Geometric Integration of ODEs

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In this talk I will give a survey of geometric integration methods for ODEs. A geometric integration method is a numerical method that preserves some geometric property of a given ODE exactly (ie without truncation error). Some examples of geometric properties that can be preserved are: * symplectic structure * phase volume preservation * symmetries & time-reversal symmetries * first integrals * Lyapunov functions * dissipation * contact structure * isospectrality * Lie group structure * foliation * Poisson structure