

## Tuning in to a mysterious radio source

Astronomers have discovered a fluctuating source of radio waves that may lie only a few light-years from our galaxy's center. The object, though still unnamed and uncategorized, may reveal new details about the Milky Way's core, which in visible light is hopelessly obscured by the dust between it and Earth.

Using the Very Large Array (VLA) radio telescope near Socorro, N.M., researchers first spotted the enigmatic emissions in late December. W. Miller Goss, Jun-Hui Zhao and their colleagues were making a routine survey of the well-known radio source Sagittarius A\*, located at the precise center of the Milky Way, when they detected a point source of radio waves located about 5 light-years off-center. Two weeks earlier, the survey had shown no evidence of radio waves from this spot, indicating the celestial oddity was compact enough to "switch on" rapidly.

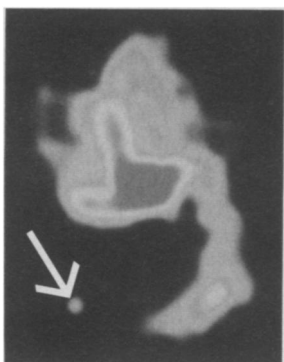
By late January, the object's radio emissions had intensified sharply, matching the output of Sagittarius A\*, the researchers reported in a March 16 circular of the International Astronomical Union. After a fairly steady and dramatic decline over the next several months, the emissions intensified slightly in early May, Goss told SCIENCE NEWS.

He and his collaborators have examined the source at three different radio wavelengths, using both the VLA and the partially completed Very Long Baseline Array. They now conclude that the emissions do not come from an ordinary star, but rather from the acceleration of high-speed electrons moving in a strong magnetic field near the galactic center.

The object's identity remains unknown, although the team has come up with two leading candidates: a supernova explosion or an X-ray binary star system. Over time, each of these would display a telltale emission pattern. Radio waves from a supernova should decay fairly steadily, explains Goss, while those from an X-ray binary should fluctuate, possibly in periodic cycles reflecting the time it takes for one member of the binary system to orbit the other.

A continued intensification of radio emissions in the coming months would favor the X-ray binary model, says Goss, who notes that binary systems may concentrate in high-density regions such as the galactic core, where the gravitational capture of one star by another is likely. X-ray binary systems feature a compact object—usually a neutron star—that pulls in mass from a larger, orbiting companion. As charged material, such as electrons, falls from the companion star onto its compact partner, the material can emit bursts of radio waves as well as X-rays, Goss says. Analyses of recent observations made with ROSAT, the British-German X-ray satellite, should reveal whether the new find is indeed an X-ray binary, he adds.

In any case, other astronomers have confirmed that it lies close to the galactic center. In March, says Goss, a team working at the Australia Telescope National Facility at Culgoora detected a molecular cloud, made of hydrogen and other gases, that absorbs certain radio emissions from this object. The cloud's absorption pattern matches that associated with other radio sources known to lie near the Milky Way's center. The researchers still can't tell, however, whether the radio source actually sits within the cloud or is a separate entity located somewhere behind it.



VLA image shows newly detected radio source (arrow) near center of Milky Way.

National Radio Astronomy Observatory

Bruce Bower reports from New Orleans at the annual meeting of the American Psychiatric Association

## Traumatic memories: Lost and found

Often, a single traumatic event creates an indelible memory. But in children who are repeatedly exposed to such experiences—as in many cases of sexual abuse—the distressing memories may lie dormant until unleashed by a seemingly inconsequential situation in adulthood, according to Lenore C. Terr of the University of California, San Francisco.

Terr bases her assertion on dozens of cases of "spontaneous recall" of childhood traumas explored in her clinical practice and described in letters from people across the country who read of her interest in traumatic memories.

In most cases, the child first "dissociates" from disturbing events. Dissociation involves psychological detachment from one's surroundings and a distancing of self from sensations, thoughts or emotions. It also alters perceptions of time and identity, often resulting in memory gaps.

In a much-publicized court case that ended this past February with a conviction, a 28-year-old woman claimed she suddenly remembered witnessing her father murder one of her playmates 20 years earlier. The woman, who said she was repeatedly raped by her father as a child, recalled the murder when she looked into her own daughter's eyes and realized that they resembled the murder victim's eyes. Terr, who testified in the case, also notes that the memory resurfaced with the woman's severing of all ties to her father after he made sexual advances to her daughter. The woman's description of the crime closely matched police evidence on the victim's wounds and the nature of the attack, Terr adds.

Paying attention to repeated behaviors may also spark the return of traumatic memories, she says. In one instance, an artist realized that her surrealistic paintings reenacted her sexual abuse as a child. In every painting, she felt compelled to depict her childhood house surrounded by flames.

"We can sometimes help kids recreate their experiences of abuse by having them draw their homes," Terr maintains.

Some researchers question the accuracy of spontaneous recall, noting that memories tend to blend together and change over time. Corroborating evidence and repeated behaviors or dreams that reflect traumatic events serve as checks on spontaneous recall, Terr contends.

## Quake's psychological reverberations

Short-lived symptoms of dissociation also appear in many healthy individuals during the days following extreme distress or physical risk, report Etzel Cardeña and David Spiegel of Stanford University.

Within a week of the October 1989 earthquake in the San Francisco Bay area, Cardeña and Spiegel surveyed 52 psychology graduate students and 49 medical students living just north of the quake's epicenter. During that time, aftershocks continued to rumble through the area. Nearly half of the students reported a sense of detachment from their surroundings, a narrowing of attention, a sense of time expansion, and memory disturbances. One-quarter of the sample described sensations of the self detaching from the body, resembling out-of-body sensations reported by people who have undergone near-death experiences, Cardeña says. Many also reported considerable anxiety. But when contacted four months later, participants offered few reports of dissociation or anxiety.

The findings confirm previous observations of trauma survivors, says Martin Roth of Cambridge University in England. "Hypervigilance and dissociation constitute built-in cerebral responses for survival in the face of danger," he asserts. The perception of time slowing down decreases the trauma victim's sense of urgency, and detachment from self and surroundings provides comfort by creating the illusion that "it's all a dream," he says.