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Title: Integrability Patterns in Wave Motion.

Abstract: This short course is devoted to an introduction to integrable PDEs of Korteweg-de Vries (KdV) type, and to the discussion of possible applications of techniques and ideas coming from integrable systems to study more general wave phenomena.

Schedule of the lectures:
Lecture 1: Introduction. From the incompressible Euler equation to KdV.
Lecture 2: KdV and Schrödinger: The Inverse Scattering Method.
Lecture 3: The KdV equation as a Liouville integrable system.
Lecture 4: The bi-Hamiltonian setting for equations of KdV type.
Lecture 5: Stratified flows. The Green-Naghdi and Miyata-Camassa-Choi equations.
Lecture 6: Hamiltonian aspects of sharply stratified flows and boundary effects.