Americas, and even Africa.

The present warming began in mid-1991 and reached its mature phase by early 1992, bringing excessive rain to central South America, northern Mexico, and the western coast of the Gulf of Mexico. At the same time, the abnormal weather caused droughts in southeastern Africa, the Philippines, and northern Australia, according to the NMC.

By mid-1992, the El Niño had lost strength as sea surface temperatures dropped in the equatorial Pacific, leading Kousky and others to announce that the warming was nearing its end. At the same time, several experimental computer models predicted that this part of the Pacific should revert to normal temperatures or even reach cool conditions by the end of the year.

Contrary to expectations, water temperatures in the central Pacific began climbing once again in late 1992, and the warmth spread toward the South American coastline, reestablishing the El Niño, says Kousky (SN: 1/23/93, p.53). During April, observations of sea surface temperatures continued to show a large patch of warm water, both along the equator and spreading to the tropics of the northern and southern hemispheres.

The warm conditions in the central Pacific probably will persist through the middle of 1993, but the equator could cool off quickly because the pool of warm water there is thin, covering only the top surface of the ocean, says Kousky.

Moisture injected into the atmosphere by the warm water in the central Pacific played a role in the intense rains that washed California this year, Kousky says. The lingering El Niño also continued the drought in southeast Africa and will likely weaken the monsoon rains in India and Indonesia this year, he adds.

While most computer models missed the call this year, a new one under development at the NMC did make the right prediction. During the summer of 1992, the NMC ran the first real forecast on the model, which correctly called for a winter warming.

This experimental version is more complex and has better resolution than other models currently in use, but its developers say they need to test it further before they can judge its accuracy. The first prediction "was a success," says NMC meteorologist Ming Ji. "It could be luck, but it was encouraging." *— R. Monastersky*

New superconductor record

After a five-year lull with no reports of a material that could superconduct at temperatures above 127 kelvins, researchers have finally found a record breaker. The new superconductor appears to offer no resistance to electrons at 133 kelvins, a group at the Laboratorium für Festkörperphysik in Zürich, Switzerland, has announced.

"Finally, something is happening again in high-T_c [high-transition-temperature superconducting]," says Andreas Schilling, lead author of the report in the May 6 NATURE.

Unlike the previous recordholder, the new superconducting champion contains mercury instead of thallium. Schilling's team made its discovery while attempting to make a material called mercury-1201, which acts as a superconductor at temperatures of up to 94 kelvins (SN: 3/20/93, p.182). Mercury-1201 contains a single mercury and copper oxide layer per unit cell of the crystal, and its Russian discoverers hypothesized that additional layers would boost its superconducting temperature. Indeed, the Swiss team has created two- and three-layered versions of the mercury-barium-copper oxide that appear capable of superconducting at 110 and 133 kelvins, respectively.

The researchers haven't determined yet just how their synthesis differed from the originally reported method. But when they examined their product with an electron microscope, they saw clear images of the plate-like grains common to high-temperature superconductors. Within the grains, they found evidence of multiple layering. Results from measurements of magnetization and resistivity led them to conclude that the triple-layered component of their material mixture could superconduct at 133 kelvins.

Scientists are still far from finding superconductors suitable for everyday applications, though. Says Schilling, "I think this material will have the same value as thallium compounds, which means it has no practical value because it's poisonous." □

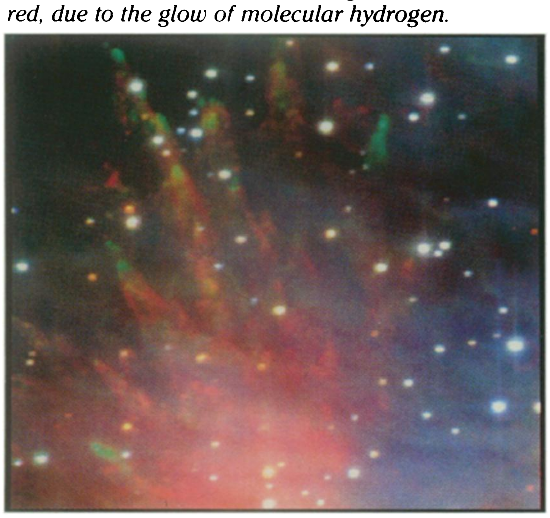
Peering into Orion nebula's stellar nursery

Astronomers have viewed with greater clarity than ever before a dust-cloaked region of starbirth in the Milky Way. The violent interactions they recorded there may shed new light on luminous knots of gas, known as Herbig-Haro objects, whose origin has been controversial ever since they were discovered in the late 1940s.

Australian astronomers David A. Allen of the Anglo-Australian Observatory in Epping and Michael G. Burton of the University of New South Wales used an infrared array to probe the interior of the dusty Orion nebula, a molecular cloud that harbors the stellar nursery nearest to Earth. They report their findings in the May 6 NATURE.

Their striking false-color images trace the high- and low-energy scenes from a startling story unfolding near the brightest star, dubbed IRc2, in Orion. Allen and Burton believe that the Herbig-Haro objects they recorded with the 3.9-meter Anglo-Australian Telescope were triggered by blobs of gas ejected from the star a mere 1,000 years earlier. Plowing into surrounding gas, the blobs ionized iron atoms, thus taking on a false-green cast. Surrounding many of these blobs are structures that resemble the bow shocks created when a boat rushes across a lake. Allen suggests that these bow shocks lack the punch to ionize iron but can excite molecular hydrogen, depicted as a red glow.

Infrared image depicts collisions in the Orion nebula. Energetic gas blobs appear green in the light of ionized iron atoms; lower-energy wakes appear red, due to the glow of molecular hydrogen.



Allen, Burton/Anglo-Australian Telescope

Other researchers say the images don't rule out alternative explanations for forming Herbig-Haro objects in Orion. C.R. O'Dell of Rice University in Houston notes that these knots might be formed when a slow-moving jet of gas from a star strikes a stationary wall of gas in the interstellar medium. Alternatively, a fast-moving jet may create knots of bright emissions as it shocks and pushes out surrounding gas. Allen says that a narrow jet could not account for the wide angular spread of the knots. However, John Dyson of the University of Manchester in England suggests that a jet wiggling like the end of a loosely held garden hose might explain the distribution.

Researchers, including Allen, agree that more than one mechanism may create Herbig-Haro objects. In any case, writes Dyson in a commentary accompanying the NATURE article, the findings "show that many [violent] surprises are in store as modern observational techniques . . . probe into hitherto unexplored regions of interstellar space." *— R. Cowen*