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Astronomy

MAY 2022

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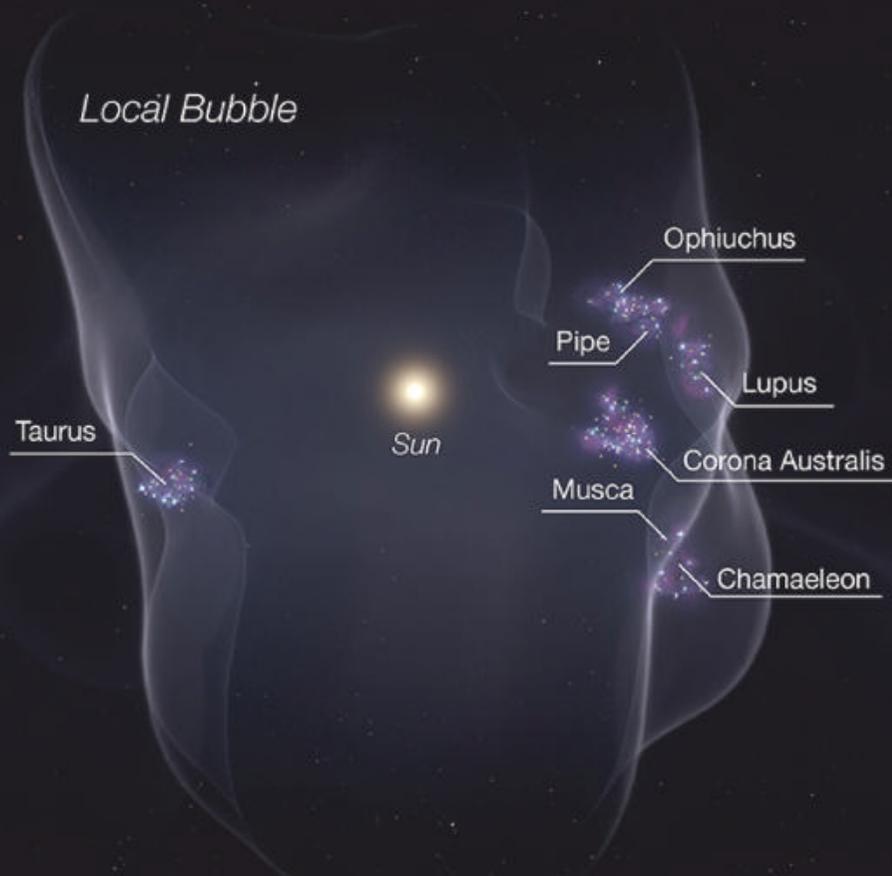
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A 1,000-LIGHT-YEAR-WIDE COSMIC BUBBLE SURROUNDS EARTH

This superbubble is responsible for nearly all nearby star formation.



BLOWING BUBBLES. Astronomers have found that star formation for 500 light-years around Earth is being driven by the expansion of the Local Bubble, seen in this artist's concept. CFA, LEAH HUSTAK (STSCI)

» Think about bubbles, and you may think of soap or gum. But for astronomers, a bubble is something else entirely.

For example, the Sun lies within the Local Bubble — a hollowed-out region of space filled with thin, hot plasma inside a shell of cold gas and dust. For decades, the history and true size of the Local Bubble remained uncertain.

Not anymore. In a paper published Jan. 12 in *Nature*, a team led by Catherine Zucker of the Harvard-Smithsonian Center for Astrophysics outlined a kind of creation story of our stellar neighborhood: The Local Bubble is the result of a series of supernova shock waves, and on its expanding surface lie nearly all the star-forming

regions near our solar system. In other words, the formation of the young stars in our galactic neighborhood were almost all triggered by the shock waves from these exploding stars, whose blown-out remains recombined to birth new suns and solar systems. Zucker calls this realization a “eureka moment.”

The so-called superbubble — which is actually shaped more like a piece of pipe cutting through the plane of the Milky Way — seems to have formed 14 million years ago, propelled outward by some 15 supernovae. The last such supernova took place about 2 million years ago, according to the work.

Zucker presented her team's work Jan. 12 at an online press conference

held by the American Astronomical Society. (The group was set to gather for its annual winter meeting in person in Salt Lake City, but the ongoing COVID-19 pandemic upended those plans.)

BUBBLES UPON BUBBLES

Zucker says that while there are tens of millions of stars inside the Local Bubble that predate the bubble's formation, there are thousands of young stars on its surface that have been birthed by the supernovae.

It just so happens that the Sun and our solar system currently sit inside this bubble. According to the team, the Sun rolled into the Local Bubble about 5 million years ago — and likely has sat in other bubbles at other times.

“This study is really the tip of the iceberg,” says Zucker. “We have clues that not just single superbubbles but the interactions of many superbubbles are driving the formation of young stars near our Sun.”

According to Zucker, the process is like plowing snow: If one or more superbubbles piles up gas in the same region of space, there should be even more star formation where those surfaces intersect.

Luckily, you don't need access to high-end data to connect to this work — you can point your telescope at those local star-forming regions. One is the Taurus Molecular Cloud — a region known to contain young stars with protoplanetary disks, which lies where the Perseus-Taurus Bubble intersects with the Local Bubble. The other is the Rho Ophiuchi complex, a vast stellar nursery in Ophiuchus. Looking into those areas gives you a chance to bear witness to the history and continuation of star birth in our galactic neighborhood. — CHRISTOPHER COKINOS