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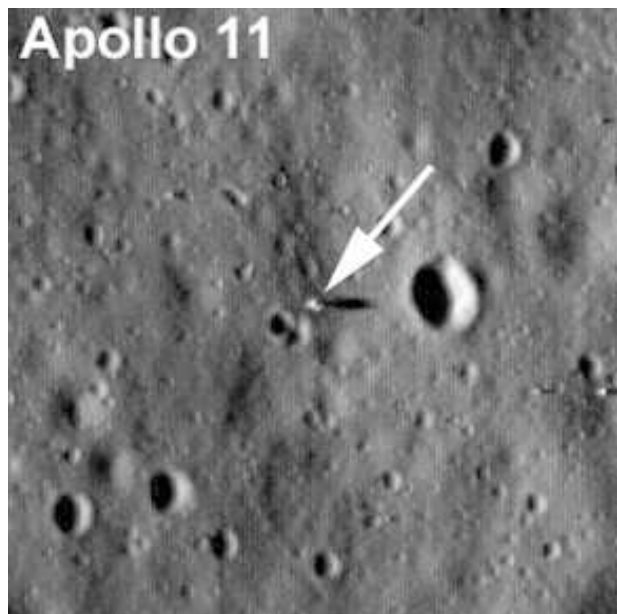
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You can almost see Neil's foot print! (Credit: NASA/LRO).

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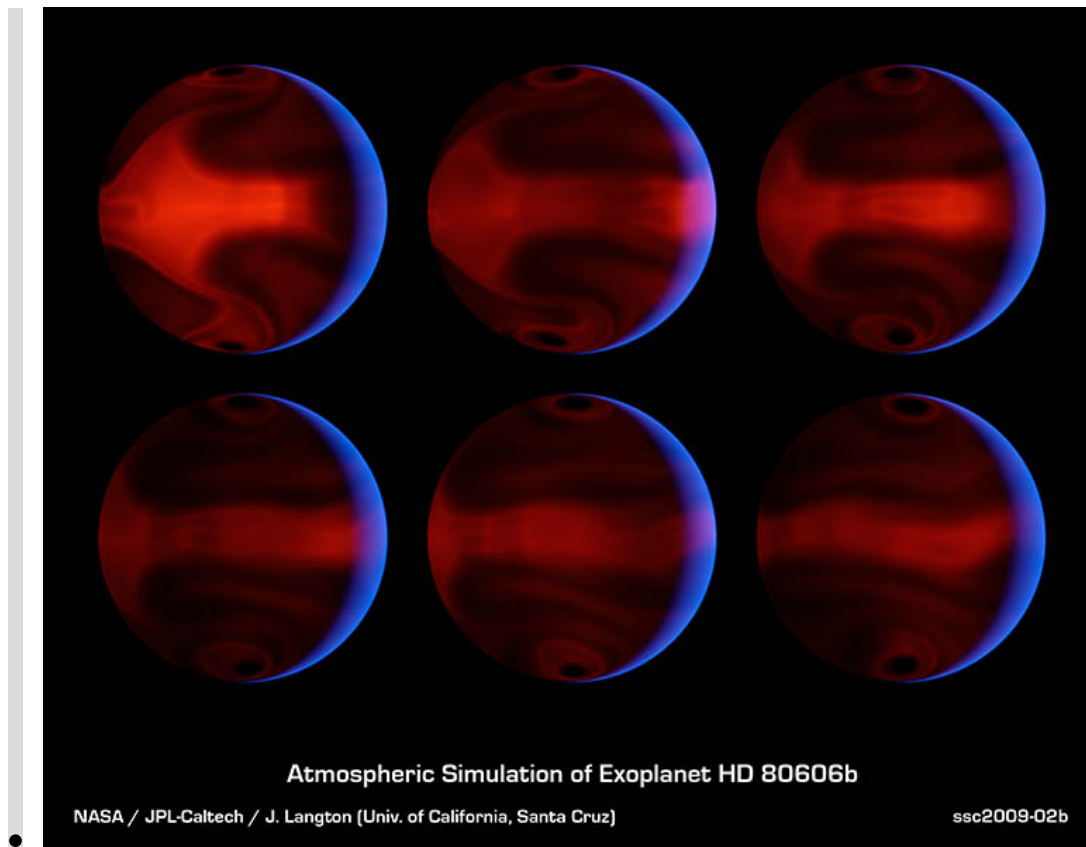
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- **The LRO Photographs the Apollo landing sites:** Fans of this space may have noticed the racy lunar pics we ran a week back as part of our *From Earth to the Moon* review. The Lunar Reconnaissance Orbiter did indeed snap pics of the famous [Apollo landing sites](#) last month. These clearly show the hardware left at multiple sites, as well as the base(s) of the Lunar Lander ascent stages, complete with shadow. You can even see the astronaut's foot trails in the lunar dust! And the LRO hasn't even entered its cruising orbit yet... expect more great pics to come!



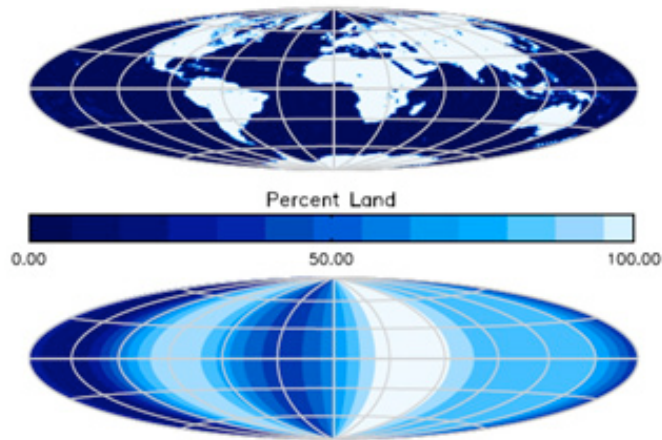
Spitzer captures Extra-planet weather! (Credit: NASA/JPL/J. Langton).

A “Cool” telescope heats up: One of the great orbiting observatories of our era is wrapping up its primary mission. The [Spitzer Space Telescope](#) has used up the remainder of coolant it carries and will now function through its final years in the near-infrared only. Placed in a receding Earth trailing solar orbit, Spitzer is out of range for a Hubble style repair mission. Without its on-board supply of liquid helium, Spitzer's detectors have warmed up to “only” 31 kelvins. Launched in 2003, Spitzer has outperformed all expectations, spotting possibly the youngest star ever seen, IR light (and weather patterns!) on a “hot-Jupiter,” and yet more evidence that our galaxy is indeed a barred one... Spitzer may just well prove to be the greatest space telescope that you've never heard of!



A Galactic core survey in X-rays...(Credit: Chandra/Harvard/D. Wang).

Galactic X-Ray Mystery Solved?:...and speaking of orbiting observatories, Spitzer's X-ray twin, Chandra, has made stunning discoveries of its own... one of which is a long standing problem with [X-ray emissions](#) along the galactic plane. Specifically, a "Galactic ridge" outlined by X-ray emissions has been observed over the last few decades extending 2 degrees above and below and 40 degrees to either side of the galactic plane. Chandra can resolve these sources in greater detail to spot no less than 473 distinct x-ray sources dotting the galactic core. Possible suspects include magnetically active white dwarfs. These visually span a selected study patch about 3% the apparent size of a Full Moon.



An Alien view of Earth? (Credit: NASA/Nicholas Cohen).

The Earth through Alien Eyes: Ever wonder if E. T.s looking at our solar system could detect *us*? The results might surprise you... in the visible spectrum, markers such as free oxygen and methane (produced largely by bovine flatulence!) may be their first clues that something interesting is transpiring on Earth. Now scientists at NASA have re-assigned the [Deep Impact](#) probe to look back at Earth, perhaps mimicking what we would see from light years away. This sort of study will be useful as we identify Earth-like candidates in the decades to come. Shrinking the rotating gibbous Earth to a single blue-white pixel, scientists were able to construct a basic "strip map" as the planet turned on its axis. While at first not very amazing, this would reveal a dynamic world of clouds, land, and sea, not the boring homogeneity of other terrestrial planets such as Venus or Mars. On this scale, the proposed ATLAST space telescope, armed with a 16-meter mirror, could map Earth-like worlds up to about 30 light years away. Intelligent bovine species, take note...



The VLA in its "Y" config! (Credit: NRAO/Dave Finley).

Uncovering millisecond pulsars: Pulsars present a mystery in radio astronomy. Remnants of massive supernovae, these rotating beacons generally spin down over millennia. A sub-class, however, known as [milli-second pulsars](#), seem to be actually *sped up*, rotating hundreds of times a second. Now, scientists at the Green Bank Radio Telescope and the Very Large Array in Socorro, New Mexico may have caught one in the act; J1023, a pulsar in a binary system about 4,000 light-years distant. Snapshots in 1999, 2000, and 2002 show a rapidly evolving system, a seemingly sun-like star gradually revealing itself through a fading accretion disk to be a millisecond pulsar spinning at 592 times per second. The dumping of accretion material by a companion star has long been thought of as the culprit in the spin up, via the law of conservation of angular momentum. This is, however, the first time astronomers have actually witnessed such a beast in action. J1203 is orbited by its companion once every 4.75 hours.

- **Pinning down Type 1a supernovae:** When we're talking extra-galactic distances, Type 1A supernovae have become the coin of the realm. These supernovae behave in a well known fashion and provide a method to compare and measure the distance to their host galaxies. Now researchers at the Laboratory of Nuclear and High-Energy Physics in Paris have combed data from the Nearby Supernova Factory to produce a quicker and more accurate method to pin down cosmic distances; known as the [642/443 method](#) due to the wave lengths it compares, it has a margin of error of 6% and can be done based on the spectra collected in a *single night*. It is also independent of interference by

galactic dust. This method will go a long way towards smoothing out the Hubble Constant as well as the effects of dark energy on the expansion of the universe.

- **Dark Matter(s):** Not to be outdone, astronomers at the Supernova H0 for the Equation of State (SHOES) team have pegged down an even older and more cherished [cosmic yard stick](#); Cepheid variables. This particular class of variable star changes luminosity in a predictable way, and if they can be identified in nearby galaxies, intrinsic distances can be known. Using the Hubble Space telescope, the SHOES team has refined this yard stick to some very distant galaxies and in the process brought the expansion rate of the universe, known as the Hubble Constant, down to 74.2 km per second per mpc, within a factor of plus or minus 3.6. This in turn will hopefully paint a picture of how dark energy has played a role in speeding up the expansion of the universe.



M31 in Infrared...our twin? (credit:K.Gordon/JPL).

Towards a Better, “Beefier” Milky Way?:(Jan 25) One thing has become clear over the last decade; we don’t live in your father’s Milky Way galaxy. New astrometry [results](#) conducted with the Very Long Baseline Array have revealed that our galaxy is rotating about 270 kilometers per second, 15% faster than was previously thought; this fact may mean something startling; our galaxy may be on the order of size of our neighboring Andromeda galaxy! Its a shame someone “over there” can’t email mail us a snapshot of ourselves... this study used the parallaxes of 18 radio sources to conduct the survey. And the baseline utilized is VERY long... think from Hawaii to New Hampshire! And now there’s pretty good evidence (see above) that we’re a barred spiral to boot... of course your grandfather’s Milky Way was thought to be the *entire universe*!

- **Launches for August:** The big launch on the ticket out of the Kennedy Space Center (KSC) is the Shuttle *Discovery* on STS-128 for Aug 25th (a predawn launch!) Unfortunately, the much anticipated first unmanned test flight of the Ares X-1 slipped to the 31st of October . And it was almost starting to seem *real* now! Next door at the Cape, a Delta 2 will launch another NAVSTAR satellite on the 17th.

Another classified launch at the Cape occurs on the 12th. Be sure to check [Spaceflight Now](#) for all of the latest updates!

- **Astro-Blooper of the Month:** An oldie but goodie came back to my attention re-watching the *Star Trek: Enterprise* series finale; in a key scene, Enterprise races towards Mars as a comet streaks towards the Red Planet... the tail, however, is facing the wrong way! With a gibbous Mars giving away the Sun's position off to the right of the viewer, the tail should have been streaming off to the *left*. It's bizarre, I know, but solar wind sweeps the comets tail away from the nucleus, often *ahead* of its own orbit!

This Month in Astro-History: On August 12, 1977 the 1st free flight of a Space Shuttle was conducted at the dry lake bed test facility at Edwards AFB. The shuttle was [Enterprise](#), which was initially intended to eventually be retrofitted for space flight but of course, never flew in space. It currently resides at Smithsonian's Steven F. Udvar-Hazy Center at the Dulles Air Port. And to think, I'm actually old enough to remember watching this short flight!.

- **Quote of the Month:** The universe is full of magical things patiently waiting for our wits to grow sharper.”
- “A Shadow Passes”

- - Eden Phillpotts

Tags: [apollo](#), [chandra](#), [dark matter](#), [deep impact](#), [enterprise](#), [lro](#), [milky way](#), [pulsar](#), [spitzer](#), [star trek](#), [STS-128](#), [type 1a supernova](#)

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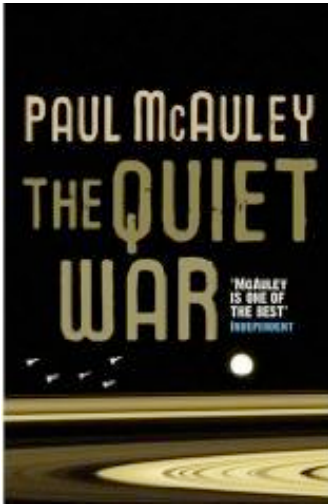
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- [Astroguyz: http://bit.ly/4BgR73](http://bit.ly/4BgR73) Saturn's rings edge on to Earth this week; Saturn is very low in the dusk sky.

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