

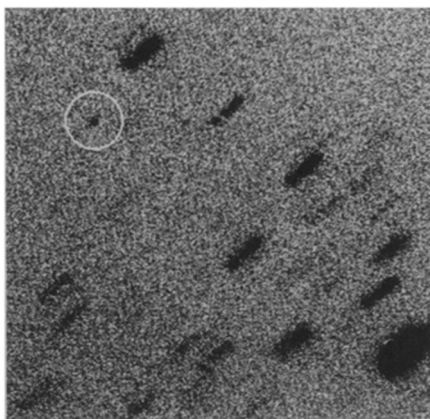
Recovered comet on track for rendezvous with ICE probe

The Comet Giacobini-Zinner, last spotted in 1979, has been seen again, pretty much where expected, on its six-and-a-half year excursion around the sun. This means it's thumbs up for the International Cometary Explorer (ICE) spacecraft, which is currently enroute to intercept the comet's tail in September 1985 (SN: 1/7/84, p. 6).

When Michael Belton and George Will re-sighted the comet at the 4-meter telescope at Kitt Peak National Observatory in Tucson, Ariz., last month, it was within four arc seconds (about 6,000 miles) of where scientists had predicted. "It's darn close to where we thought it was going to be," says John Brandt, comet scientist for the ICE space mission at Goddard Space Flight Center in Greenbelt, Md. "That is far within the change that we can make in the trajectory of the spacecraft."

According to Goddard's Robert Farquhar, ICE's flight director, it is important that the ICE trajectory be adjusted to the comet's pinpointed orbit so that the two meet when there is good data coverage by terrestrial antennas.

Project scientists had been worried that the comet would stray from its predicted course because it has a history of erratic behavior. As it goes through perihelion (closest approach to the sun), says Belton,



AURA, Inc., Kitt Peak National Observatory

This is the tenth time the Comet Giacobini-Zinner (circled) has been seen since it was discovered in 1900. The elongated marks are images of stars, smeared out to follow the motion of the comet.

it throws off dust and gas like a rocket, causing it to deviate from its path.

The recent sighting is fortunate not only because it showed the comet to be essentially on track, but because it was made so early. "If we were off-course," Farquhar told SCIENCE NEWS, "it would have been far more difficult to correct the ICE orbit if we hadn't located the comet until 1985." Farquhar says that they will need more ob-

servations to refine the orbit.

The problem with guaranteeing more sightings is that there are only a handful of telescopes in the world capable of detecting the comet at its current distance. When Belton and Will found the comet it was about 340 million miles from the earth and roughly five million times fainter than the faintest stars that can be seen with the naked eye. Moreover, astronomers have been having trouble reserving time on telescopes for the comet. In fact Belton and Will had to borrow telescope time from two astronomers at the University of California at Berkeley.

Nonetheless, Brandt thinks the observations will be made. "Everyone understands that this is *the* first comet mission," he says. Farquhar also notes that the recent data have since helped another astronomer find the comet in data initially taken with a smaller telescope on January 28; now two points on its path are known.

Farquhar doesn't expect that any mid-course corrections to ICE's path will be made until June of next year. Scientists will meet this coming July to decide exactly where ICE will be aimed in the comet's tail. The next thing to worry about, says Farquhar, is the encounter itself, since the probe will be entering an unknown environment. —S. Weisburd

Jungle jaws: Giant bee rediscovered on Indonesian islands

Once described more than a hundred years ago, but never reported again, the world's largest bee has seemed a "golden grail" to bee experts. But a biology graduate student, accompanying an anthropologist on a folk biology study, now reports he has rediscovered the giant bee on an Indonesian island.

Adam Messer of the University of Georgia was walking through the jungle one day in 1981 when he heard a buzzing sound and followed it to a tree. There, two large bees were collecting resin. Messer says he knew immediately that he had come across the long-lost *Chalicodoma pluto*. "No other bee has jaws the size of those," Messer says.

Since then Messer has observed the lives of the giant bees, going far beyond what British biologist A.R. Wallace reported in 1861. Messer tracked down seven bees' nests, which are built inside tree-dwelling termite nests that resemble papier-mâché basketballs. The bees' quarters, made of dried tree resin, are like plastic tubes and are impermeable to the termites. Messer is also the first to describe the male giant bee, which is half the size of the female and far less bizarre in appearance.

Any communal lifestyle is unusual for bees of the group that includes giant

bees. So Messer was surprised to find that several female giant bees share living space in the nest. However, there is no division of labor as in the few more social species of bees.

The outstanding physical characteristic of *C. pluto*, next to its size, is the



University of Georgia

In this life-sized photograph, the world's largest bee, the giant bee, dwarfs a common honeybee. The giant bee is distinguished by its size, its pincer-like mandibles and white-striped abdomen.

mouthparts, or mandibles, of the female. "They are like needle-nosed pliers on an utterly bizarre head," Messer says. The female uses these huge mandibles to gather resin that leaks out of surface wounds of certain trees. She scrapes it together into a ball and holds the ball of resin tightly in her mandibles as she flies back to the nest.

For almost a year, for five hours a day Messer sat on a ladder a few inches from the nest entrance and observed the bees. "They are intimidating. They are as big as hummingbirds and sound like a hummingbird," he says. "But they are docile, they never bothered me."

Like other bees, however, they do sting. It is a minor defense, Messer says. He was once stung unexpectedly, although he jokes that as a good scientist, he had to perform that last experiment. "It wasn't bad. The sting is smooth, not barbed [like a honeybee sting]," he says.

Messer now has found the bees on three different Indonesian islands, but they are very rare. The native islanders have a folk name for the insect, "king bee," but they say they had never seen it themselves. Messer's description of the giant bee is published in the current issue of the JOURNAL OF THE KANSAS ENTOMOLOGICAL SOCIETY. —J.A. Miller