

Calamity alert: 27 million years out

ASTRONOMERS have revealed that a massive cloud of gas will crash into the Milky Way, but, not to worry, it won't be for another 27 million years or so, and even then, it's unlikely to do much damage to our home galaxy.

Doctoral astronomy student Gail Smith first discovered the Smith Cloud back in 1963 when she detected the radio waves emitted by its hydrogen. New observations by NASA's Hubble Space Telescope indicate the high velocity gas cloud was ejected from the outer regions of our galaxy's disk about 70 million years ago and is now hurtling back toward the Milky Way at a speed of 700,000 mph. At this rate, it is expected to collide with the Perseus arm, one of two major spiral arms of the galaxy, in about 27 million years.

The cloud, the trajectory of which is well known, has been stretched into the shape of a comet by gravity and gas pressure. It is 11,000 light-years long and 2,500 light-years across.

To give you an idea of how large this is, a light-year is the distance light travels in one



AMANDA JERMYN
REACH FOR THE STARS

year, which is almost 6 trillion miles. While the cloud is not visible because the radiation it emits is not in the visible light spectrum, if it were visible in the sky it would have an apparent diameter 30 times greater than the diameter of the full moon.

One theory held that the Smith Cloud had its origins outside the Milky Way, as a failed galaxy or gas from intergalactic space that was captured by our galaxy's gravity. However, new evidence suggests it originated within the Milky Way but was later ejected.

A team of researchers, led by Andrew Fox, an astronomer at the Space Telescope Science Institute in Baltimore, used the Hubble Space Telescope's cosmic origins

spectrograph to examine the cloud's chemical composition. They discovered that it contained about the same amount of sulfur as that found in the outer disk of the Milky Way, suggesting that the cloud formed in this region and was enriched by material from the region's stars.

While there are many other high velocity gas clouds in the vicinity of the Milky Way this is the only one with a well-known trajectory, so there may be others interacting with our galaxy in similar ways. Fox notes: "Our galaxy is recycling its gas through clouds, the Smith Cloud being one example, and will form stars in different places than before."

Why the cloud was ejected is still unknown, though a cluster of supernova explosions has been suggested as a possible trigger. Another mystery is how it has remained relatively intact throughout its long journey. As its trajectory brings it closer to the Milky Way that is starting to change. According to Fox, "The cloud is fragmenting and evaporating as it plows through a halo of diffuse gas surrounding our galaxy. It is basically falling

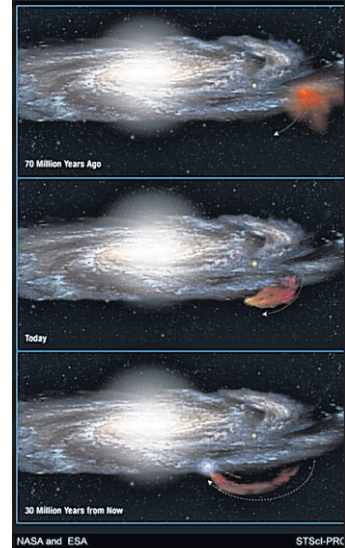
apart. This means that not all of the material in Smith's Cloud will survive to form new stars." However, when the material that does survive collides with gas in the galaxy there should be a dramatic surge in star formation.

The Stars Club and the Springfield Science Museum will host "Stars over Springfield" on Friday at 7:30 p.m. It's an astronomy adventure for the whole family. A fee of \$3 for adults and \$2 for children under 18 will be charged.

Also, join the Springfield Stars Club on Jan. 24 at 7 p.m. at the Springfield Science Museum for a talk by Alan Rifkin and Richard Sanderson on solar eclipses. The talk will include information on the upcoming August solar eclipse. Refreshments will be served, and the public is welcome. The meeting is free for club members, with a suggested donation of \$2 for the public.

Amanda Jermyn, of Longmeadow, is vice president of the Springfield Stars Club. For more information, visit the club's website, reflector.org, like them on Facebook or call 800-336-9054.

Trajectory of Smith Cloud



This diagram shows the 100-million-year-long trajectory of the Smith Cloud as it arcs out of the plane of our Milky Way galaxy and then returns like a boomerang.

(NASA GRAPHIC)

IF YOU GO

Event: Solar eclipses
When: Jan. 24, 7 p.m.
Where: Springfield Science Museum, Quadrangle, 21 Edwards St., Springfield
Cost: Free, Springfield Stars Club members; \$2, donation, all others
For more info: Online, reflector.org

SPRINGFIELD

Horace Smith Fund offers scholarships to local grads



HORACE SMITH

The Horace Smith Fund, now in its 118th year, has scholarship and fellowship money available for graduates of Hampden County public

and private high schools.

Scholarship awards of \$10,000 are distributed as \$2,500 annually and renewable each year until graduation. Fellowship awards of \$12,000 are distributed as \$4,000 annually and renewable for two additional years.

Students must maintain at least a B average in college.

Recipients are selected on a variety of criteria, including SAT scores, class rank, extra-curricular activities, financial need, recommendations, and a personal written account of why the student feels deserving of financial assistance.

Fellowship applicants must also submit their GRE scores and transcript. All recipients must be full-time students and residents of Hampden County.

Last year, \$258,000 was awarded to 25 individuals. Scholarships were given to 19 graduating seniors from

14 Hampden County high schools.

Two scholarships were also awarded to college students to assist them in completing their education. Four fellowships were given to college graduates from Hampden County high schools.

The Horace Smith Fund was established in 1899 by the successful and generous philanthropist who was a co-founder of Smith & Wesson, located in Springfield. The scholarships and fellowships are named in honor of Walter S. Barr, a West Springfield businessman, whose widow left the bulk of the family estate to the Horace

Smith Fund in 1950.

Completed applications must be received either electronically or be mailed by Feb. 1 to: The Horace Smith Fund at 1441 Main St., Springfield, MA

01103.

Applications are available at area high-school guidance offices, online at **Horace-SmithFund.org** or by calling 413-739-4222.

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