

# Physical Sciences Notes

## X-RAY ASTRONOMY

### Optical Identification of X-ray Source

The fourth X-ray source to be identified with a point of visible light in the night sky has been discovered by Dr. Victor M. Blanco, director of the Cerro-Tololo Inter-American Observatory at La Serena, Chile. The X-ray object, although called Centaurus XR-2 after the constellation in which it was believed located, is actually in the constellation of Musca, Dr. Blanco has determined from optical observations.

The first visible star found to emit X-rays was the sun. Outside of the solar system, the first object discovered radiating both in the visible and the X-ray range was the Crab Nebula (SN: 4/8); the second was a source in the constellation of Scorpius known as Sco XR-2, and the third was Cygnus XR-2 (SN: 7/1).

## THEORETICAL ASTRONOMY

### New Institute in England

Following several years of negotiation, a new institute of theoretical astronomy has been established at Cambridge University in England under the direction of Dr. Fred Hoyle.

The institute is being financed by a combination of government, university and private money, with the government's Science Research Council contributing 40 percent of operating costs for the first five years, mainly to meet the cost of buying and running the computer.

Members of the institute will do no regular lecturing.

## ATMOSPHERIC PHYSICS

### Modern Day 'Ben Franklin'

Benjamin Franklin flew a kite into a thunderstorm to prove that lightning was electricity, so successfully that no one now doubts it. Modern day Ben Franklins are using long wires carried aloft by rockets to guide lightning strokes so that their measurements can be made under reasonably reproducible conditions.

When a suitable thundercloud is observed overhead, the ship-borne rocket is fired, trailing aloft one end of a thin stainless steel wire. The lower end is grounded to the vessel and therefore to the ocean. In a typical case, the triggered lightning stroke jumped between the rocket at a height of about 100 meters to the cloud at a height of 1,000 meters or more.

The experiments, conducted by scientists from the Lightning and Transients Institute in Minneapolis, the Cambridge Research Center in Bedford, Mass., and the Federal Aviation Agency, are reported in the Sept. 15 JOURNAL OF GEOPHYSICAL RESEARCH.

## INTERNATIONAL SCIENCE

### Scientists Urged to Learn Russian

In chemistry, mathematics and some other areas of scientific research, every fifth paper appears in Russian, yet less than five percent of U.S. scientists have a reading knowledge of the language, a survey conducted by the National Science Foundation shows.

Valuable Soviet research findings may be lost to U.S.

scientists because of this inability, J. G. Tolpin of Northwestern University warns in the September CHEMIST. Even with the development of electronic translating machines, the chemical engineer notes, translated versions often appear 6 to 18 months later than the original, and many reports never appear in English.

On the other side of the Iron Curtain, however, Tolpin estimates that probably half of the Soviet scientists can read English-language research reports in their fields, and many more know conversational English.

He urges that U.S. scientists learn enough Russian to be able to scan Soviet publications for significant reports, so that they can recognize, even if not translate, those of importance in their own specialty. Tolpin stresses that the ability to scan Soviet publications for significant reports is no full substitute for training U.S. scientists to translate Russian.

## THEORETICAL ASTRONOMY

### Atoms in Space Change Light

The presence of contaminating atoms on dust grains in interstellar space can drastically change the interaction of the grains with electromagnetic radiation over a wide range of wavelengths, extending from the optical to the far infrared, British astronomers suggest.

Dr. Fred Hoyle and Dr. N. C. Wickramasinghe of Cambridge University, England, believe that interactions of such dust on an intergalactic scale could account for the three-degree Kelvin background radiation believed the residue of the primordial fireball from which the universe was formed (see SN: 2/4).

## SOLAR SYSTEM ASTRONOMY

### Laser Microprobe for Analysis

The variation in the abundances of primordial rare gases in meteorites is important to understanding the early history of the solar system and earth. These abundances, which are a clue to the meteorite's age, have sometimes been found to vary in different portions of the same meteorite.

To deal with this Dr. G. H. Megrue of Smithsonian Astrophysical Observatory and Harvard College Observatory has developed a system that can be used to analyze rare gases in the microgram range. He uses a pulsed ruby laser to volatilize, under vacuum, approximately one microgram of material from polished sections of meteorites.

The extracted gases were separated at low temperature, then analyzed by mass spectrometer. He found that not all the dark parts of one meteorite contained the same abundances of primordial helium and neon, indicating the necessity of further measurements of isotopic abundances by this method to establish why there is a difference.

Dr. Megrue reports in the Sept. 29 SCIENCE that the laser microprobe and mass spectrometer "offer a powerful technique for exploring isotopic variations on a micron scale."