

Elements of the Teaching Program

We describe the currently-envisioned elements of the teaching program. We will teach computational methods in parallel with the entire program. It is hoped that students can get involved at an early stage with helping to visualize the results of our ongoing research and thus participant in the work.

- Simple linear oscillator (second-order system)
- Modifying differential equations into difference equations for computational solution (accuracy vs. computational time)
- Simple nonlinear oscillator (second-order system)
- Frequency decomposition and frequency combs
- Stability
- Simple noise models (random walk, Langevin)
- Computational modeling of simple noise
- Putting it all together (a simple clock)
- Large-dimensional linear oscillators (lattices)
- Large-dimensional nonlinear oscillators and stationary solutions
- Stability revisited
- Wave equations and guided waves
- Diffraction and dispersion
- Nonlinearity, solitons, and frequency combs