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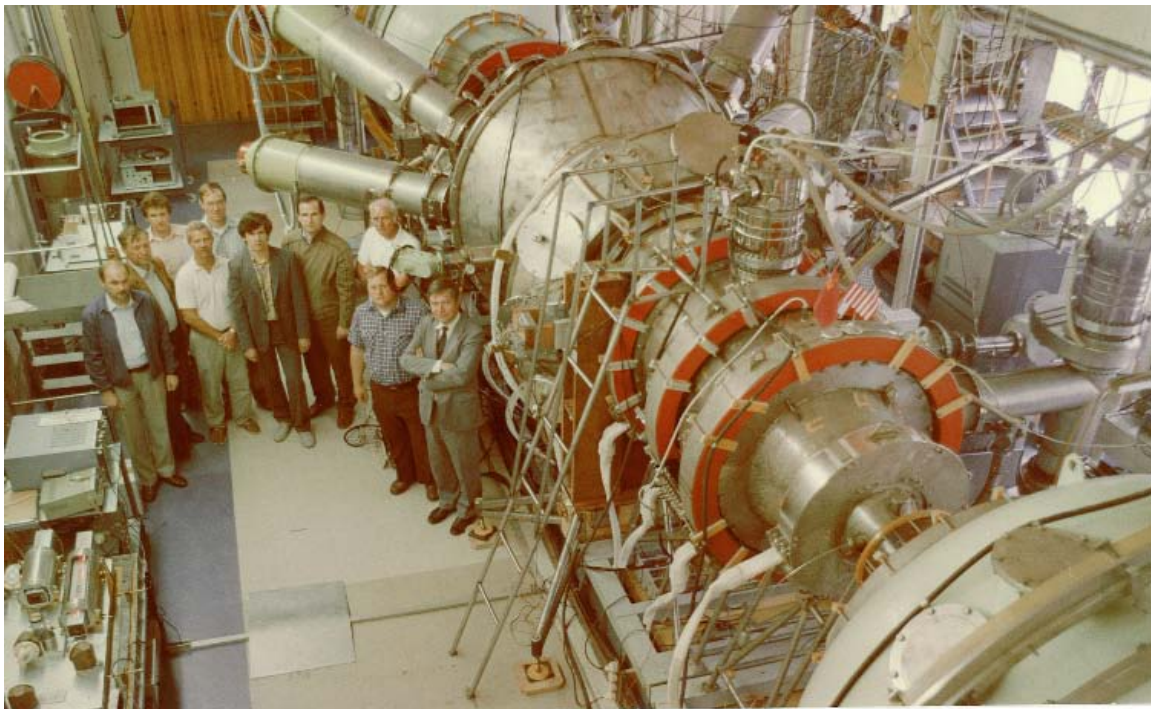
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## **Magnetic Mirrors are Simple Again**

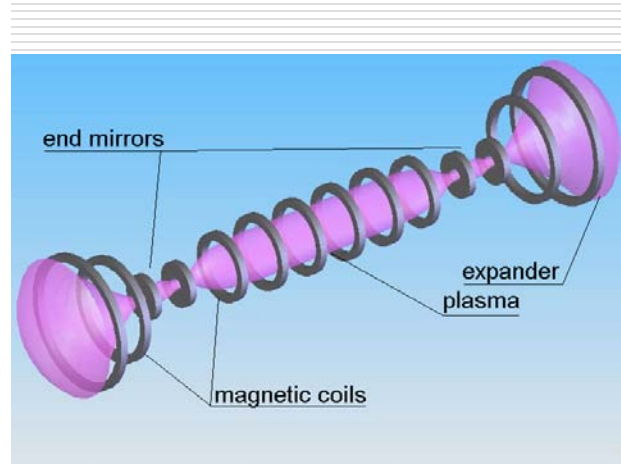
Russian researchers have achieved relatively high plasma pressures using a line of weak simple circular magnets, with a strong magnet on each end (called mirrors which reflect particles). With further research this discovery could lead to applications such as burning toxic waste from nuclear power plants. Previously it was thought that much more complex and inefficient baseball-seam shaped magnets would be necessary.

Magnetic mirrors confine charged plasma particles, much like the earth's magnetic field. Since simple circular magnets can be built with high magnetic fields they confine plasmas better. However, early mirror experiments indicated that plasmas leaked across the magnetic field. Now Russian experiments, carried out in Siberia, show that complex magnets are not necessary. This was achieved by inducing a sheared rotating vortex which confines plasma, much like a whirlpool can trap a swimmer.

While mirror research has been dormant in the US, it continued in Japan and Russia where physics understanding progressed and innovative concepts were developed. These advances opened up possibilities for applications of mirror systems such as a neutron source for material testing or as a fusion-fission hybrid to burn toxic nuclear wastes.



The GDT Device Where the Mirror Experiments were carried out in Novosibirsk Russia



The Russian magnet configuration..

Submitted by Thomas C. Simonen, [simonen42@yahoo.com](mailto:simonen42@yahoo.com)

On Monday researchers from Japan, Russia, Sweden, and the US will discuss “Innovative Magnetic Mirror Concepts and Applications.