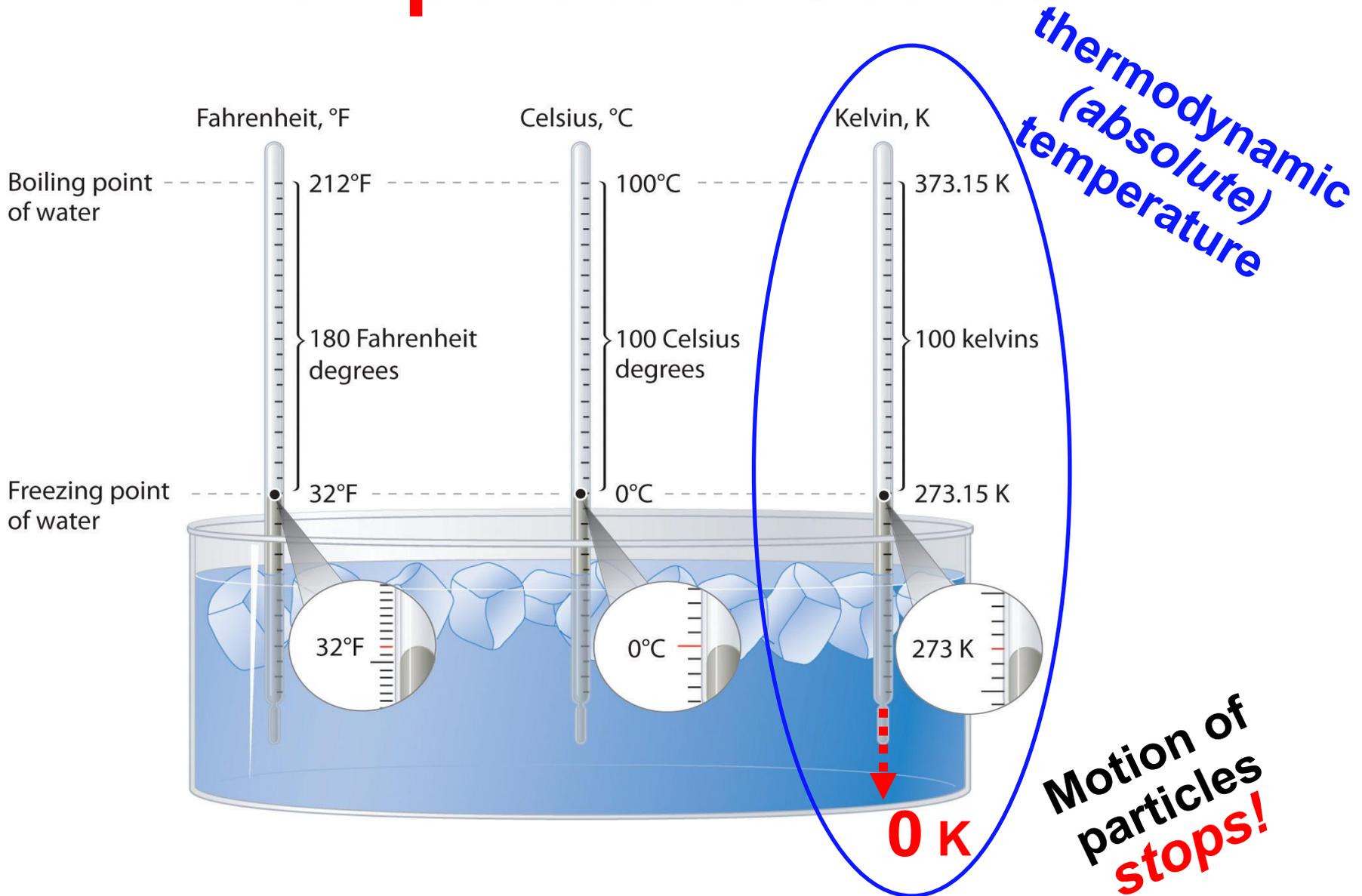


Temperature Scales

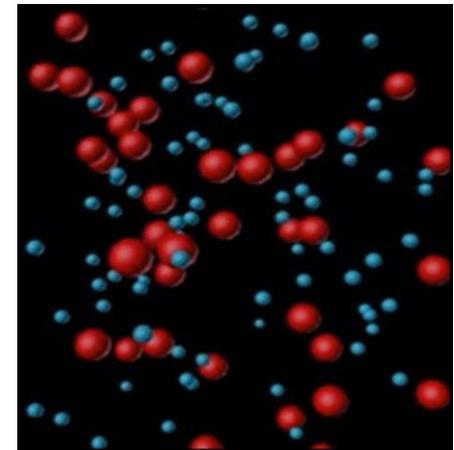
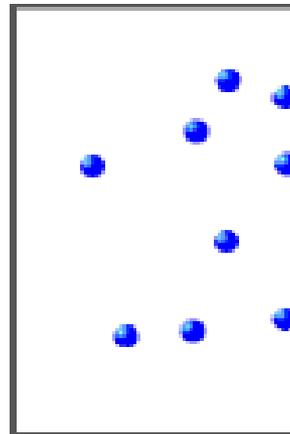
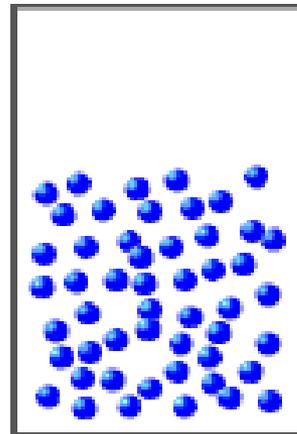
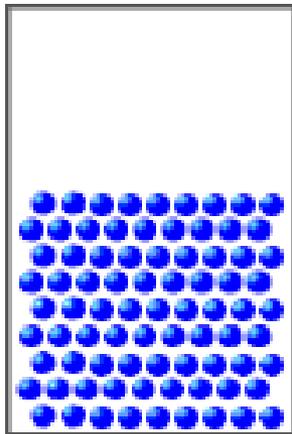
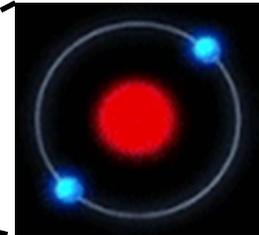
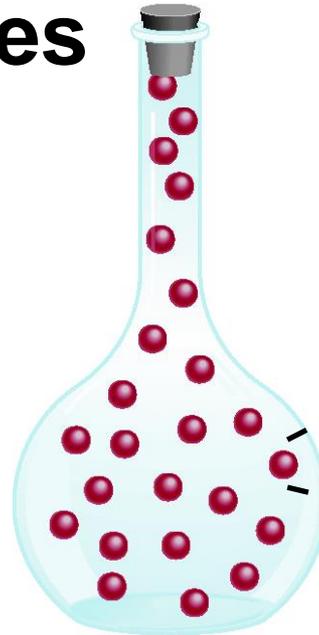
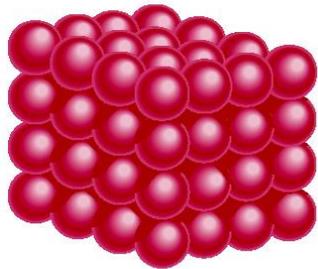


But what happens if you raise the temperature to super-high levels... between 1000°C and 1,000,000,000°C ?

Will everything just be a gas?

As **energy** of particles **increases**...

...**electrons**
fly free!

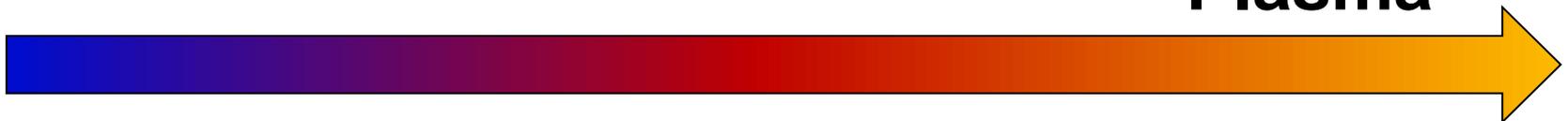


Solid

Liquid

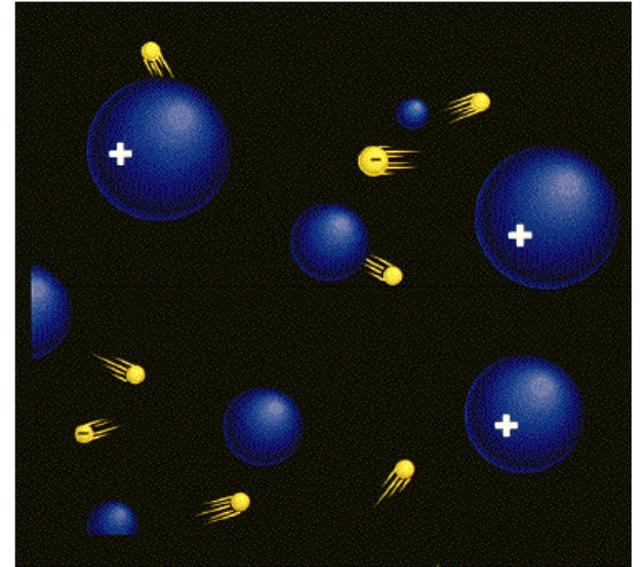
Gas

Plasma



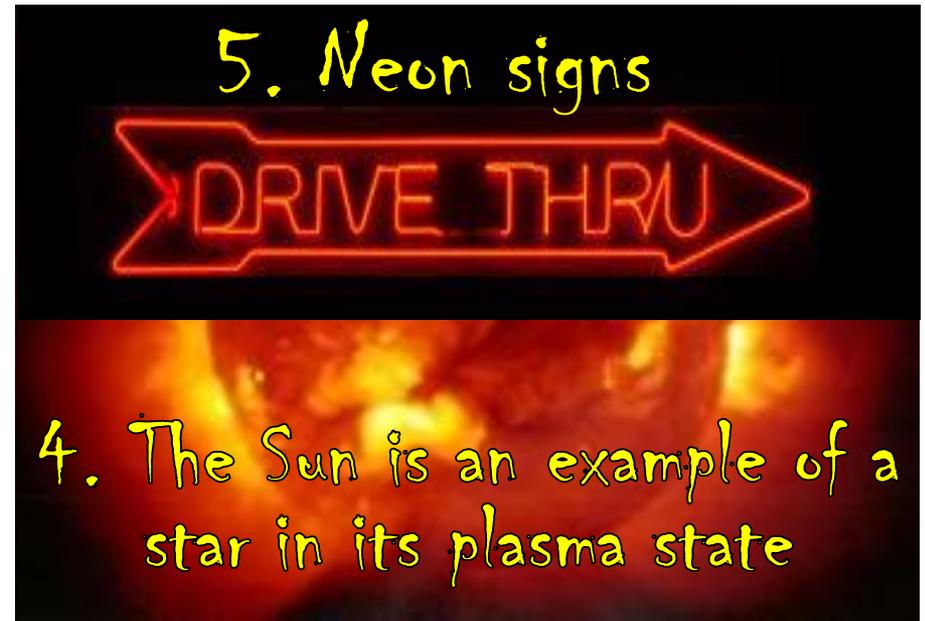
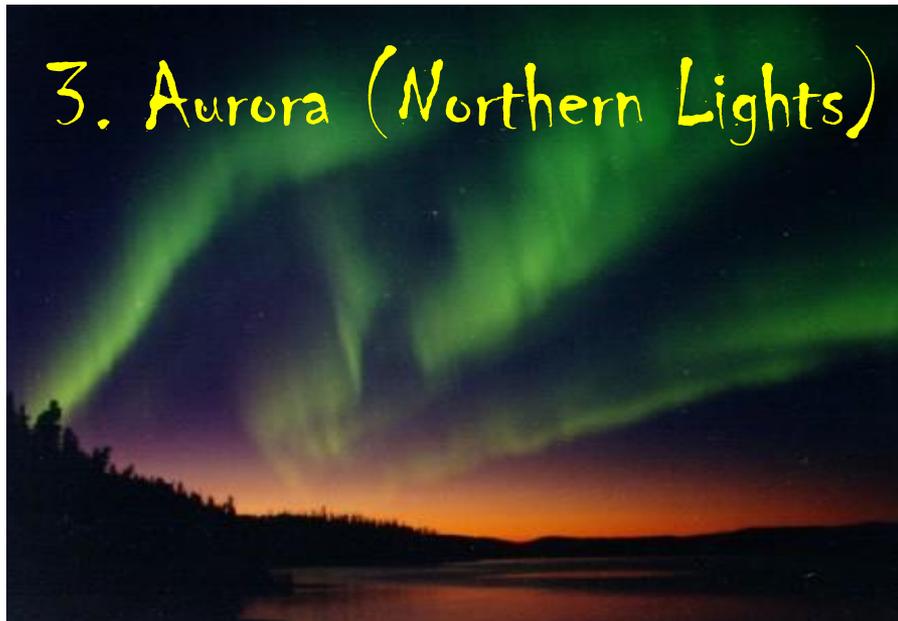
PLASMA

- A plasma is an **ionized gas**: positively charged nuclei swim in a "sea" of freely-moving dissociated electrons.
- A plasma is a very good **conductor of electricity**: it produces and responds to magnetic fields.
- Plasmas, like gases, have an **indefinite shape** and an **indefinite volume**.
- A gas is usually converted to a plasma in one of the following two ways:
 - by exposing gas to **extremely high temperatures** that cause electrons to leave the atoms
 - from a **huge voltage** difference between two points



Plasma is a common state of matter!

Some places where plasmas are found...



How many states of matter?

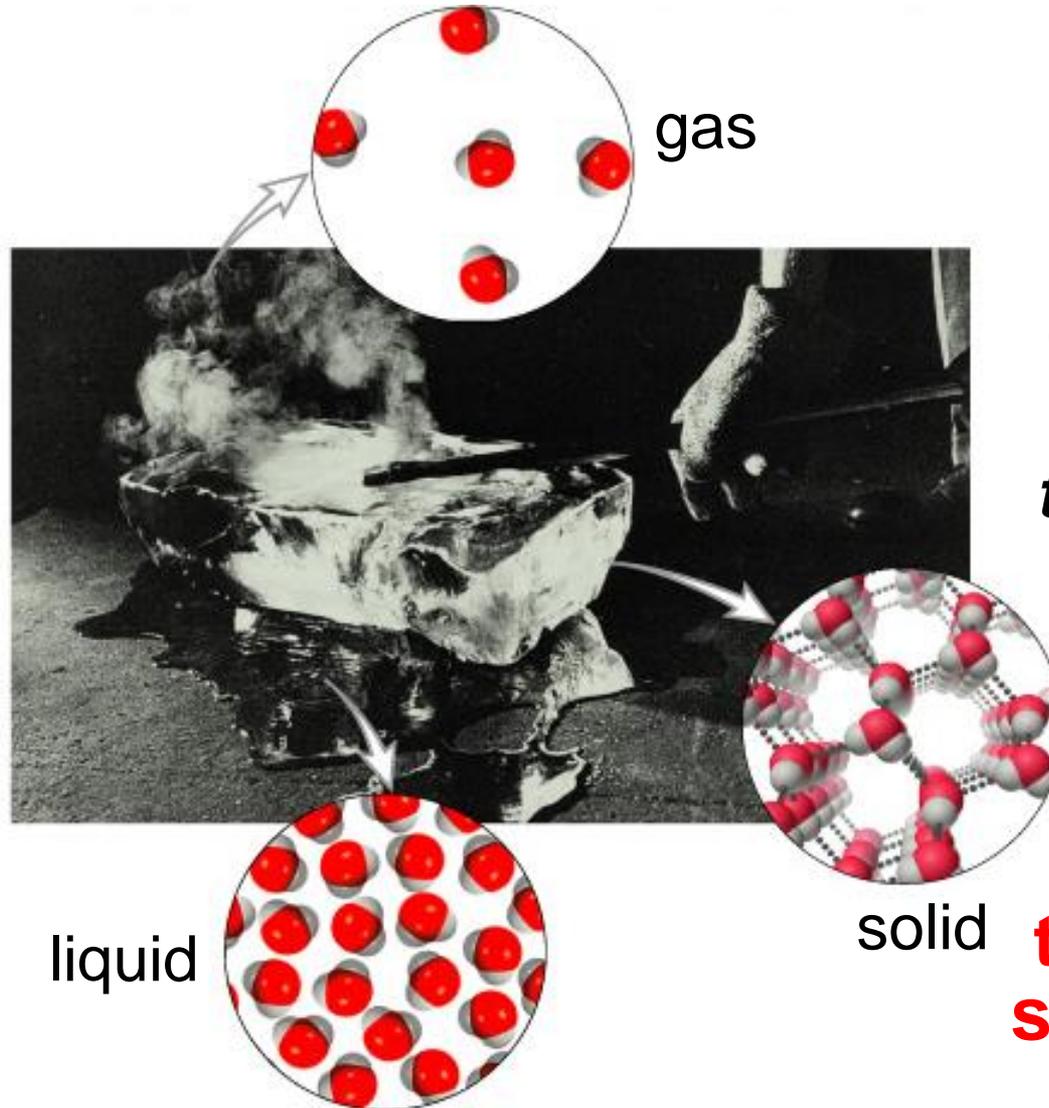


Can you spot a *change*?

Physical Change

Effect of a Hot Poker on a Block of Ice

A change from **one state of matter to another...**

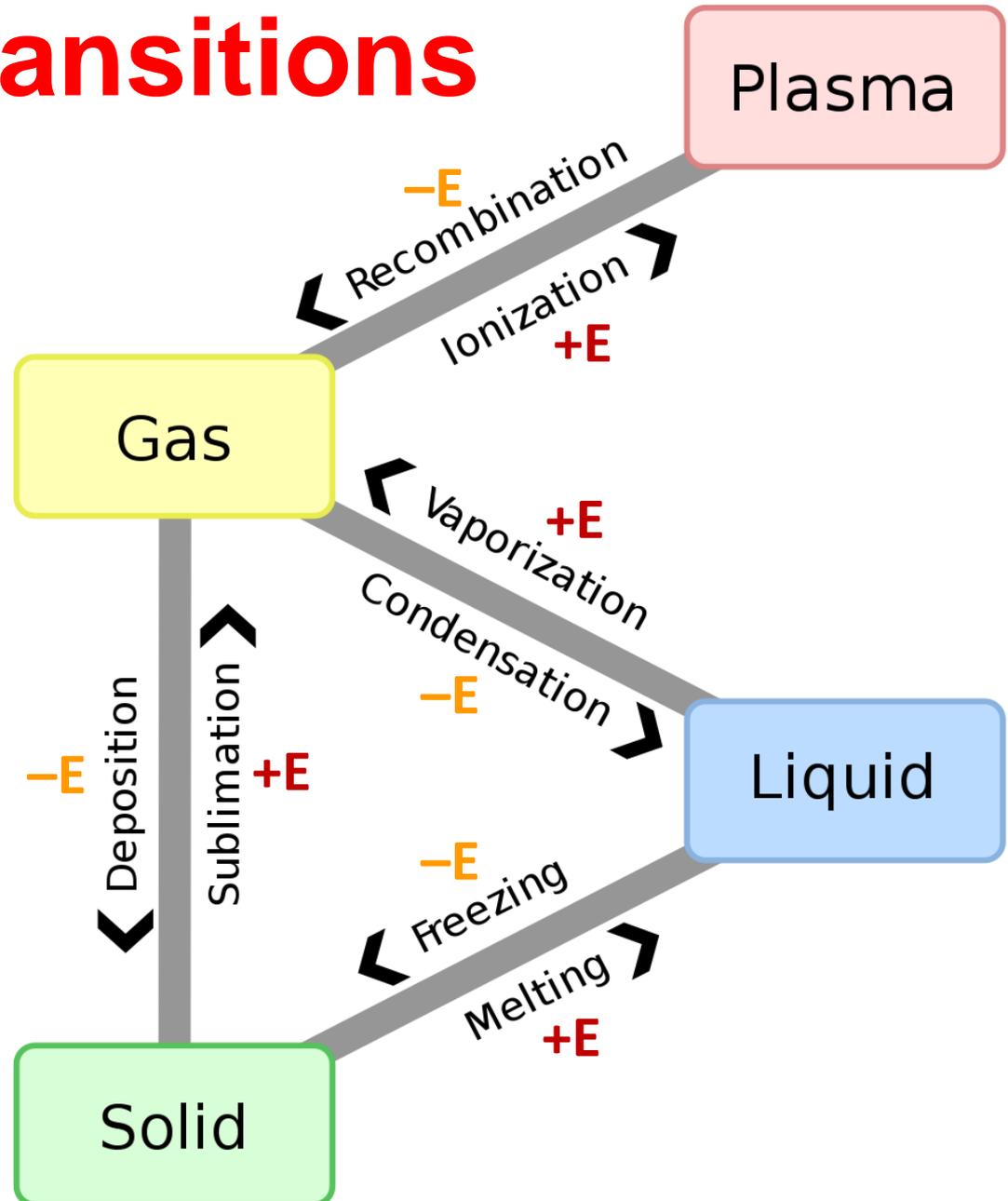


...is called a ***phase transition.***

But it's all the SAME substance!

Phase Transitions

- A phase transition is the transformation from one phase or state of matter to another one by heat transfer.
- Heat can be absorbed (+E) or released (-E) by a substance as it changes structure.
- A phase transition can be recognized by an abrupt change in physical properties.



Phase Transition Examples

Dry Ice Sublimation



Freezing Lava



Frost Deposition



Dew Condensation

