Integrable systems and applications

Loughborough University, 12-16 September 2022

Programme

Monday 12 September

9:50-10:00 Welcome

10:00-10:50 **Gennady El**, Northumbria University, UK
Generalised Riemann problem for soliton gas

11:20-12:10 **Alexander Tovbis**, University of Central Florida, US
Recent developments in spectral theory of soliton gases for integrable equations

12:10-13:00 **Robert Jenkins**, University of Central Florida, US
Connecting different models of soliton gases

14:00-14:50 **Miguel Onorato**, University of Turin, Italy
Thermalization vs integrability in the Fermi-Pasta-Ulam-Tsingou chain

14:50-15:40 **Jerry Bona**, University of Illinois Chicago, US
KdV in a quarter plane: asymptotic periodicity and mass transport

16:10-17:00 **Deniz Bilman**, University of Cincinnati, US
On Universal Wave Patterns in Rogue Wave Formation

17:10-17:50 **Matteo Sommacal**, Northumbria University, UK
Integrability, instabilities, and the onset of rogue waves

Tuesday 13 September

10:00-10:50 **Yuji Kodama**, Ohio State University, US
KP solitons and algebraic curves

11:20-12:10 **Barbara Prinari**, University at Buffalo, US
Inverse Scattering Transform, solitons and soliton interactions for the complex coupled short-pulse equation

12:10-13:00 **Derchyi Wu**, Academia Sinica, Taiwan
Stability of the Kadomtsev-Petviashvili multi-line solitons

14:00-14:50 **Boris Konopelchenko**, University of Salento, Italy
On the fine structure and hierarchy of gradient catastrophes for the multi-dimensional homogeneous Euler equation

14:50-15:40 **Raffaele Vitolo**, University of Salento, Italy
Projective geometry of homogeneous second-order Hamiltonian operators

16:10-17:00 **Boris Kruglikov**, UiT the Arctic University of Norway, Norway
On geometry of higher dimensional dispersionless integrable equations

17:10-17:50 **Antonio Moro**, Northumbria University, UK
Statistical ensembles, nonlinear differential equations and integrability: from mean field models to hydrodynamic chains

Wednesday 14 September

10:00-17:00 **Excursion to Chatsworth House**

18:00-19:00 **Poster session**

Henry Carr, Northumbria University, UK
Riemann problem for a dense soliton gas for the KdV equation: a numerical study

Marta Dell'Atti, University of Kent, UK and
Pierandrea Vergallo, University of Salento, Italy
Classification of degenerate non-homogeneous hydrodynamic type operators

Georgi Grahovski, University of Essex, UK
Real Hamiltonian forms of affine Toda field theories and exceptional Lie algebras

Mahendra Panthee, University of Campinas, Brasil
Global analytic solution to the generalised Benjamin equation

Moahammad Reza Rahmati, Universidad De La Salle Bajio, Mexico and
Gerardo Flores, Centro de Investigaciones en Optica, Mexico
Extended trace formula for vertex operators

Mats Vermeeren, Loughborough University, UK
A Lagrangian perspective on integrability

Thursday 15 September

10:00-10:50 **Roberto Camassa**, University of North Carolina, US
Some issues in the mathematical modeling of internal wave propagation

11:20-12:10 **Lev Ostrovsky**, University of Colorado Boulder, US
Joint Effects of Rotation and Topography on Internal Solitary Waves

12:10-13:00 **Emilian Parau**, University of East Anglia, UK
A dissipative Nonlinear Schrödinger model for wave propagation in the marginal ice zone

14:00-14:50 **Maciej Dunajski**, University of Cambridge, UK
Elizabethan vortices

14:50-15:40 **Rossen Ivanov**, Technological University of Dublin, Ireland
Integrable systems on symmetric spaces

16:10-17:00 **Sonia Boscolo**, Aston University, UK
Control of complex nonlinear wave dynamics in dissipative systems by machine learning

17:10-17:50 **Christian Klein**, University of Burgundy, France
Numerical study of Davey-Stewartson systems

19:00-21:00 **Conference dinner** at Burleigh Court restaurant

Friday 16 September

10:00-10:50 **Mark Hoefer**, University of Colorado, US
Modulated Multiphase Waves in Soliton-Mean Flow Interaction

11:20-12:10 **Michael Shearer**, North Carolina State University, US
The Dispersive Riemann Problem for the BBM Equation

12:10-13:00 **Sergey Gavrilyuk**, Aix-Marseille University, France
Soliton limit for the Whitham modulation equations for the BBM equation

14:00-14:50 **Alfred Osborne**, Nonlinear Waves Research Corporation, Alexandria, VA, U. S. A.
Two Fundamental Properties of Nonlinear Integrable Wave Equations with Hamiltonian Perturbations

14:50-15:40 **Gino Biondini**, University at Buffalo, US
On one-dimensional reductions and integrability of the Whitham equations for the Kadomtsev-Petviashvili equation

17:00 Bus leaving to Cambridge (from the Schofield Building)