A New Explanation for the Compression Phenomenon in Condensed Matters

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Due to the fact that matters in the world are divided into different types (gas, liquid, solid, …) and sometimes gas matters can become liquid and solid or on the contrary, solid matters can also become liquid or gas and liquids can also turn into solids and gases in the world.

If we want to turn a type of gas into liquid and solid, it is enough to apply pressure and temperature, or both of them, which easily does. In turns of gas into solid or liquid the volume of the gas will be reduced to one tenth, one hundredth or maximum to one thousandth of the previous volume. In fact, we have turned the gas into a dense matter and increased its density without affecting its atomic structure.

Now we take into account some metals such as Iron, Lead and Mercury. Considering that Mercury is denser than the previous two elements, but the word "compression" does not exist in it. It should be noted that it is not easy to call any object or mass compact or dense.

The important point is that there are relatively dense objects such as protons, neutrons and electrons in the universe. Considering their extremely high density, which is about $10^{17}\ {}^{kg}/_{m^3}$, if we get these particles, it can be said that we have dense objects. But when they are in a proton star or a white dwarf, which is one of the simplest objects created from the death of a star, although they have a high density and a very small volume but we cannot say the proton stars or white dwarfs are compressed, like Mercury.

Result:

According to the above examples, it can be said that a proton star or a white dwarf is a dense object, but the word compression cannot be used for it. In fact, it can be said that the densest objects have a structure that seems compact, but actually it is not. In order to show the hardness of Proton in comparison, it can be said that if the hardness of diamond is like the hardness of wood, the hardness of Proton is like steel.

Therefore, all matters in the world can be classified in such a way that some liquid substances such as water are neither dense nor compressed; some are dense but not so compressed such as mercury. In fact, the hardness of a proton star compared to a diamond is like the hardness of steel compared to wood, and if the hardness number of a diamond be 10, proton stars ones would be about 20.

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