raising, or setting priorities.

Industry is hoping CVI will be replaced by an independent body in which it would have equal status with the agencies. But WHO is not keen on this idea, says Jacques-François Martin, who headed the biologics committee of the International Federation of Pharmaceutical Manufacturers' Associations for 4 years: "The CVI brought industry back to the table. [Now] we feel very frustrated and excluded from the global process at a critical time." Bjorn Melgaard, director of the department for vaccines and other biologicals at WHO, says WHO—under its new head, Gro Harlem Brundtland, appointed last year—has every intention of establishing an equal partnership with the private sector. An announcement is expected in September or October. **–HELEN GAVAGHAN**

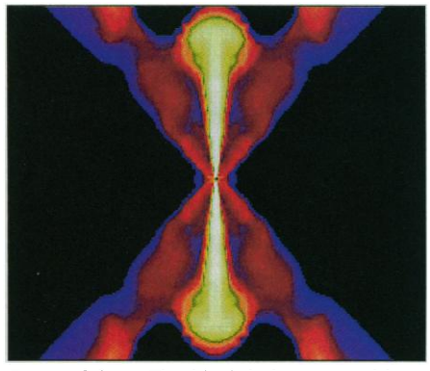
Helen Gavaghan is a writer in Hebden Bridge, U.K.

ASTROPHYSICS

Gamma Beams From a Collapsing Star

ATLANTA—Astrophysicists see a spark of consensus emerging on the origins of mysterious gamma ray bursts, the most powerful explosions in the cosmos today. The longest lived blasts, lasting 10 seconds or more, may arise when new black holes consume doomed stars far more massive than the sun and spit out intense beams of energy, according to work presented here this week at a meeting of the American Physical Society. But other bursts, lasting less than a second, remain unexplained.

If we floated above Earth's atmosphere with eyes that could spot gamma rays, we would see flares as bright as Venus pop off at least once per day across distances of billions of light-years. The most recent detection, on 23 January, pointed to a burst so distant that its brilliance as seen from Earth implied an explosive release equivalent to converting a mass greater than that of our sun into pure energy.



CREDIT: MACFADYEN AND WOOSLEY, UC SANTA CRUZ

Focused fury. The black hole spawned by a massive collapsing star, or "collapsar" (center), may propel fierce gamma ray–emitting jets. Highest energies (white and yellow) emerge in tightly focused beams.

However, studies in this week's *Science* and next week's *Nature* suggest that the burst's energy could have been much lower (see News story, p. 2003). It may have appeared deceptively bright because the object targeted us with a narrow searchlight blast of gamma rays. That jibes perfectly with a scenario championed by astrophysicist Stan Woosley of the University of California, Santa Cruz. His "collapsar" model, devised with graduate student Andrew MacFadyen, proposes an exotic chain of events that may churn out gamma ray beams while generating an outsized supernova explosion.

A massive star explodes as a supernova when it exhausts its nuclear fuel and collapses, and astrophysicists agree that the collapse of the most massive stars spawns black holes. The hole swallows gas from the slowly moving poles of the star. But if the rest of the star is spinning quickly enough, it careens in a disk around the black hole at close to the speed of light. Then, according to Woosley and MacFadyen's calculations, the hole gulps the disk within 10 to 20 ferocious seconds. The inner part of the disk heats to 20 billion degrees and shoots stupendously energetic jets of particles out of narrow channels at the star's poles. Twisted magnetic field lines may help the jets drill into space.

The jets probably collide with clumps of gas billions of kilometers from the star to create gamma rays. Particles within the jets may clash violently against one another to unleash gamma rays as well, Woosley notes. Astronomers would see only about one of every 100 such events in the universe—the ones that happen to point their bright beams at Earth.

This scheme builds on the "hypernova" hypothesis advanced a few years ago by theorist Bohdan Paczyński of Princeton University. "We think the collapsar is the engine that drives the hypernova," Woosley says, because a shock wave from the collapsar would obliterate the rest of the star in a titanic supernova. That concussion would stoke the visible "afterglow" that telescopes see at the burst site. A bizarre supernova last year, called 1998bw, coincided with a relatively nearby gamma ray burst, supporting the idea, Woosley notes (*Science*, 19 June 1998, p. 1836).

Another favored model for gamma ray bursts, merging neutron stars, may explain the blasts that shut off in less than a second. However, such collisions probably aren't energetic enough to account for events like that of 23 January, Woosley believes.

Astrophysicist Gerald Fishman of NASA's Marshall Space Flight Center in Huntsville, Alabama, says Woosley's model is the most credible yet: "There are no showstoppers. People haven't found any fatal flaws." **–ROBERT IRION**

Robert Irion is a science writer in Santa Cruz, CA.

ScienceScope

Hot Developments The federal government got mixed news this month about its efforts to safely stow the nation's nuclear waste. Department of Energy (DOE) officials were pleased on 22 March when a federal judge waved aside a final lawsuit aimed at blocking the first shipment of radioactive waste to its Waste Isolation Pilot Plant (WIPP), a series of excavated salt caverns near Carlsbad, New Mexico (*Science*, 12 March, p. 1626). After a 25-year struggle, WIPP expects this week to offload the first trucks filled with tainted clothing, tools, and nuclear weapons leftovers.

Another long-planned repository, however, faces more questions. On 3 March, a technical review board raised further doubts about the adequacy of plans for a repository under Yucca Mountain, Nevada (above), where Congress wants to stash the bulk of the nation's hottest stuff, such as commercial power plant wastes (*Science*, 12 March, p. 1627). The U.S. Nuclear Waste Technical Review Board asked DOE to reconsider current plans that allow waste to generate high temperatures in the vault. Instead, it wants the agency to ponder designs for keeping lower temperature waste caskets, which have less chance of boiling groundwater and geochemically altering surrounding rock.

Price War Librarians dedicated to driving down academic journal prices are going on the offensive. Next week, the 160-library Scholarly Publishing and Academic Resources Coalition (SPARC) will unveil a $500,000 program to launch five or so university-based electronic journals and Web resources in science, medicine, and technology. The Scientific Communities Initiative aims to give scientists cheaper access to information by creating alternatives to increasingly expensive for-profit journals (*Science*, 30 October 1998, p. 853). For-profit publishers have taken a dim view of such projects, saying it is unrealistic to expect academics to shoulder the burden of providing the services—from editing to proofreading—that they offer. SPARC, however, doesn't foresee any shortage of applicants for the roughly $100,000 grants. Interested groups have until 21 May to apply (www.arl.org/sparc).

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