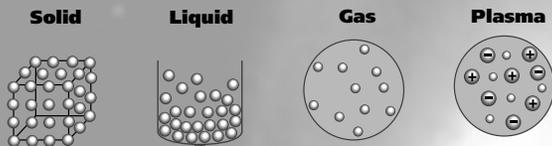


PLASMA IS... sometimes called the "Fourth State of Matter." Most people know about three states of matter: solids, liquids and gases. However, plasma is another form of matter that is far more common than all the other states of matter put together.



What is a plasma? A plasma is a gas that contains electrically charged particles — enough charged particles to significantly affect its electrical properties and behavior. A plasma is created when gas atoms are "ionized" or broken into positively charged parts (ions) and negatively charged parts (electrons). Although gaseous in nature, plasmas behave very differently from uncharged gases such as the air we breathe or the steam that comes from a kettle.

The type of atoms comprising a plasma and the percentage of atoms ionized, temperatures, pressures and other conditions in the plasma determine its nature.

For example, atoms that are combined (or fused) together in extremely hot plasmas in the sun or a fusion reactor create large amounts of energy. At lower temperatures and pressures, plasmas can be used to produce the microscopic channels and conducting surfaces in semiconductor chips.

In space, plasma exists in relatively diffuse forms such as nebulas and in more condensed and hotter forms such as stars or supernovas. On earth, plasmas with an incredibly wide variety of useful characteristics impact almost all facets of our lives and economy. The picture on the other side of this brochure illustrates just a few examples.



Plasma processing is used in the manufacturing of today's computer chips.

Coalition for Plasma Science

The objective of the Coalition for Plasma Science is to increase public awareness and understanding of plasma science and its many applications and benefits for society.

Members of the Coalition include many well known universities, national laboratories, professional organizations and companies.



WANT TO LEARN MORE?

Visit our web site at
<http://www.plasmacoalition.org>

Call toll free
1-877-PLASMAS (1-877-752-7627)

Or e-mail us at
CPS@plasmacoalition.org

Few People

Know It,

But . . .

Plasmas Are Everywhere!



Today there are interplanetary probes using plasma propulsion. Tomorrow people may be propelled through space by plasma thrusters.



All stars, including our own sun, are fusion reactors made of plasma.

Interstellar and intergalactic nebulas are rarefied plasmas that are incubators for stars.



Lightning is a plasma that occurs when a powerful electrical discharge between the earth and clouds ionizes the atmosphere along its path.



The auroras ("Northern Lights" and "Southern Lights") are caused by charged particles from the solar wind striking plasma in the earth's ionosphere.



Plasmas are used to create high-temperature protective coatings for turbine blades in jet engines.



In hospitals plasmas are found in gas lasers used for surgery. They are also used in surface hardening of artificial joints and sterilization of medical instruments.

Plasma flat panel displays are used in high resolution television monitors.

Plasma processes are essential to the manufacturing of today's powerful computer chips.

The welding arcs used to construct our buildings and automobiles are plasmas.

Fluorescent lamps, the workhorses of modern lighting, contain plasmas in a tube. Plasma also creates the light in outdoor street lamps and in neon signs.

Fusion, one of the most promising energy sources of the future, takes place in a plasma heated to over 100 million degrees Celsius!



Plasmas are used in pollution cleanup, water purification, waste treatment and recycling of metals.

Not only are plasmas used to harden automobile engine parts, but the very spark in a car's spark plug is a plasma!