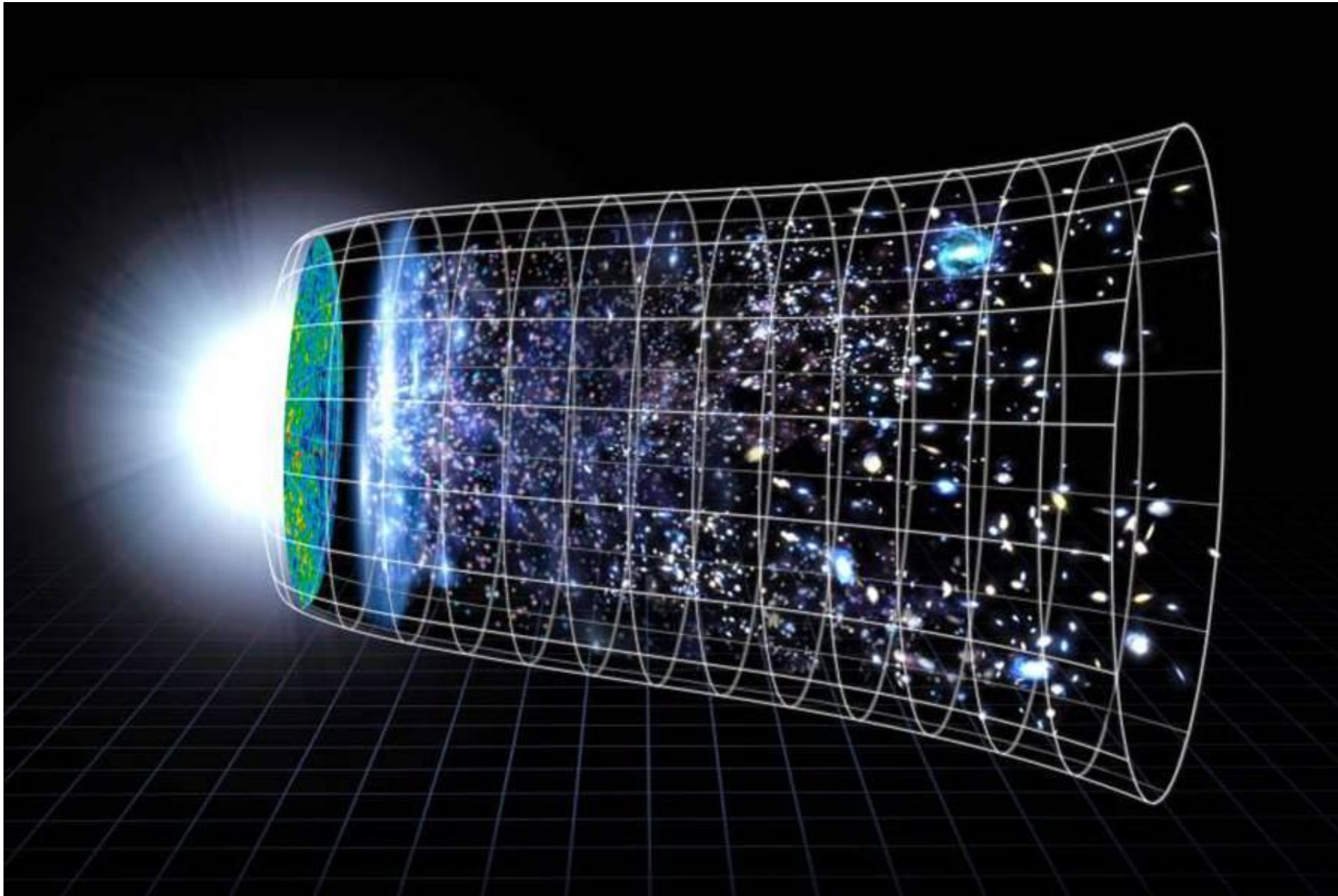
Albert Einstein  
1879 – 1955





Albert Einstein  
1879 – 1955









# Zrýchľovanie rozpínania









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Ďakujem za  
pozornosť!





