days. For any given ground-based telescope, that means one every two weeks on average, says Schaefer—given roughly even odds of a particular burst occurring at night, in the accessible part of the sky, and during clear weather.

Ironically, the satellite could trump the ground-based telescopes: It will itself observe gamma-ray bursts at optical wavelengths. "Swift won't get all of them," says Schaefer, a member of the Swift team. But, he admits, the ground-based telescopes will have to find their own niches. Swift will need 85 seconds to point its optical detector, says Schaefer. "Carl [Akerlof] is faster than Swift. So ROTSE's—and the other ground-based telescopes'—domain is 10–85 seconds."

In what could turn out to be a particularly fruitful niche, REM's detection—and perhaps eventually Super-LOTIS's—will extend into the infrared. One possible explanation for why the early optical signal has been so evasive is that gamma-ray bursts may occur mostly in star-forming regions, where dust would absorb optical wavelengths. "We will certainly detect a large number of these dark bursts," says REM project scientist Guido Chincarini of the University of Milan–Bicocca. Even more enticing, he adds, is the prospect of detecting extremely distant gamma-ray bursts, whose visible light is redshifted into the infrared. "These bursts could be as far away as the reionization epoch, or further. If we catch only one of these—that is the real dream—it will be the event of the decade."

When they are not homing in on a gamma-ray burst, REM, ROTSE, and their kin will scan the skies, stocking up wide-field images that can be trolled for variable stars, active galactic nuclei, quasars, and other variable and transient celestial objects. "This all-sky record of variability is one of the unheralded things about ROTSE," says Schaefer, who, as a graduate student 20 years ago was one of the first people to look for optical counterparts to gamma-ray bursts, poring over some 50 000 photographic plates at Harvard University. In the 1980s, after nearly a century, Harvard stopped collecting the plates, adds Schaefer. "ROTSE data will fill this gap."

The small telescopes can also alert their bigger brethren about gamma-ray bursts and other transient phenomena. For example, spectra are needed to determine astronomical distances. "We can't do spectroscopy, but we can help others who do," says Akerlof. "Usually, it takes four to eight hours to recognize that something actually was a gamma-ray burst. If we can recognize rapid variations fast, that's a better smoking gun. If you can catch it within an hour or two, you have a reasonable chance of doing spectroscopy with a 1- or 2-meter telescope; if you wait a day, the signal fades and you have to use an 8-meter class telescope." Accordingly, TAROT and REM will coordinate with their neighbor, the Very Large Telescope; the ROTSE telescope in Namibia will work closely with the nearby High Energy Stereoscopic System (see PHYSICS TODAY, June 2000, page 50); and so on.

The field of gamma-ray bursts is changing incredibly fast, says Schaefer. "Before 1997, when measurements of the optical afterglow first gave the distance to a gamma-ray burst, the uncertainty in the distance was 12 orders of magnitude. Horrifying! The energy was uncertain to 24 orders of magnitude. Horrible! Can you think of anything less well known than that?"

TONI FEDER

Livermore Veteran Is Lab's New Director

Physicist Michael Anastasio, a 21-year veteran of nuclear weapons research and stockpile stewardship program oversight at Lawrence Livermore National Laboratory, was named LLNL's new director on 4 June; he replaces director C. Bruce Tarter. Anastasio, the ninth director at LLNL since the lab's founding in 1952, began in the nuclear weapons design physics division at the lab in 1980, and, for the past year, has been the deputy director for strategic operations.

"We must continue to make innovative contributions to advance national security and all areas of science and technology," Anastasio said after his appointment was announced. The primary challenges for the lab, he said, are maintaining the nation's stockpile of nuclear weapons and developing new technologies to combat terrorism.

Anastasio's appointment ended an embarrassing selection process in which another physicist, Ray Juzaitis of Los Alamos National Laboratory, was within 30 minutes of being named to the LLNL director's job when Department of Energy officials interceded and stopped the announcement. A radio talk show host in San Francisco complained to DOE officials that Juzaitis had been one of Wen Ho Lee's supervisors at Los Alamos. When a controversy erupted, Juzaitis protested that linking him to Wen Ho Lee was unwarranted, then withdrew as a candidate (see PHYSICS TODAY, June 2002, page 26).


LLNL

ANASTASIO

Anastasio was recommended by University of California President Richard Atkinson and confirmed by the board of regents. The university manages LLNL for DOE and the National Nuclear Security Administration. Atkinson took the blame for the selection process problems, saying he failed to communicate properly with government leaders in Washington, DC. When asked if he thought it proper that a radio talk show host should have a role in selecting the head of a national weapons lab, Atkinson said, "That's the world we live in."

In response to questions about the Bush administration's considering the resumption of underground nuclear testing and developing ground-penetrating "mininukes," Anastasio said he and the other weapons lab directors "don't feel there is any need to go back to underground testing." He added that "we don't yet have any plans to build any new bombs," although the labs might proceed with studies to see what new nuclear weapons could be possible.

He said the controversial $3.5 billion National Ignition Facility under construction at LLNL is "going very well, and one year from now we hope to get first light." NIF was plagued with technical problems and cost overruns under Tarter's regime. Anastasio described NIF as a "vital tool" for maintaining the US nuclear weapons stockpile.

Anastasio, who took office on 1 July, may have to oversee the movement of LLNL from DOE to the Department of Homeland Security proposed on 6 June by President Bush. Lab officials did not have details of the proposal.

JIM DAWSON

LANL Rescues Cosmic-Ray Detector

Gus Sinnis was pleasantly surprised when he and his colleagues got the High Resolution Fly's Eye purring this past May. They'd never touched the ultrahigh-energy cosmic-ray detector before, and it had been collecting dust for nearly eight months ever since heightened security after last September's terrorist attacks