

# Popular Abstract

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One of the hardest problems in physics is figuring out what happens when you put a bunch of interacting sub-atomic particles together, this is called the many-body problem. This is important since many natural phenomena, everything from batteries to the burning of our sun, is caused by bundles of sub-atomic particles, usually in the form of atoms or atomic nuclei. The difficulty of the many-body problem comes from the fact that each particle's motion is affected by that of every other particle, making the equations that describe them very complicated and in most cases, impossible to solve by hand. This is where the relatively recent advent of computers has found use in tackling this problem numerically, using computational methods that have been developed specifically to take advantage of the ever increasing power of computers to find approximated and brute-force solutions for many types of these bundles, and with great success. In this manuscript, we give an introduction to some of these methods and demonstrate a computer program that applies them to a small collection of particles, such as a small nucleus.