

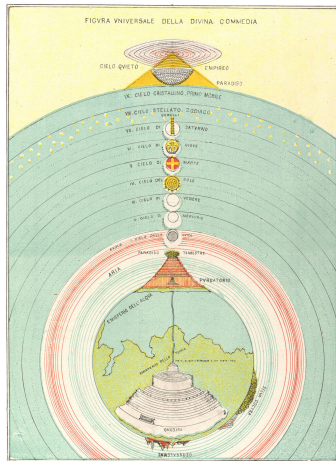
# O hvězdách a o vesmíru

Jiří Horák

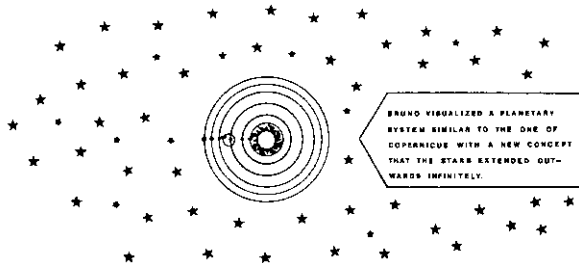
19. 5. 2023



# Dante Alighieri: Božská komedie (1321)

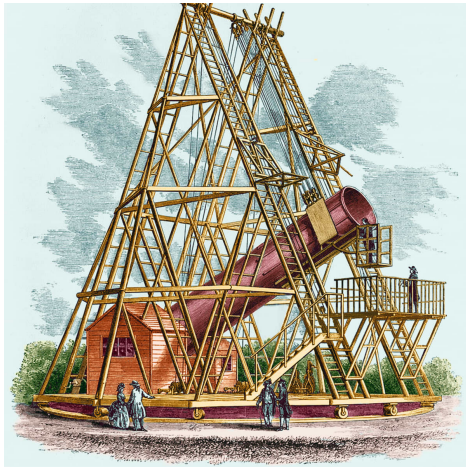


# Giordano Bruno: (1548 – 1592)

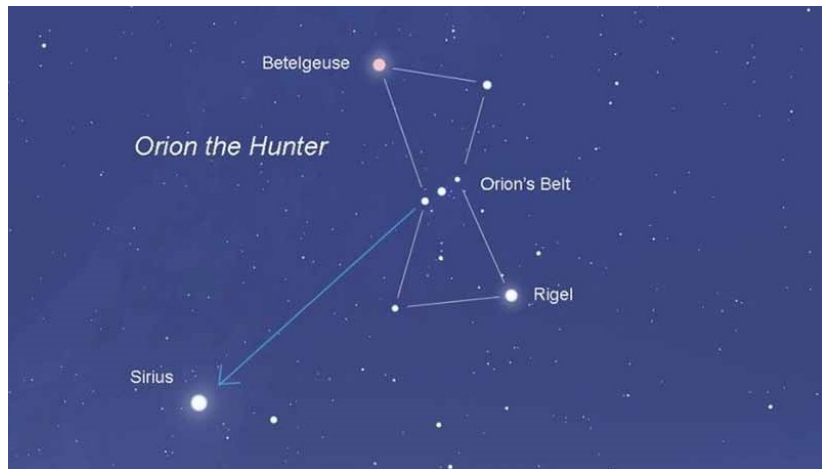




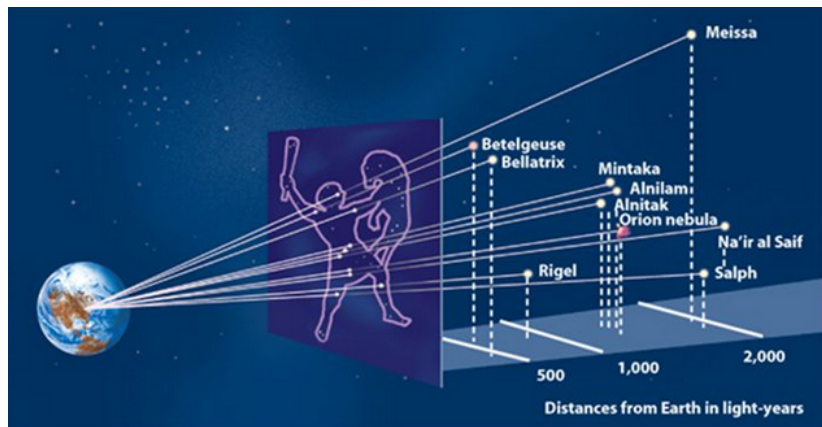
# William Herschel (1738-1822)



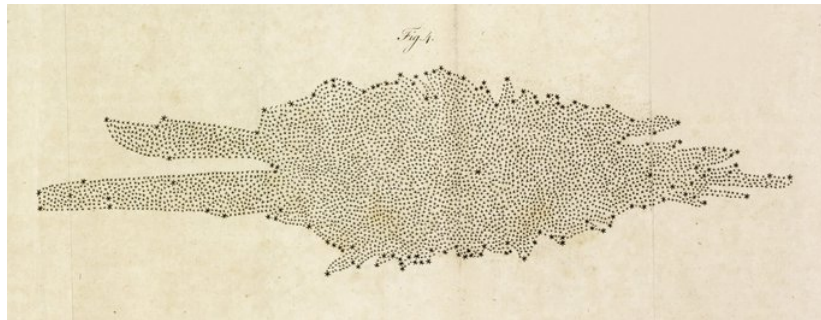
# Sirius v souhvězdí Velkého psa

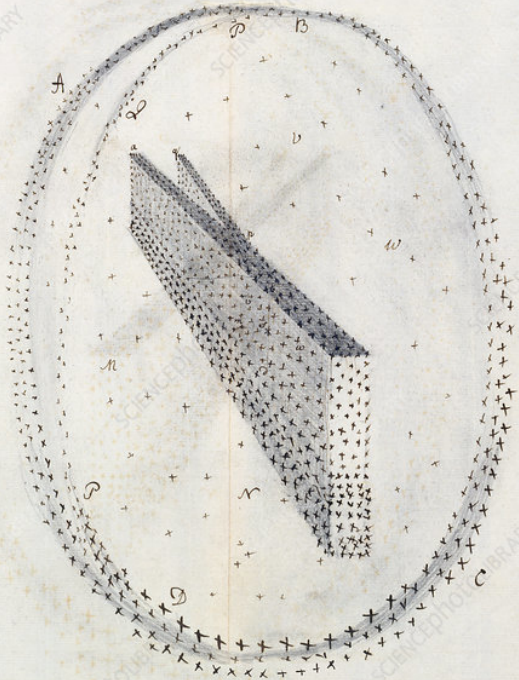


# Hvězdy souhvězdí Orion

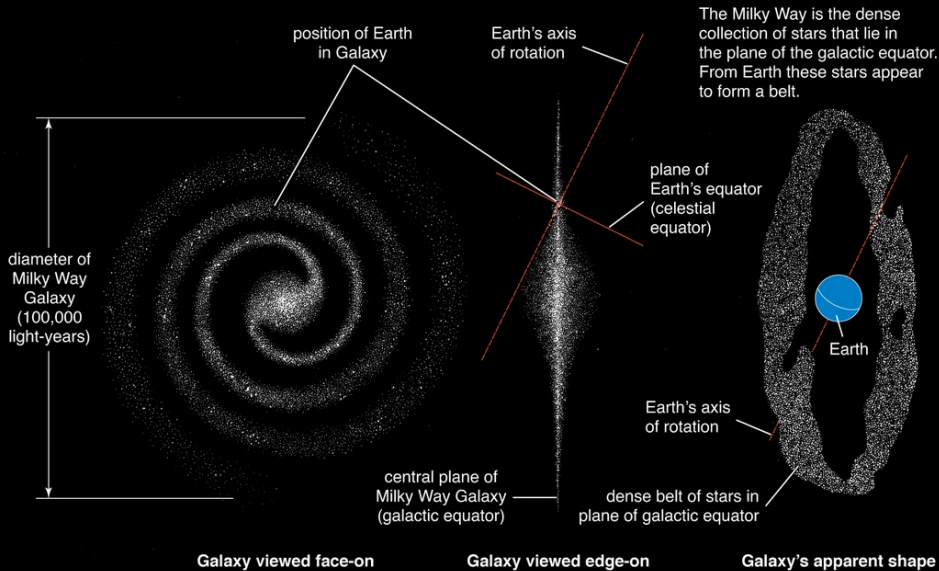


# Rozložení hvězd podle Hershela





# The Milky Way Galaxy

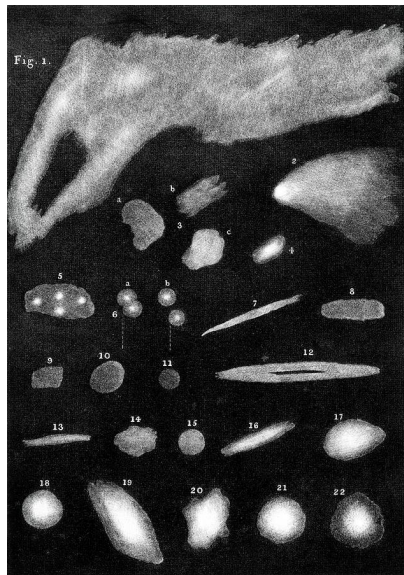
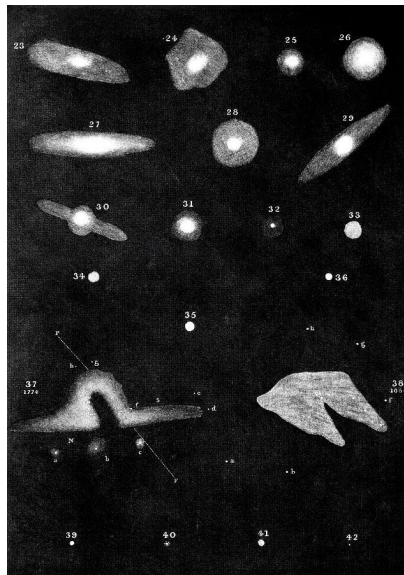


# Mlečná dráha je disk Galaxie

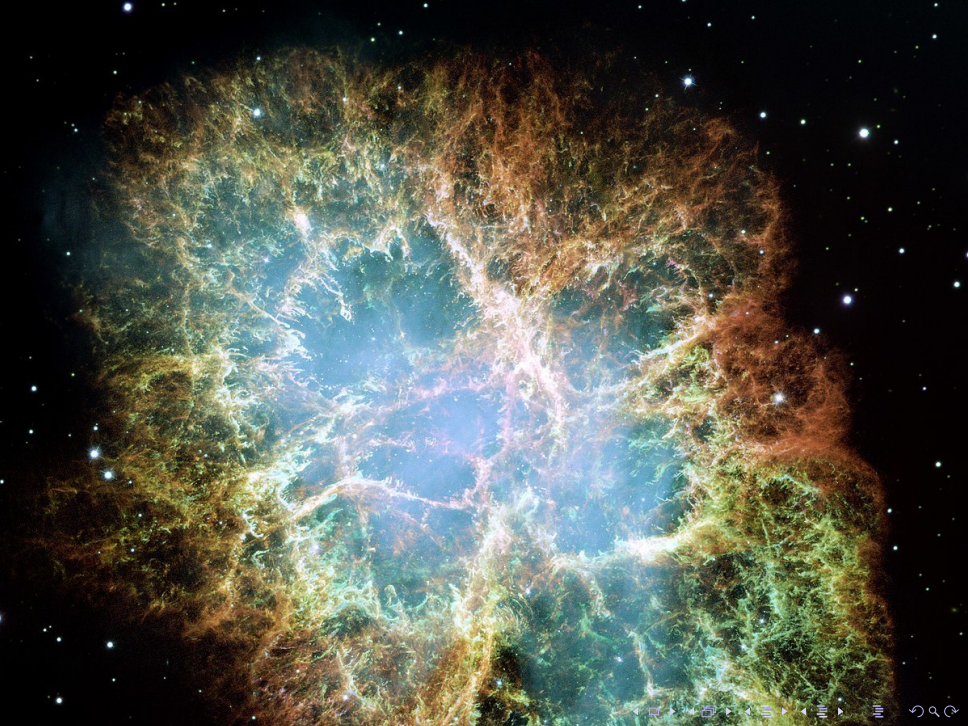




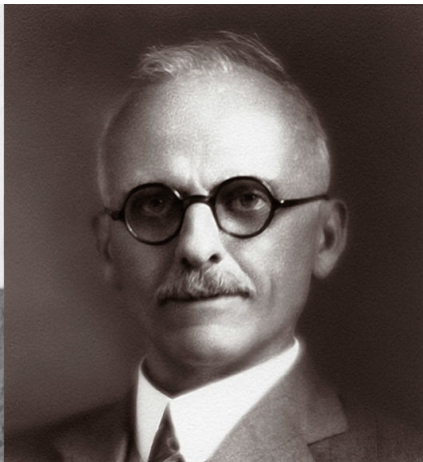
# William Herschel: Katalog mlhovin



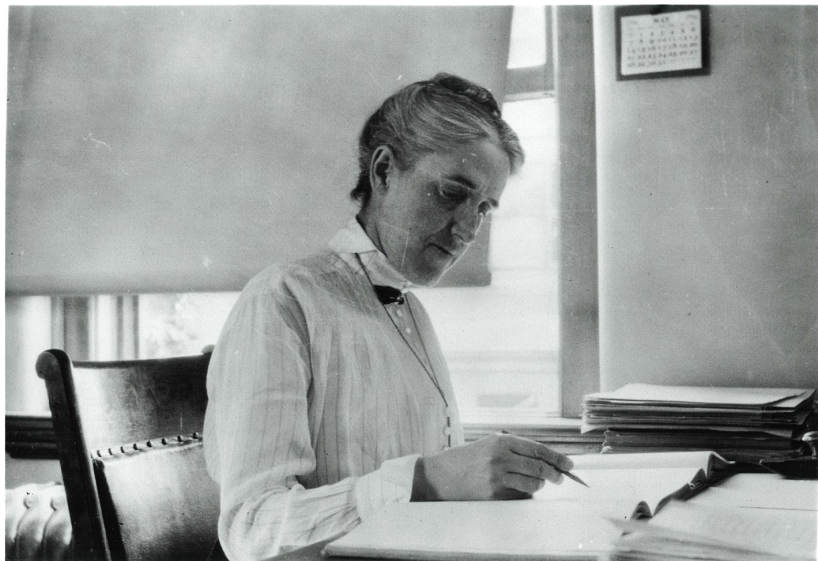




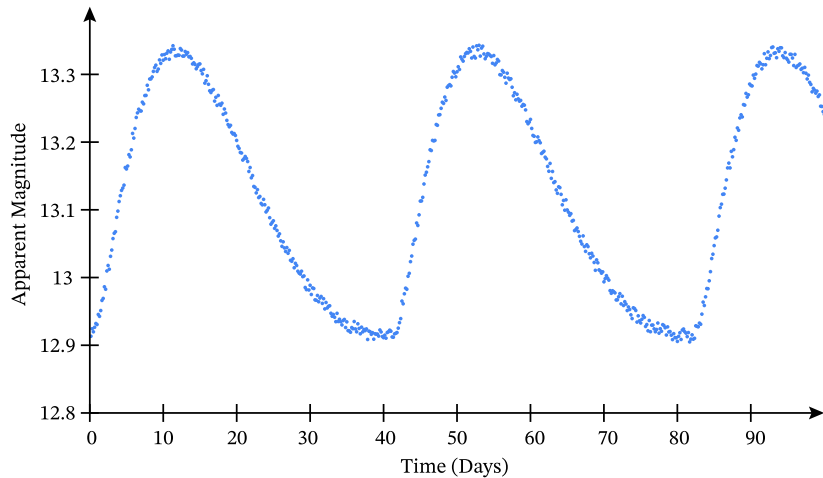
## Velká debata (1920, Washington)



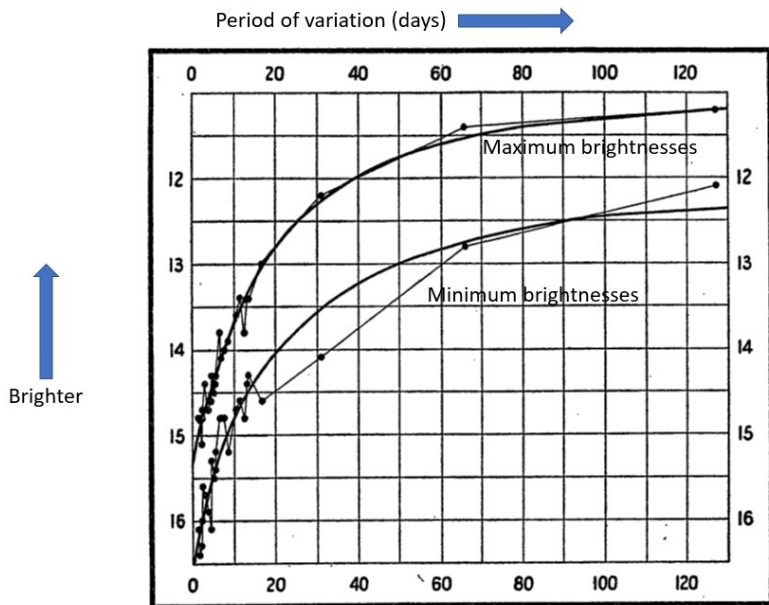
# Henrietta Leavittová (1912)



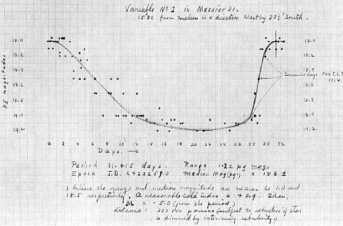
# Cefeidy – proměnné hvězdy



# souvislost mezi periodou a svítivostí cefeid



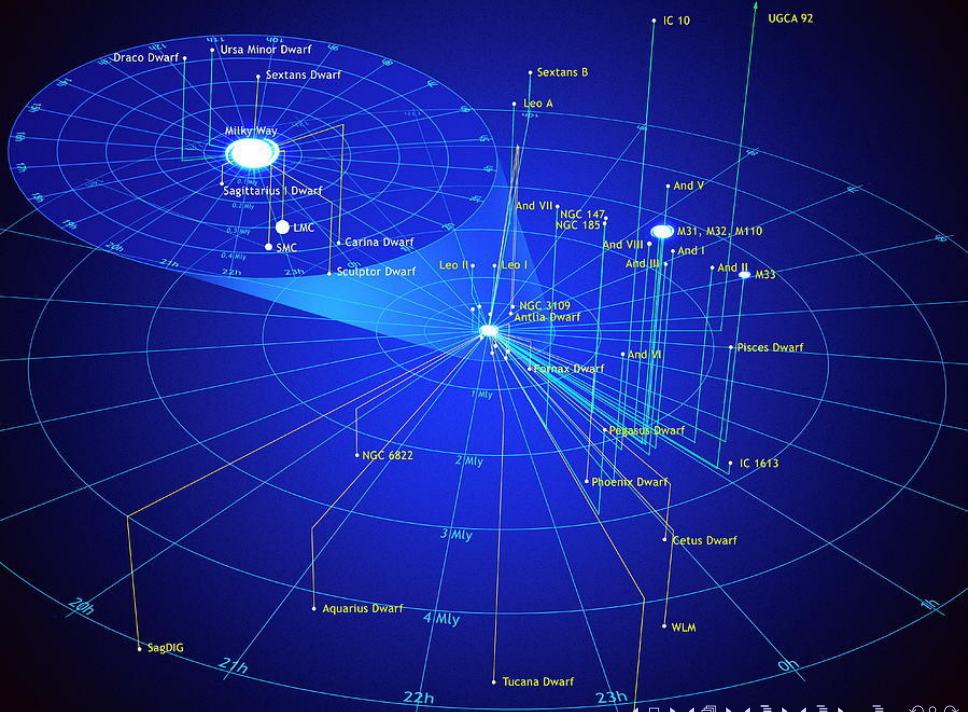
# Edwin Hubble – pozorování mlhoviny M31 v Andromedě



M31 je vzdálená 900 000 světelných let

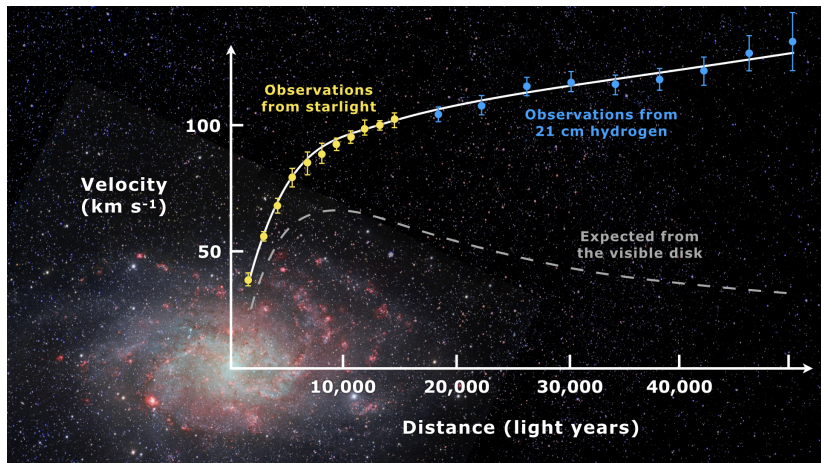




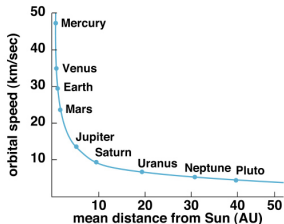
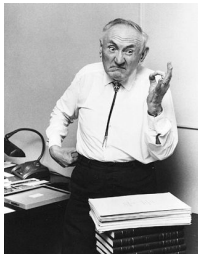




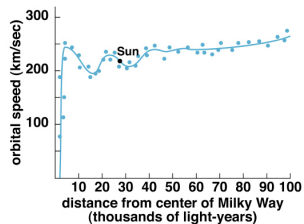
# Rotační křivky galaxií



# Fritz Zwicky a temná hmota



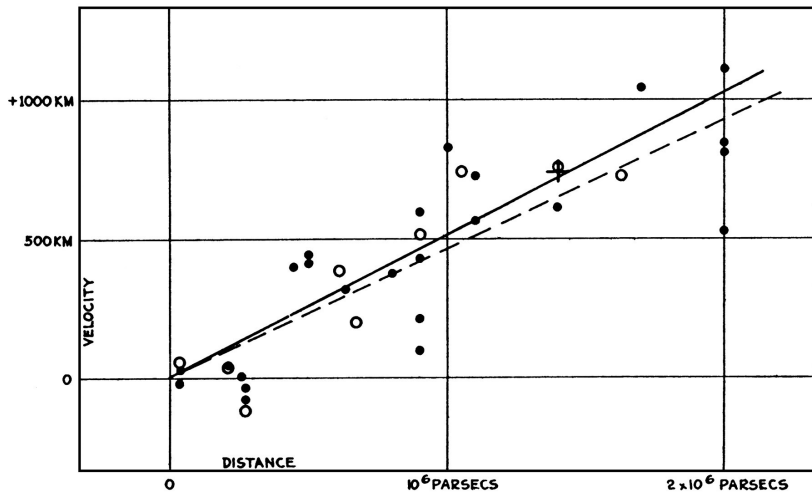
(b)  
Copyright © Addison Wesley



(c)  
Copyright © Addison Wesley

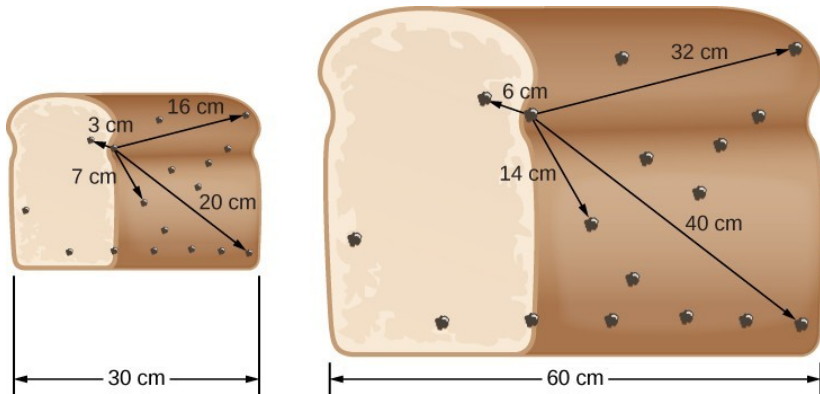
Ve vesmíru je 5× více temné než zářivé hmoty

# Hubbleovo pozorování cefeid v dalších galaxiích



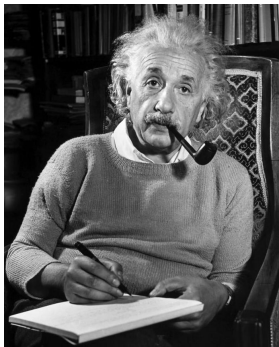
**Vesmír se rozpíná**

# Rozpínání vesmíru analogie



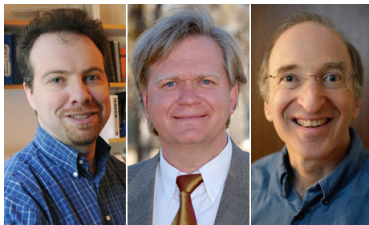
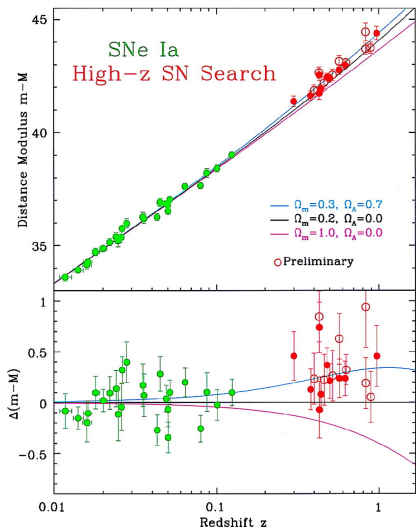
**Začátek vesmíru byl asi před 13 miliardami let**

# Einseinova "největší chyba"



Zavedení kosmologické konstanty

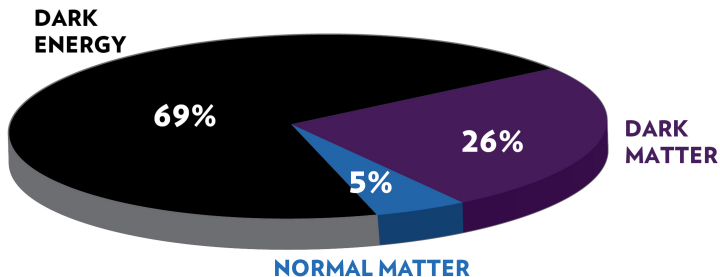
# Hubbleův diagram po 70 letech



**Rozpínání vesmíru se zrychluje**

# Co (ne)víme o vesmíru

## ENERGY DISTRIBUTION OF THE UNIVERSE



**Něco víme jen o 5% celkového obsahu vesmíru**