

---

## Science & Technology Briefs

---

### World's Highest Automatic Weather Station

On May 4, twelve scientific researchers from the Institute of Tibetan Plateau Research at the Chinese Academy of Sciences, with the aid of some very experienced Tibetan mountain climbers, installed an automatic weather station at 8,849 meters, on the very peak of Mount Qomolangma (Mount Everest, as it is known in the West). It replaces the station set up at 8,430 meters by British and U.S. scientists in 2019. Eight elevation-gradient meteorological stations were also set up from 5,200 to 8,800 meters.

Collecting and studying data from these stations at this altitude above sea level will yield valuable insights about the condition of local glaciers and mountain snow melt, the water source for more than 10 major rivers in Asia that nurture more than 2.5 billion people. It will also help scientists monitor and understand the global monsoon system and other important weather mechanisms so that experts and policy-makers can make informed decisions regarding changes in the climate, biodiversity preservation, and development. Studies will be conducted to monitor pollutants, and changes in the Rongbuk glacier and in the ice lake.

Medical studies will be conducted on the researchers themselves to explore the impact of an ultra-high altitude environment on human health. This expedition is the largest since surveys of the Qinghai-Tibet Plateau started in 2017.

Just a few days later, on May 19, a team from the National Geographic Society placed an automatic weather station at 8,830 meters.

---

### Artificial Rain-Making Experiment to Prevent Forest Fires

As [reported](#) June 3 by Interfax, the Russian government will conduct an experiment later this year in artificially inducing precipitation to prevent forest fires, according to an agreement worked out with the Republic of Sakha (Yukutia), an arid region where 80% of all wildfires in the Russian Federation originate. Yukutia is in the Russian Far East, is bordered on the north by the Arctic Ocean, and covers 3 million square kilometers. The authorities are to report the results of the experiment back to President Putin by Dec. 15.

Envisioned are aircraft for artificial inducement of precipitation not just after fires break out, but also to prevent fires. A Yak-42 cloud-seeding aircraft has already arrived in the region and will be joined later by an Antonov An-30. After years of neglect since the collapse of the Soviet era's forestry maintenance, forestry is finally again getting the attention it is due.

---

### In Case of Thermonuclear Attack

Have you been wondering what to do in case of a thermonuclear attack? On July 11, New York City's Emergency Management office issued a helpful public service [announcement](#) outlining "three important steps" for you to take: (1) "Get inside fast." (2) "Stay inside with doors and windows closed. If you were outside during the blast, get clean immediately. Remove clothing and shower with soap or shampoo." (3) "Stay tuned. Follow

media for more information. Don't go outside until officials say it's safe."

What is behind this attack of pollyana fantasy propaganda? Are citizens being encouraged to think that thermonuclear war may be acceptable to maintain U.S. hegemony? What does the average citizen actually know about thermonuclear war and the "nuclear winter" that would follow? Perhaps citizens should heed the words of former U.S. Secretary of Defense William Perry in this slightly dated (2017) [interview](#). The risk is much greater now. The better course: Stop the war drive.

---

### 'Water for Life' Project Proposed in Italy

Italian farmers' associations have reported that due to extreme drought, Italy has already lost 30% of its agricultural production. On July 25-30 there will be no more water for irrigation in Lombardy, declared President of Lombardy Attilio Fontana.

In this context, Italy's largest construction and engineering company, Webuild, has launched a project to defeat the water crisis with a network of medium-sized desalination plants. Webuild SpA proposes to invest €2.5 to 3 billion to build 16 such plants that could be operational in two years. Webuild CEO Pietro Salini said the group will soon present the project to the government under the United Nations' "environmentally sustainable" Water for Life umbrella program.

The Webuild Group, a global leader in infrastructure in sectors like water, is active in the entire water cycle, from the supply of drinking and irrigation water, to the treatment of wastewater. Through its associated company, Fisia

---

Italimpianti, Webuild is a leader in planning and construction of plants for treating water and desalination, with a production equal to six million cubic meters per day of treated water, satisfying the daily needs of a combined total of 20 million people throughout the world. The Group was also behind the construction of a very complex plan in Nevada in 2016 to guarantee the Las Vegas water supply. It included a hydraulic tunnel called Intake No. 3 at Lake Mead, which is now ready to go into service whenever a lowering of the surface level of the artificial lake puts at risk the needs of nearly two million residents in the city and surrounding area.

Webuild is also the general contractor for the Messina Bridge, a project that had been canceled by the Monti government in 2011, but which Webuild insists it can build, even *without* public funds, if a political decision is taken.

---

## Radiation Hormesis During Deep Space Travel

Krzysztof W. Fornalski of the National Centre for Nuclear Research (NCBJ), in Otwock, Poland, has addressed the challenging issue of radiation adaptation and radiation resistance during deep space travel in his recent [paper](#) published May 5 in the *Journal of Space Safety Engineering*.

Fornalski states that a pre-exposure to low-level radiation (e.g., the perpetual galactic cosmic rays, GCR) induces an adaptive response (hormesis), which can enhance DNA repair, improving astronauts' health and making them more resistant to unpredictable fluxes of highly energetic particles.

---

## A Space Drag Sail To Get Rid of Space Junk

Chinese scientists at the Shanghai Academy of Spaceflight Techno-

logy announced July 6 the launch of a first in space, a "space drag sail," which is made to clear space junk out of orbit. It is but one-tenth the thickness of a human hair and 25 square meters in area. It attached itself to the rear of a spent Long March rocket that was floating around in orbit, spread out, and created enough drag to slow the rocket down and accelerate its fall into the atmosphere for burn-up.

Today, over 30,000 objects in low-Earth orbit are being tracked by the European Space Agency's Space Debris Office, most no longer operational, reported *Newsweek* in a July 7 [article](#) on the invention. It is estimated there are around a million objects whizzing about that are too small to track, but not too small to cause significant damage to, or complete destruction of a space station or satellite, upon which Earth's civilization depends.

---

## Fusion Plasma Stable at 75 Million Degrees Centigrade, TAE Technologies Reports

In a July 19 [press release](#), plasma physicists at TAE Technologies (formerly Tri Alpha Energy, Inc.) announced they have achieved temperatures greater than 75 million degrees Centigrade with their fusion reactor named Norman. The temperature of the Sun's core is said to be 15 million degrees.

Unveiled in 2017, Norman was initially designed to keep the plasma stable at 30 million degrees Centigrade. Improvements have since been made.

Although scientists have achieved fusion, the key goal that has never been reached is a self-sustaining fusion reaction, so that it produces more power than it requires to keep going. For example, the leading type of nuclear reactor design, the toka-

mak, uses power-hungry electromagnets in order to keep the plasma confined.

TAE Technologies was founded in 1998 with the purpose of developing commercial fusion power. Its current model, Norman, uses a field-reversed configuration in a cylindrical chamber, and confinement relies upon a poloidal field. It works by heating hydrogen gas to such temperatures that it becomes a plasma—a gas of positively charged ions, electrons, and the accompanying magnetic field. Norman shoots two clouds of hydrogen plasma together into a central reaction chamber, where the plasma is held in place magnetically, and heated and stabilized by neutral beams.

Despite also needing powerful magnets, TAE says its approach is optimal because it can use a fuel mixture of hydrogen and boron that is expected to maximize the lifetime of the reactor, since very little of the energy released is carried by destructive neutrons.

The machine is huge, measuring roughly 24 meters long, 6 meters high, and weighing about 27 metric tons. It consumes up to 750 megawatts of peak power, comparable to a utility-scale power plant.

TAE announced the temperature milestone as it closed a \$250 million funding round, bringing the total invested to \$1.2 billion. Its next fusion reactor model will be called Copernicus.

Said Michl Binderbauer, CEO of TAE Technologies, in a press release:

"The caliber and interest of our investors validates our significant technical progress and supports our goal to begin commercialization of fusion by the end of this decade. Global electricity demand is growing exponentially, and we have a moral obligation to do our utmost to develop a baseload power solution that is safe, carbon-free, and economically viable."