

数学与系统科学研究院

计算数学所学术报告

报告人: **Prof. Christian Lubich**

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报告题目:

**Symplectic integration of
post-Newtonian equations of motion
with spin**

邀请人: 唐贻发研究员

报告时间: **2011 年 8 月 26 日 (周五)**

下午 14: 00-15: 00

报告地点: **科技综合楼三层 311**

计算数学所报告厅

Abstract:

We present a non-canonically symplectic (or Poisson) integration scheme tailored to numerically computing the post-Newtonian motion of a spinning black-hole binary. Using a splitting approach we combine the flows of orbital and spin contributions. In the context of the splitting, it is possible to integrate the individual terms of the spin-orbit and spin-spin Hamiltonians analytically, exploiting the special structure of the underlying equations of motion. The outcome is a symplectic, time-reversible integrator, which can be raised to arbitrary order by composition. A fourth-order version is shown to give excellent behavior concerning error growth and conservation of energy and angular momentum in long-term simulations. Favorable properties of the integrator are retained in the presence of weak dissipative forces due to radiation damping in the full post-Newtonian equations. The talk is based on joint work with B. Bruegmann and B. Walther.

欢迎大家参加!