In The News

“Impossible” cold clouds in Milky Way’s heart

Scientists have discovered dense clouds of cold, neutral hydrogen gas hidden within the Fermi bubbles—giant structures of hot gas extending 50,000 light-years above and below the Milky Way’s center. Using the Green Bank Telescope, researchers found that these clouds are around 10,000 K, over 100 times cooler than their million-degree surroundings. Each cloud contains thousands of solar masses and is located about 12,000 light-years above the Galactic Center. This finding challenges current theories, which predict that cold gas cannot survive in such hot, turbulent environments for more than a few million years. The discovery suggests that the Fermi bubbles are far younger than previously thought—likely less than 5 million years old. Ultraviolet data from the Hubble Space Telescope supports this, showing ionized gas consistent with cold material being heated and evaporated. These cold clouds act like tracers, revealing the otherwise invisible galactic outflow. The results offer new insight into how energy and matter cycle through galaxies, reshaping our understanding of galactic feedback, evolution, and the Milky Way’s recent violent past. ◆

Cheaper, smarter way to capture Carbon Dioxide

Researchers at Georgia Tech, in collaboration with international partners, have developed a more cost-effective and energy-efficient method for direct air capture (DAC) of carbon dioxide by leveraging the cold energy from liquefied natural gas (LNG) regasification. Instead of wasting the extreme cold produced when LNG is warmed for use, the team uses it to chill air, enabling enhanced CO_2 capture with porous materials called physisorbents. This process operates at around −78°C and significantly boosts CO_2 adsorption efficiency. Two materials—Zeolite 13X and CALF-20—showed strong performance, with CO_2 capacities three times higher than traditional amine-based systems and requiring low energy for regeneration. Economic modeling suggests this method could reduce the cost of capturing CO_2 to as low as $70 per ton, down from over $200 in current systems. Because LNG terminals are widespread in coastal areas, this method also expands DAC’s geographical potential beyond dry, cool regions. The research highlights how existing infrastructure can be reimagined to support climate goals and opens up new possibilities for carbon capture materials at cryogenic temperatures. ◆

Tiny winged reptile just changed history

A team led by the Smithsonian has discovered the oldest known pterosaur fossil in North America, dating back over 209 million years to the late Triassic period. Found in a remote area of Petrified Forest National Park in Arizona, the fossil is a tooth-studded jawbone from a small, gull-sized flying reptile—one of the earliest vertebrates capable of powered flight. Named *Eotephradactylus mcintireae,* the new species likely fed on armored fish, as suggested by its worn teeth. The fossil was uncovered by Suzanne McIntire, a longtime volunteer at the Smithsonian's FossiLab, and the species was named in her honor. Published in *Proceedings of the National Academy of Sciences,* the study describes a rich bonebed containing more than 1,200 fossils, including ancient turtles, amphibians, and early reptiles. This site, dating just before the end-Triassic extinction, captures a rare ecosystem in transition as older animal groups faded and newer ones emerged. Located in the Owl Rock Member, the volcanic ash-rich site helps fill critical gaps in the fossil record and offers fresh insight into early Mesozoic life. ◆

Sharks don't just glow blue

A new study has uncovered that the iconic blue color of the blue shark (Prionace glauca) is produced by intricate nanostructures within its skin—offering fresh insights into shark biology and bio-inspired materials. Researchers from City University of Hong Kong found that tiny, tooth-like scales called dermal denticles contain pulp cavities filled with guanine crystals and melanin-packed vesicles. The guanine reflects blue light, while melanin absorbs other wavelengths, creating a vivid and highly saturated blue colour. These nanostructures are organized like "bags of mirrors and absorbers," working together to control light. Using advanced imaging and computational modeling, the team confirmed that subtle changes in the spacing between guanine layers could shift the shark's colour from blue to green or gold. These changes might be triggered by environmental conditions like depth or water pressure, potentially giving sharks a dynamic camouflage system. The findings not only deepen our understanding of shark evolution but also offer promising applications for sustainable design. Structural coloration, unlike chemical dyes, is non-toxic and environmentally friendly—ideal for innovations in marine and optical technologies. ◆