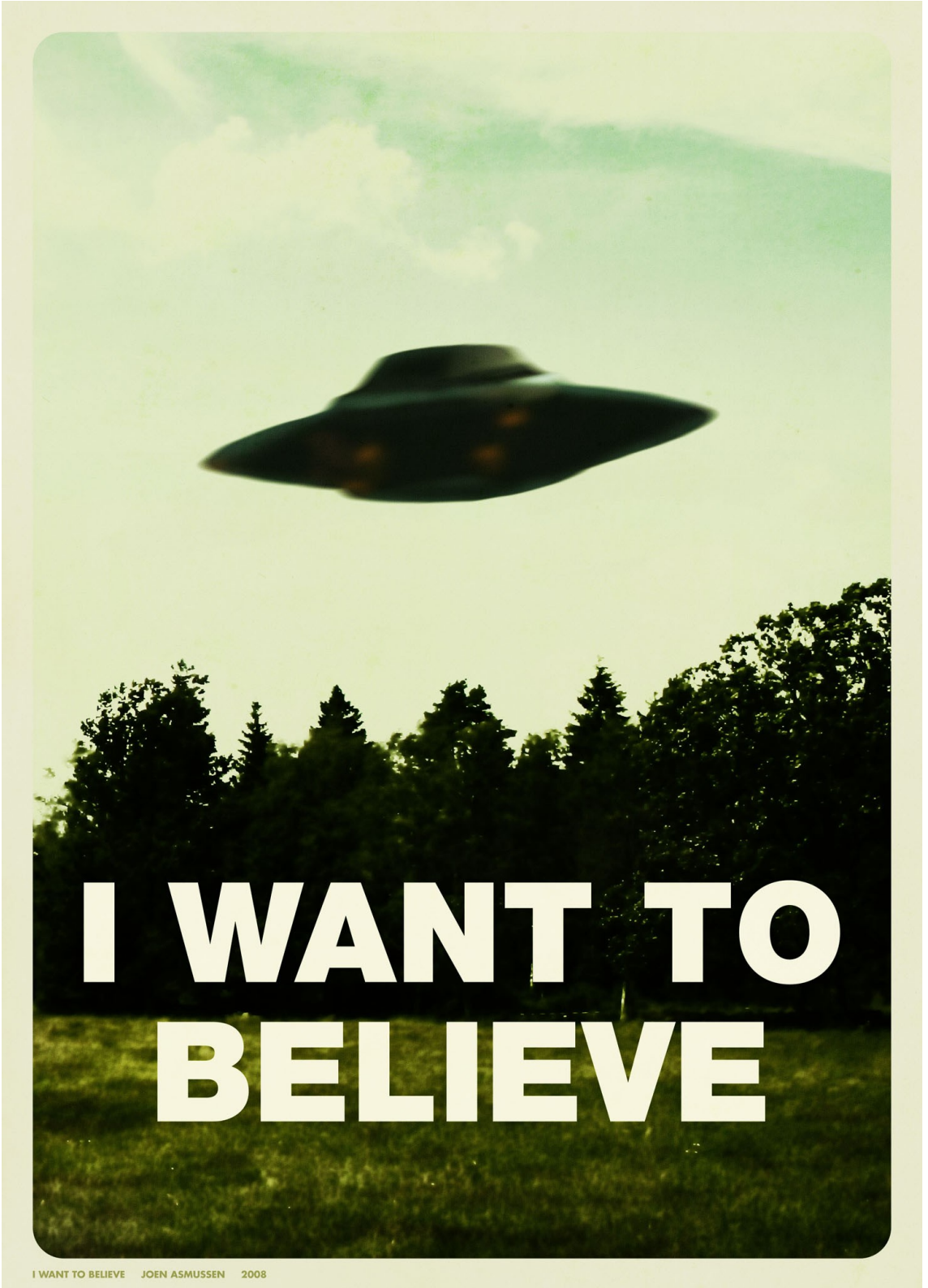
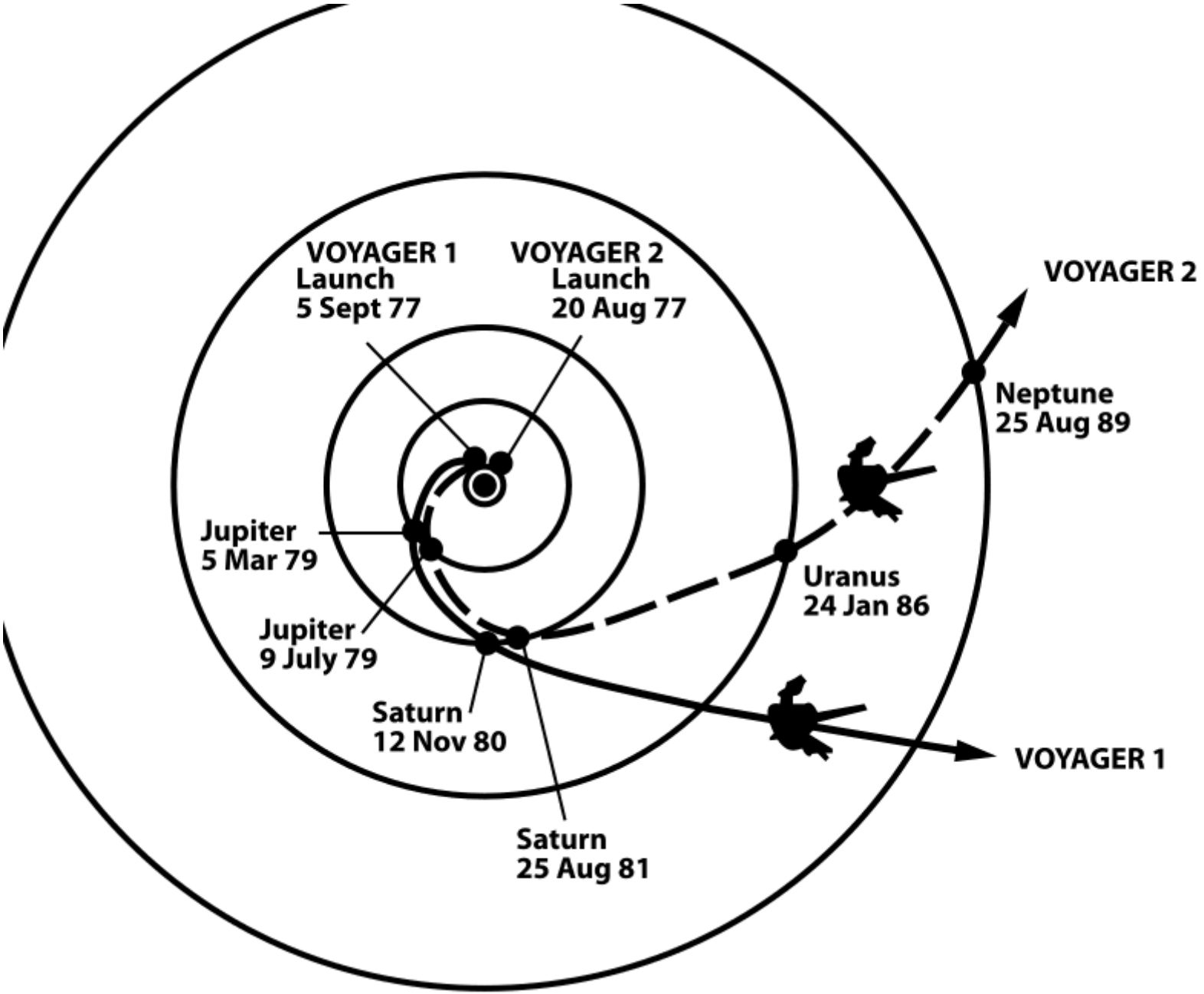
Viajes espaciales

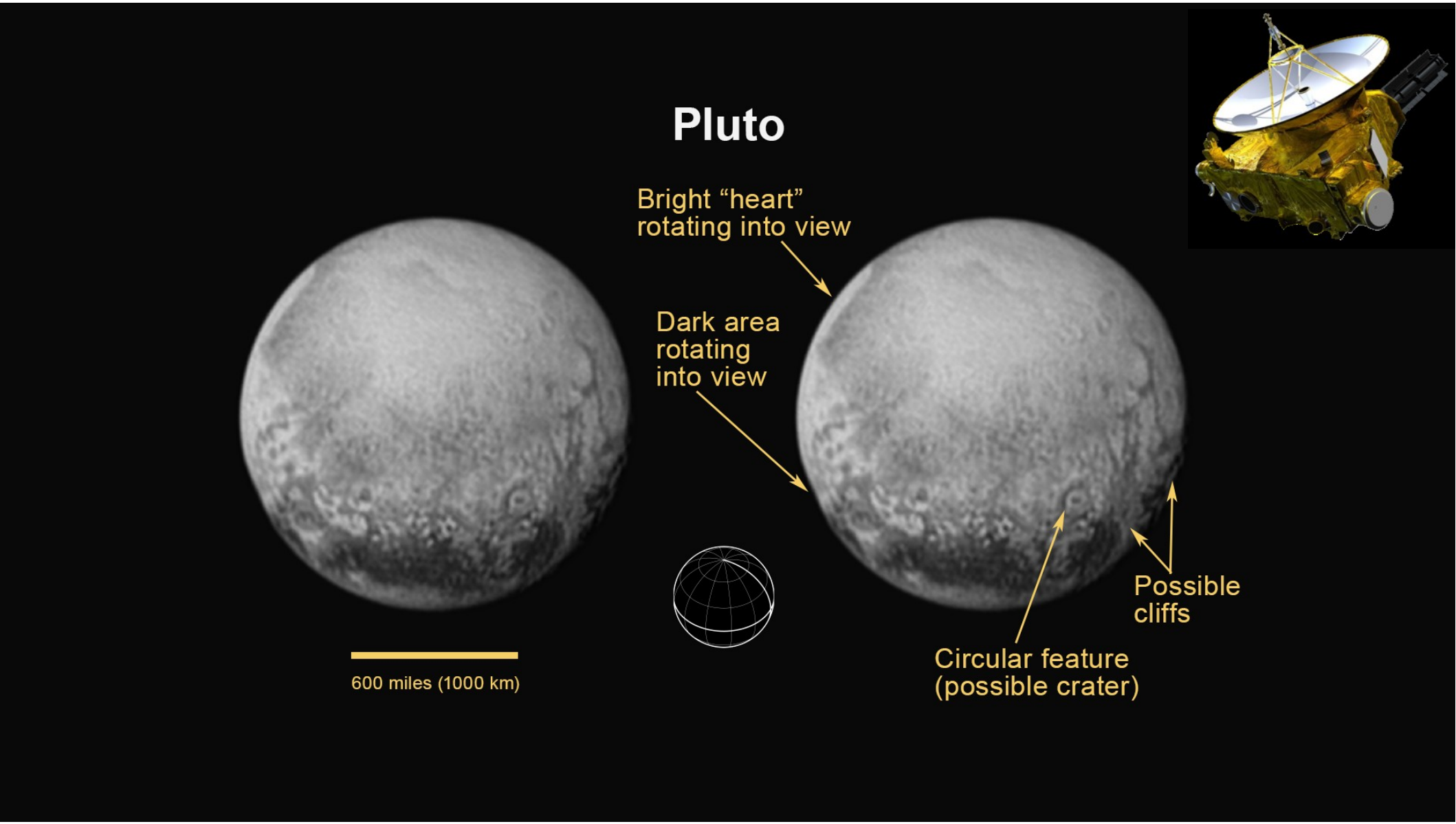
Jaime E. Forero Romero
Universidad de los Andes
Curso Astronomía Popular
Septiembre 2015



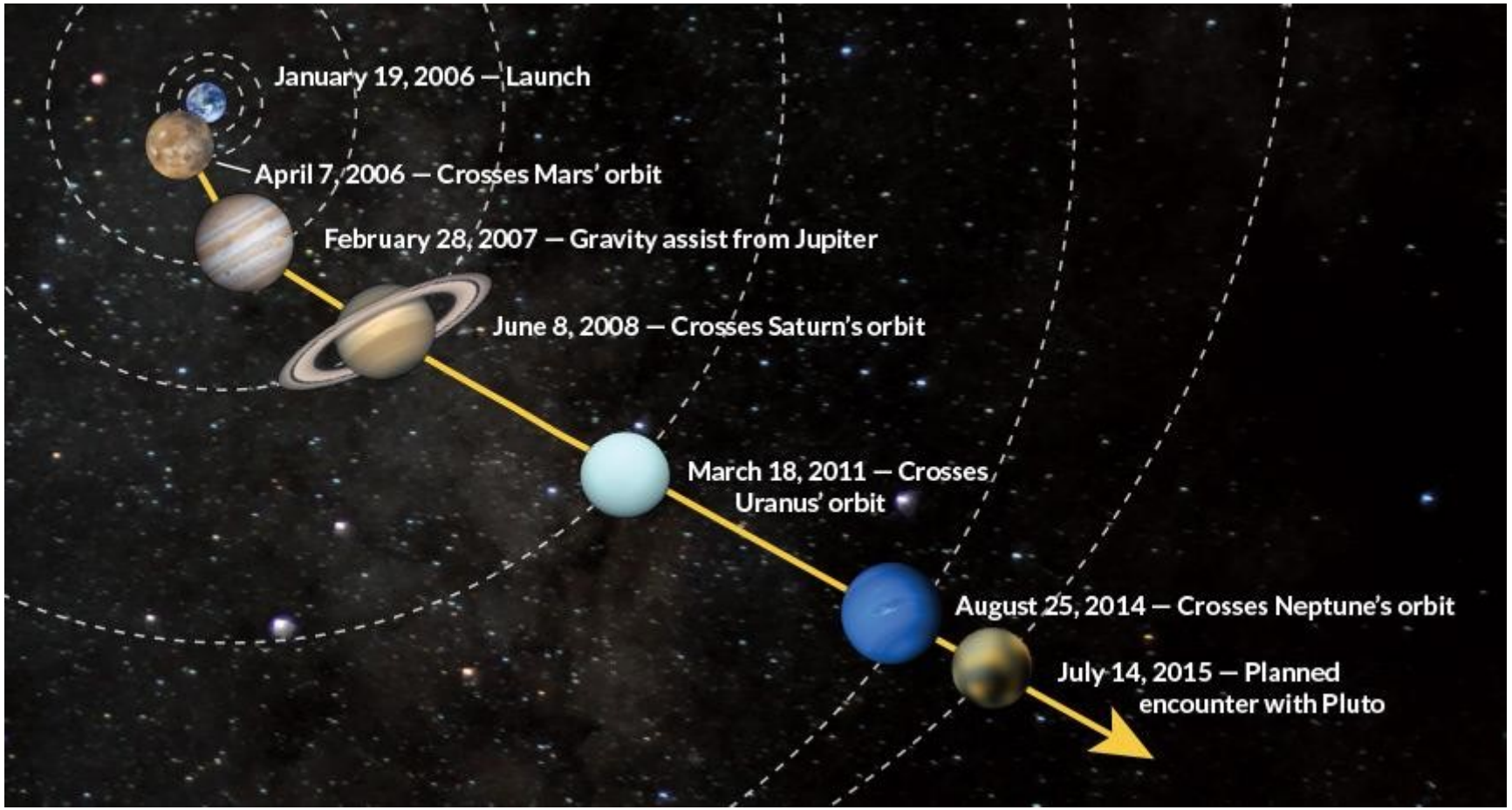
http://imgur.com/gallery/2jsfax6



Wikicommons: The trajectories that enabled NASA's twin Voyager spacecraft to tour the four gas giant planets and achieve velocity to escape the Solar System. Source: http://solarsystem.nasa.gov/multimedia/display.cfm?IM_ID=2143

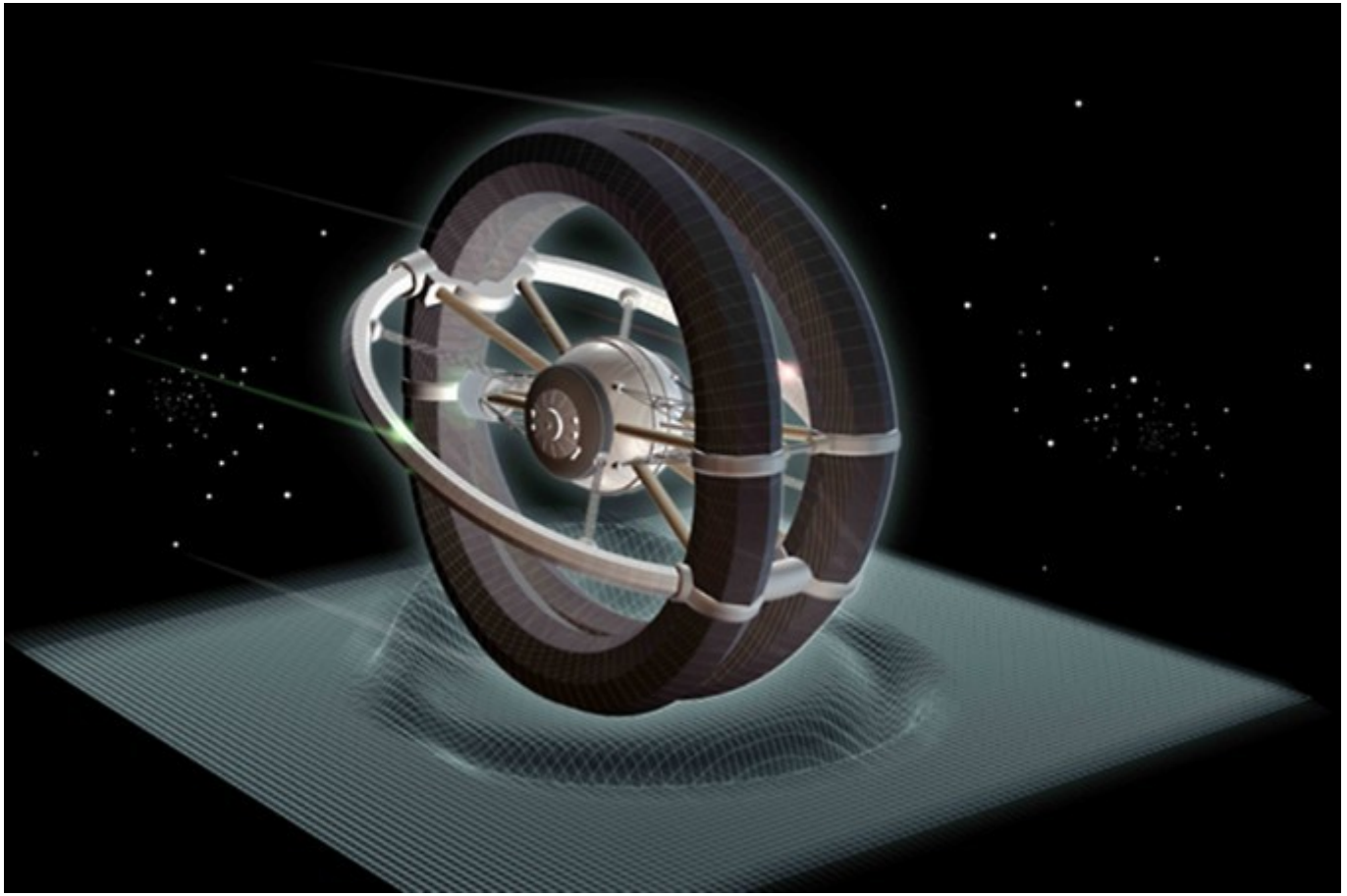


https://www.nasa.gov/mission_pages/newhorizons/main/index.html



https://www.sciencenews.org/article/rendezvous-pluto?mode=magazine&context=190368

Wikicommons: The trajectories that enabled NASA's twin Voyager spacecraft to tour the four gas giant planets and achieve velocity to escape the Solar System. Source: http://solarsystem.nasa.gov/multimedia/display.cfm?IM_ID=2143



http://www.icarusinterstellar.org

Professor Miguel Alcubierre joins Icarus as an Honorary Member of Project XP4

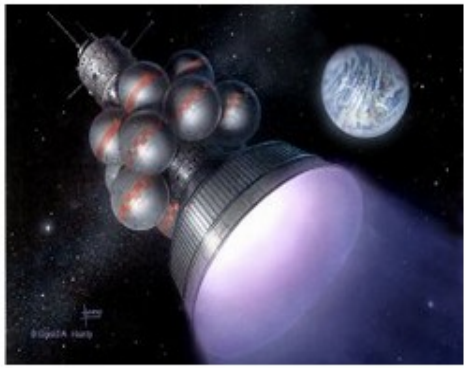
posted by admin on May 30, 2014

Icarus Interstellar is thrilled to announce that Professor Miguel Alcubierre has joined the XP4 team as an Honorary Member.

Prof. Miguel Alcubierre was born in Mexico City in 1964. He obtained his Physicist degree from the National University in Mexico (UNAM) in 1988, and a PhD in Physics from the University of Wales in 1994. He later worked for several years as an Adjunct Professor at the Max Planck Institute for Gravitational Physics in Potsdam, Germany. Since 2002 he joined the Nuclear Sciences Institute at UNAM where he is now a Full Professor, and since June 2012 Director. Considered the father of the warp drive, his 1995 paper was the first to rigorously study the warp drive metric, made famous in sci-fi series such as Star Trek.

His research is in the area of numerical relativity, which is concerned with the computational simulation of astrophysical systems using Einstein's theory of general relativity. In this area he has concentrated on the study of sources of gravitational waves, and particularly black hole collisions. He is author of more than 50 publications, as well as a textbook published by Oxford University Press.

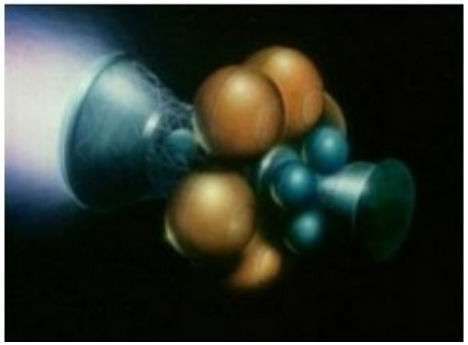
GALLERY OF **DAEDALUS & ICARUS**



Daedalus by David Hardy

I have always been interested in plans for interstellar travel, and have been a member of the BIS since 1952, so of course followed their Daedalus design study closely. In a way I suppose this could be compared with their earlier 1939 study for a moonship, using banks of solid fuel in stages. This is not the way it happened, yet Apollo did have several features foretold by this, and of course the Shuttle uses solid boosters. So perhaps history will repeat itself one day! The painting itself was done in the 1980s, I think for a Marshall Cavendish book, but at that time I painted the explosion a reddish colour. Later I was able to change this digitally on a scan in Photoshop, and I also changed the planet, which was originally Neptune.

David A. Hardy
dave@astroart.org
http://www.astroart.org



Daedalus Airbrush by Rick Sternbach

The blueprint and airbrush illustration were both prepared for the COSMOS miniseries based on orthographic drawings supplied by the BIS.

Rick Sternbach
rick@spacemodelsystems.com
http://www.spacemodelsystems.com

Build your own embedded spacetime (a theoretical outreach talk)

Jocelyn Read

University of Mississippi

July 17, 2011

http://www.amaldi9.org/abstracts/123/ConstructingPaperOutreachTalk.pdf

make a physical model from any
static & spherically symmetrical metric:

$$ds^2 = g_{tt}dt^2 + g_{rr}dr^2 + r^2\left(d\theta^2 + \sin\theta d\phi^2\right)$$

choose time slice of the spacetime
(here: t=const)
(ignore g_{tt} for now)

look at equatorial plane ($\theta = \pi$)

Geometry in the metric:
it relates proper distance in radial direction

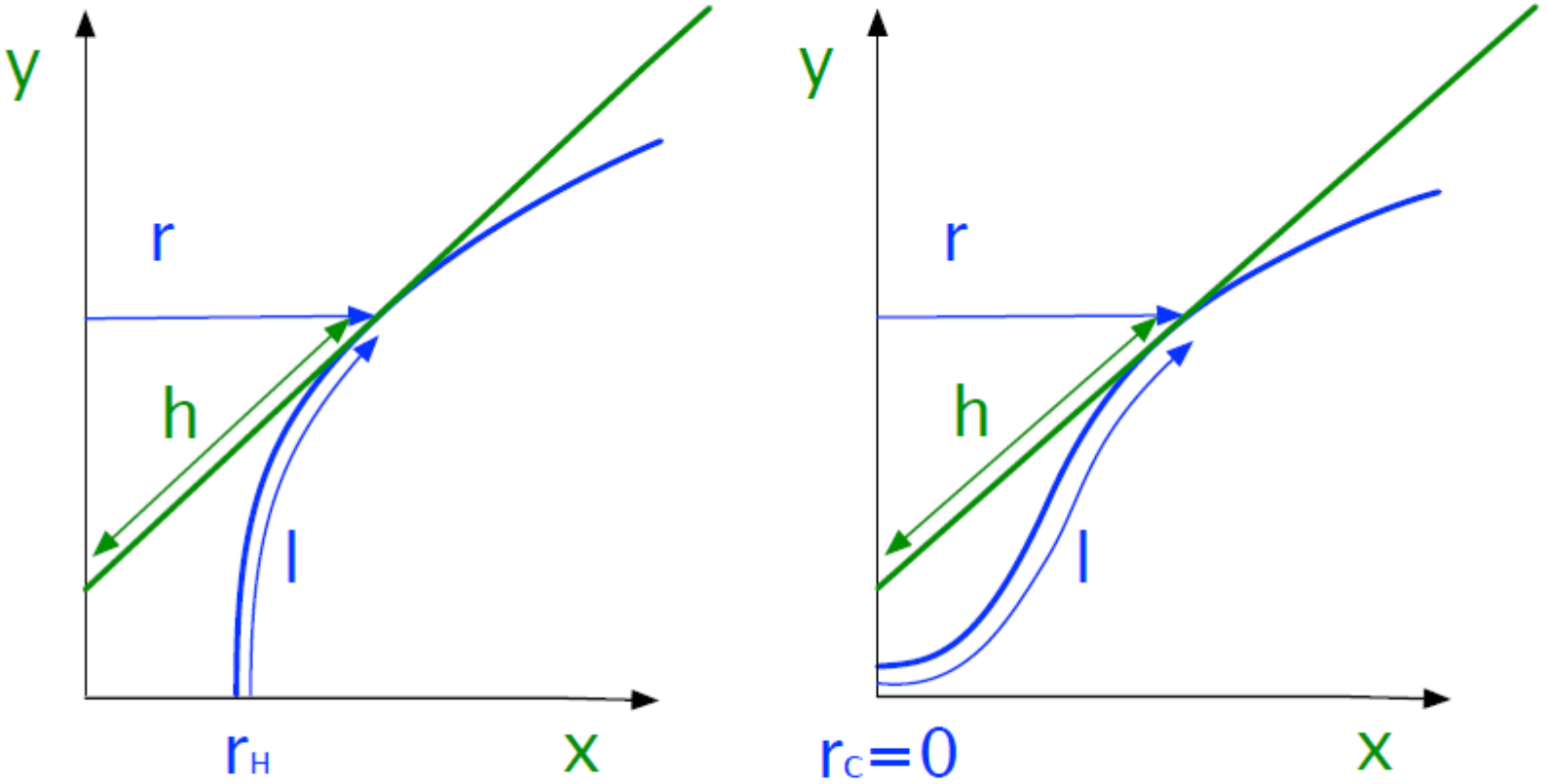
$$l(r) = \int_{r_*}^{r} \sqrt{g_{r'r'}}dr'$$

to circumferential distance (in ϕ direction)

$$c(r) = 2\pi r$$

http://www.amaldi9.org/abstracts/123/ConstructingPaperOutreachTalk.pdf

Look at tangent cones to embedded spacetime slice

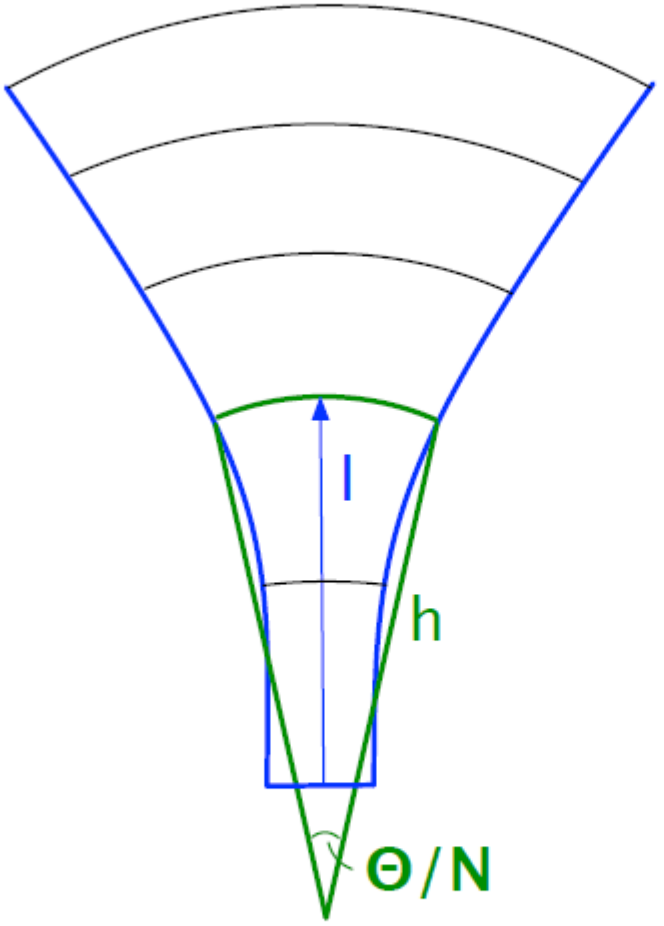


distance to centre of cone in embedding space:

$$h = r\sqrt{g_{rr}}$$

http://www.amaldi9.org/abstracts/123/ConstructingPaperOutreachTalk.pdf

build spacetime by spacing cone edges by proper length
divide into N segments to construct from paper



$$h = r\sqrt{g_{rr}}$$

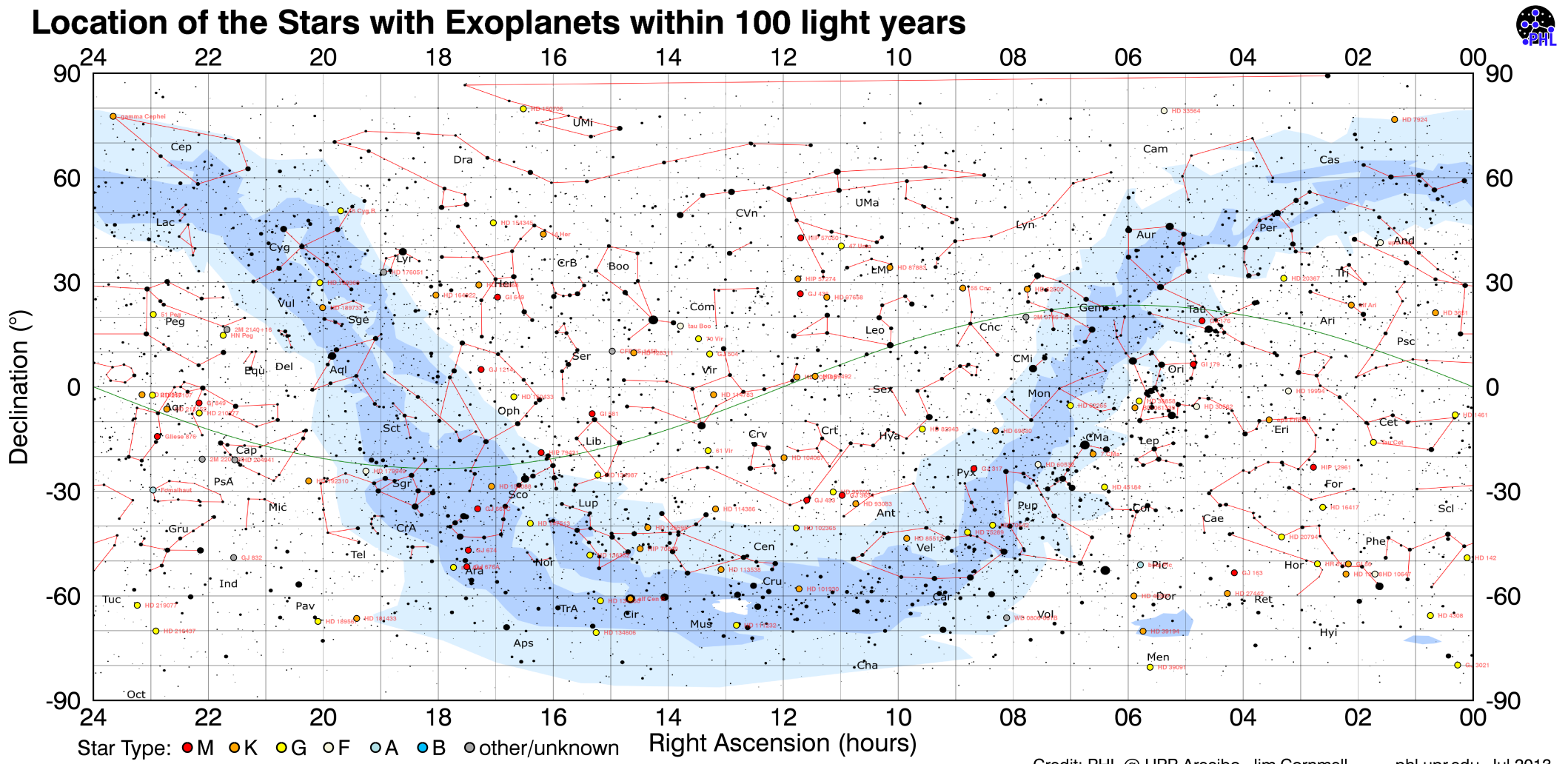
$$\Theta = \frac{2\pi}{\sqrt{g_{rr}}}$$

$$l(r) = \int_{r_*}^{r} \sqrt{g_{r'r'}}\, dr'$$

http://www.amaldi9.org/abstracts/123/ConstructingPaperOutreachTalk.pdf

http://www.huffingtonpost.com/brandon-judell/movie-review-interstellar_1_b_6100562.html

Distancias en el Universo



Trailer Aluna: https://www.youtube.com/watch?v=mHQ4FfgBBXI

Trailer Aluna: https://www.youtube.com/watch?v=mHQ4FfgBBXI

Aluna (fragmento con Richard Ellis)https://www.youtube.com/watch?v=gLiSAKqzTZM

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Trailer Aluna: https://www.youtube.com/watch?v=mHQ4FfgBBXI