

Science News of the Year

This is a review of important science news stories of 1978 as reported in the pages of SCIENCE NEWS. The references after each item refer to the volume and page number in which the main article on the subject appeared in SCIENCE NEWS (Vol. 113 is Jan.-June; Vol. 114 is July-Dec.). Where several references exist, the news developed and was reported in more than one issue. Back issues or, when out of stock, copies of articles are available for 50 cents each by writing to SCIENCE NEWS, 1719 N Street, N.W., Washington, D.C. 20036.

Space Technology

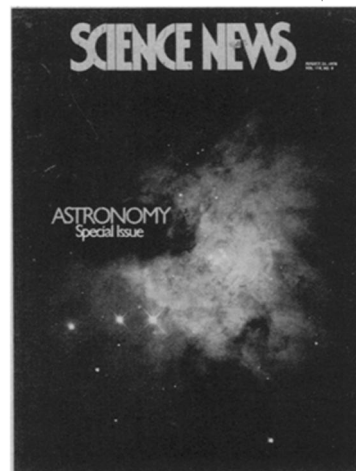


- Soviet cosmonauts Vladimir Kovalenok and Aleksandr Ivanchenkov spent a record 140 days in orbit aboard the Salyut 6 space station (114:327), far surpassing the 96-day stay of Yuri Romanenko and Georgi Grechko aboard the same facility earlier in the year (113:183), which had already eclipsed the 84-day U.S. Skylab mark.
- Although developmental problems delayed the U.S. space shuttle's 1979 first orbital flight at least six months (113:89, 213; 114:230), NASA selected crews for the first flights (113:183) and a group of later-mission candidates that included blacks and the U.S. astronaut program's first women. 113:36
- Ten spacecraft visited Venus in December, including five atmosphere probes and an orbiter of the U.S. Pioneer Venus project (114:420) and two Soviet landing craft, each deployed from a flyby vehicle, known as Venera 11 and 12 (114:435).
- The Voyager 1 and 2 probes, en route to 1979 encounters with Jupiter and beyond, become only the third and fourth spacecraft to attempt — and survive — passage through the asteroid belt. 114:198, 437
- The four Viking spacecraft continued to study Mars during the year, although orbiter 2 finally ran out of gas in July after nearly two years of operation. 114:70
- Two major astronomical satellites were launched, including the second High Energy Astronomy Observatory (114:343, 357) and the International Ultraviolet Explorer. 113:71, 100
- The all-microwave Seasat was launched to study the ocean surface, but failed amid some controversy after providing 99 days of data. 113:374; 114:4, 89, 280

- A variety of meteorological and earth-resources satellites were launched, all of them carrying some experiments related to pollution and the environment: TIROS-N (114:280), Nimbus-G (114:295), the Heat Capacity Mapping Mission (113:292), GOES-3 (113:406) and Landsat 3 (113:149).
- The third International Sun-Earth Explorer satellite was sent to study the sun's earthbound output from an unusual orbit circling one of the sun-earth libration points. 114:57
- The European Space Agency's Geos-2 was launched to study the earth's magnetosphere from geostationary orbit. 114:57
- Orbital Test Satellite 2 was launched as the forerunner to an operational European communications satellite system. 113:361
- President Jimmy Carter announced his new space policy, which included new emphasis on security-related space activities and closer interaction between military and civilian interests. 114:244, 294, 341
- The Skylab orbiting workshop, unoccupied since early 1974, was reactivated from the ground and shifted into an orientation with minimal atmospheric drag in hopes that it could be kept aloft until space shuttle astronauts could send it into a higher, longer-lived orbit, but NASA later abandoned the effort. 113:149, 388; 114:52, 68, 279, 439
- Pieces of the Soviet Cosmos 954 satellite hit the ground in western Canada, triggering a major search for some of its nuclear components (and heightening concern about the future of Skylab). 113:69
- NASA began making samples of Apollo moonrocks available to high schools. 113:137



Astronomy



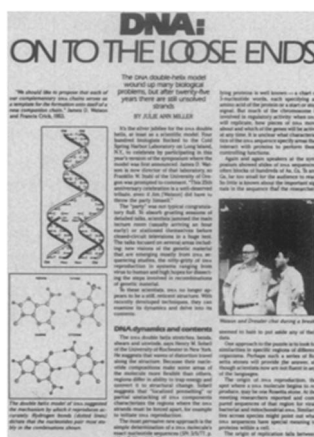
- Evidence for supermassive objects in the centers of two galaxies (NGC6251 and M87) was reported. 113:180, 308
- Observations of a star so young it was called "new born" were reported. 113:20
- A possible satellite of Pluto was discovered, enabling new conclusions about the planet itself. 114:36
- A theory that all open universes develop to an anisotropically twisted "heat death" was published. 114:405
- Increased attention focused on the possibility that the condensation of the solar system might have been triggered by the shockwave of a nearby supernova. 113:182
- Some observers concluded from occultation studies that the asteroid Herculina may have a natural satellite, suggesting the possibility that other asteroids may also. 114:36, 88, 440
- The first gamma ray spectral line was recorded. 113:117
- Evidence for antimatter in the center of our galaxy was found. 113:292
- A drop in the sun's temperature was recorded. 113:118
- Theorists proposed the possible existence of a quark star. 114:100
- An asteroid with the smallest semi-major axis and thus shortest year of any known was discovered and named Ra-Shalom in honor of the Camp David summit meeting. 114:228
- The rings of Uranus were directly "imaged" for the first time, and measurements indicated a 15-hour rotation period for the planet. 114:324
- Hundreds of meteorites discovered in Antarctica were found to include the best-preserved carbonaceous chondrite

known and a previously unknown type of basaltic achondrite. 113:390; 114:37

- Water of hydration was discovered on several asteroids, adding to the single previously identified example. 114:345
- The first preliminary "mapping" of the sulfur ions around Jupiter was done, revealing a semi-torus more than a million kilometers across. 114:345

Biology

- Insulin production by bacteria was approached by two groups using recombinant DNA methods. 113:388; 114:195
- Brain activity in animals and humans was visualized by use of radioactive metabolic analogs. 114:324, 340
- Monoclonal antibodies offered a new handle on cell and viral components. 114:444
- The first U.S. maximum safety (P4) facility for recombinant DNA experiments opened at Fort Detrick and the NIH eased their guidelines. 113:180; 114:437
- Using recombinant DNA techniques, biologists transferred a gene from a rabbit into monkey cells and another from a bacterium into yeast. 114:292; 113:37
- The bacterium that causes crown gall tumors was used to transfer selected genes into plant cells. 114:45
- Biologists created a mouse that may have a human chromosome and one derived from six parents. 113:341; 114:261
- Pressure tolerance of individual enzymes in fish reflects the depths that the fish inhabit. 114:55



- An embargo on export of Rhesus monkeys from India focused attention on primate breeding facilities to supply biomedical research. 113:55
- Russian scientists determined that the baby mammoth found frozen in Siberia died of blood poisoning, and a California scientist received a piece of muscle for protein analysis. 114:379; 113:167
- Specimens of an elusive luminescent Caribbean fish were captured. 113:135
- Truffles, the rare fungal delicacy, were successfully cultivated by French scientists. 113:150

Medicine

- The world's first test-tube baby was born in England this year (and a second was reported but not confirmed in India), sparking worldwide interest and controversy and leading to efforts in the United States and other countries to produce more. 114:51, 212, 261, 407
- Endorphins, enkephalins and other psychopharmacologically active peptides from the pituitary gland continued to boggle the medical research world, to promise valuable new drugs and even to win two researchers in the field a Lasker research award. 113:280; 114:359, 374
- A book that claimed that a millionaire, with the aid of scientists, created an infant in an exact genetic copy of himself sparked both public and scientific controversy over whether the book was a hoax and over whether human cloning was indeed possible. 113:164
- A National Academy of Sciences committee completed the first phase of its mission in helping Congress and the President decide whether the Food and Drug Administration should be allowed to ban saccharin or not. Its conclusions pretty well vindicated the findings that led the FDA to ask for a ban on the sweetener in 1977. 114:325
- A drug to treat viruses internally rather than on the surface of the body was approved for the first time by the Food and Drug Administration and was only the third such drug ever to be okayed by the FDA. It raises hopes that the FDA might also approve some other antiviral drugs in the near future, particularly for widespread public health problems such as colds, flu, hepatitis and herpes genital infections. 114:309
- Although five separate studies had shown from 1974 through 1977 that menopausal women who take estrogens run a considerable risk of getting uterine cancer, two researchers claimed that all the studies contained a serious methodological flaw. Other scientists countered these conclusions and declared that the findings substantiated, rather than detracted from, the five initial studies. 114:389
- The discovery of restriction enzymes, enzymes that snip long chains of DNA into segments that can be separated and identified, not only helped open the field of recombinant DNA during the late 1970s, but in 1978 earned the three scientists who made the discovery a Nobel Prize in Medicine. The discovery also led to prenatal diagnosis of two inherited blood diseases — beta-thalassemia and sickle cell anemia. 114:83, 276, 326
- Long-term studies on coronary artery bypass surgery began to establish guides as to which patients will benefit from the procedure. 113:314
- A slow virus—a virus that waits months or even years before triggering swift,



dramatic and nearly always fatal central nervous system disease — was finally identified, and it is not even a total virus, rather a naked core of DNA without a protein coat. 114:245

- A drug to prevent traveler's diarrhea — an antibiotic called doxycycline — was found. 113:232
- Histocompatibility antigens, proteins on the surface of cells that play a major role in organ transplant rejection, were found to serve as handles for viruses to enter cells. This is ironic, because while the antigens are helping to keep certain alien objects, such as transplanted organs, out of the body, they are letting other foreign objects, viruses, in. 114:230
- Several drugs that manipulate the nerve-transmitting chemical acetylcholine, which has been linked with learning and memory functions in the brain, looked promising in the treatment of senile dementia, a devastating disease that progressively destroys a person's ability to learn and remember and for which there is currently no cure. 114:102
- Thanks to recent technological advances, enzymes were used as drugs, in the production of drugs and in disease prevention. 114:58
- Radioactively labeled antibodies were used to diagnose various kinds of tumors. 114:23

Chemistry

- Methods were developed to assess reproductive hazards from occupational chemical exposures in both men and women. Hexachlorophene cleanser use by hospital workers was linked to birth defects. 113:214, 332; 114:21
- Barry Commoner added pan-fried hamburgers to the list of foods suspected, on the basis of bacteria tests, of causing cancer. 113:326
- Lucifer yellow, a new fluorescent dye, lights up cells 100 times more brightly than its predecessor. 114:298
- Computer programs modeled shapes of molecules and details of reactions. 113:362
- Chemists developed a molecular sieve

of crystalline silica that repels water and adsorbs organic molecules. 113:133

- A resin, cholestyramine, was successfully used to remove toxic pesticide kepone from patients. 113:69
- Chemists synthesized the 13-carbon ring that is the natural precursor of erythromycin and the plant hormone gibberellic acid. 114:73, 437
- Enzymes that make specific cuts in carbohydrates began to be used to analyze complex molecular structures. 114:73
- Analysis of genetic markers on white blood cells, used in 1,000 paternity suits, was more definitive than standard red cell blood type matching. 113:376
- Environmental chemists found that air pollutant NO₂ killed human lung cells growing in the laboratory and damaged mouse lung tissue after three-month exposures, but did not harm human subjects in eight-hour exposures. A Japanese study showed the most lung inflammation among inhabitants of an area with the high air levels of sulfur oxides and suspended particles. 113:199
- Physical chemists' tool, nuclear magnetic resonance, was used to detect human tumors. 113:187

Behavior

- Evidence is mounting that an imbalance of dopamine, norepinephrine and other brain chemicals may be involved in schizophrenia, depression and other behavioral disorders. 114:362



- Changing the sleep-wake cycles of a manic-depressive can produce dramatic, but temporary, improvement. 114:367
- In the first reported study of its kind with humans, federal researchers reported that "human aggression ... may have a biological component to it." That component appears to be related to the neurochemicals serotonin and norepinephrine. 113:356
- Children of Nazi holocaust victims now living in the United States were reported to be suffering from holocaust-related emotional disturbances, many around the same chronological age at which their



parents were interned in concentration camps. 113:324

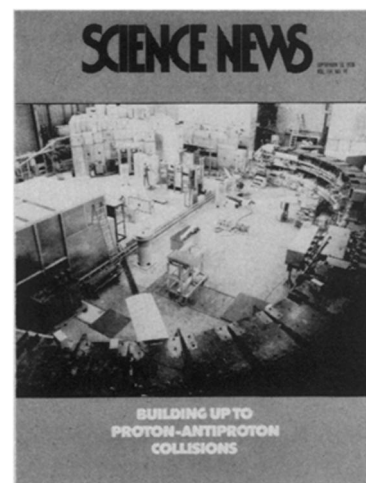
- A "five-fold overdiagnosis of schizophrenia" was reported among psychiatric inpatients, indicating what researchers called inaccuracies in current diagnostic criteria. 114:230
- Research on Sudden Infant Death Syndrome yielded possible predictive factors, including the possibility that SIDS may be a type of early "learning disability" in 2- to 4-month-olds. 113:234
- California scientists reported that a baffling type of potentially lethal botulism strikes infants and may be one cause of crib death. 113:297
- The placebo effect, long believed to be psychological in nature, was reported to have a biochemical component: Endorphins—the brain's natural opiate peptides that have been linked to pain suppression — are apparently activated when some patients take a placebo. 114:164
- Preliminary findings with rats indicated that drug addiction may occur in specific brain areas, researchers at Hunter College and Albert Einstein College of Medicine reported. 113:212
- Newly reported results from Seymour S. Kety's adoption studies in Denmark suggested a strong genetic component in some cases of depression and a substantial environmental aspect to schizophrenia. Kety theorized that part of that environmental component may be a "viral agent" that attacks the nervous system. 114:244
- Stress-related medical and psychological problems — suicides, hospital admissions, heart attack deaths, imprisonment and others — were linked to short-term "spurts" of economic prosperity that follow longer-term downward trends. 113:166
- A five-year study of hypertension among air traffic controllers revealed the group to be at risk to develop high blood pressure. The rigors of the job appear to trigger extreme fluctuations in pressure in one-third to one-half the men studied. 113:166
- "Americanization" was identified as the primary reason that Italian Americans in Roseto, Pa., have become progressively less healthy over the past decade. In the

early 1960s, Rosetans had a heart attack death rate less than one-third that of the rest of the country. 113:378

- University of California psychologist Arthur R. Jensen reported that his latest studies involving reaction time indicate further evidence that intelligence has a definite "biological basis." 114:181

Physics

- An experiment that gave strong support (in some opinions proof) to the theory that unifies the weak subnuclear and electromagnetic classes of force was done at the Stanford Linear Accelerator Center. 114:20
- Antiprotons were kept in a storage ring for the first time. 114:132, 234, 278
- The hottest temperature on earth, 60



million degrees Kelvin, was achieved in the thermonuclear fusion experiment called the Princeton Large Torus. 114:116

- Indirect evidence for gravity waves was found. 114:421
- The highest static pressure yet achieved, 1.72 megabars, was reported. 113:375
- A metallic form of xenon was produced, pointing the way to metallic hydrogen. 114:358



- A new class of mesons related to the charm quarks, the F mesons, was reported. 113:68
- Evidence for the existence of a third class of neutrino was reported. 113:196
- A transuranic element exhibited superconductivity for the first time. 113:310
- The PETRA storage ring at Hamburg began operations. 114:69, 234
- A way of making a path through air for a beam of electrons by electrically dissociating the air with a laser beam was demonstrated. 114:116
- A highly efficient photovoltaic material made with amorphous silicon was demonstrated. 114:406
- A semiconductor laser that produces light pulses only picoseconds long was announced. 113:246

Environment

- While Congress debated unsuccessfully over how much of Alaska's pristine wilderness to protect, the President permanently set aside 56 million acres as national monuments. 113:343; 114:279, 358, 406
- The snail darter became a catalyst for Supreme Court action and a congressional amendment that weakened the force of the Endangered Species Act. 113:310, 403; 114:68, 247, 279
- The Tecopa pupfish became the first animal removed from the endangered-species list by reason of extinction. 114:39
- Recognition of the extent to which our environment is contaminated with toxic chemicals — radioactive and otherwise — prompted investigation and action by the federal government. 114:57, 279, 369, 388
- Harvard scientists found that a single exposure to some pesticides can induce brain changes that last more than a year. 114:424
- Burning otherwise dangerous polychlorinated hydrocarbons — such as PCB's — at temperatures too low can form even more toxic isomers, a Swedish study showed. 114:21
- A 10-year statistical study of health effects from air pollution indicates where antipollution investments pay off best. 113:21
- Results of the efforts of more than 50 research groups show why it is so hard to study and contain oil spills on the open seas; oil that comes ashore is another matter. 113:38; 114:85
- Results of three epidemiological studies show a small link between at least two types of cancer and low-level exposure to ionizing radiation. 113:117, 135
- Microwave plasma detoxification completely destroys even the most hard-to-degrade chemicals. 113:392
- Three proposed regulations would track hazardous wastes from cradle to grave and see that they're buried right. 114:440



- The best mosquito-killer known — a bacterium — should be available soon. 114:183
- Despite scientific efforts to curb them, locusts swarmed to plague proportions throughout northeast Africa. 114:61

Earth Sciences

- One group of researchers forecast the Nov. 29 Oaxaca, Mexico, quake; another group caught it in the act. 114:404, 422
- On April 28, the biggest solar flare — in terms of radio-frequency energy — was recorded. 113:309
- A "group prediction" for the next 25 years forecast that warming by CO₂ will balance the natural cooling cycle and that temperatures worldwide, though slightly warmer in the north, will increase uniformly. 113:116
- Air sampling revealed a new threat to the atmosphere — methyl chloroform — and confirmed the presence of some old ones. A revised estimate put eventual ozone depletion at 15 percent. 114:212, 379, 407, 423
- Certain airplane crashes and the destruction that accompanies tornadoes were attributed to sudden air currents called downbursts. 113:374
- An unexpected volcanic outpouring of unknown origin was discovered during DSDP Leg 61 in the Pacific. 114:133
- Analysis of paleomagnetic data showed that the earth's radius has changed less

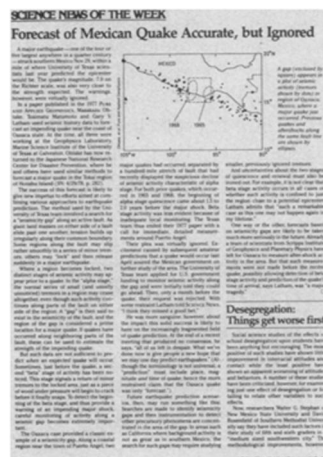
- than 0.8 percent in the last 400 million years. 113:101
- The DSDP tracked the evolution of the Mariana trench and island arc system. 113:246
- The still unexplained "East Coast booms" were variously attributed to unusual weather plus military aircraft, the Concorde and methane bubble bursts. 113:181, 281
- Researchers found evidence for animal prescience of earthquakes. 113:278
- Researchers continued to probe for solar-weather links, and a "global electrical circuit" was proposed as a possible coupling mechanism. 113:340; 114:105
- Researchers drilled 1,920 meters into the crust of Iceland, the landward extent of the Mid-Atlantic Ridge, to learn about the ocean crust. 114:165
- A network was established to monitor the growing problem of acid rain. 113:407
- The federal government established a program to reduce loss of life and property due to earthquakes. 114:22
- A National Climate Program, designed to coordinate climate research, was established. 114:246

Anthropology & Archaeology

- Margaret Mead, for more than 50 years the embodiment of cultural anthropology, died on November 15 in New York. She was 76. 114:355



- Sherman and Austin, two chimpanzees at the Yerkes Regional Primate Research Center, accomplished what researchers reported was "the first instance of... symbolic communication between non-human primates." 114:117
- Fossilized tracks dated around 3.6 million years were uncovered by Mary Leakey in northern Tanzania. Among several animal tracks were those Leakey and others believed were made by human-like creatures. 113:132
- The worldwide population growth rate has finally begun to decline. 113:116
- Naturalist Jane Goodall revealed that





chimps in the wild have a killer instinct apparently unrelated to simple needs for survival and food. 113:276

- Thirty-million-year-old bone fragments of *Aegyptopithecus* were discovered in Egypt's Fayum Depression. It was the oldest reported find yet of the forerunner to higher primates. 113:196
- The world's first known talking gorilla, Koko, was reported to have a working vocabulary of 375 hand signals, an 85 to 95 IQ and tendencies to lie, accept bribes and rhyme words. 114:265
- Chimp-human physical differences were reported to be greater than those between dissimilar species of frogs. Biochemically, however, humans and apes are 30 times closer than the frogs. 113:229
- The two-and-one-half-foot-long femur of an 18,000-year-old bear was discovered in Utah. Investigators theorized it may represent a new species, perhaps even a new genus, of Pleistocene bear. 114:55
- A spiral carving discovered in Chaco Canyon may be the first known noon marker of summer solstice. 114:148

Technology

- Bell Telephone Laboratories improved gallium-arsenide semiconductors to double the speed at which electrons course through them. 114:260
- Albany International Corp. announced government approval to package the sex pheromone of bollworms in short, plastic, adhesive fibers as a birth-control technique to limit the pests. 113:360.
- Development of a pocket-size camera to take three-dimensional photographs was announced by Nimslo Co. of Atlanta. 114:296
- Sintered calcium-phosphate ceramics make tissue-compatible bone implants that act and fuse like the real thing. 113:168
- A plasma carburizing process developed by General Motors to case-harden steel saves time, money and natural gas. 114:296
- Corning Glassworks created a photo-sensitive glass that can be permanently

colored any hue by varying the length of its exposure to ultraviolet light. 113:165

- Cameras employing charge-coupled devices are extending the depth to which one can observe — in time and space — our universe. 114:146
- Sandia Laboratories sterilized sewage sludge with gamma radiation to the point at which it can be safely fed to livestock as a feed supplement. 113:89
- Radioisotope dating of archaeological artifacts using particle accelerators was shown to require less time and mass than other techniques, including carbon-14. 113:29, 187
- Electroplating is cleaner, cheaper and faster with Bell Labs' system. 113:343

Energy

- After 18 months of grueling debate, the Congress passed a much-weakened version of President Jimmy Carter's energy bill. 114:279, 358
- That solar energy is feasible today and will become increasingly more so was the impetus for Sun Day and a *SCIENCE NEWS* special issue. 113:248, 255, 256, 258, 262, 263, 309
- President Carter's efforts to kill the Clinch River breeder reactor were thwarted at every turn. 113:175; 114:54
- The first federally funded commercial wind generator began two years of tests in Clayton, N.M. 113:55



- U-25B, the joint U.S.-Soviet magneto-hydrodynamics project, began generating electricity and feeding it into the Moscow power grid. 113:6
- Thermionic energy conversion—a dark horse technology that converts heat into electricity — will get more work out of fossil, nuclear and solar energy. 113:202

Science and Society

- The People's Republic of China moved from mystery into the spotlight as a crash program to modernize and industrialize — with Western help — took form. 113:358; 114:24, 53, 248, 440

- Women are generally making slow gains toward equal pay and representation in the sciences, but not without some fighting and emotional trauma. 113:200; 114:92
- Soviet handling of the trial and sentencing of "refusenik" Anatoliy Shcharanskiy, a computer scientist, has dampened U.S.-USSR relations and trade. 113:7; 114:69, 165
- The Internal Revenue Service challenged the tax-exempt status of several



- scientific and engineering societies. By year's end, only the American Physical Society had won its appeal. 114:103, 231, 392
- The antifluoridation movement scored a victory when a Pennsylvania judge ordered the local water authority to stop fluoridating drinking water. 114:358
- Worldwide losses in cropland and agricultural productivity portend a major food crisis, according to a Worldwatch Institute study. 114:308
- Congressional hearings brought to light shenanigans by the Department of Energy and its predecessor agencies in the handling (and eventual transfer) of a research contract exploring a cancer-radiation link. The General Accounting Office was asked to investigate. 113:103; 114:101
- In reversal of an earlier opinion, the National Institute of Drug Abuse says smoking marijuana contaminated with paraquat can pose a significant health hazard. 113:212
- Computers appear successful in helping dropouts overcome functional illiteracy. 114:394
- Preliminary findings of a survey that may take years to complete show a high rate of leukemia among persons exposed to nuclear blasts in the military. 113:92
- The last smallpox case in the world — announced last year — really wasn't, thanks to a laboratory accident. 114:182
- The People's Republic of China sent the first exchange students, since the Cultural Revolution, overseas for training in Western universities. Six sent to the U.S. this year are but a fraction of the 10,000 China hopes to train abroad during the next two years. 114:248