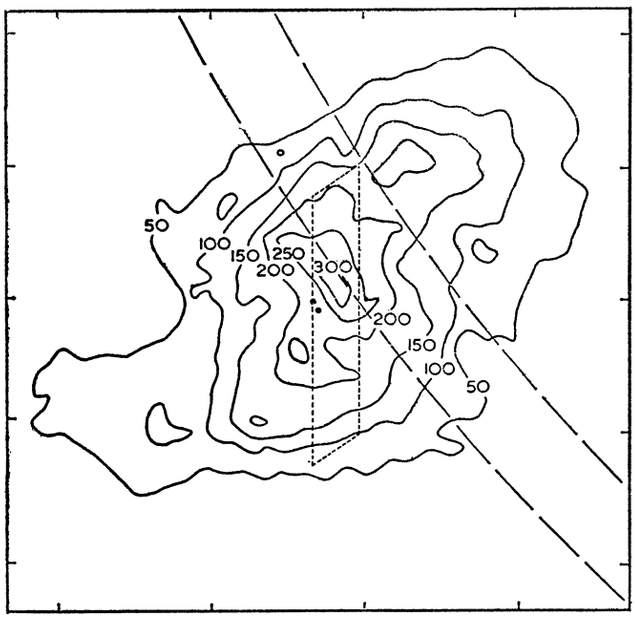
Physical Sciences Notes

RADIO ASTRONOMY

Radio Source Mapped in Crab Nebula



Radio astronomers have tuned their antennas in on the radio waves being broadcast by the Crab Nebula for many years. Now they are able to map it, at certain frequencies, with an accuracy X-ray astronomers would like to achieve (see facing page).

In the March 25 NATURE, four scientists present three reports on their most recent observations of the Crab Nebula at 1420 and 81.5 megacycles using the large antennas of the Mullard Radio Astronomy Observatory, University of Cambridge.

Dr. N. J. B. A. Branson mapped the linear polarization of radio sources within the Crab Nebula at 1420 megacycles. He found little correspondence between the radio and optical polarization but was able to obtain a distribution of flux densities across the nebula.

Dr. J. F. R. Gower's observations enabled him to locate the position of the low frequency raido source in Crab. He compared the total signal with a smaller scintillating component to determine the position of the small source at 81.5 megacycles (see diagram).

Also tuning in on the Crab Nebula at a frequency of 81.5 megacycles were Drs. A. G. Hewish and S. J. Bell, who measured the angular size and the flux density of the small source.

Dr. I. S. Shklovsky of the P. K. Sternberg State Astronomical Institute has suggested that the low frequency radio source may be associated with the X-ray source.

HONORS

AEC Award Winners

Five U. S. scientists have been selected to receive the Lawrence Memorial Award for 1967 for their contributions to various facets of atomic energy. The scientists will receive a cash award of $5,000, a gold medal and a citation, to be presented on April 27.

Dr. Mortimer M. Elkind of the National Institutes of Health profoundly influenced biological thought concerning radiation injury by demonstrating that mammalian cells are capable of recovering in large measure from the damaging effects of radiation.

In addition to many contributions to the development of production processes involving the separation of materials of great importance to the nuclear energy program, **Dr. John Melvin Googin's** specialty could be described as "scientific trouble shooter" at the Y-12 Plant at Oak Ridge.

Dr. Allan F. Henry of the Bettis Atomic Power Laboratory in Pennsylvania developed the first comprehensive theoretical description of the reactor kinetics of a pressurized water nuclear plant.

During the past few years, **Dr. Robert Thorn** of the Los Alamos Scientific Laboratory has made distinct contributions toward better understanding of the vulnerability of nuclear weapons system. He is responsible for initiating and conducting the essential calculations that lead to final weapon designs.

Dr. John O. Rasmussen is an outstanding authority in nuclear chemistry and physics, particularly in the area of the microscopic model of nuclear structure. He holds a joint appointment as professor at the University of California, Berkeley and senior staff member of the Lawrence Radiation Laboratory.

ACOUSTICS

Synthesis of Wind-Instrument Tones

The creation of new types of musical instruments having greater artistic capabilities than those now available could result from research on the synthesis of wind-instrument tones using a high-speed computer.

The tones of the clarinet, oboe, bassoon, tuba, flute, trumpet, trombone, French horn and English horn have been synthesized and identified with 77 percent accuracy by musically literate auditors.

"Synthetic oboe tones are as good as the natural ones for identification purposes," Dr. William Strong of Brigham Young University, Provo, Utah, and Dr. Melville Clarke of Melville Clark Associates, Cochituate, Mass., have found.

They report in the current (Jan.) JOURNAL OF THE ACOUSTICAL SOCIETY OF AMERICA that synthetic bassoon and clarinet tones are "nearly as good as the natural ones."

Tones lasting 700 milliseconds were synthesized digitally on an IBM 7090 computer at Massachusetts Institute of Technology's Computation Center. Several tones for each instrument were synthesized at representative frequencies for that instrument.

MAGNETISM

Megagauss Magnetic Fields

Milliongauss magnetic fields—10 to 100 times greater than any generated by conventional methods—are now being created in laboratories using explosives and recently declassified A-bomb technology.

During the course of the fleetingly brief implosion, of the kind used to assemble a critical uranium mass to trigger a bomb, tremendous amounts of chemical energy are converted directly into electromagnetic field energy.

At the opening session of the American Physical Society meeting in Chicago last week, Dr. Thomas Erber, leader of a group working in this field at Illinois Institute of Technology, outlined the "truly extraordinary conditions" that can be achieved during implosions.