Lorenzo Romano Amedeo Carlo Avogadro (August 9, 1776 – July 9, 1856) was an Italian savant chemist, most noted for his contributions to the theory of molarity and molecular weight.

During his stay in Vercelli, he wrote a concise note (memoria) in which he declared the hypothesis of what we now call Avogadro's law: equal volumes of gases, at the same temperature and pressure, contain the same number of molecules. Avogadro's Law implies that the relationship occurring between the weights of same volumes of different gases (at the same temperature and pressure) corresponds to the relationship between respective molecular weights. Hence, relative molecular masses can be calculated from the masses of gas samples. Avogadro developed this hypothesis after Joseph Louis Gay-Lussac had published in 1808 his law on volumes (and combining gases). The greatest difficulty Avogadro had to resolve was the huge confusion at that time regarding atoms and molecules – one of the most important contributions of Avogadro's work was clearly distinguishing one from the other, admitting that simple particles too could be composed of molecules, and that these are composed of atoms. For instance, John Dalton did not consider this possibility. Avogadro did not actually use the word "atom" as the words "atom" and "molecule" were used almost without difference. He considered that there were three kinds of "molecules," including an "elementary molecule" (our "atom"). Also, a keener attention was given to the definition of mass, as distinguished from weight.

In honour of Avogadro's contributions to the theory of molarity and molecular weights, the number of molecules in one mole was renamed Avogadro's number, \( N_A \). It is approximately \( 6.0221415 \times 10^{23} \). Loschmidt (notable Austrian scientist - March 15, 1821 - July 8, 1895) first calculated the value of Avogadro's number, now called Avogadro's constant, which is still sometimes referred to as the Loschmidt number in German-language countries (Loschmidt’s constant now has another meaning). Avogadro's number is commonly used to compute the results of chemical reactions. It allows chemists to determine the exact amounts of substances produced in a given reaction.