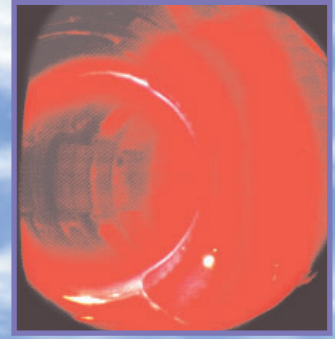


Plasma

4th State of Matter

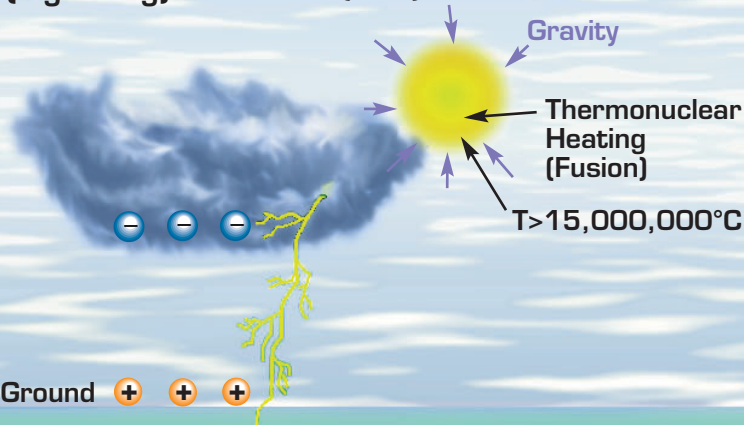


Man-made Plasma

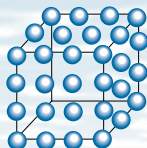
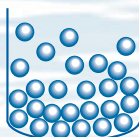
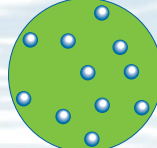
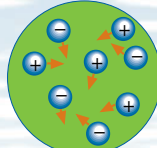
How is a Plasma Produced?

Electrical Discharge (Lightning)

High Pressure/
Density/Temperature (Sun)



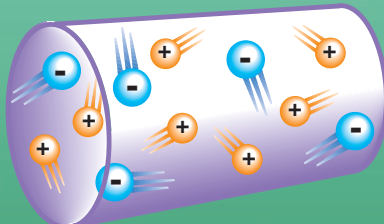
States of Matter

Solid	Liquid	Gas	Plasma
Example Ice H_2O	Example Water H_2O	Example Steam H_2O	Example Ionized Gas $H_2 \rightarrow H^+ + H^+ + 2e^-$
Cold $T < 0^\circ C$	Warm $0 < T < 100^\circ C$	Hot $T > 100^\circ C$	Hotter $T > 100,000^\circ C$ (> 10 electron Volts)
			
Molecules Fixed in Lattice	Molecules Free to Move	Molecules Free to Move, Large Spacing	Ions and Electrons Move Independently, Large Spacing

How is Plasma Contained?

Unconfined

- Particles bounce off wall like ordinary gas
- Plasma loses energy - container gets hot



Magnetically Confined

- Charged particles spiral around magnetic field lines
- Plasma follows magnetic field lines and is insulated from container

