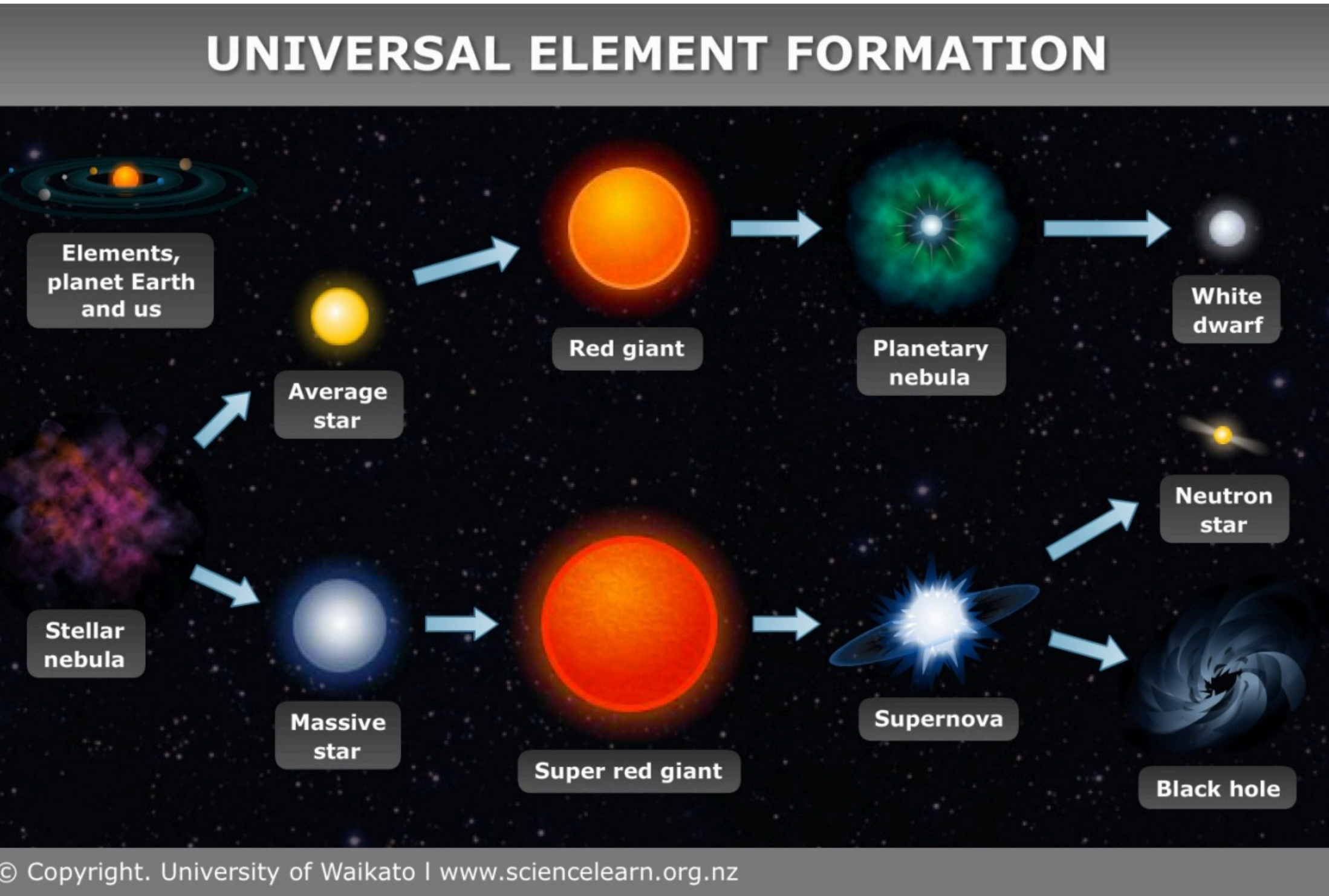


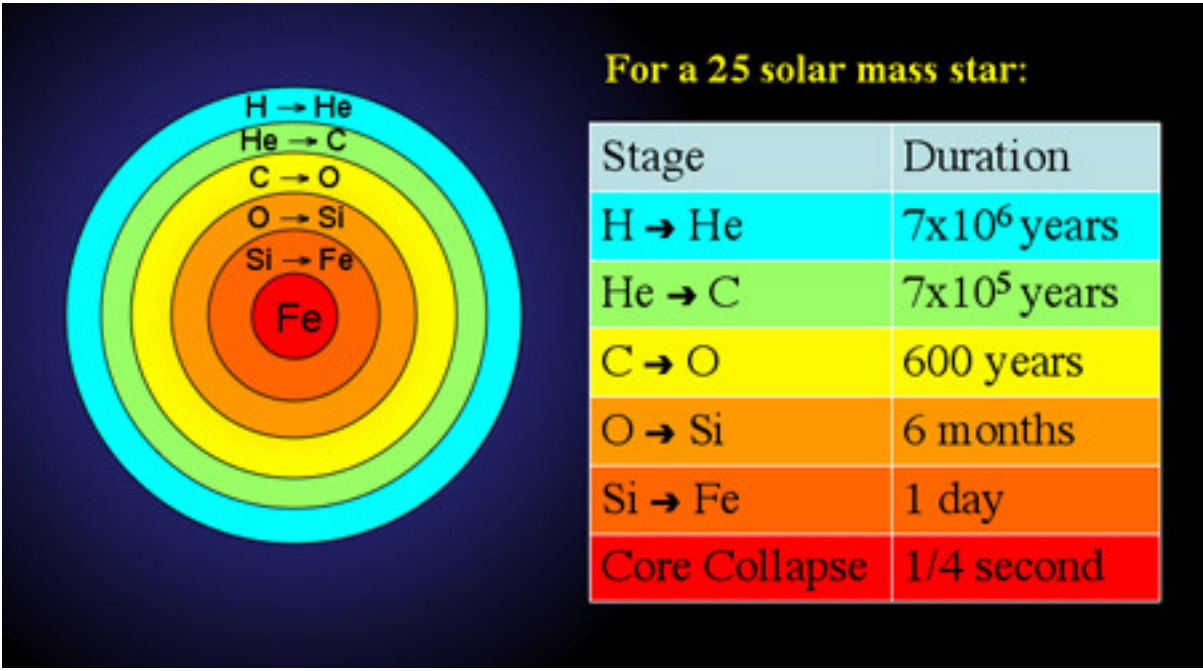
The Lifecycle of the Sun

Have you ever looked up at the stars and realized that you are the by product of a stars life cycle?

Well, you are, and it all started in a stellar nursery where a large accumulation of dust and gas slowly got forced together to form larger bodies of mass. These baby stars result in having a stronger gravitational force that pulls in more and more of its surroundings. If this process continues until resulting in the formation of a star with a minimum core density of 100 gm/cc, then hydrogen fusion will begin.



This is what we call a main sequence star, and the stable balance between gravitational forces and nuclear fusion allows for these stars to exist naturally in the universe, such as our sun. However, as we know, nothing lasts forever and in approximately ten billion years our sun will die. At this time the gravitational force will exceed the outward nuclear fusion pressure as it runs out of its hydrogen fuel source. It will then shrink to the point where subatomic particles are forced to share more space than they like. This triggers the Pauli exclusion principle to take effect and the strong force between these particles repel so forcefully that the star expands outward. Once it has found an equilibrium with its now less dense core and larger radius, it is in its red giant stage. Here it may stay for a billion years where it slowly cools and contracts until it becomes a white dwarf. However, If we revert to when our star stopped turning hydrogen in helium and its core began to become denser. If there is enough helium or heavy elements available, and the core reaches a density necessary to fuse these heavier elements, then the star can continue to burn bright. Continuing the cycle of burning one fuel source through fusion to a heavy element as the core gets denser and denser.



With the inevitable Pauli exclusion principle forcing the star to expand rapidly, sending all kinds of elements into the universe. Allowing the creation of carbon life and complex compound materials to fill the universe.