

Astro Seminar Series



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Long-term Integrations of the Solar System

I'll discuss the differences between symplectic and non-symplectic integrators in the context of long term orbit simulations of the Solar System. In particular, I'll present our recent implementation of the non-symplectic Gauss-Radau scheme, IAS15, as well as the symplectic integrator WHFast. These algorithms are the most accurate and fastest algorithms running on standard computer architectures. Both of them achieve sub-linear energy error growth (Brouwer's law) over a billion dynamical times (more than 10^{10} timesteps). I'll talk about the tricks we used to write code that is both fast but also ensures that all important floating-point operations are unbiased. Our integrators are freely available and come with an easy to use python wrapper. I will give an live demo on how to use them at the end of my talk.

Tuesday Oct 13, 3:30pm
Bell Room (103)
Rutherford Physics Building