
Science & Technology Briefs

ESA Ends Cooperation With China Manned Space Agency and Space Station

In 2015, the European Space Agency (ESA) signed an agreement with the China Manned Space Agency. A core group of ESA astronauts took up learning Chinese, and in August 2017, two ESA astronauts joined 16 Chinese taikonauts for 9 days of sea-survival training.

As [reported](#) Jan. 25 in *SpaceNews*, ESA is no longer planning to send astronauts to China's *Tiangong* space station. The excuse, announced by ESA Director General Josef Aschbacher:

"We are very busy supporting and ensuring our commitments and activities on the International Space Station where we have a number of international partners working together. For the moment we have neither the budgetary nor the political, let's say, green light or intention to engage in a second space station; that is, participating on the Chinese space station."

Aschbacher did not address potential ESA involvement in China's planned International Lunar Research Station, a project involving Russia.

According to a Feb. 7 [posting](#) on *Ars Technica*, in mid-2018 Alain Charneau, then CEO of ArianeGroup, had talked of how Europe must resist U.S. efforts at space dominance:

"Europe is not going to say, 'I want to dominate the space world'. Europe wants access to space. Europe wants to have their own infrastructure in space, with Galileo and *Copernicus*. We seek cooperation."

An [article](#) in the Feb. 12 *Global Times* reports what happened: ESA's

decision to quit *Tiangong* was taken under pressure from the U.S.

When the ISS reaches the end of its life, *Tiangong* will most likely be the only station in Earth orbit. Dozens of developing countries have already joined in the Chinese program.

Time To Recall Russia's 1992 Joint Russia-U.S. Defense System Proposal

[Documents](#) released Jan. 30 by the National Security Archive provide a glimpse into the first post-Soviet meeting of Russian and U.S. leaders. Most interesting was the three-part proposal from Russian President Boris Yeltsin to U.S. President George H.W. Bush, presented at their Feb. 1, 1992 meeting at Camp David. After a private meeting, both sides gathered with other high-level officials. Yeltsin had brought with him Yevgeny Velikhov, Vice President of Russia's Academy of Sciences.

Yeltsin first proposed that the two countries could begin by cutting the number of their nuclear warheads in half. Next, that the uranium in the warheads would be re-purposed, in facilities located in both countries, to provide fuel for a massive expansion of peaceful nuclear energy. Beyond this proverbial transforming of swords into plowshares, Yeltsin laid out the larger mission:

"[L]et's discuss our proposal for joint creation of a global defense system. The purpose is not to *compete* in creation of a space system like SDI. We have experience in space research, and we have good nuclear weapon experts. We would like to float the idea, and discuss in general, establishing a joint global defense system with joint manufacturing."

"Your and our research could be combined on space-based systems of command and control and communications. We could have a joint project. This would be much cheaper for both of us and would be a measure of trust between us. It would remove all suspicions. If we could announce today that we are no longer enemies and that we seek to be allies, that would herald a new era in relations between the U.S. and Russia."

Yeltsin wanted their joint statement to reflect their turning from adversaries to allies, and had just spelled out an alliance forged in a joint and large-scale science-driver project. Tragically, Bush insisted that the joint statement refer to a more vague notion of "friendship," explaining that saying "allies" would give the impression that all issues between them had been resolved.

The "Russian SDI proposal" made that day closely modeled the SDI offer that U.S. President Reagan had extended to the Soviets in 1983. The intellectual author of *that* proposal, Lyndon LaRouche, who had conducted backchannel discussions on the SDI with the Soviets on behalf of Reagan's administration, was at that time in prison, in large part because of his getting Reagan to go for such grand and open diplomacy. Bush, who had his own role in the actions against LaRouche, failed to embrace Russia's SDI offer, and here we are, 31 years later, at each other's nuclear throats.

New Spinoff Companies To Improve on Livermore's Laser Fusion Breakthrough

Several private fusion energy projects are following up on the Dec. 5

laser fusion breakthrough by the National Ignition Facility (NIF) at Lawrence Livermore National Laboratory in California—the first-ever experiment to achieve a net fusion energy gain (of 1.5 to 1), but one using a huge, 30-year-old laser array in a military-purposed facility. The principles demonstrated by the NIF breakthrough can immediately be pushed further by new systems.

Science magazine on Feb. 15 [reports](#) on several such efforts.

Current NIF Director Tammy Ma, as quoted by *Science*: “We don’t know how to build a power plant.” But a former NIF director, Dr. Edward Moses, hopes to start building a test power plant in five years at his California start-up, **Longview Fusion Energy Systems**, using the NIF “indirect drive” approach, directing lasers onto the walls of a capsule and generating x-rays around a fuel pellet within the capsule, but with much more efficient lasers applying more energy at a much higher repetition rate.

Moses: “It’s not hard. The technology is all available, it just has to be integrated.”

The approach used at **Focused Energy**, located in Texas and in Germany, also led by NIF veterans, is to use one laser pulse to compress the fuel, as at NIF, and a second laser to generate a beam of protons onto the fuel just as it reaches maximum compression, to ignite it. Their aim is a demonstration plant in the early 2030s.

A third new company, **Fast Light Fusion** in the UK, is trying to use a high-speed projectile instead of a laser to implode the fuel, akin to the approach of Canada-based **General Fusion**.

In *Science* and in other reports surveyed on these startups, the NIF’s breakthrough of using a strong magnetic field around the fuel capsule as the fuel is ignited—to maintain com-

pression and fuel density—continues unmentioned.

Low-Dose Radiation Yields Dramatic Improvement for Alzheimer’s Patients

Reports from the principal investigators, neurology websites, and Canadian national [media](#) (CTVNEWS) tell the story of an 80-year-old patient in hospice with Alzheimer’s Disease (AD) who showed immediate improvement in cognition, speech, movement, and appetite after receiving ionizing radiation to her brain from repeated CT scans in 2015. She did so well that she was discharged from hospice to long-term care.

Based on this case, a small pilot clinical trial, carried out in 2020 by Baycrest-Sunnybrook in Toronto, examined the effect of low-dose ionizing radiation (LDIR) on severe AD. Five individuals living with severe AD were given three treatments of low-dose radiation (CT scans) spaced two weeks apart. Results were published in the *Journal of Alzheimer’s Disease*.

Remarkably, three of the five showed improvements within one day of the first treatment! Their relatives reported increased alertness and responsiveness, recognition of loved ones, mobility, social engagement, mood, and more.

Lead author and driving force behind the study, Dr. Jerry Cuttler, a retired Atomic Energy of Canada scientist, wrote:

“Numerous neurological disorders, including AD, are thought to be caused in part by oxidative stress that damages all cells, including those in the brain. We have natural protection systems to combat the damage, but they become less effective as we get older. Each dose of radiation stimulates our natural protection systems to work harder—to

produce more antioxidants that prevent oxidative damage, to repair more DNA damage and to destroy more mutated cells.”

Webb Telescope Discovers Earliest Galaxies Now Known

An international team of astronomers has used near infrared (NIR) data from the James Webb Space Telescope (JWST) to study galaxies whose light has taken more than 13.4 billion years to reach Earth, making them the earliest galaxies now known.

The European Space Agency [reported](#) on this major milestone in the pages of *SciTechDaily* Feb. 13:

“The investigation of the faintest and earliest galaxies was the leading motivation behind the concepts for these instruments [NIRCam and NIRSpec]. In 2015 the instrument teams joined together to propose the JWST Advanced Deep Extragalactic Survey (JADES), an ambitious program that has been allocated just over one month of the telescope’s time spread over two years, and is designed to provide a view of the early universe unprecedented in both depth and detail. JADES is an international collaboration of more than 80 astronomers from ten countries.”

“The JADES program began with NIRCam, using over 10 days of mission time to observe the field in nine different infrared colors, and produced exquisite images of the sky. The region is 15 times larger than the deepest infrared images produced by Hubble, yet is even deeper and sharper at these wavelengths. The image is only the size of a human viewed from a mile away. However, it teems with nearly 100,000 galaxies, each caught at some moment in their history, billions of years in the past.”