School on Light and Cold Atoms

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ICTP-SAIFR/IFT-UNESP

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Computer simulations play an essential role in studying physical systems and act complementary to experiments and purely theoretical physics. This course aims to introduce computational physics concepts through two guided projects. The first deals with numerical solutions of Schrödinger's equation for one-dimensional potentials, while the second is related to calculating the scattering length of a two-body potential. Students will have the opportunity to produce their own code to solve the problems and have time to ask questions. The programming logic and algorithms will be discussed so that each student can use their choice of programming language.

Suggested reading material:

Computational Physics, second edition, Giordano, N.J. and Nakanishi, H., 2006, Sections 10.1 "Time-independent Schrödinger equation: some preliminaries" and 10.2 "One dimension: shooting and matching methods".