Abstract:

One of the unique attractions of atomic physics is the possibility of the extremely accurate theoretical predictions and stingiest experimental tests of those predictions. There are numerous observable quantities which can be accurately calculated and measured. The advancements in the experimental technologies and further development of the high-precision atomic theory methodologies lead not only to our better understanding of atomic properties but also to remarkable opportunities for applications in many areas. I will report on various modern applications of the atomic calculations ranging from the study of fundamental interactions to applications of atomic physics to future technological developments, such as quantum computing and optical atomic clocks.