1123-65-386   **Thomas Trogdon***, University of California, Irvine, Department of Mathematics, and **Deniz Bilman**, University of Michigan, Department of Mathematics. *Numerical inverse scattering for the Toda lattice.*

The Toda lattice is the prototypical discrete-space, continuous-time completely integrable Hamiltonian system. It was introduced by Morikazu Toda in 1967 and analyzed in detail by Flaschka in 1974. The bi-infinite Toda lattice can be solved with its associated inverse scattering transform (IST). The IST is closely tied to the interpretation of the flow as an isospectral deformation of a bi-infinite tridiagonal matrix. I will discuss the numerical computation of the IST for the Toda lattice by solving Riemann–Hilbert problems numerically. The numerical IST allows for the computation of the solution for all times, including the long-time regime. This is joint work with Deniz Bilman (U. of Mich.). (Received August 30, 2016)