

Communicating about science – and astronomy in particular in the Internet era

Lia Labuschagne

ASSA Symposium 2012



Not talking about

- Resources on the Internet or how it has transformed the way we access & share data & information generally
- Outreach in any detail
- Astronomy education support online or otherwise
- Turning terabytes of data into useful information
- interpretation for decision-making or building a scientific case
- Story-telling, creating models and aids
- How to put together a website or look at the best places to go





Mars will look a



ASSA

No, NOT Venus, Earth & Jupiter from Mars

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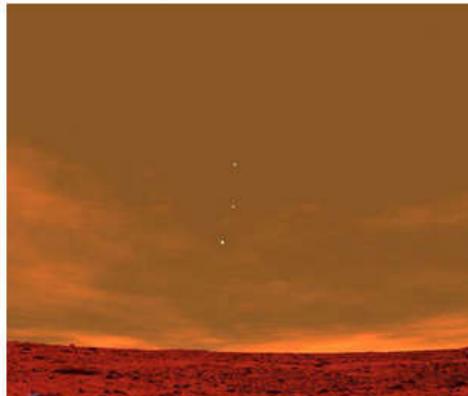
Bad Astronomy

« Saving space science – do you Uvinku?
Home, from space: Earth Illuminated »

An unreal Mars skyline

Well folks, it's been a while, so it's time for a good ol' fashioned BA debunking.

This morning I got an email from BA Blogger Joshua Frost as well as a note on Twitter from self-author Diana Diano telling me about a picture making the rounds on tech interwebs, purporting to be taken from Mars. It shows the Martian landscape at twilight, and claims that the three lights in the sky are Earth, Venus, and Jupiter:

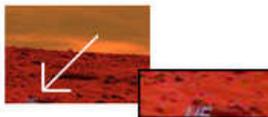


Pretty, isn't it? You can find endless copies of it online, just search on the term "mars skyline". It's been picked up on tons of Tumblr and other social media.

But yeah, there's just one problem: it's not real.

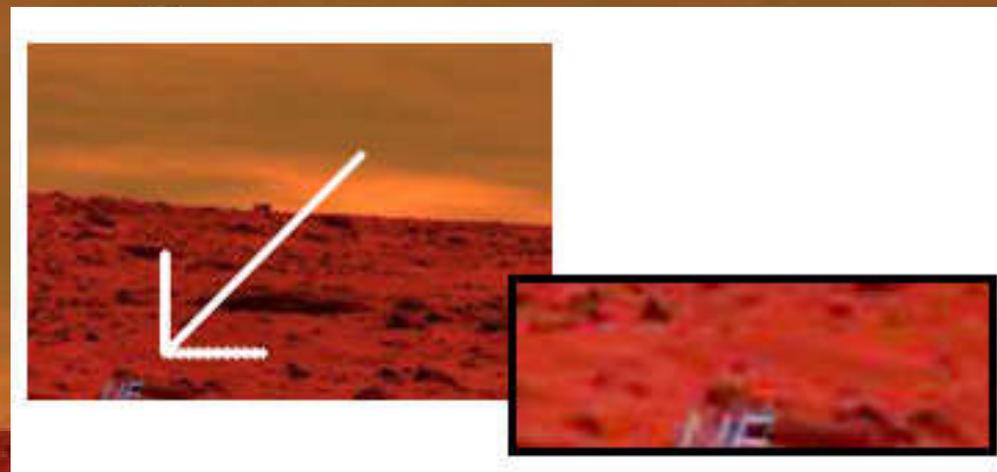
I know right away it wasn't legit, but it's hard to say exactly how. I've run into this problem before; I have a lot of experience looking at space images, and you just get a sense of what's real and what isn't. This one screams fake. The landscape color is a bit too saturated for Mars. The sky's the wrong color. The clouds are too numerous, the wrong color as well, and they have that "rendered by software" look to them.

But that's not proof, of course. Gut sense may not be a bad place to start, but it makes for lousy evidence. The thing is, there is solid evidence the picture isn't real! Look to the lower left corner of the image, see the letters there? Here's a zoom:



See? The arrow points to the letters, and I zoomed in and enhanced the brightness and contrast a bit. The letters are "NE" – as in, "northeast".

This is exactly what you see when you use planetarium software on a computer to display the sky. Programs like Starry Night, SkySafari, and so on will put the cardinal directions (north, south, and so on) along the horizon to indicate what direction you're looking. And many of them will display the appearance of the sky from other planets. It's clear that's what we have here: a rendered view from Mars using planetarium software. I'm not sure which one (there are quite a





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Frequently Asked Questions

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2012: Beginning of the End or Why the World Won't End?

12.22.11

Remember the Y2K scare? It came and went without much of a whimper because of adequate planning and analysis of the situation. Impressive movie special effects aside, Dec. 21, 2012, won't be the end of the world as we know. It will, however, be another winter solstice.

Much like Y2K, 2012 has been analyzed and the science of the end of the Earth thoroughly studied. Contrary to some of the common beliefs out there, the science behind the end of the world quickly unravels when pinned down to the 2012 timeline. Below, NASA Scientists answer several questions that we're frequently asked regarding 2012.

Question (Q): Are there any threats to the Earth in 2012? Many Internet websites say the world will end in December 2012.

Answer (A): Nothing bad will happen to the Earth in 2012. Our planet has been getting along just fine for more than 4 billion years, and credible scientists worldwide know of no threat associated with 2012.

Q: What is the origin of the prediction that the world will end in 2012?

A: The story started with claims that Nibiru, a supposed planet discovered by the Sumerians, is headed toward Earth. This catastrophe was initially predicted for May 2003, but when nothing happened the doomsday date was moved forward



Scenes from the motion picture "2012." Courtesy: Columbia Pictures

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The Mars Hoax Goes Viral

06.09.09

For the sixth year in a row, a message about the Red Planet is infecting worldwide email boxes. It instructs readers to go outside after dark on August 27th and behold the sky. "Mars will look as large as the full moon," it says. "No one alive today will ever see this again."

Don't believe it.

Here's what will really happen if you go outside after dark on August 27th. Nothing. Mars won't be there. On that date, the red planet will be nearly 250 million km away from Earth and completely absent from the evening sky.

The Mars Hoax got its start in 2003 when Earth and Mars really did have a close encounter. On Aug. 27th of that year, Mars was only 56 million km away, a 60,000-year record for martian close approaches to Earth. Someone sent an email alerting friends to the event. The message contained some misunderstandings and omissions—but what email doesn't? A piece of advanced technology called the "forward button" did the rest.

Tolerant readers may say that the Mars Hoax is not really a hoax, because it is not an intentional trick. The composer probably believed everything he or she wrote in the message. If that's true, a better name might be the "Mars Misunderstanding" or maybe the "Confusing-Email-About-Mars-You-Should-Delete-and-Not-Forward-to-Anyone-Except-Your-In-Laws."

Another aspect of the Mars Hoax: It says "Mars will look as large as the full Moon if you magnify it 75x using a backyard telescope." The italicized text is usually

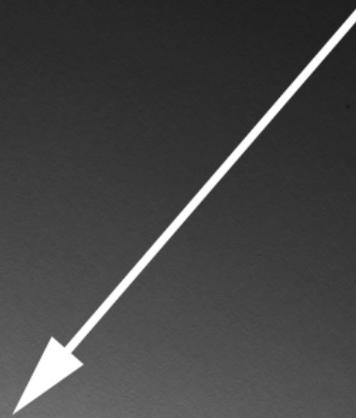
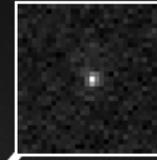


Only in Photoshop does Mars appear as large as a full Moon



Mars in August 2003 during a 60,000-year record close approach. Even then, the planet resembled a bright star, not a full Moon. Photo credit: John Namy & Carol

You are here



- First-ever image of Earth from the surface of another planet
- Taken by Mars rover Spirit March 8, 2004
- *The contrast in the panoramic camera image was increased two times to make Earth easier to see*
- Image credit: NASA/JPL/Cornell/Texas A&M

Pale blue dot



Candice Hansen-Koharcheck became the first person to ever see the 'blue dot' at a computer at NASA's Jet Propulsion Lab in California.

She was searching through a database of images sent home by the Voyager 1 spacecraft, which at the time was nearly 4 billion miles away. "I knew the data was coming back," she says, "and I wanted to see how it had turned out."

Finally, she found it.

"It was just a little dot, about two pixels big, three pixels big," she says. "So not very large."

But this was the Earth — seen as no human had ever seen it before.

What's more, an accidental reflection off the spacecraft made it look as though the tiny speck was being lit up by a glowing beam of light. "You know, I still get chills down my back. "Because here was our planet, bathed in this ray of light, and it just looked incredibly special."





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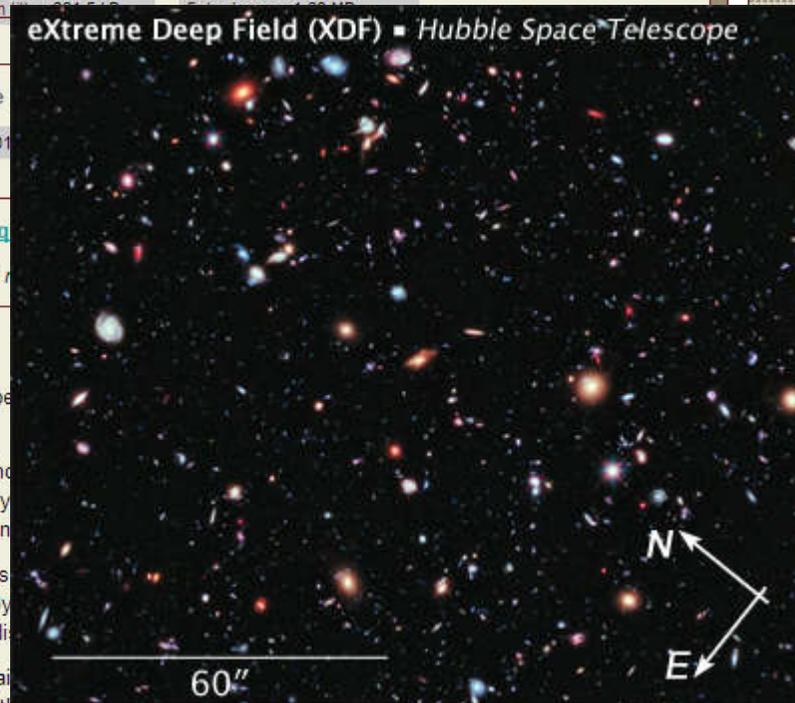
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ABOUT THIS IMAGE:

Like photographers assembling a portfolio of beautiful images, astronomers have assembled mankind's deepest-ever view of the universe.

Called the eXtreme Deep Field, or XDF, the photograph is a mosaic of Hubble Space Telescope photographs taken of a patch of sky that covers only a tiny fraction of the angular diameter of the full Moon.

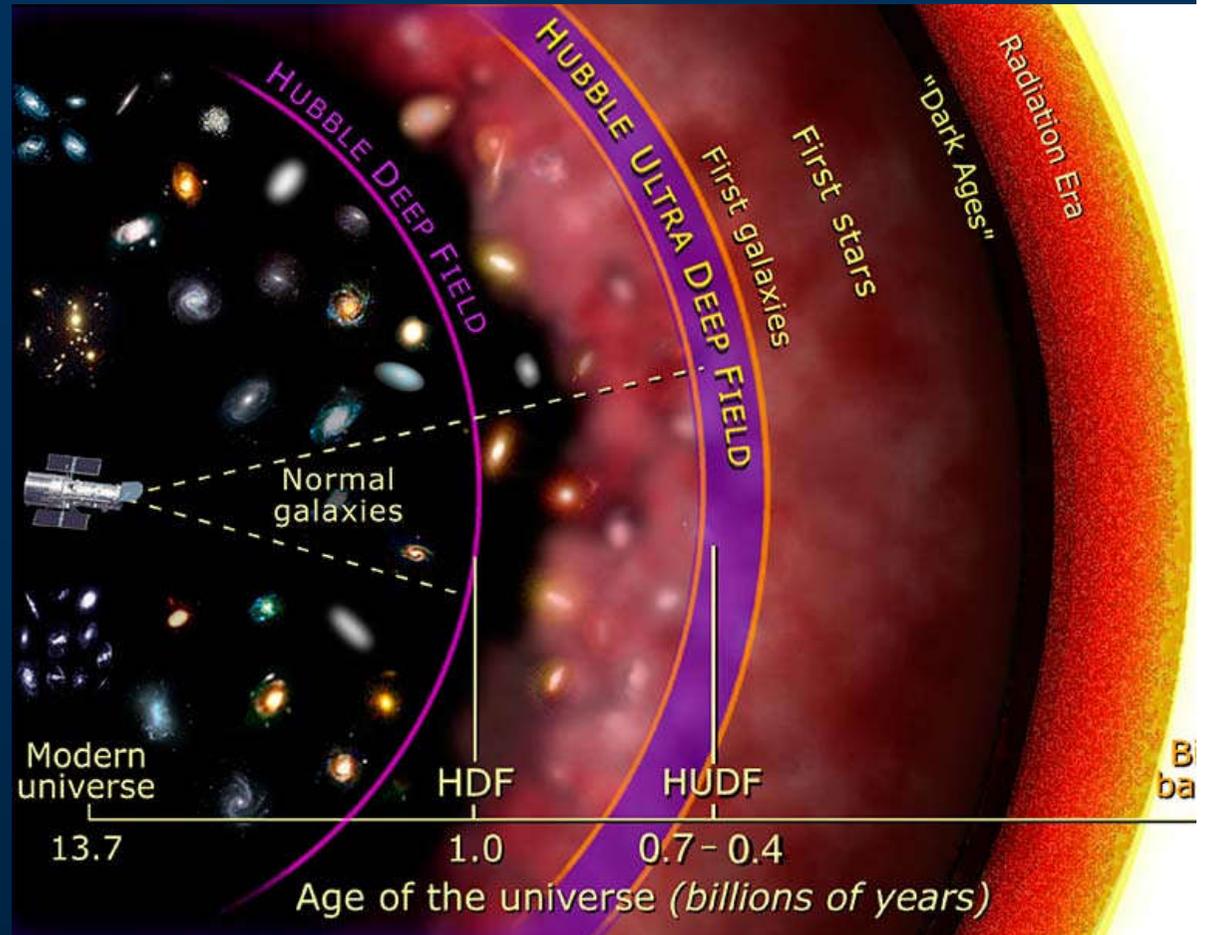
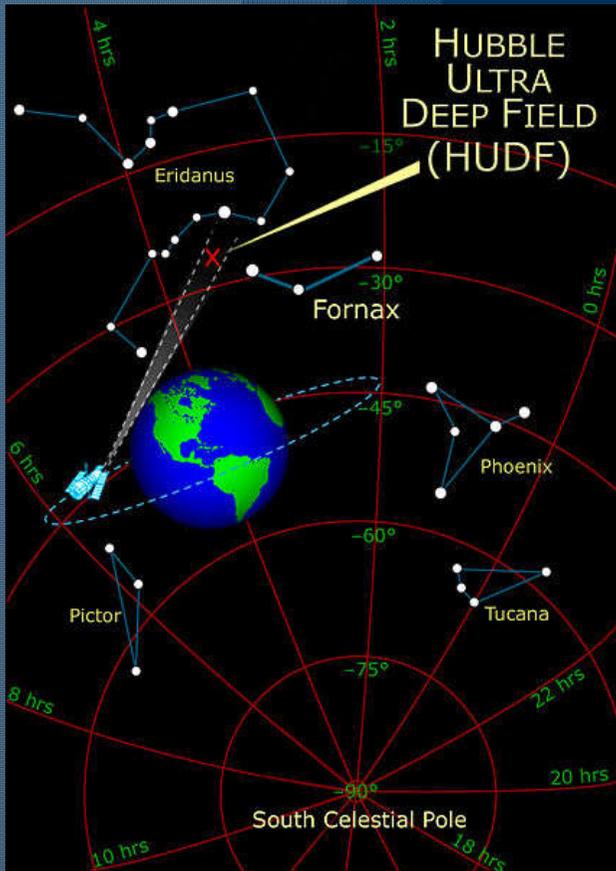
The Hubble Ultra Deep Field is an image of a small area of sky that was assembled from Space Telescope data from 2003 and 2004. By stitching together thousands of galaxies, both nearby and very distant, astronomers have created a deep view of the universe.

The new full-color XDF image reaches much farther into the universe than the Ultra Deep Field.

The new image was taken by the Wide and Field-of-View (WFOV) camera, which includes an infrared camera, enabling new studies of the earliest galaxies in the universe. The XDF contains about 5,500

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Explain with diagrams



Spoiling a good argument with facts

Example: the elitist argument

(or also the argument that the use of scientific endeavour and things like space its use is not immediately evident)

“Rather spend money on other, more useful things...”

... like maybe education....?

Public expenditure on education in the EU-27 (2009) equalled **5.4 % of GDP**; expenditure of both public and private sources of funds on educational institutions amounted to **6.2 %**

Spoiling a good argument with facts

... or defending our countries

Rank	Country	Spending (\$) ^[3]	% of GDP	Per capita (\$)
—	World total	1,546,529,200,000	2.2%	
1	 United States	689,591,000,000	4.7%	2,141
2	 China	129,272,000,000	2.1%	74
3	 Russia	64,123,000,000	3.9%	428
4	 France	58,244,000,000	2.3%	879
5	 United Kingdom	57,875,000,000	2.6%	893
6	 Japan	54,529,000,000	1.0%	401
43	 South Africa	3,735,000,000	1.3%	78

Source: Stockholm International Peace Research Institute (SIPRI)
military expenditure database for 2011



Compare to per cap investment in space programmes

On average, every citizen of an ESA member state pays in taxes for expenditure on space, about the same as the price of a cinema ticket

In the USA, investment in civilian space activities is almost four times as much = thus, about the value of four cinema tickets

	GDP in 2004	Percent spent on space
USA	11.8 trillion	0.14%
Europe	11.7 trillion	0.03% (not inc. individual agencies)
Japan	3.7 trillion	0.05%
China	7.3 trillion	0.02%
Russia	1.4 trillion	0.06%
India	3.3 trillion	0.03%

WHY be good at communicating?

REALISM

...any organisation, and for that matter any human endeavour, even science –

...**can only continue to exist and thrive in the long term by the consent of the society and communities within which it operates**

For that we need a **scientifically literate population**

and that broad-based understanding means tax income and political support for science in general, astronomy & particular



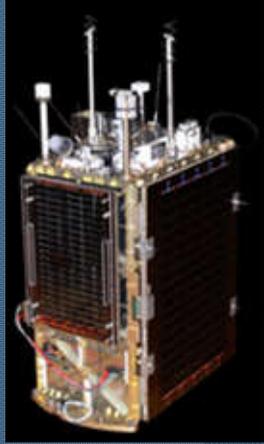
We also want more kids to become

- Professional astronomers, physicists and other scientists
- Engineers
- IT specialists etc



And we want more

Participants in part-time/amateur activities



It is not rocket science why communication is important

...but we do have to explain why space rockets, telescopes and mega-computers are necessary and what the spin-offs are

...and many do it brilliantly

The challenge is new to interpret rather than distribute or exchange content and to keep issues on the agenda



Glut of information means **noise**

which means making ourselves heard is difficult

- finding tools & techniques as important as it is to remove the noise from a photograph or scientific data

A bit of **an ego issue**

Our **audience/readers** are important ...not the person/organisation doing the talking

- Know who we are talking to & what their information needs are, then
- and use the means that are **most convenient to them**
- Appropriate **level of information**



The Internet today

The Internet is a powerful medium to convey science and other messages because it is so

- accessible
- democratic and inclusive
- increasingly interactive
- Increasingly integrated with cheap mobile technology

.... But also difficult to predict

So...KISS – but tell

Keep it simple and appropriate

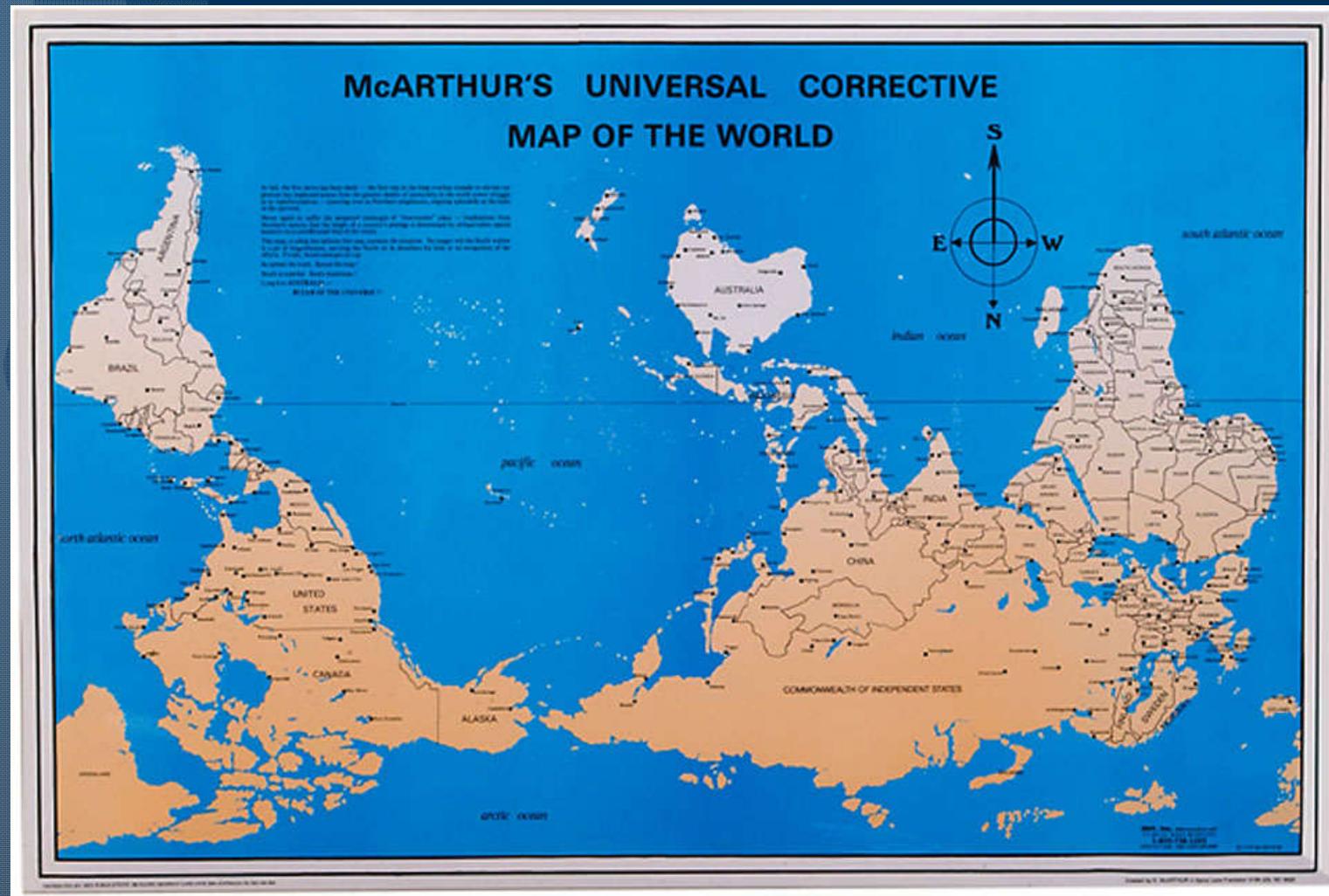
Make it **interactive** – whether online,
in person or in print, via radio etc

Put it into a **context** that people
relate to

We have all the great pictures of
concepts that we drop the
imagination



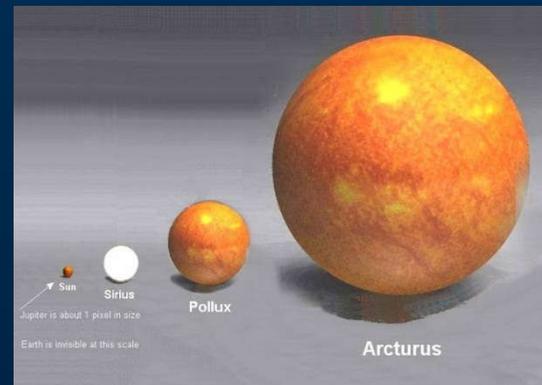
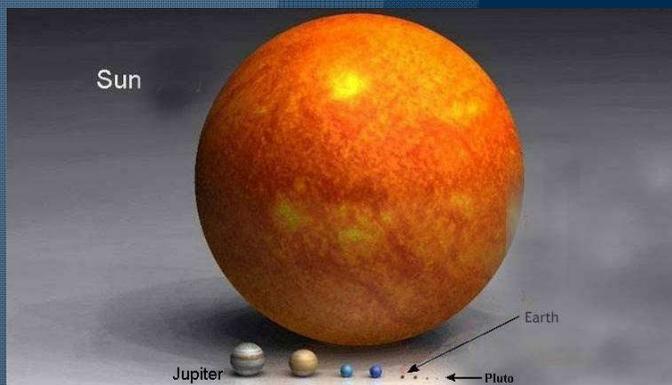
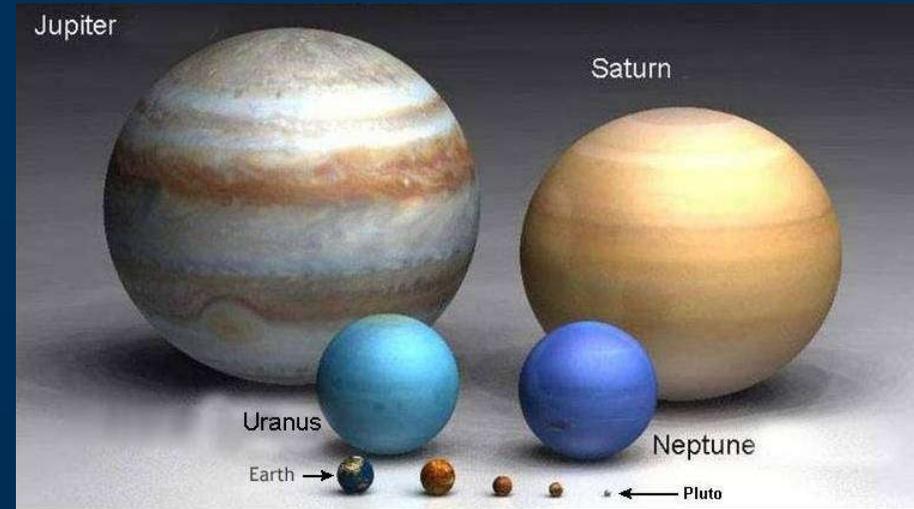
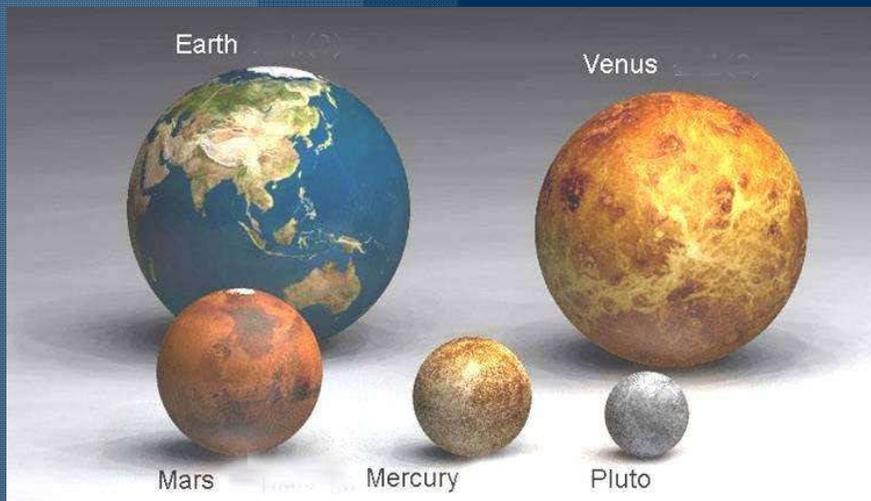
Looking at things differently takes work and shifting our own perceptions



**...but we have the best
material to work with**



Explaining scale





Take a fast journey

You left the Earth at 50 000 km per hour or 0.01% the speed of light

THIS IS ALREADY VERY FAST (remember that the ISS travels at almost 28 000 km per hour and goes around the world 15.7 times a day!) This is how long it will take you to travel to some places:

Earth's Moon	7.67 hours
The planet Mars	2.18 months
The planet Saturn	2.92 years
Pluto	13.1 years
Closest star to the Sun (Proxima Centauri)	92 800 years
Centre of our Milky Way Galaxy	647 million years
Closest large spiral galaxy (Andromeda)	53.9 billion years
Coma Cluster of galaxies	7 330 billion years
Edge of the observable Universe	323 000 billion years