

LESSONS LEARNED FROM PRODUCING THE ASTRONOMY PICTURE OF THE DAY

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BACKGROUND: KNOW YOUR PRESENTER (RJN)

- Publishes mostly on gamma-ray bursts, gravitational lensing, and sky monitoring
 - Several predictions have actually come true!
- Meetings attended usually involve GRBs & lensing – new to this type of meeting!
- By day: rank and file physics professor at Michigan Tech University
 - Currently mentors three graduate students doing astrophysics research
 - Teaches Astro 101 **without a textbook**
 - Video lectures online since 2006
- co-created the Astrophysical Source Code Library (ascl.net) in 1999
 - Now lists 1250+ codes!
- Always loses yearly penny competition to JTB

BACKGROUND: ASTRONOMY PICTURE OF THE DAY (APOD)

- Started in 1995 at NASA's GSFC in Maryland, USA
 - Tries to be an annotated encyclopedia of best and most educational astronomy images
 - Main NASA site receives 1M+ page views daily; **most popular domain under nasa.gov**
 - Arguably the oldest daily blog on the web
- Entire site created, edited, written in English, by two people (RJN and JTB)
- Site translated daily by volunteers into **Arabic**, Bahasa **Indonesian**, Catalan, **Chinese**, Chinese, **Croatian**, Czech, **Dutch**, Farsi, **Farsi**, Galego, **German**, French, **Hebrew**, Japanese, **Korean**, Montenegrin, **Polish**, Romanian, **Russian**, Serbian, **Slovenian**, Spanish, and **Turkish**
- Social media sites include Facebook, Twitter, G+, Instagram, Reddit (2M+ followers, Likers, etc.)
- Apps available for iPhone, Android, Windows phones

The background features a dark grey to black gradient. On the left side, there is a large, semi-circular scale with numerical markings from 140 to 260 in increments of 10. Several concentric circles and arcs are scattered across the image, some with arrows indicating a clockwise or counter-clockwise direction. The overall aesthetic is technical and scientific.

LESSONS WE LEARNED THAT MIGHT
BE GENERALLY APPLICABLE TO
ASTRONOMY OUTREACH

COMMUNICATE ON MANY LEVELS

- A young child should find the images intriguing
- A grade-school student should learn at least a few words and concepts
- A high-school student should learn context and some depth
- **A science-illiterate member of the public should not be insulted or intimidated**
- **A science-literate member of the public should learn some interesting astronomy**
- **A college student should become better educated in science and astronomy**
- **A graduate student should learn things they were already pretending to know**
- **A teacher at any level should be able to use APOD in their classroom**
- **A professional astronomer should be able to learn details of a current event from the links**

ASSUME DIVERSITY

- Be culture independent
- Be computer and hardware independent
- Be browser and social media platform independent
- We all see the same sky: **use the night sky as a unifying medium**

LEVERAGE EXISTING COMMUNITIES

- Space organizations (e.g. NASA, ESA, JAXA)
- Professional observatories (e.g. Gemini)
- Professional astronomers (e.g. University of Home City)
- Professional astrophotographers (e.g. TWAN)
- Amateur astrophotographers
 - Posts on Facebook, Twitter, YouTube, etc.

ACCEPT GOOD VOLUNTEERS

- Include non-traditional careerists, retirees, students, intelligent people with spare time
 - Leverages people with inherent interest in astronomy
- **Treat them as the equals that they are**
- Allows outreach projects to continue with lower funding requirements

SURVIVE FUNDING DROUGHTS

- Have a steady job
 - Yes, this is the hardest part
- Apply for grants but be able to survive without them
 - Typically, grants are for **starting** something, not for **running** something
- Realize that popularizing astronomy can be extremely competitive

The background features a dark grey to black gradient. On the left side, there is a large, semi-circular scale with tick marks and numerical labels ranging from 140 to 260. Several circular elements are scattered across the page, including solid and dashed lines, some with arrows indicating a clockwise or counter-clockwise direction. The overall aesthetic is technical and scientific.

APOD SPECIFIC ANECDOTES

WHAT MAKES FOR A GOOD APOD IMAGE?

- Inspires awe and curiosity
- Topical
- Tells a story
- Simple

- Utilizes multiple image planes
 - Foreground, background, sky
- Includes a sky from which a good annotated rollover can be composed



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2014 November 3

In Green Company: Aurora over Norway



Earthrise

APOD: 2015 September 6

NASA, Apollo 8

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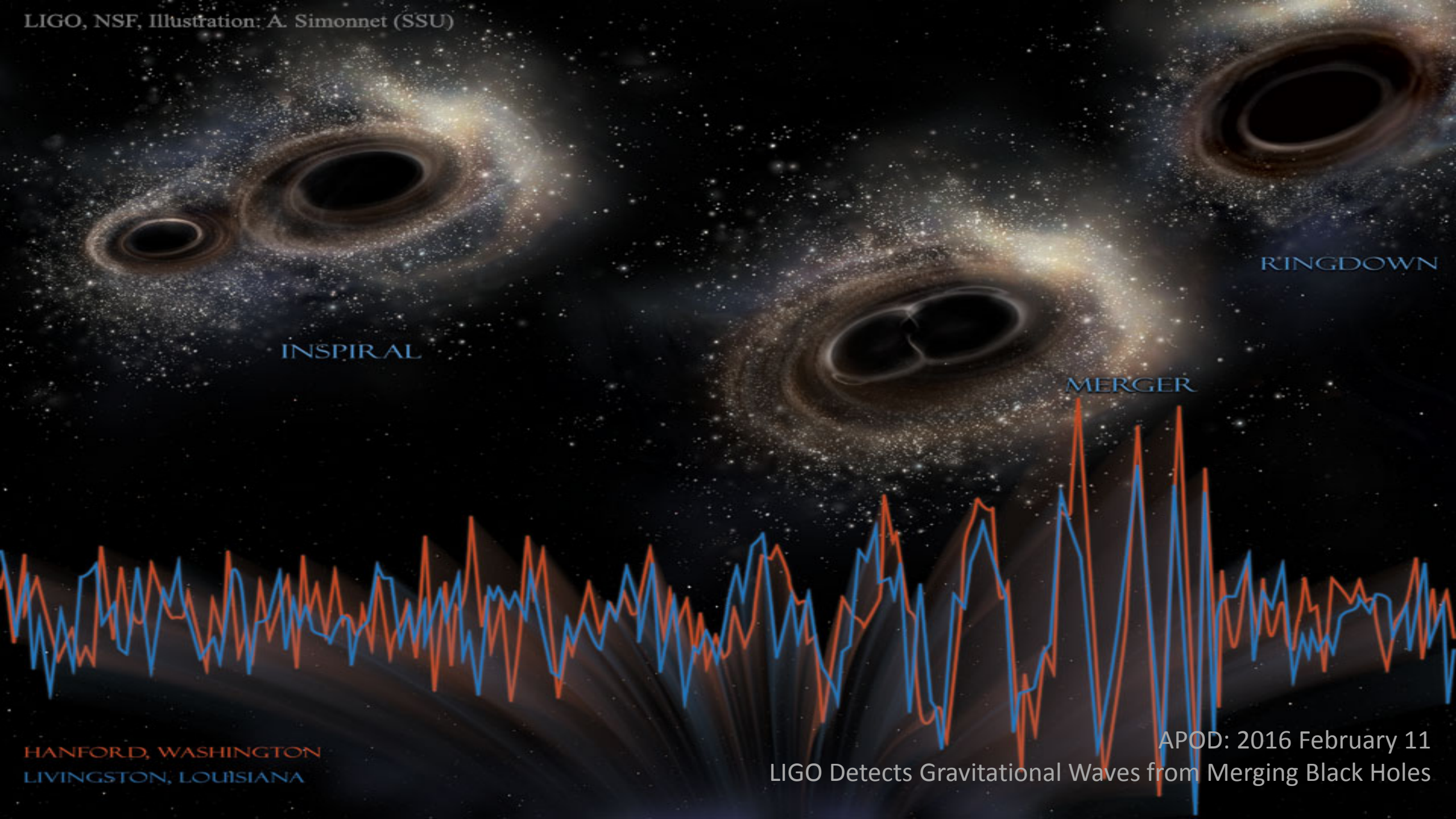
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INSPIRAL

MERGER

RINGDOWN

HANFORD, WASHINGTON
LIVINGSTON, LOUISIANA

APOD: 2016 February 11
LIGO Detects Gravitational Waves from Merging Black Holes

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Contemplating the Sun

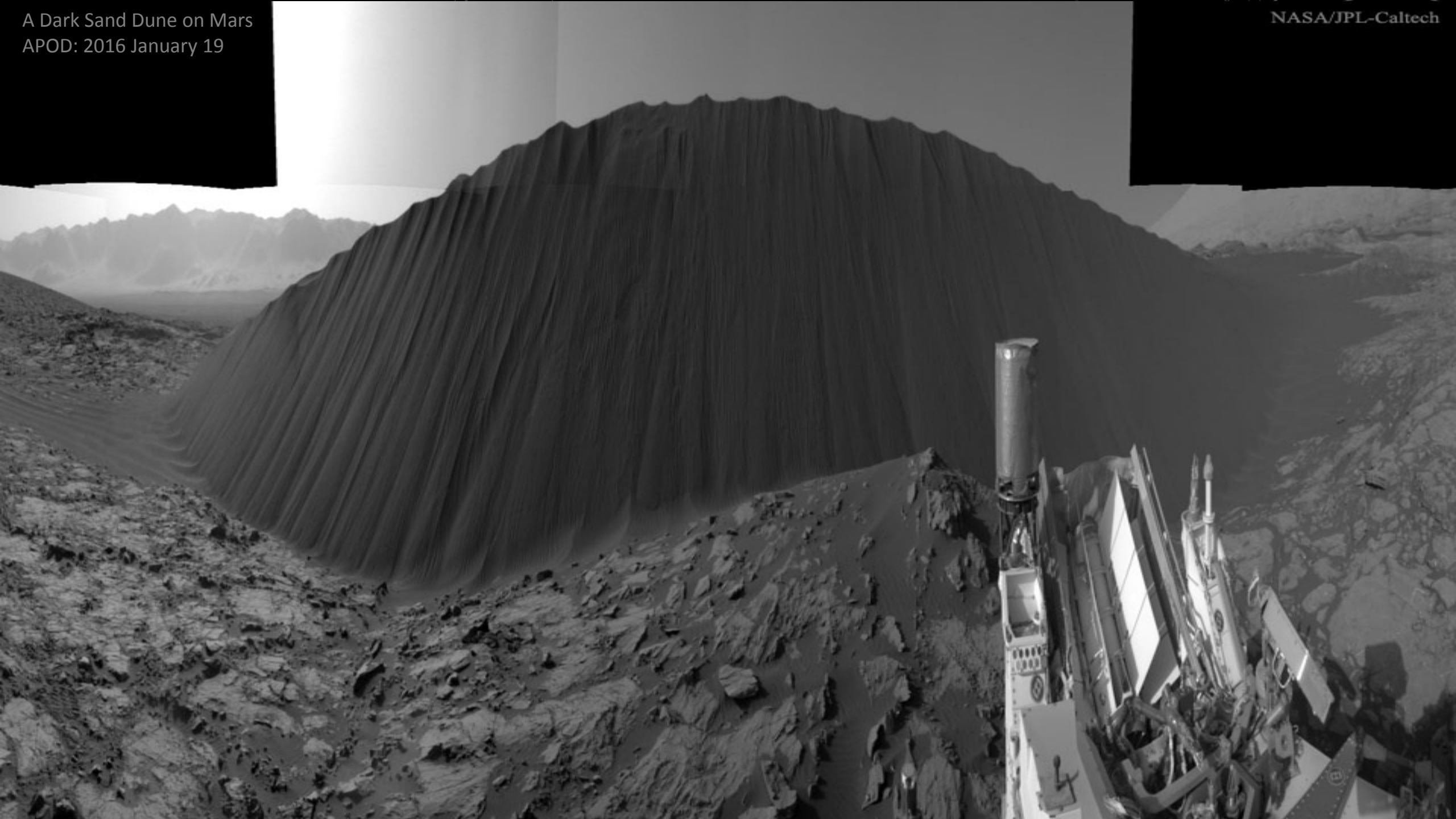
APOD: 2012 May 28

Image Credit & Copyright: Steven Gilbert



A Dark Sand Dune on Mars
APOD: 2016 January 19

NASA/JPL-Caltech



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The Average Color of the Universe
Credit: Karl Glazebrook & Ivan Baldry (JHU)
2009 November 1

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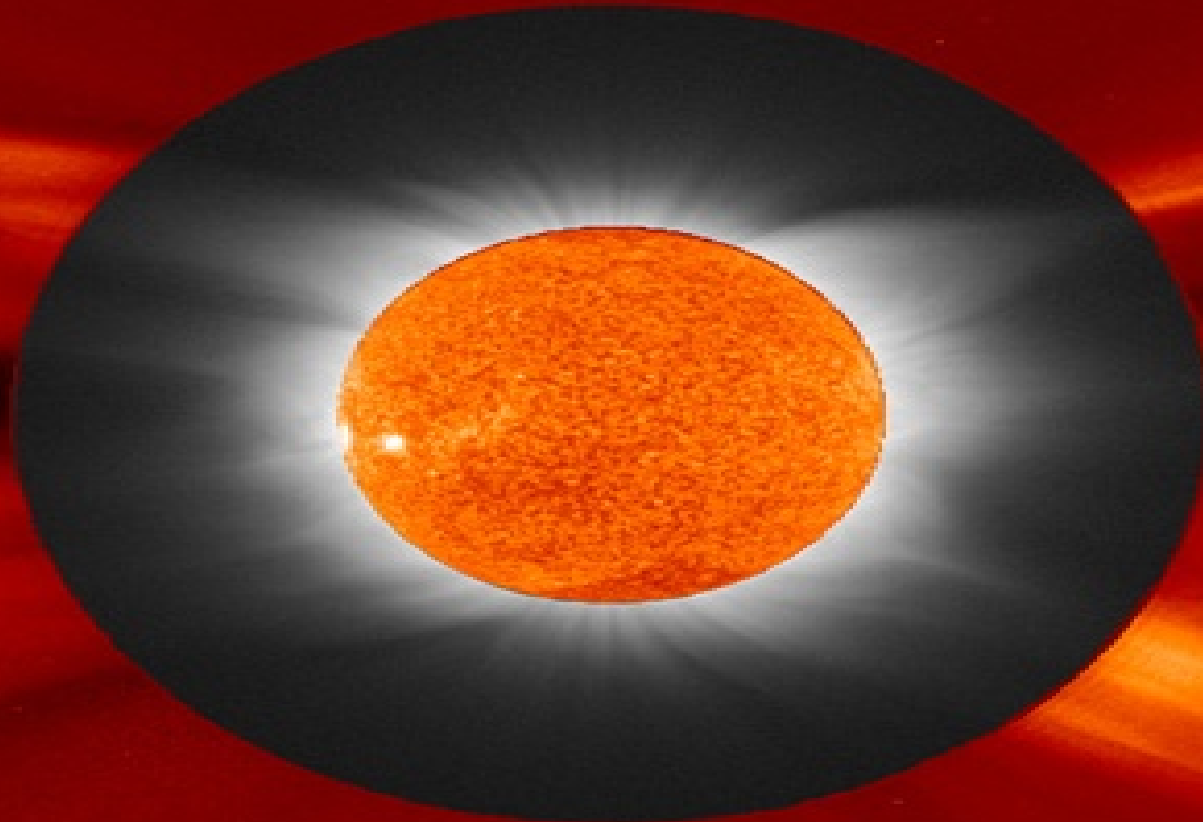
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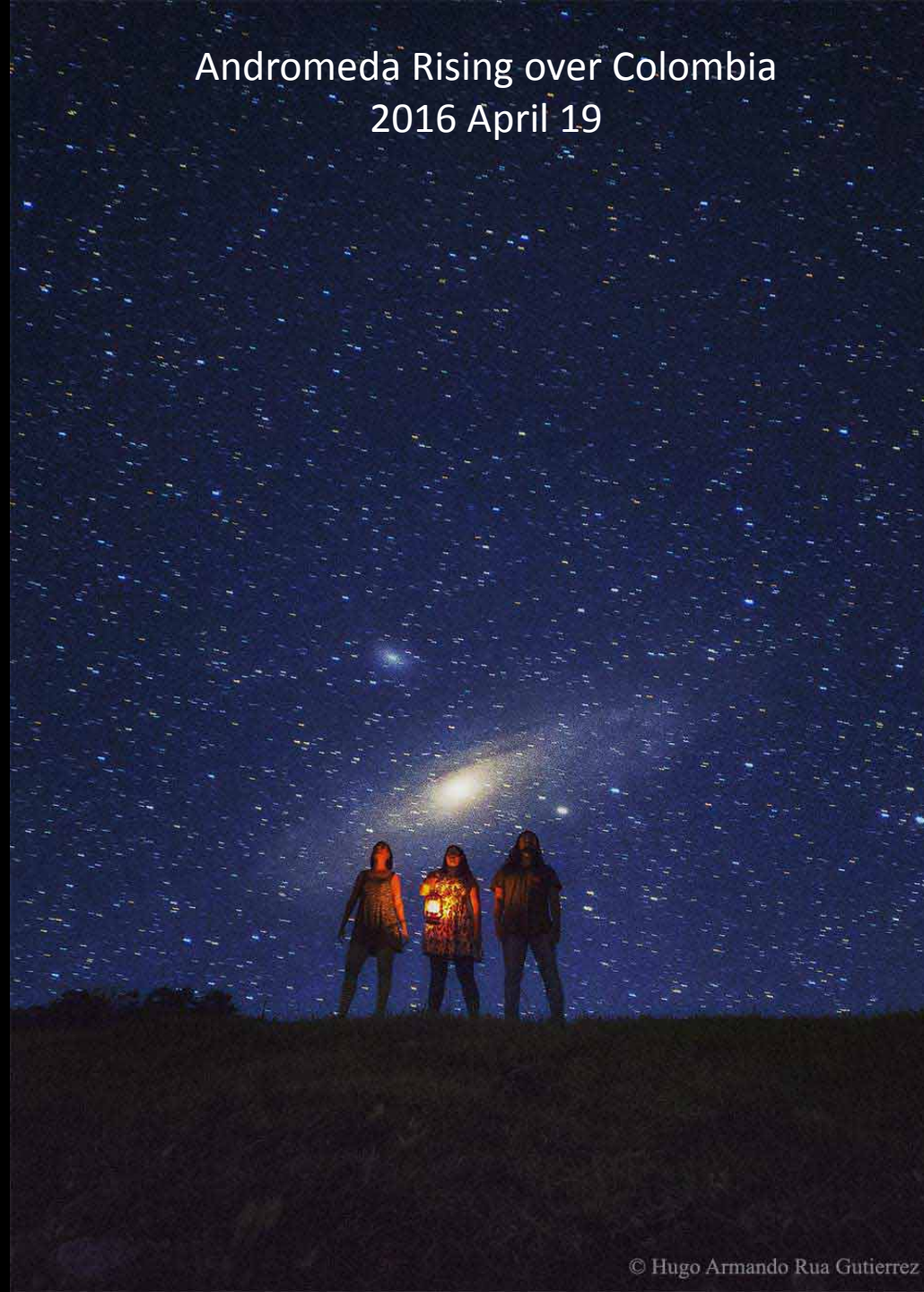
Solar Eclipse and SOHO

Credit: 2006 Team - Williams College Eclipse Expedition, NSF, National Geographic,
SOHO Consortium, ESA, NASA / Jay M. Pasachoff

APOD: 2006 March 31



Andromeda Rising over Colombia
2016 April 19



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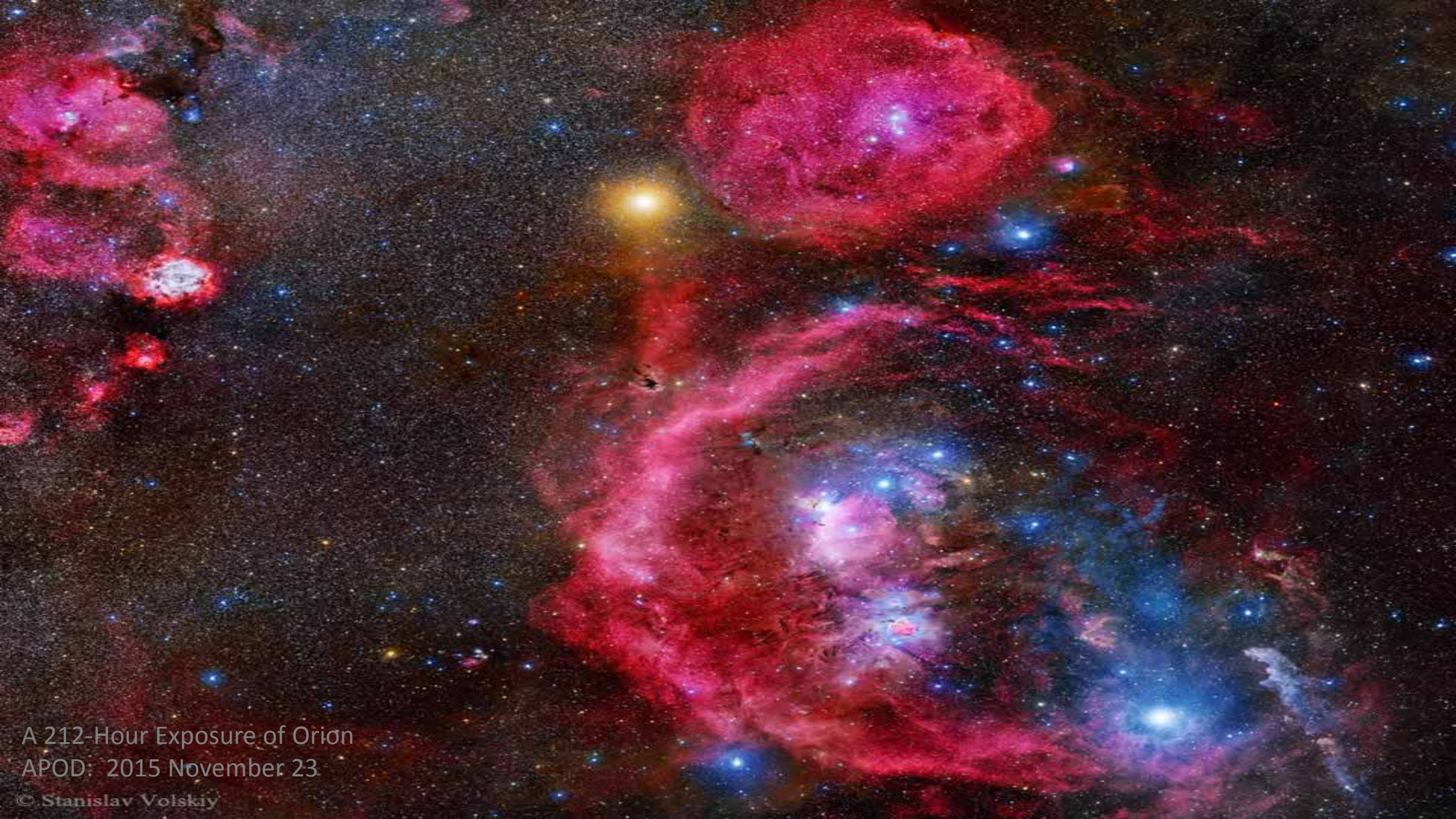
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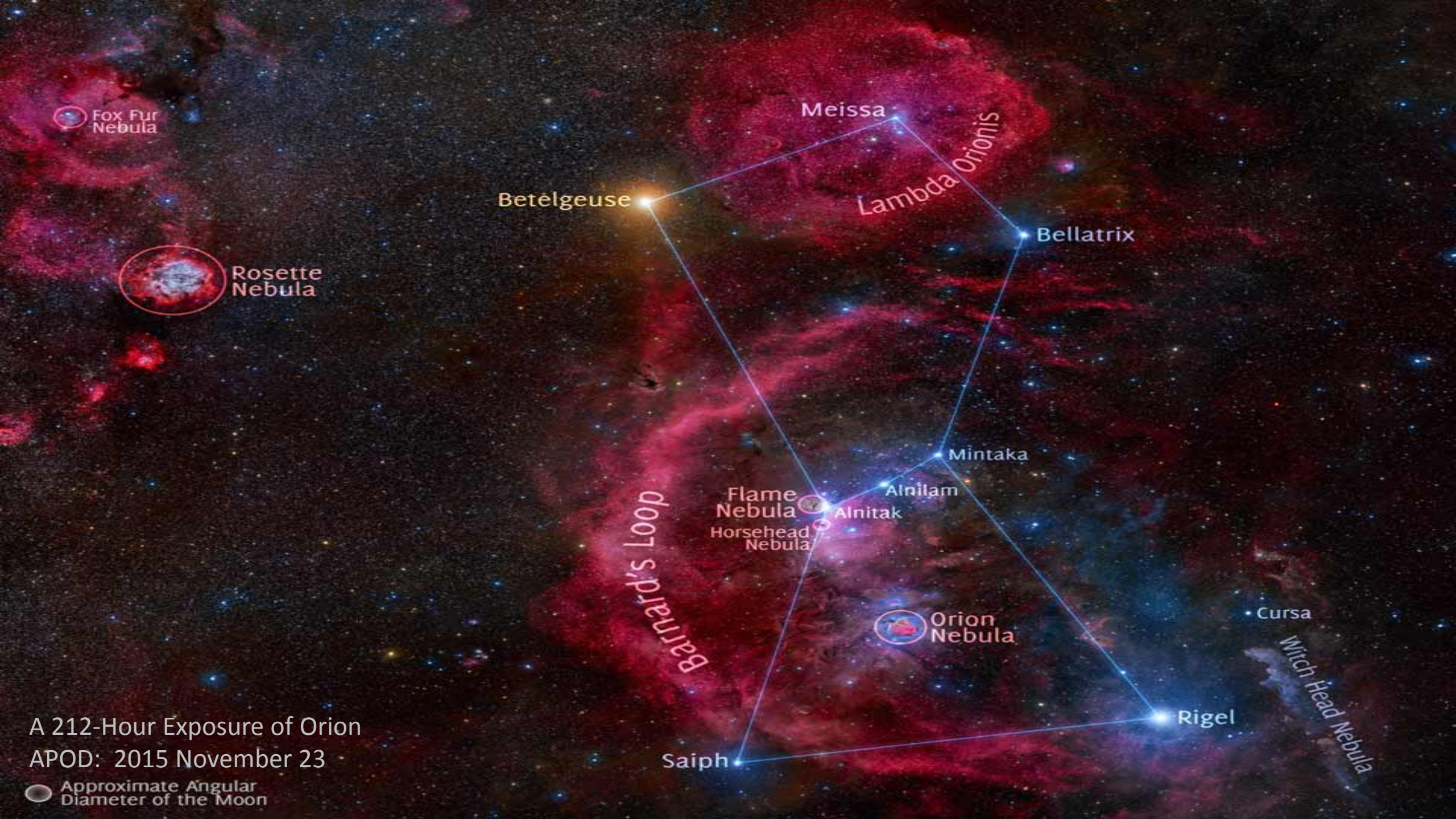
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A 212-Hour Exposure of Orion

APOD: 2015 November 23

© Stanislav Volskiy



Fox Fur Nebula

Rosette Nebula

Meissa

Betelgeuse

Lambda Orionis

Bellatrix

Mintaka

Flame Nebula
Horsehead Nebula

Alnilam

Alnitak

Orion Nebula

Cursa

Witch Head Nebula

Barnard's Loop

Saiph

Rigel

A 212-Hour Exposure of Orion
APOD: 2015 November 23

○ Approximate Angular Diameter of the Moon



The Milky Way Over Tenerife
APOD: 2011 April 5

J.C. Casado (c) starryearth.com



Procyon
 CANIS MINOR
 Christmas Tree Cone Nebula
 M45
 Rosette Nebula
 Jellyfish Nebula
 M43
 Auriga
 Planing Star Nebula
 Capella
 Seaquill Nebula
 Barnard's loop
 Sh2-264
 ORION
 Aldebaran
 TAURUS
 California Nebula
 CAMELOPARDALIS
 M41
 Sirius
 Hyades
 PERSEUS
 Pleiades
 Heart Soul Nebula
 URSA MAJOR
 Polaris
 URSA MINOR
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 Waning Moon
 Cassiopeia
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The Milky Way Over Tenerife
 APOD: 2011 April 5

HOW APOD IS VIEWED

- ~ 1,000,000 see the main image
- ~ 25 percent of those will read the title (250,000)
- ~ 25 percent of those will read the caption lead (62, 500)
- ~ 25 percent of those will read the entire caption (15,625)
- ~ 25 percent of those will follow at least one of the educational links (3,906)
- ~ 25 percent of those will follow most of the links (976)

- ~ 100 percent will notice, eventually, if the overall quality goes down

- Takeaway: **create public outreach presentations with a similar pyramid** in mind

HYPERLINKS

- Hyperlinks are a third dimension
 - I picture them as skyscrapers standing out of the page
- Links help students understand background (example: [Colombia](#))
- Links help teachers explain hard concepts (example: [redshift](#))
- Links help astronomers find papers (example: ADS)
- Links help everyone to explore (example: A walk up a volcano video)
- Links for comic relief (example: silly cats)

SUMMARY: POSSIBLE OUTREACH LESSONS LEARNED FROM CREATING APODS

- Have a popular hook and/or venue
- Communicate on many educational levels
- Leverage current events, local culture
- Be inclusive of anyone with sincere interest
 - Actively work to include and appeal to people of any race, creed, color, sex, age, orientation, etc.
 - Do not encourage trolls
- Show your interest and have fun – fun is contagious