

spaced along an east-west line, and the two others move along a 300-m rail track at the eastern end of the 1.6-km baseline. First observations will be made at 21-cm wavelength, for which the resolution will be 22 sec of arc. The telescope will be used for counts of radio sources, investigation of the structure and spectra of these sources, and work on the distribution of radiation and polarization in nearby spiral arms of our own galaxy.

The Science Research Council has agreed to meet the estimated £2-million (\$4.8-million) cost of the 5-km (3-mile) interferometer at the University of Cambridge. The new telescope will be built at Lord's Bridge, site of the existing 1-mile interferometer, along the roadbed of a now disused railroad that runs along the northern boundary of the Mullard Radio Observatory, a few miles outside Cambridge. Eight 12.8-m-diameter paraboloids will comprise the interferometric array; four of them will be fixed and four movable along the east-west axis of the instrument.

The existing 1-mile interferometer has a resolution of 20 sec of arc. The planned instrument is expected to

see structure as fine as 1-2 sec of arc. It will be used for observations of quasi-stellar objects and radio galaxies; as with the present instrument radio astronomers from any British university will have access to it.

Check of T Invariance in Electromagnetic Interaction

An apparent violation of time-reversal invariance in the electromagnetic interaction was reported at the New York American Physical Society meeting by David Bartlett, K. Goulianos, Carl Friedberg, Ira Hammerman and David Hutchinson of Princeton. The group compared angular distributions for $n+p \rightarrow \gamma+d$ with data from other sources on the inverse reaction $\gamma+d \rightarrow n+p$ to test reciprocity and hence check time-reversal invariance. In the experiment, neutron energies from 160 to 680 MeV were studied. At lower values of energy the angular distributions for both of the reactions matched. But at about 600 MeV, which corresponds to formation of the N^* resonance, the curves did not match. Michael Longo (University of Michigan) and his collaborators in a similar experiment do not see the large effect reported by the Princeton experimenters. Although many particle

physicists are excited about the observations, a typical attitude is, "Interesting if true." —GBL

Polar Cap May Have A Geoelectric Field

During the period of high solar and geomagnetic activity in late May 1967 the Air Force satellite OV1-9 detected energetic proton fluxes coming up the magnetic field lines from the earth at high magnetic latitudes ($\lambda \geq 65$ –70 deg). Ludwig Katz and Paul L. Rothwell of Air Force Cambridge Research Laboratories suggest that, because the flux is highly collimated along magnetic-field lines, there may be a radial polar electric field of about 0.14 volts/meter (*Phys. Rev. Letters* **21**, 1764, 1968). Electric fields had been suggested earlier as a possible explanation for aurora or other polar-cap particle precipitation.

Polarized Targets Used To Study Spin Effects

By hitting targets of aligned Ho^{165} with a polarized neutron beam, experimenters are now able for the first time to study the dependence of total cross section on the relative orientation of neutron spin and nuclear spin.

In recent work at Stanford (*Phys. Rev. Letters* **20**, 502, 1968), the target is a cylinder of polycrystalline holmium metal (1.6-cm diameter, 7.4 cm long), mounted inside a dewar that is provided with thin windows for the passage of a fast-neutron beam; the cylinder is thermally anchored to a bath of pumped He^3 at a temperature of 0.3 K. An external magnetic field of 18 000 oersteds along the axis of the cylinder is provided by a superconducting solenoid. The large hyperfine interaction between the nuclear magnetic moment and the atomic electrons causes a nuclear polarization of 55%. This method of producing systems of oriented nuclei is a common one, but applying it to a target suitable for experiments with fast neutrons is new.

The Stanford group, consisting of Thornton R. Fisher, J. S. McCarthy, R. S. Safrata (now at the Nuclear Research Institute, Rez, Czechoslovakia), E. G. Shelley (now at Lockheed Palo Alto Research Laboratories), finds that over the range 0.3–15 MeV total cross section depends strongly on nuclear orientation. The

IN BRIEF

The Serpukhov alternating gradient synchrotron is now producing 10^{12} protons/pulse at 70 GeV, according to Yuri Ado, who spoke at the March Particle Accelerator Conference in Washington. The space-charge limit on intensity is about 2×10^{12} protons/pulse.

Argonne has successfully operated the world's largest superconducting magnet, which will provide an 18-kG field for the 3.7-meter bubble chamber nearing completion. The magnet consists of a 110-ton stack of circular coils inside a 1600-ton steel yoke.

An experiment on OGO-5 has detected low-frequency fluctuating electric fields generated in the earth's bow shock. R. W. Fredricks, Charles F. Kennel, Frederick L. Scarf, G. M. Crook and I. M. Green (*Phys. Rev. Letters* **21**, 1761, 1968) of TRW Systems Group found that the turbulence is strongly correlated with time variation in the magnetic field.

A new candidate for the standard

wavelength is the 3.39-micron rotation-vibration line of methane. R. L. Barger and J. J. Hall of the Joint Institute for Laboratory Astrophysics locked two lasers independently to the transition with a reproducibility of ± 1 part in 10^{11} (*Phys. Rev. Letters* **22**, 4, 1969). This reproducibility is two orders of magnitude better than the present length standard, the 605.6-nanometer line of Kr^{86} .

The compressibility of nuclear matter in S^{32} is about 200 MeV, according to calculations (*Phys. Rev. Letters* **21**, 1479, 1968) by Werner Scheid, Rainer Ligensa and Walter Greiner (University of Virginia and the University of Frankfurt). They used O^{16} – O^{16} scattering data from Yale. The new 2.7-m (107-inch) reflector at the McDonald Observatory, University of Texas, is currently the world's third largest optical telescope. To be used largely for planetary astronomy, the instrument was paid for by NASA.