ASTRONOMY

Gamma Blast From Way, Way Back

COLUMBUS, OHIO—A blast of gamma rays picked up by satellites last December originated 10 billion years ago at the very edge of the visible universe, observers reported here last Sunday. The event was a gamma ray burst, a flash of high-energy radiation that occurs roughly once a day at a random point in the sky. In just the last year, astronomers have learned that these flashes originate in distant galaxies, implying that their sources are the most energetic events in the universe. But the spectacular distance of this event could force theorists to come up with still more energy to stoke the mysterious bursts.

At a meeting of the American Physical Society, Shrinivas Kulkarni of the California Institute of Technology described how he, his Caltech colleague George Djorgovski, and others used the 10-meter Keck Telescope in Hawaii and NASA's Hubble Space Telescope to study a fuzzy patch of light at the site of a 14 December gamma ray burst. By making a spectrum of the fuzzy patch, presumably the galaxy in which the original explosion took place, Kulkarni and Djorgovski were able to measure its "redshift"—the stretching of its light by the universe's expansion, which is a measure of distance. The result, detailed in a paper accepted at *Nature*, is a redshift of 3.418. That puts the source at a distance several times greater than the only comparable measurement, a figure of 0.835 or more for another burst's optical counterpart (*Science*, 23 May 1997, p. 1194). Kulkarni declined to elaborate on the finding until his paper appears.

"It's just spectacular," says Princeton University astronomer Neta Bahcall. "This is almost at the fringes of anything observed in the universe," says Jonathan Katz, an astrophysicist at Washington University in St. Louis. "The farther away [the bursts] are," he adds, "the more energy they require" to explain their observed brightness, which could make the new measurement "a bit frightening to theorists."

A cascade of observations at different wavelengths led to the discovery. Gamma ray detectors can't accurately pin down the location of a burst, but the cameras aboard the Italian-Dutch BeppoSAX satellite spotted the x-ray afterglow of the 14 December event and determined a relatively accurate position for it. That allowed other astronomers to find a fading optical counterpart. Once the fading leveled off—suggesting that the light of the host galaxy was emerging—Kulkarni used the Keck to find the galaxy's emission spectrum and measure its redshift. More recently, he photographed the tiny patch of sky with the Hubble. The image shows what appears to be a faint, elongated galaxy containing a point of light, probably the fading ember of the original explosion.

Many theorists believe that a gamma ray burst is the first flash from a violent fireball, perhaps triggered by the collision of two neutron stars. The fireball then loses steam, producing fading counterparts at progressively longer, lower energy wavelengths—x-rays, visible light, and radio waves. But the titanic energy implied by this latest measurement could send theorists looking for ways to squeeze more brilliance from the fireball.

Katz and many others have already proposed that the energy from an outburst can be channeled in a particular direction, perhaps by magnetic fields. If an explosion happened to be pointed toward us, it would look brighter for a given energy. If so, Earth may have been caught last December in a gamma ray searchlight from across the universe.

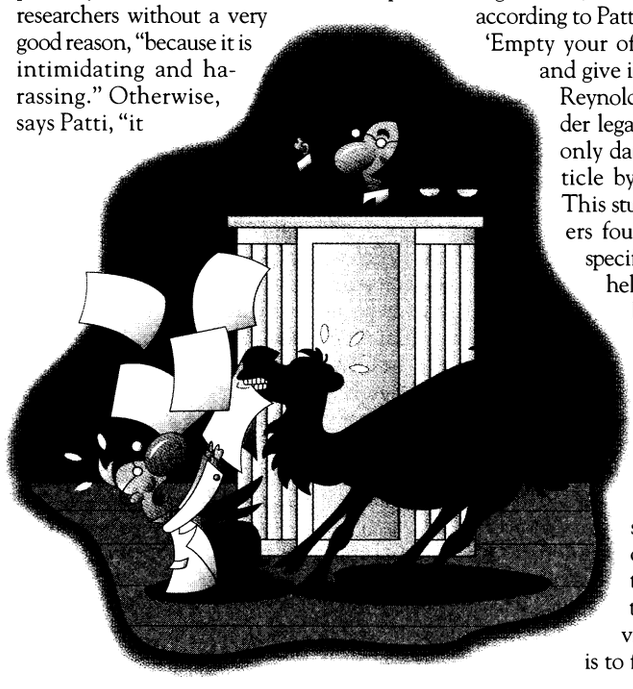
–James Glanz

RESEARCH CONFIDENTIALITY

UC Fights Tobacco Company Subpoena

The tobacco companies are asking Congress to declare a truce in the legal war over smoking, but at the same time they are waging some pitched battles in the states over the control of scientific files that could be important in antismoking lawsuits. In March and April, for example, R. J. Reynolds Tobacco Company of Winston-Salem, North Carolina, maker of Camel cigarettes, obtained two subpoenas demanding broad access to the files of cancer epidemiologist John Pierce of the University of California (UC), San Diego. He co-authored a study published in the 18 February *Journal of the American Medical Association* (JAMA) that links cigarette advertising and teenage smoking. On 20 April, university lawyers filed their latest response in a state court in San Diego, arguing that Pierce should not be compelled to surrender all the raw data Reynolds has demanded.

UC counsel Christopher Patti says the university is making a novel argument in this case. "In the past, we have been more concerned about the need to protect unpublished data" from premature release through court actions. But now that subpoenas have become a "routine tactic by the industry," says Patti, "we are more concerned about the broader issue of chilling research" in controversial areas. In briefs that aim to block subpoenas of Pierce in two separate lawsuits in state courts, Patti says, UC is arguing that companies "just should not be allowed" to subpoena researchers without a very good reason, "because it is intimidating and harassing." Otherwise, says Patti, "it means that if you want to do tobacco research, you've got to have a lawyer" on tap.



TERRY E. SMITH

R. J. Reynolds's initial subpoena sought everything in Pierce's files relating to tobacco advertising, marketing, or promotion—including memos, letters, and electronic messages, according to Patti. They "basically told Pierce, 'Empty your office into a bunch of boxes and give it to us,' " he says. Since then, Reynolds has narrowed its request under legal challenge, agreeing to seek only data supporting the JAMA article by Pierce and his colleagues. This study of 1752 California teenagers found that cigarette ads—and specifically "Joe Camel" images—helped get nonsmoking teenagers hooked on cigarettes.

Pierce views this kind of subpoena, even if it fails, as "personal harassment." He says he is fortunate to be defended by UC's legal team, which has successfully argued against broad subpoenas in the past. According to Pierce, other institutions have not been willing to defend their researchers as vigorously. The effect, he says, is to force authors of controversial