

Cosmology/Astrophysics News

Parker Solar Probe

January 22, 2020 for Rose City Astronomers SIG

<http://101iq.com/RCA>

Science – November 15, 2019

- New form of carbon might be used as reflective coating in telescope mirrors
 - <https://science.sciencemag.org/content/366/6467/782.abstract>
- Generation of solar spicules and subsequent atmospheric heating
 - <https://science.sciencemag.org/content/366/6467/890>

Nature – November 21, 2019

- Hayabusa2 craft departs asteroid Ryugu and will return with sample at the end of 2020
- Cassini photos of Titan assembled as full map
 - <https://www.nature.com/articles/s41550-019-0917-6>
- Second interstellar visitor “Comet 21/Borisov”
 - <https://www.scientificamerican.com/article/two-interstellar-intruders-are-upending-astronomy/>
- Extreme emission seen from gamma ray bursts
 - <https://www.nature.com/articles/d41586-019-03503-6>
 - <https://www.nature.com/articles/s41586-019-1750-x>
 - <https://www.nature.com/articles/s41586-019-1754-6>
 - <https://www.nature.com/articles/s41586-019-1743-9>

Science – November 22, 2019

- How a moon of Saturn got its stripes
 - <https://arxiv.org/abs/1911.02730>
- MU69 (Ultima Thule) renamed “Arrokoth”
- Bold plan to retrieve Mars samples takes shape
 - <https://science.sciencemag.org/content/366/6468/932>

Nature – November 28, 2019

- Articles on OSIRIS-Rex mission to Bennu
 - <https://www.nature.com/collections/jibgaighje>
- Articles on Black Holes
 - <https://www.nature.com/collections/dbechdjfig>
- Articles on Fast Radio Bursts
 - <https://www.nature.com/collections/rswtktxcln>
- Star – Black hole system found by measuring motion
 - <https://www.nature.com/articles/s41586-019-1766-2>

Science – November 29, 2019

- European Mars rover in a race against time to fix parachutes

– [https://www.sciencemag.org/news/2019/11/european-mars-rover-race-against-time-fix-parachutes\](https://www.sciencemag.org/news/2019/11/european-mars-rover-race-against-time-fix-parachutes)

Nature – December 5, 2019

- Supernova 1987A's neutron star location narrowed
 - <https://www.sciencedaily.com/releases/2019/11/191119105545.htm>
- Parker Solar probe early findings reveal fast rotating wind
 - <https://www.nature.com/articles/d41586-019-03684-0>
- Accretion of a giant planet onto a white dwarf star
 - <https://www.nature.com/articles/s41586-019-1789-8>

Science – December 6, 2019

- NASA's OSIRIS-Rex craft's close-up view of Bennu, an active asteroid
 - <https://science.sciencemag.org/content/366/6470/1192.summary>
 - <https://science.sciencemag.org/content/366/6470/eaay3544/tab-figures-data>

Nature – December 12, 2019

- NASA's Parker Solar Probe early results
 - <https://science.sciencemag.org/content/366/6470/eaay3544/tab-figures-data>
 - <https://www.nature.com/articles/s41586-019-1811-1>
 - <https://www.nature.com/articles/s41586-019-1813-z>
 - <https://www.nature.com/articles/s41586-019-1807-x>
 - <https://www.nature.com/articles/s41586-019-1818-7>

Science – December 13, 2019

- Type II supernovae from binary stars
 - <https://science.sciencemag.org/content/366/6471/1325.4>
 - <https://www.aanda.org/articles/aa/abs/2019/11/aa35854-19/aa35854-19.html>
- Mapping winds in Mars' upper atmosphere
 - <https://science.sciencemag.org/content/366/6471/1363>

Nature – December 19/26, 2019

- Earth's magnetic field is older than we thought.. Now at least 3.7 billion years old (instead of 3.5)
 - <https://www.nature.com/articles/d41586-019-03807-7>
- Marsquakes reveal red planet's hidden geology – 300 quakes sensed by NASA's InSight lander
 - <https://www.nature.com/articles/d41586-019-03796-7>
- A statistical solution to the chaotic non-hierarchical three-body problem
 - <https://www.nature.com/articles/s41586-019-1833-8>

Nature – January 2, 2020

- Galaxy cluster illuminates the cosmic dark ages – 370 million years after the Big Bang
 - <https://www.nature.com/articles/d41586-019-03893-7>
 - <https://www.nature.com/articles/s41586-019-1829-4>

Science – January 3, 2020

- **Japan boosts neutrino efforts**

Japan is expanding neutrino research to better understand properties of the phantom particles and the cosmic processes that produce them. This spring, scientists will increase the sensitivity of the 22-year-old Super-Kamiokande neutrino observatory by doping water in its observation chamber with the rare-earth metal gadolinium. The detector will then watch for signals generated when neutrinos from supernovae hit the water, providing clues about the dynamics within those exploding stars. Japan's legislature is expected to fund an even bigger step: construction of the 72 billion Japanese yen (\$660 million) Hyper-Kamiokande. Ten times larger than its predecessor, it will capture that much more data about neutrinos emanating from the Sun, distant stars, and supernovae.

- **Dueling dark matter detectors**

The race to detect hypothetical particles of dark matter—the invisible stuff that binds together the galaxies with its gravity—enters a new phase this year with the startup of two powerful new underground detectors. Since the 1980s, physicists have used ever bigger and more sensitive ones to search for so-called weakly interacting massive particles (WIMPs), theorized to weigh 100 times as much as protons and to interact with other matter only through the feeble weak nuclear force. This year, the XENON-NT detector, which contains 8 tons of frigid liquid xenon, will turn on in the subterranean Gran Sasso National Laboratory in Italy. At the Sanford Underground Research Facility in South Dakota, the LUX-ZEPLIN (LZ) detector, which contains 10 tons of liquid xenon, will also power up. If XENON-NT and the LZ see nothing in the next few years, dark matter hunters could push for bigger WIMP detectors or set their sights on other hypothesized forms of dark matter. The Italian lab's future also remains uncertain, as former lab officials face prosecution for allegedly allowing contamination of local drinking water.

Nature – January 9, 2020

- Not all fast radio bursts are created equal
 - <https://www.nature.com/articles/d41586-019-03894-6>
 - <https://www.nature.com/articles/s41586-019-1866-z>

Science – January 10, 2020

- Neutron star properties

- https://iopscience.iop.org/journal/2041-8205/page/Focus_on_NICER_Constraints_on_the_Dense_Matter_Equation_of_State

Nature – January 16, 2020

- Earth-sized exoplanet found in habitable zone
 - <https://www.nature.com/articles/d41586-020-00014-7>
- SpaceX test black satellite
 - <https://www.scientificamerican.com/article/spacex-tests-black-satellite-to-reduce-ldquo-megaconstellation-rdquo-threat-to-astronomy/>
- 6 dust-enshrouded objects orbiting the Galactic black hole
 - <https://www.nature.com/articles/s41586-019-1883-y>

Miscellaneous

- Next meeting February 19, 2020
- Happy New Year.