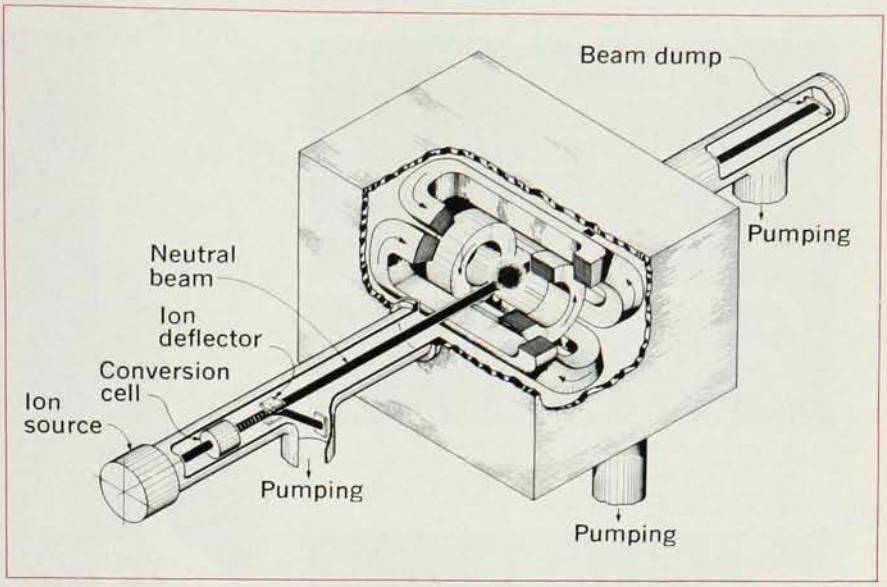
Arthur H. Snell, assistant director of Oak Ridge.

The electron-cyclotron heated target plasmas have been under development at Oak Ridge for some time. In the simple mirror configurations used earlier a surrounding gas pressure of 10^{-5} torr was required to provide a continuous supply of cold electrons for gross stability. Snell expects that a magnetic-well configuration will yield gross stability of the target plasma without the cold electrons. Then the pressure can be reduced to 10^{-6} torr or lower, low enough for hot-ion build-up (due to high trapping efficiency) to interesting densities.

IMP will use a magnetic-well configuration, which incidentally will also suppress the negative-mass instability. It will be smaller than DCX-1 (and its successor, DCX-2) in physical size but larger in terms of Larmor orbits. It will use superconducting coils in a flexible mirror-quadrupole arrangement. (Copper windings would require 23 MW of dc power.) Some parameters for IMP are given in the table.

In a parallel experiment at Oak Ridge (INTEREM), which uses a simple mirror configuration so that ambient pressure must be relatively high, 0.1 amperes of 20-keV H^0 particles are injected into a microwave plasma produced in a 2.5-kG magnetic field. Experimenters have found a hot-ion density of 3×10^8 cm^{-3} with no indication of ion cyclotron radiation signalizing the instabilities previously encountered.



OAK RIDGE IMP experiment now being designed will inject neutral atoms into a target plasma produced by microwave heating.

Getting a Charge Out Of a Solar Power System

A solar power system capable of converting sunlight into all the electricity needed to operate a large manned orbiting space station for a year or more can be built with existing technology and equipment, RCA Astro-Electronics scientists announced at the Inter-Society Energy Conversion Engineering Conference in Miami, Fla. Functioning as part of a space station in a 200-nautical-mile orbit, the system would generate 5 to 8 kW of usable power.

During daylight, the system would produce 8 kW for the station's onboard systems while simultaneously charging the batteries so that 5 kW would be available when the earth obstructed the sunlight. To make this possible, the solar array would have a capability of 15.5 kW.

The most distinguishing feature of the system proposed in this NASA-sponsored study would be four paddles each 5.2 by 8.5 meters. Blanketed by solar cells that convert sunlight into electricity, the panels would be arranged in an H configuration around the manned space station. The system could be assembled, tested and ready for operation by the early part of the next decade.

. . . also of Interest: Albany, Michigan State, Germanium

The State University of New York, Albany expects to install a 4-MeV Dynamitron in the academic year 1968–69 that will produce intense beams of positive ions for the study of low-yield neutron and proton capture reactions. The research program, directed by Jagadish Garg, will include nucleon polarization studies and high-resolution neutron and gamma spectroscopy . . . Michigan State University will soon have a TRIGA Mark 1 reactor that will operate at 250 thermal kW . . . J. C. McGroddy and M.I. Nathan of IBM find that bulk germanium in a high electric field can modulate a direct current with high-frequency oscillations in the gigahertz range. □

Parameters for Oak Ridge IMP

Steady state magnetic field	20 kG at center
Longitudinal mirror ratio	2:1
Radial mirror ratio	1.3:1
Maximum field	70 kG, near quadrupole coil
Mirror coils	15-cm diameter throats, coils spaced about 30 cm apart, conductor to conductor
Effective plasma volume	1.5 liters
Microwave power	2 kW at 55 GHz (5.5 mm) cw, from specially developed traveling-wave amplifiers
Neutral beams	One or two, estimated 0.2 A each of H^0 at 20 keV, with 50% energy spread built in