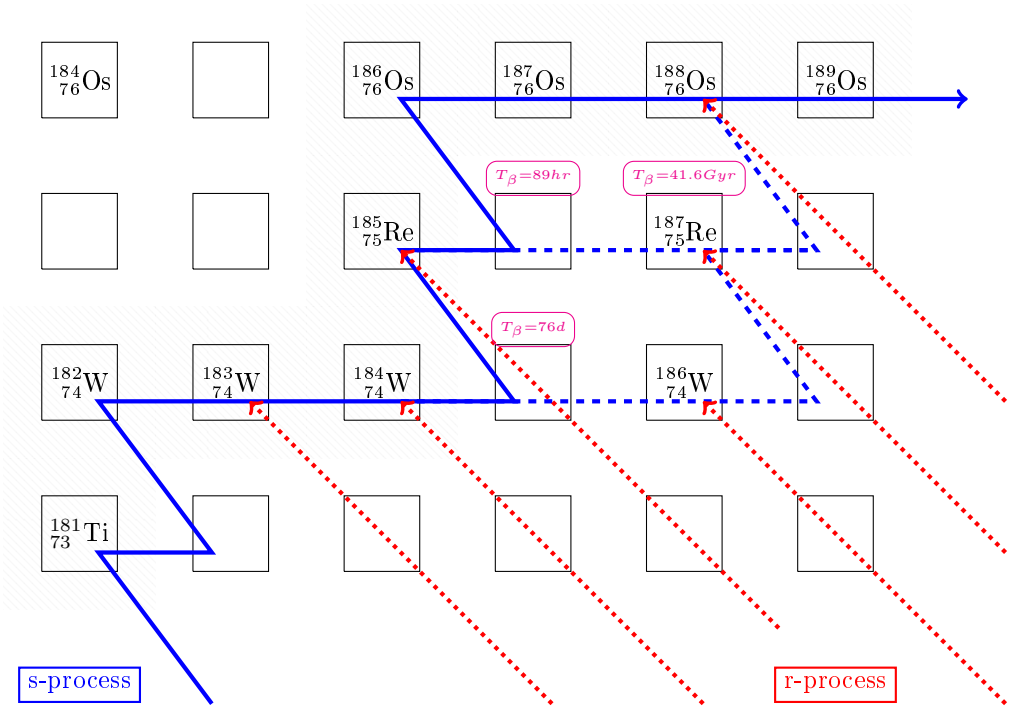

Figure 1: Chart of nuclides around massnumber 187, adopted from ?, *fig.1*. The stable nuclei are denoted with their chemical symbols. The path of the s-process follows the valley of stability (shaded region), and is drawn as a blue solid line. Neutrons are absorbed during the s-process until and unstable isotope is reached, the unstable nuclide then β^--decay s to the higher isobars[1]. R-process nuclei are already very neutron-rich, and β^--decay s to the highest stable isobar. The path of the r-process is shown as red dotted lines. $^{185}_{74}$W , and also $^{186}_{75}$Re , are potential branching points (), and can cause branched s-proces paths that are shown as blue dashed lines. The half-lifes of these potential branching point nuclei, as well as the half-life of $^{187}_{75}$Re , are written in magenta over the nuclei.

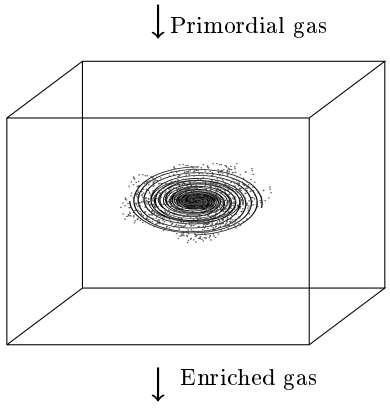

Figure 2: The diagram shows the concept of inflow and outflow of a one-zone galaxy model. All gas content is initially prestine (from big bang nucleosynthesis), as is the gas content of the extragalactic medium. Star formation in the galaxy synthesized heavy metals and enriches the gas content of the galaxy. Star formation is also a major contributing to supernovae, which in turn drive outflow of enriched material into the extragalactic medium. This does not mean that any enriched material is returned from the extragalactic medium, that would require a two-zone galaxy model.

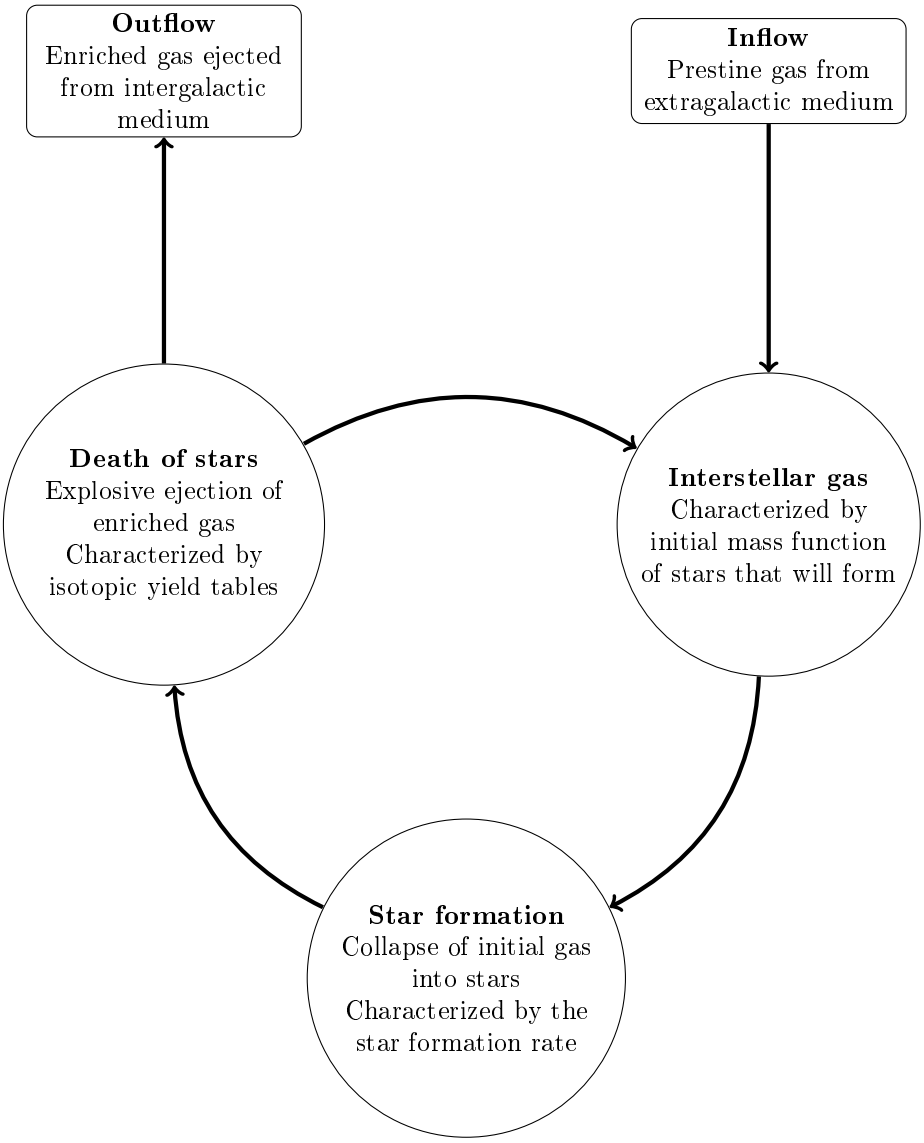

Figure 3: Diagram depicting recycling of gas in a one-zone galaxy model. Initially the stellar gas is prestine, from big bang nucleosynthesis, just like the inflow from extragalactic gas. Stars form from the prestine gas, forming stellar populations from a given star formation rate and initial mass function. Stars end their life asymptotic giant branch stars or explosive type 2 supernovae, ejecting enriched material back into the interstellar medium. These events leave remnants, like white dwarves, neutron stars and black holes, which can interact with eachother and other stars to produce secondary explosive events. Together the explosive events can drive additional outflow of enriched material away from the galaxy, into the extragalactic medium. It should noted that this applies to one-zone models of galaxies, which have two sides; the inside and the outside. Ignoring all effects from layered structure of galaxies like; circumgalactic medium, disk, bulge, etc.

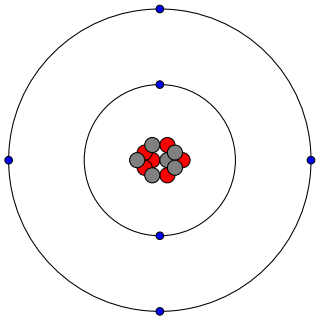

Figure 4: Figurative representation of a ${}^{12}_{6}\mathrm{C}$ -atom with six protons, neutrons, and electrons. The protons (red) and neutrons (gray) occupy the nucleus in the center, while the electrons (blue) orbit around them. According to quantum physics the electrons do not rotate around the nucleus in spherical orbits, but occupy orbitals/energy states around the nucleus as probability distributions. Real and relative sizes do not apply.