ASTROPHYSICS

Key to Other Worlds

Neutrinos may serve as a key to discovering other "suns" in anti-matter worlds if an effective neutrino telescope can be devised—By Ann Ewing

➤ NEUTRINOS, nature's most elusive atomic particles, could serve as a key to detecting other "suns" in the universe made of anti-matter, the opposite of the kind of matter found on earth, and in our sun.

This possibility was suggested by Dr. Bruno Pontecorvo, the ex-British physicist who now lives in Russia. Italian-born Dr. Pontecorvo fled from England to Russia in 1950 and is now a Soviet citizen, considered one of Russia's top physicists.

Dr. Pontecorvo's suggestion of using a neutrino telescope to spot worlds of anti-matter is made in Soviet Physics Uspekhi, 6:1, 1963.

The problem is to build an effective neutrino telescope, Dr. Pontecorvo reported. Although this may be extremely difficult to do for other stars, it should be possible to build one to scan the sun.

Anti-matter worlds cannot be detected by their light, since the photons carrying light's energy are neutral and therefore the same, whether emitted by normal matter or by anti-matter. However, neutrinos and anti-neutrinos can be told apart since they have a different direction of spin, or helicity.

A star made of anti-matter, which would be converting antihydrogen into antihelium, would emit anti-neutrinos and could therefore be told from a star burning normal matter.

Neutrinos can also be used to detect the nuclear reactions occurring in the center of our sun, Dr. Pontecorvo suggests.

The most characteristic feature of neutrinos is their immense penetrating power. An iron plate the thickness of billions of times the distance from the earth to the sun, which is 93 million miles, would not stop one.

Dr. Pontecorvo has won a Stalin Prize and this year was awarded the Lenin Prize for Physics. A member of the Academy of Sciences of the USSR, he works at the Joint Institute for Nuclear Research, less than a hundred miles from Moscow.

• Science News Letter, 84:99 Aug. 17, 1963

ASTRONOMY

Young Stars Emit More High-Energy Radiation

➤ A FEW BILLION years ago, the sun was producing much more high-energy radiation than it is today, Dr. O. C. Wilson of Mt. Wilson and Palomar Observatories in Pasadena, Calif. The younger the star, the higher the level of the radiation.

Stars similar to the sun, but younger, put out far more energy in the X-ray and ultraviolet portions of the spectrum than do older stars.

High-energy radiation is believed highly important in the formation and early development of life. The greater amounts of ultraviolet light put out by the sun in its youth may have been the critical factor in the formation of the first living cells.

By measuring the high-energy output of various stars, astronomers can learn more about the birth and death rates of stars, and where and when stars are most likely to form.

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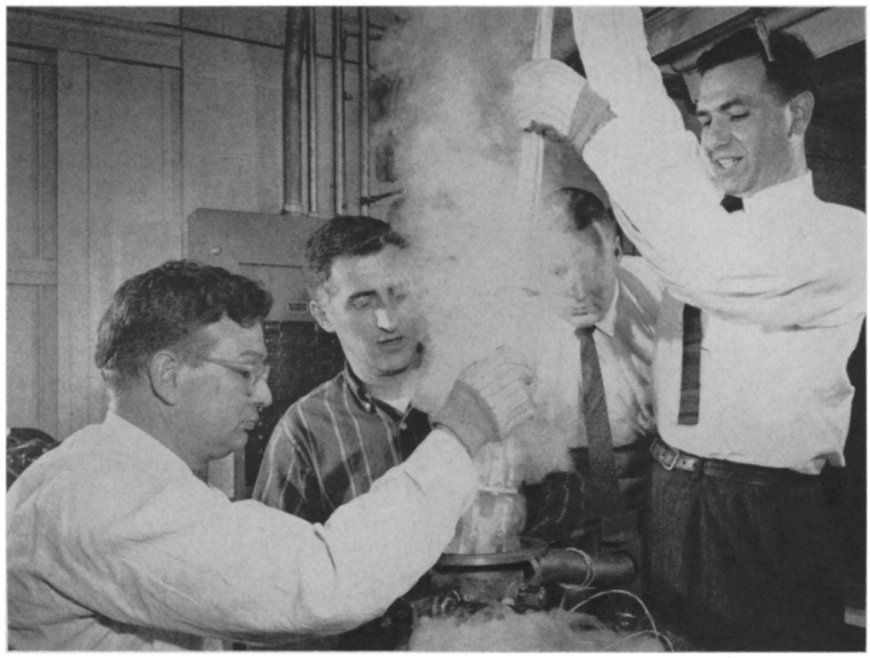

General Electric

SUPERCONDUCTING COIL—The superconducting coil, after attaining a magnetic field of 101,000 gauss, is shown being removed from liquid helium by the developers (left to right), Drs. D. Luther Martin, Charles A. Bruch and Mark G. Benz and Carl H. Rosner of General Electric Research Laboratory.

GEOLOGY

North Sea Surveyed For Oil, Gas Deposits

➤ THE MOST ACTIVE spot in the globe for oil and natural gas prospecting is the North Sea geological basin.

A Dutch-American firm has found an enormous deposit of natural gas in northeastern Holland's Groningen Province near the German border. The gas was in the sands of an underground rock formation which happens to extend under a large area of the North Sea.

Speculation is that this sea covers massive reserves of petroleum, a source of tremendous wealth for the bordering countries. Already seven companies are surveying the off-shore areas.

The underground deposit alone is estimated to contain 2,000 billion cubic feet of available natural gas, enough to take care of all the needs of the Netherlands for the next 40 years. By then, nuclear energy is expected to be Europe's main source of power.

The Netherlands Gas Union, a government agency, is drawing up plans for the actual tapping and distribution of the bonanza.

Science, 141:399, 1963, cited the possibility of oil and gas deposits under the sea as a reason for the United States' full support of Project Mohole, the attempt to bore a hole through the earth's crust.

• Science News Letter, 84:99 Aug. 17, 1963

SPACE

Mariner II: Once Around The Sun, and Still Going

➤ MARINER II, the space probe that made a close-up, on-the-run inspection of Venus last December, completed its first lap around the sun Aug. 1.

The satellite, which was launched on Aug. 27, 1962, has traveled approximately 540 million miles since then. On Dec. 14, it passed within 22,000 miles of Venus and swung nearer the sun, reaching its closest approach to the sun on Dec. 27.

Now, it swings in and out on its 346-day journey around the sun, approaching to within 62.5 million miles at the closest and receding to 113.8 million at the farthest.

• Science News Letter, 84:99 Aug. 17, 1963