consists of four internal rings carrying parallel currents in the toroidal direction. Just like all multipoles, the device has axial symmetry about the major axis of the torus. Ohkawa designed the device to reduce losses to the ring supports, one of the major limitations in earlier octopoles; it has a plasma volume of 10 000 liters.

In the first experiments Ohkawa used a plasma density of 3×10^{10} particles/cm^3; electron temperature was about 5 eV. In the new experiments Ohkawa pushed the density higher (10^{11} particles/cm^3) and the temperature lower (a few eV), to a regime where one should get classical diffusion. Ohkawa did indeed observe classical diffusion for the first 150 millisec; then the behavior smoothly changed and became Bohm-like. His measured decay time of 200 millisec corresponds to about 300 times the Bohm value.

Although the octopole confinement is the longest observed in any toroidal device, its plasma is cold and dilute and not likely to be scaled up into a reactor because of the interior rings. (General Atomic plans to build a Doublet device, in which internal conductors are replaced by plasma current.) However, because the octopole plasma is well contained one might now try to understand what effects are responsible for the enhanced confinement and then apply the knowledge to a geometry that is more suitable for a fusion reactor.

The Tokomak plasma is already nearly thermonuclear; it gives neutrons, it is hot and it is dense. At Dubna N.J. Peacock and D. C. Robinson of Culham Laboratory and N. Sammikov of the Kurchatov Institute reported that Tokomak T-3 produced in one mode of operation electron temperatures of 900 ± 100 eV and confinement times of about 25 millisec with a density of 2×10^{13} particles/cm^3. Earlier measurements by Kurchatov had yielded 3×10^{13} particles/cm^3 at 1000 eV and 20 millisec. The Culham–Kurchatov collaboration determined temperature and density by analysis of Thomson scattering from a pulsed ruby-laser beam.

Air Force Solar Telescope and OSO-6 Now Observing the Sun

Two new devices are now observing the sun—a solar vacuum-tower telescope built by Air Force Cambridge Research Laboratories and OSO (Orbiting Solar Observatory)-6.

The solar telescope is 111 meters high and has a central core that contains the entire optical system, which is evacuated to 0.250 torr. Light enters through a 76-cm aperture, passes through a quartz window and is then reflected by two flat mirrors to the 64-inch (1.62-meter) focusing mirror (focal length 55 meters) at the bottom of the shaft. Theoretical resolving power is 0.2 sec of arc; so one can expect to resolve fine details on the solar disc.

AIR FORCE SOLAR TELESCOPE is 111 meters high. The optical system is evacuated to 0.250 torr.

Because the objective port is high above most air turbulence and heat currents that swirl up when the sun heats the ground, and because the optical system is evacuated, image stability is expected to be excellent. Richard B. Dunn designed the system.

Located in the Sacramento Mountains of New Mexico, the $3.3-million instrument will be used to study solar centers of activity—sunspots, magnetic fields, flares and plage areas. One goal is identification of precursors to solar flares.

OSO-6 is returning data from seven experiments. From its vantage point above the atmosphere, it can study in detail the ultraviolet and x-ray spectra at any point in the solar disc. Its expected lifetime is six months.

IN BRIEF

US and Soviet radio astronomers were to collaborate this fall on the longest baseline ever used for two-telescope interferometry. Telescopes at Green Bank, W. Va., and the Crimean Astrophysical Observatory near the Black Sea—9600 kilometers apart—should provide a resolution of 0.0003 to 0.0005 seconds of arc at a 3-cm wavelength.

Construction has begun on an observatory to house a 40-inch (101-cm) astrometric telescope at the Fan Mountain Observatory of the University of Virginia.

A two-year oceanographic study of the central Mediterranean is taking place. Geophysicists from the Woods Hole Oceanographic Institution, the University of Bologna and the University of Trieste are coöperating in the project and expect to obtain continuous reflection and refraction data from the earth's crust down to the Mohorivicic discontinuity.

Dicke Panel Says US Lags in Radio-Astronomy Construction

The National Science Foundation Ad-Hoc Advisory Panel for Large Radio-Astronomy Facilities, headed by Robert H. Dicke, has decried the lack of US radio-astronomy construction. The panel, originally convened in August 1967 (PHYSICS TODAY, September 1967, page 71), met again to review its original recommendations. In a recently issued report the panel points out that none of the suggestions made two years ago has yet been implemented. The US, it says, has stood still while Germany, India, the Netherlands and the UK have begun construction on large radio telescopes, several of which will soon be in operation.

Noting that discoveries since the panel first met (pulsars, existence of interstellar formaldehyde, ammonia and water) have made construction of new telescopes even more imperative now than two years ago, the panel recommends that:

- the 305-meter spherical-dish telescope at Arecibo, Puerto Rico (PHYSICS TODAY, April, page 65) be resurfaced so that it can be useful for centimeter-wave radio astronomy. Resurfacing was urged two years ago as a relatively inexpensive improvement.
- the Cal Tech proposal for con-