

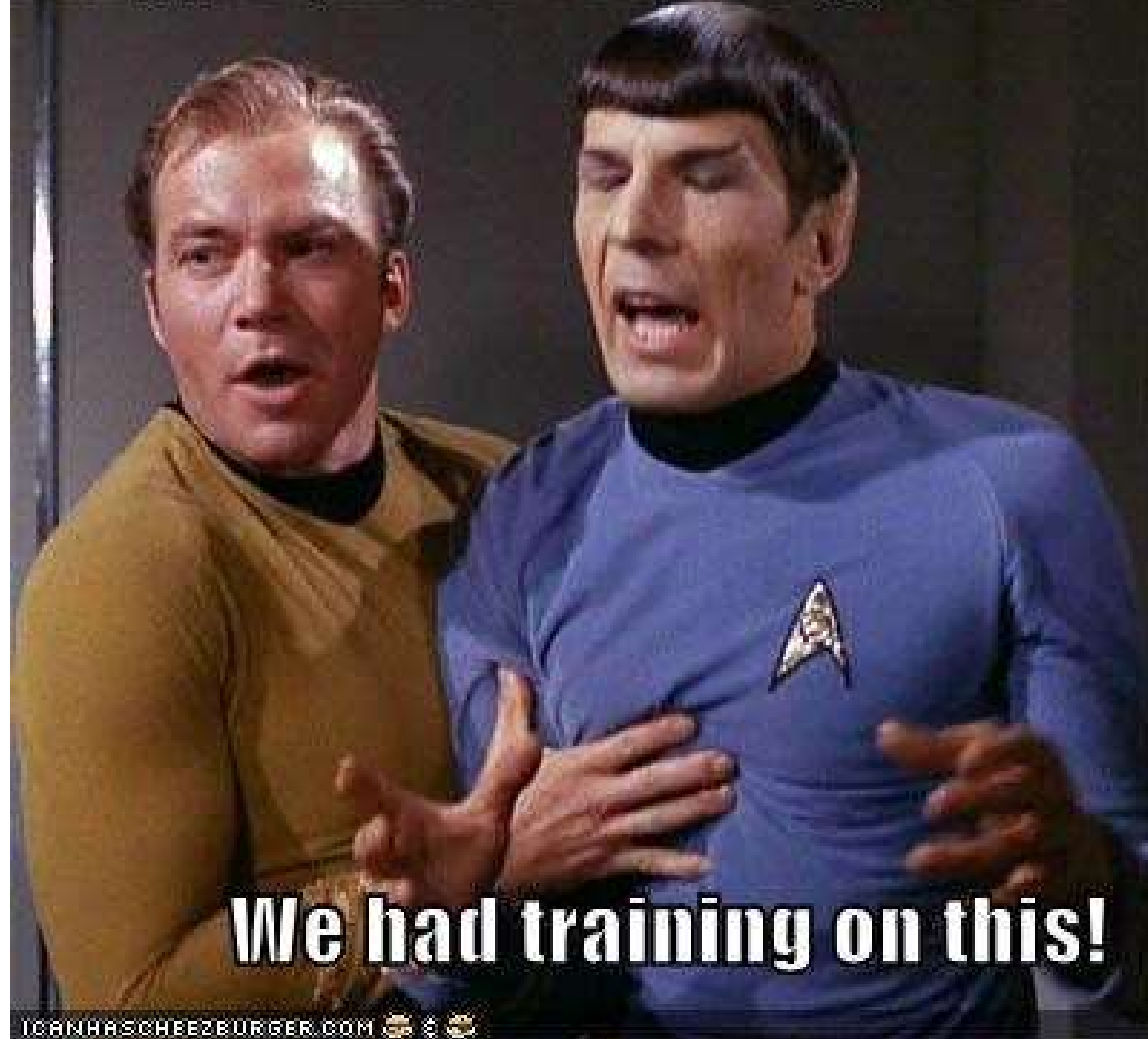
Space – The Final Frontier



Star Trek -
The show that
broke racial
barriers



Inappropriate touching, Jim!



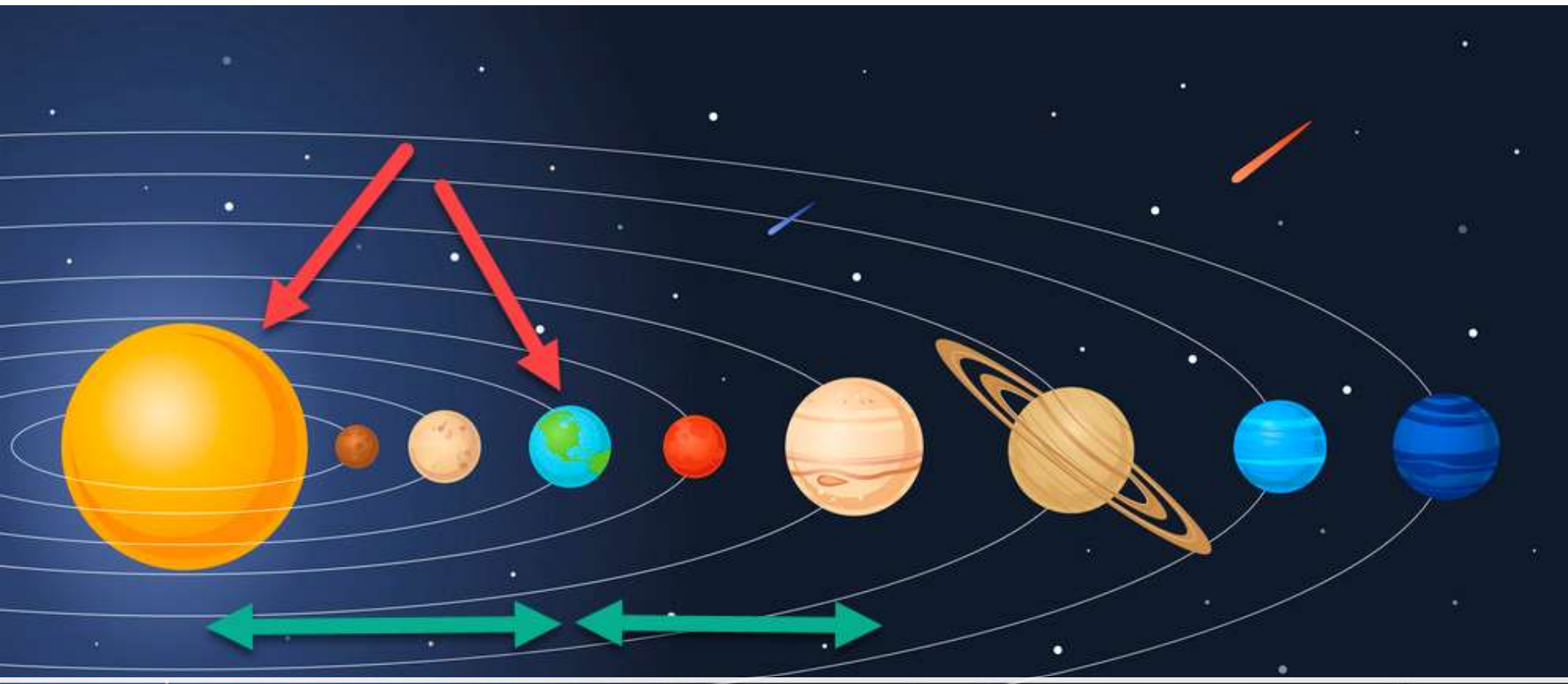
We had training on this!



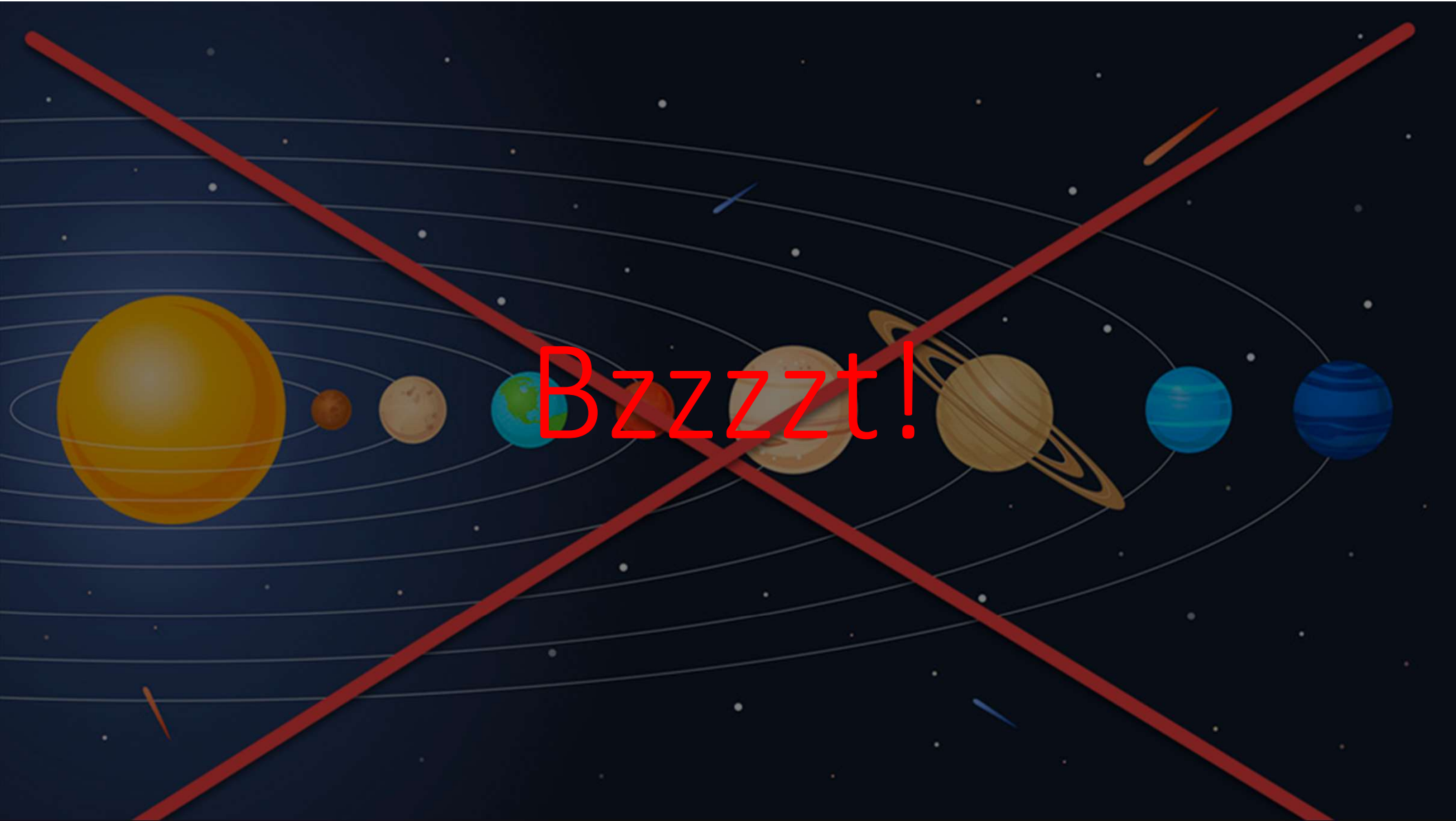
HOW BIG IS SPACE, REALLY?

How many grew up with this model of the solar system?





Or this model



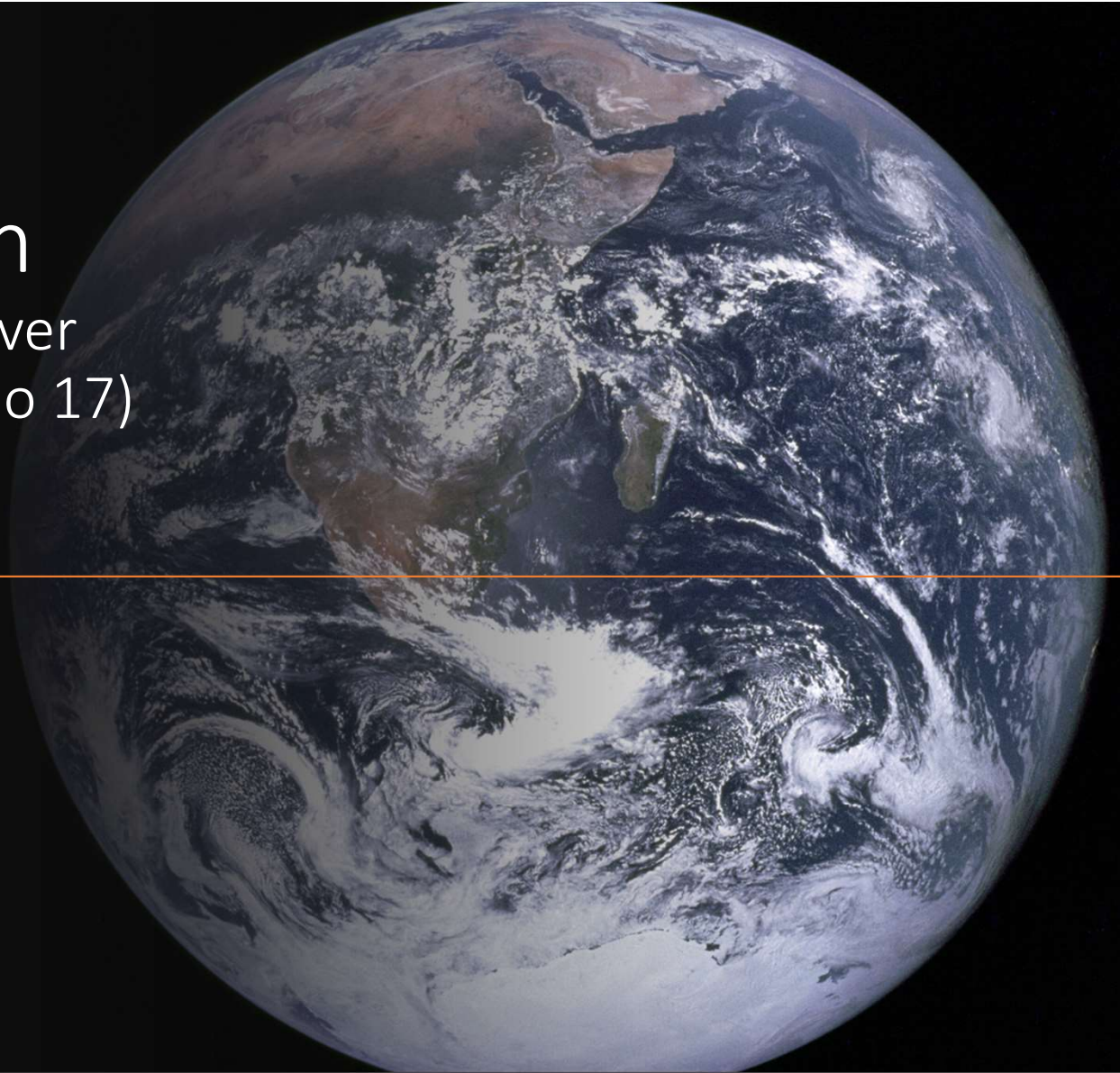
Bzzzt!


The first image of earth
ever captured by humans
Apollo 8



Spaceship Earth

First full earth picture ever
taken from space (Apollo 17)



A high-angle, wide-view photograph of Earth from space, showing the Americas and surrounding oceans. The image is dark and atmospheric, with a blue and white color palette. The text is overlaid on the image in a white, sans-serif font.

You develop an instant global consciousness, a people orientation, an intense dissatisfaction with the state of the world, and a compulsion to do something about it. From out there on the moon, international politics look so petty. You want to grab a politician by the scruff of the neck and drag him a quarter of a million miles out and say, "Look at that, you son of a bitch."

— *Ed Mitchell on seeing the Earth from the Moon*

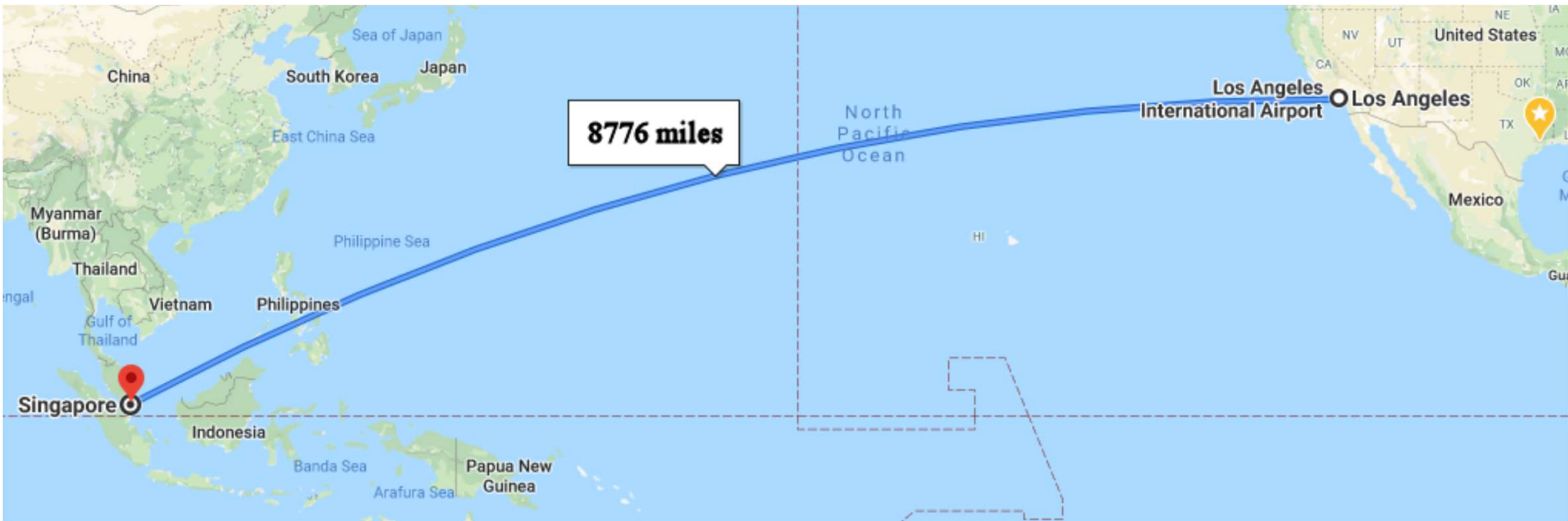
How Big Is
It?

7,915 miles in diameter



24,865 miles in circumference

Can We Grasp It?





What if we made
earth the size of a
golf ball?

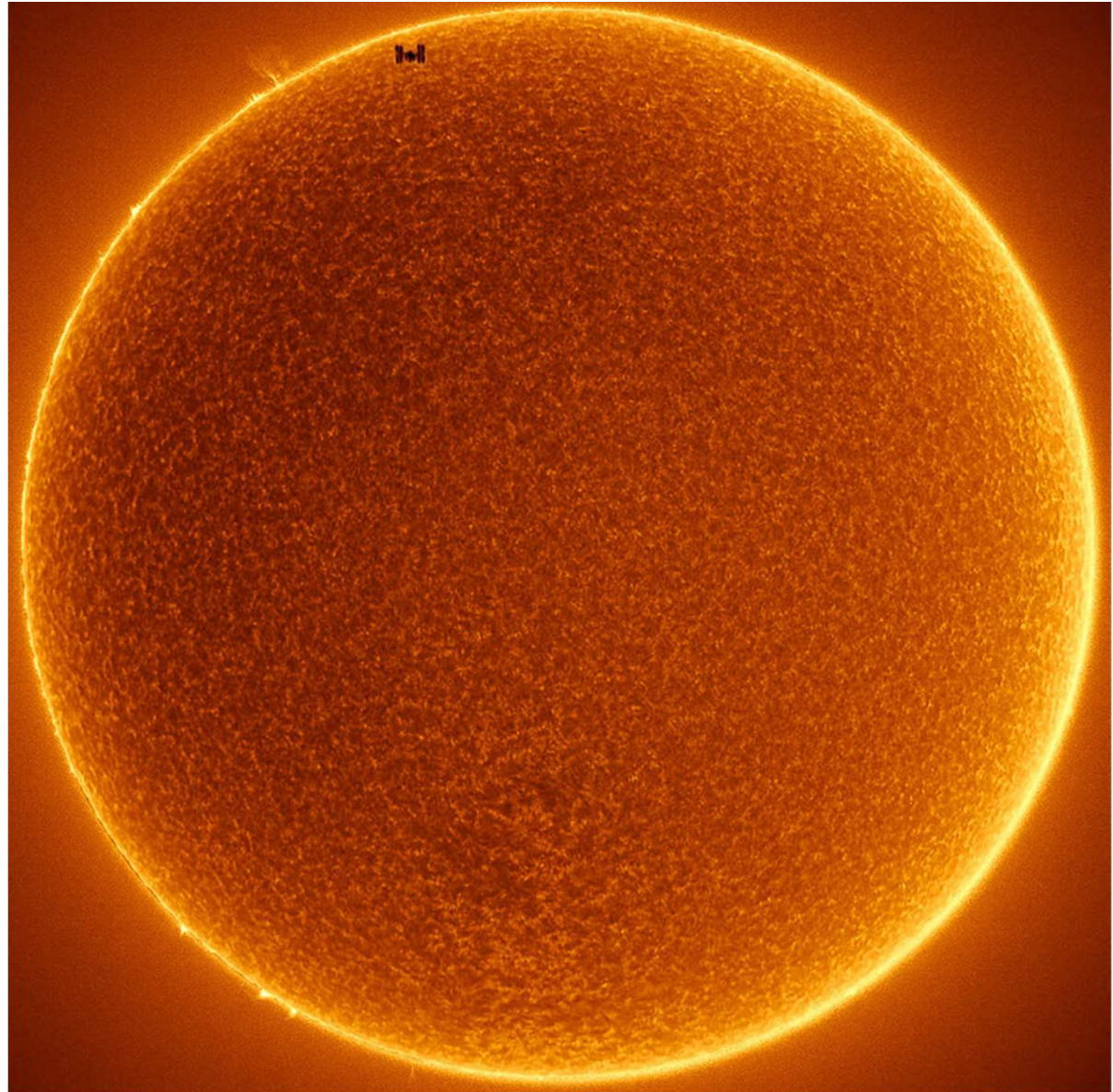
The Earth Compared to A Golf Ball

Item	Size	Units
Diameter of Earth (miles)	7,918	miles
Diameter of Golf Ball (inches)	1.68	inches
Scale	298,602,857	

The Sun!

My mom calls me son
because I'm so bright

How big is it?



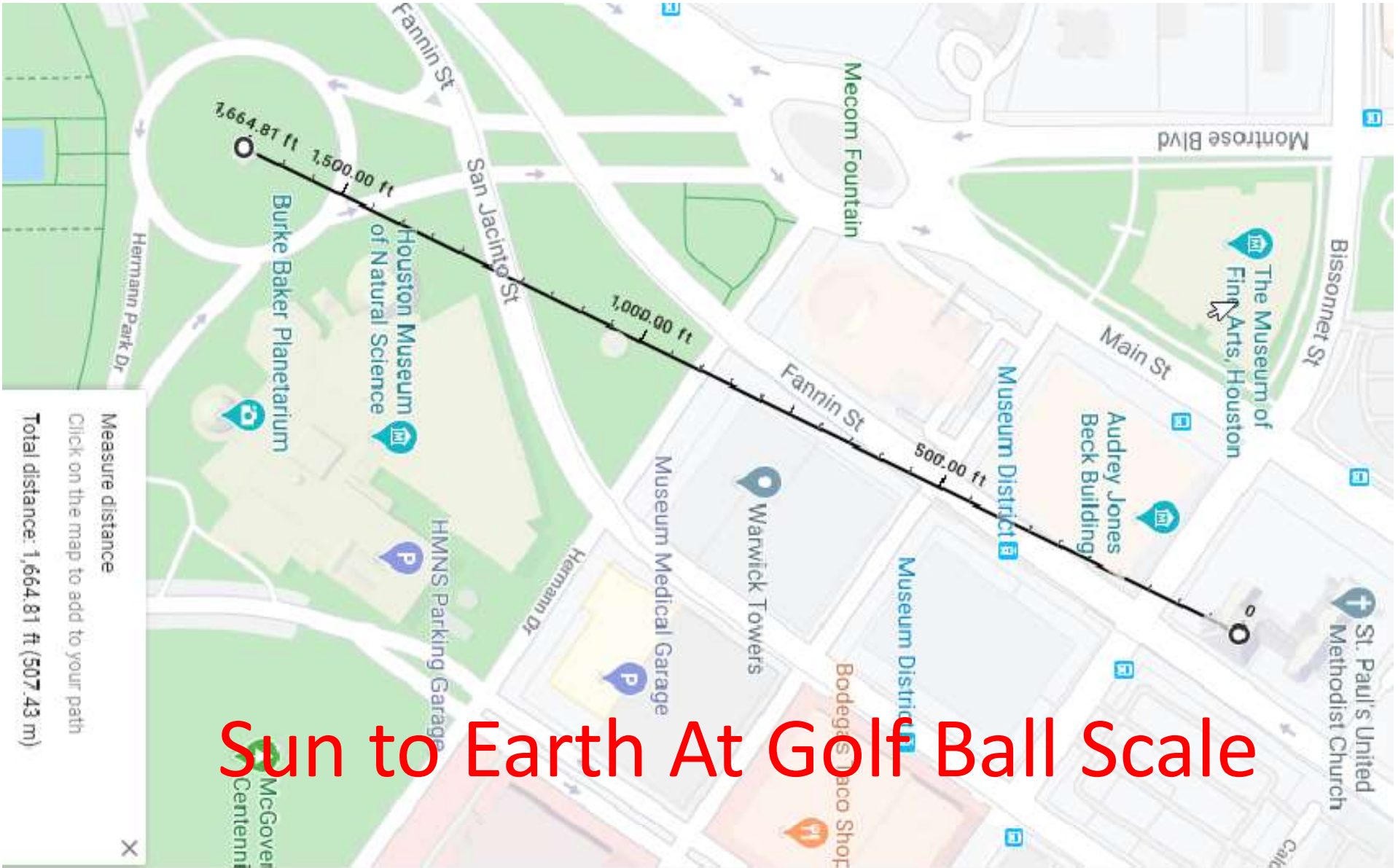
And... What If We Shrunk the Sun!

Item	Size	Units
Diameter of Sun (miles)	864,370	miles
At Scale of Golf Ball (inches)	183.41	inches
At Scale of Golf Ball (feet)	15.28	feet

More than 100 times the diameter of the earth

How Far Is the Earth From the Sun?

Item	Size	Units
Distance Earth to Sun (miles)	92,956,000	miles
At Scale of Golf Ball (feet)	1,643.68	feet
At Scale of Golf Ball (miles)	0.31	miles



Sun to Earth At Golf Ball Scale

Bzzzzt!!! - Wrong



And what about
Jupiter?



What If We Shrunk Jupiter

The largest planet in the solar system?

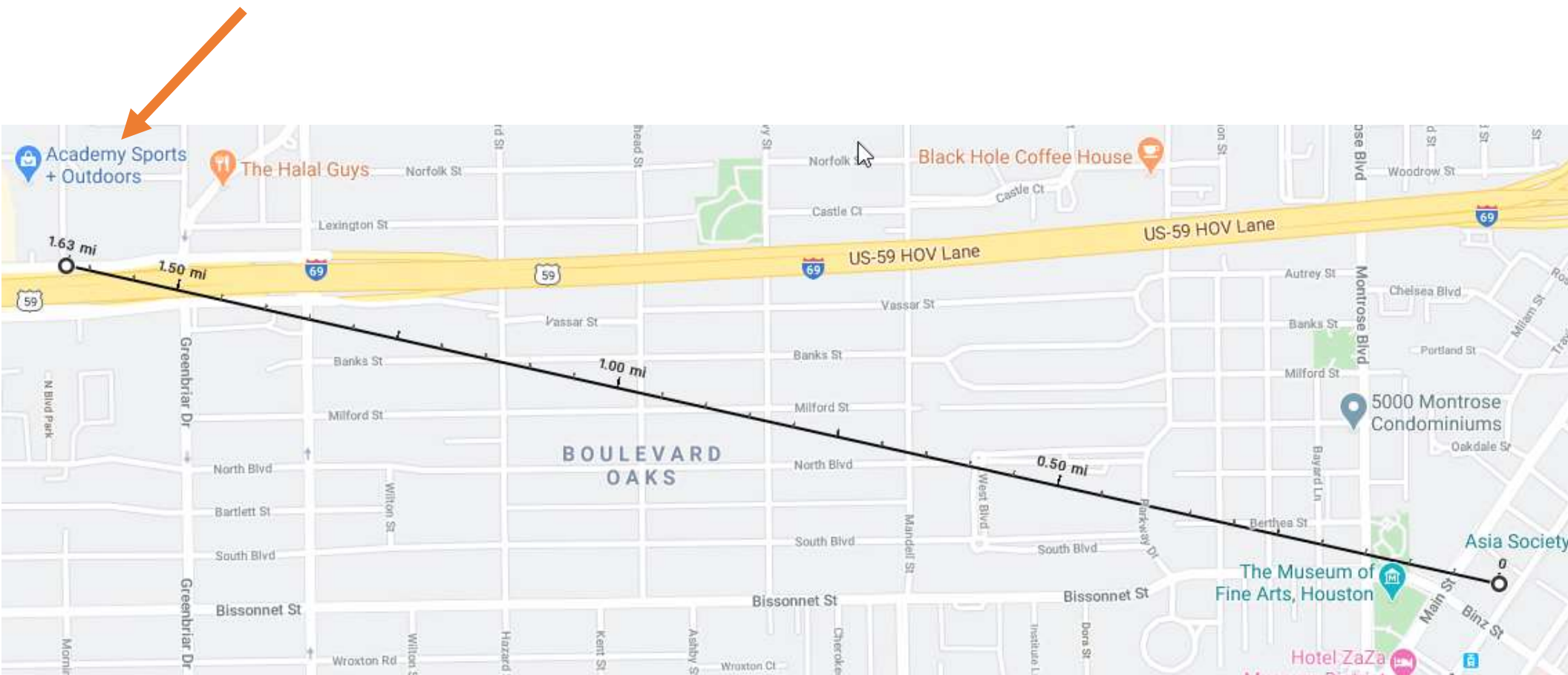
Item	Size	Units
Diameter of Jupiter (miles)	86881	miles
At Scale of Golf Ball (inches)	18.44	inches
At Scale of Golf Ball (feet)	1.54	feet



Jupiter At Golf
Ball Size

How Far Is Jupiter From the Sun

Item	Size	Units
Distance Jupiter to Sun (miles)	484,630,000	miles
At Scale of Golf Ball (feet)	8,569.40	feet
At Scale of Golf Ball (miles)	1.62	miles



Sun to Jupiter At Golf Ball Scale

ALPHA CEN



ALPHA CEN X-RAY CLOSE-UP



OK – The Nearest Star – 4.2 light years
Alpha Centauri – Alpha Proxima

OPTICAL

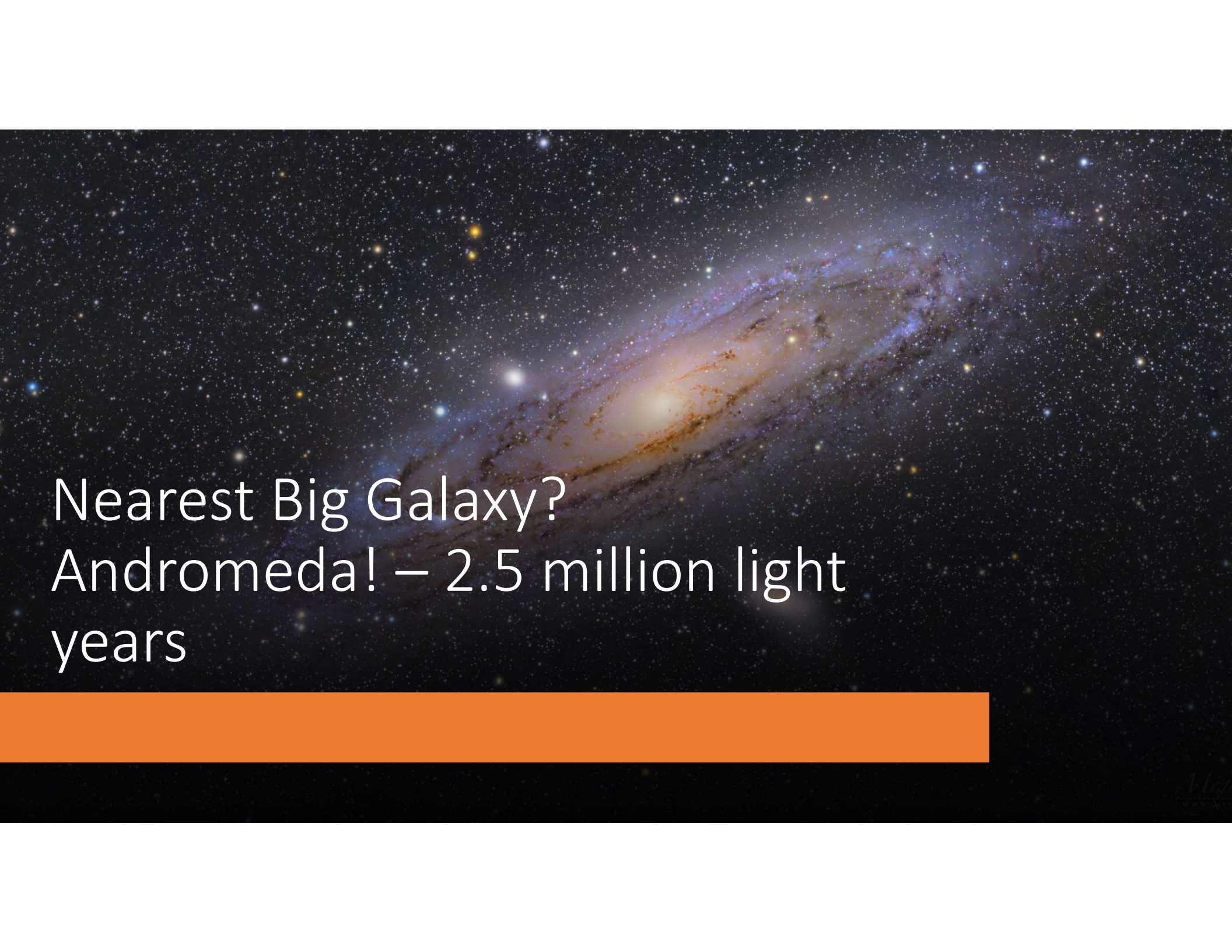
How Far to Alpha/Proxima Centauri?

Item	Size	Units
Nearest Star - Promixa Centauri	4.22	light years
Nearest Star - Promixa Centauri	24,809,380,000,000	24 trillion miles

And At Golf Ball Scale?

Item	Size	Units
At Scale of Golf Ball (miles)	83,085	miles

83,085 miles



Nearest Big Galaxy?
Andromeda! – 2.5 million light
years

How Far to the Andromeda Galaxy

Item	Size	Units
Nearest Galaxy - Andromeda	2.5 million	light years
At Golf Ball Scale	49,220,895,408	49 trillion miles

49 trillion miles
At golf ball scale



The observable universe is at least 46 billion years across

Estimates of 200 billion to 2 trillion galaxies

Space – It's Kind of Big Out There!

Thank you!

