

the formidable killing apparatus of her front legs. Males usually dismounted with getaway leaps or aerial takeoffs. At other times, males crept toward a mate, freezing if she looked in their direction. "It was like Woody Allen courting Sharon Stone," Maxwell says.

Even if he didn't see evidence for overt suicide, he still checked for possible benefits of male sacrifice. Male redback spiders are so small, "they're popcorn" to the female, he says, but a male mantid makes a substantial meal.

A 1988 study by Tim R. Birkhead, at the University of Sheffield in England, and his colleagues had reported that females that ate their mates produced larger clutches of eggs. Birkhead's team, however, had limited the females' food. Females on a more generous diet, Maxwell found, would accrue no reproductive benefit by eating the father of their offspring.

While the theory that suicidal males equal nutritional boosts for female mantids remains controversial, Maxwell leans toward the view of sexual cannibalism proposed in 1997 by Göran Arnqvist of the University of Umeå in Sweden and Stefan Henriksson. Studies of fishing spiders led them to their basic conclusion: Nobody benefits.



A female bordered mantid, the larger of the pair, has knocked the head off a male (on her back) but not diminished his performance.

Or rather, nobody benefits as an adult.

Instead, cannibalism is just an accidental side effect of the evolutionary pressure for female rapacity. The females that start life with a strong tendency to attack first, fast, and furiously get more food and grow larger. Once they're adults, that extra size gives them a major advantage over their daintier sisters in producing more offspring.

A tendency for adults to shred their suitors is nothing more than the aftereffects of a bug-eat-bug childhood, the researchers suggest.

Arnqvist and Henriksson demonstrat-

ed the reproductive benefits of youthful female voraciousness in their fishing spiders. Although females of this species nail a mate from time to time, males issue no invitations to do so.

One biologist suggests sexual cannibalism should be viewed in terms of the more general phenomenon of one organism eating another of the same species. David W. Pfennig of the University of North Carolina at Chapel Hill reviewed cannibalism across many species and can list a variety of both costs and benefits.

As a general phenomenon, cannibalism is widespread, according to Pfennig. Insects, spiders, fish, mammals—lots of species are taking a bite of their neighbors. On the upside, cannibalism is a handy way to get nutrition. Presumably, a conspecific meal has precisely the compounds that the diner needs.

Unfortunately, that food probably also has precisely the diseases and parasites that can attack the eater.

The disease risk is bad enough when eating a youngster (SN: 5/19/98, p. 295), as many cannibalistic species do. Pfennig, however, predicts that an animal chomping on an adult will pick up even more pathogens.

Therefore, even for the survivor, cannibalistic mating, he worries, could be the ultimate in unsafe sex. □

Astronomy

Gamma-ray bursts: Going the distance

Astronomers may have identified a new and quicker way to determine the distance to those mysterious flashes of energetic radiation known as gamma-ray bursts. If the finding proves correct, scientists could use bursts to probe some of the earliest events in the cosmos.

Although Earth-orbiting satellites record a burst popping off at least once a day, astronomers have measured the distance to only a handful. That's because scientists must find the fleeting, visible-light counterpart to the gamma rays and then determine its redshift—the amount by which the expansion of the universe has shifted the light to redder, or longer, wavelengths.

Two researchers have now closely examined the six bursts for which astronomers have measured distances. Enrico Ramirez-Ruiz, now at the University of Cambridge in England, and Edward E. Fenimore of the Los Alamos (N.M.) National Laboratory calculated the intrinsic brightness of each flash. They found that the most luminous flashes flicker the most, while those that are intrinsically dimmest vary the least.

If that pattern holds true, scientists would have a new way to determine distance. They would simply compare the luminosity of a burst, as indicated by the flickering, with the observed brightness, which declines as the inverse square of distance.

Ramirez-Ruiz and Fenimore presented their findings last month at the annual gamma-ray-burst symposium in Huntsville, Ala. If the link between flickering and brightness proves reliable, a burst could serve as a new yardstick for measuring distances to other objects. Because bursts are bright enough to be detected from far away, the yardstick would allow astronomers to measure distances deep in space and far back in time, Fenimore says.

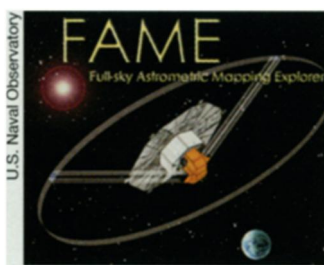
"The correlation looks good, but there are still very few data points," says Stan Woosley of the University of California, Santa Cruz.

At the conference, Jay P. Norris of NASA's Goddard Space Flight

Center in Greenbelt, Md., presented evidence for another type of distance indicator. Norris finds that the more luminous the measured burst, the smaller the lag time between its high-energy and low-energy photons. —R.C.

FAME to gaze at the stars

Howdy neighbors! If all goes according to plan, astronomers 5 years from now will be getting a lot more familiar with 40 million of the closest stars in our galaxy.



Artist's depiction of the new spacecraft.

help elucidate the nature and distribution of the invisible material, called dark matter, that pervades the universe.

NASA announced funding for the 5-year mission, known as FAME (Full-sky Astrometric Mapping Explorer), last month.

Searching for telltale wobbles in the motion of stars as they move across the sky, FAME will deduce the presence of unseen planets and failed stars known as brown dwarfs. Because the craft can find planets that orbit at great distances from their parent stars, it may uncover evidence of entire planetary systems, rather than just single, massive planets that tightly circle their parents.

To scan the sky, FAME will shift position using a lightweight solar sail rather than rocket fuel (SN: 8/21/99, p. 120). —R.C.