

Hot plasma - new energy source?

by Mary MacDonald

In some areas of research the U of A is ahead of others, or at least is offering stiff competition to such institutions as MIT and the University of Washington. One of these areas is in the study of "hot plasma", conducted by Drs. A.A. Offenberger and P.R. Smy.

What is "hot plasma"? Stated very simply, a plasma is an ionized gas which contains charged particles - positive ions and negative electrons. Since like charges repel and unlike charges attract, the plasma with a deficit of electrons behaves differently than a gas.

We already use plasmas in neon signs, welding arcs and other areas. The main new interest in plasmas is nuclear fusion which may provide a new source of energy which would be valuable now that the world appears to be in an "energy crisis."

"Fusion we believe could yield an unlimited supply of energy," says Dr. A.M. Robinson of the U of A Electrical Engineering Department. Fusion also has other advantages. "It has not yet been proven, but it may be cleaner than fission, that is, it may not be radioactive," he says, "and also there would be more control over energy flow with no chance of the process going out of control, since by

the removal of the fuel, the process stops."

Plasmas are involved in the nuclear fusion process, as opposed to the fission process which involves splitting of a heavy atom such as uranium. Fusion is when two light atoms such as hydrogen and helium, are fused together to produce a new atom which is lighter in mass. The excess mass is then converted to energy.

How are these particles fused together? As both hydrogen and helium used in this example have positive charges, they repel. In order to fuse them, they must be driven rapidly toward each other. High temperatures produce rapid movement. These temperatures evaporate the particle to a gas and to a plasma when the energy produced by higher temperatures strips it of electrons. With a deficit of electrons, the product is an ionized gas or plasma. As extremely high temperatures (around 50 million degrees) are used, the plasma is referred to as "hot plasma".

Two main problems in producing these are: how to attain the temperature, and when this has been reached,

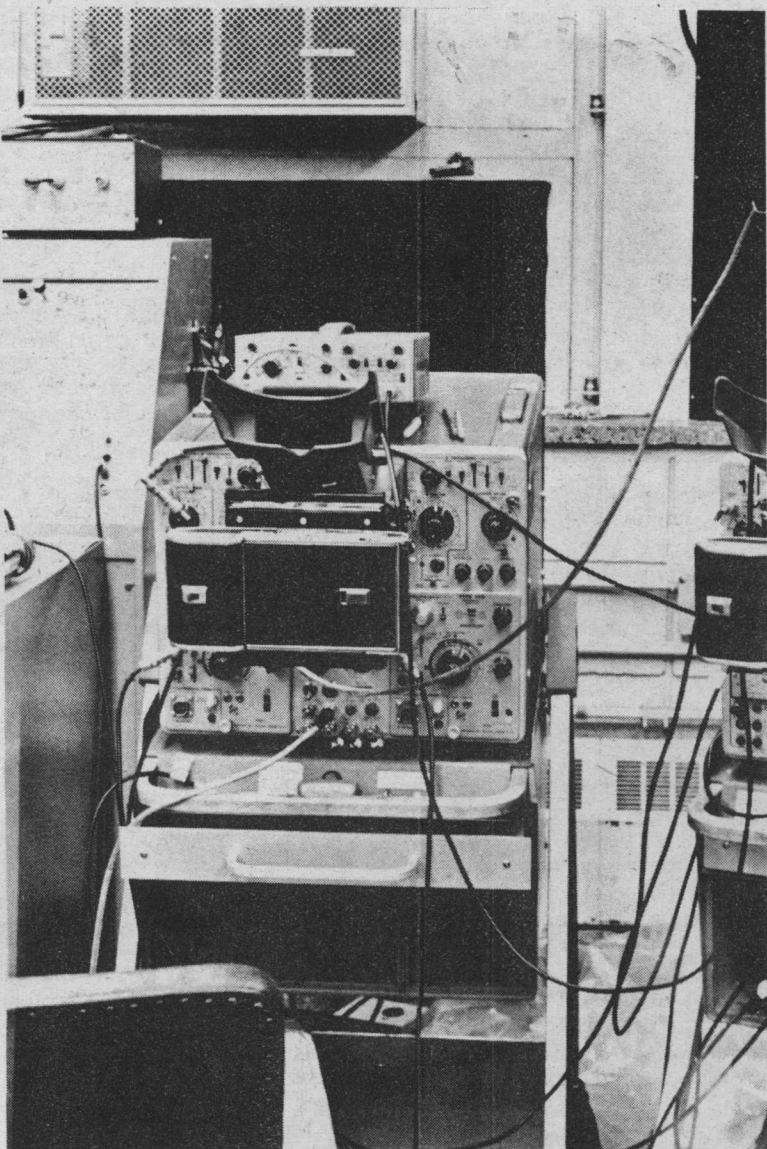
what suitable container can be found. Normally it would seem that a container would melt under such temperatures but the real problem is that the walls cool down the plasma.

The container problem is solved through the use of magnetic and electrical fields but the temperature one is more difficult. Two methods involving lasers are currently under research. One involves the bombarding of a sphere by a laser which is focused down on it. Energy is produced by compression into the center of the sphere.

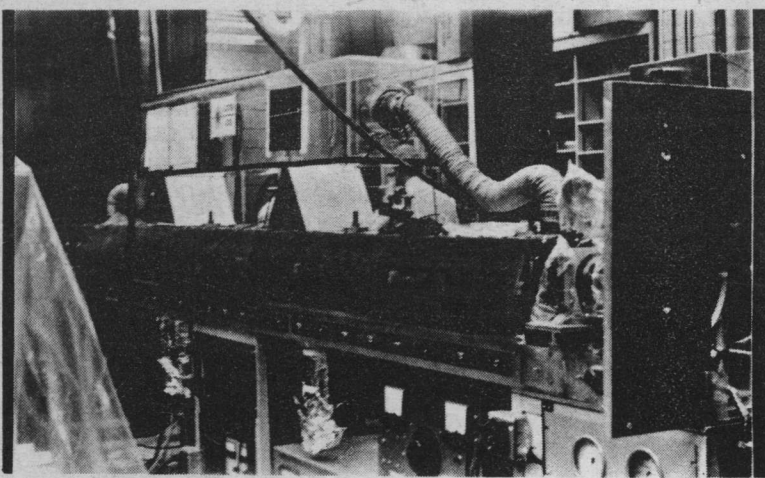
The U of A is trying to prove, either feasible or not, a second method. This involves shooting laser pulses into the plasma. As the energy moves outward from the point of focus the plasma cools, so other ideas are being researched. Now work is being done on the use of short pulses and magnetic fields.

If the research at this university and other institutions proves successful, there may be a new type of energy available to replace the present ones now in use.

(with the help of Dr. A.M. Robinson)



What moviegoers used to regard as fiction is now common knowledge (almost).



The U of A's laser.

Ed student proposes priorities

"I think we should decide on one or two objectives - immediate projects to work on. Then as time goes on we can add more projects to be worked on."

This, Bob Wall said Jan. 20, is the approach he'll be suggesting at the conference of Western Canada education students in Saskatoon Feb. 14, 15 and 16. The conference is to discuss federation of Western education student unions.

Wall, president of the Education Students' Association at the University of Alberta, said he'll be "going for sure. And besides myself two or three other delegates from here will go. We'll be deciding the exact number on Wednesday."

Wall said he hopes a lot of time won't be wasted arguing about a comprehensive listing of

all aims and objectives a federation could have, and on the "correct position" on all of the many and varied problems education students face.

"The thing is to get working together to solve some of these problems," he said, "and we can't deal with them all at the same time. I think the thing to do is to talk about one or two specific aims and how to achieve them, such as transferability and better practice teaching programs."

"The big thing to talk about is how to improve practice teaching. Practice teaching as it presently exists is a really poor method of screening and training potential teachers. As a result there are too many poor teachers."

"And," said Wall, "I'd like to see some kind of unification

of education in Western Canada so that education students and teachers have some freedom of movement, so that we can go from one province to another without losing the value of our credits towards our degrees, or our certificates.

OPTOMETRISTS

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