Elliptic Integrable Systems and Related Topics:

Advanced Seminars

ELLIPTIC
IS ART

Dates: September 18 - September 30, 2024 (Arrival: Sep 18, Departure: Sep 30)
Venue: Shanghai University, Shanghai, China
Organizers: Wei Fu (East China Normal University), Frank Nijhoff (University of Leeds, Shanghai University), Cheng Zhang (Shanghai University), Da-jun Zhang (Shanghai University)
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Sponsors: NSFC Tianyuan Grant

Link: https://math.shu.edu.cn/info/1043/20891.htm

Objectives:

This is a programme of Tianyuan Advanced Seminars, focusing on elliptic integrable systems, elliptic solutions and related topics. There are two ways that elliptic curves can play a role in integrable systems: either as elliptic type solutions (i.e., solutions expressible in terms of elliptic functions) or as elliptic deformation of the equations themselves (namely, elliptic integrable systems, which contain the modular parameters of an elliptic curve). In either way, the study of the elliptic case is richer than the trigonometric/hyperbolic and rational case, and reveals many new features of the models in question, thus leading to new insights into the true nature of those integrable systems.

The main focuses of the Advanced Seminars are the following:
(1) The discrete Krichever-Novikov equation and the related novel structure.
(2) Algebra representation of the vertex operators involved with elliptic functions.
(3) Finite gap solutions.
(4) Integrable systems associated with elliptic curves.
(5) Ultra-discrete integrable systems and related topics.
(6) Discretization of elliptic curves and applications.
(7) Elliptic Lax pairs and isomonodromic deformation problems.
(8) Elliptic orthogonal polynomials and corresponding integrable systems.
(9) QRT maps and generalizations.

Invited speakers:

Name	Institute	Visiting dates
James Atkinson	UK	18 Sep – 30 Sep
Anton Dzhamay	BIMSA	14 Sep – 21 Sep
Andrew N. W. Hone	University of Kent	13 Sep – 29 Sep
Nalini Joshi	University of Sydney	19 Sep – 03 Oct

Yuji Kodama	The Ohio State Univ	18 Sep – 29 Sep,
Kenichi Maruno	Waseda Univ	18 Sep – 29 Sep
Yasuhiro Ohta	Kobe Univ	18 Sep – 27 Sep
Linyu Peng	Keio Univ	23 Sep – 02 Oct
Pieter Roffelsen	University of Sydney	18 Sep – 30 Sep
Alexander Stokes	Waseda Univ	18 Sep – 30 Sep
Daisuke Takahashi	Waseda Univ	18 Sep – 21 Sep
Peter van der Kamp	La Trobe Univ	18 Sep – 30 Sep

Programme (tentative):

18 Sep: 14:00pm-20:00pm, registration, LeHu Hotel
19 Sep: 09:30am-10:00pm, registration, GJ-303
Lunch: 11:30-13:00, LeHu Hotel
Seminars

Date	10:00-11:00	11:00-11:30	14:00-15:00	15:00-15:40	15:40-16:40
19 Sep Thu	S1 Nijhoff	Tea break	S2 Takahashi	Tea break	S3 Dzhamay
20 Sep Fri	S4 Takahashi	Tea break	S5 Dzhamay	Tea break	S6 Stokes
21 Sep Sat	S7 Dzhamay	Tea break	S8 Stokes	Tea break	S9 Stokes
22 Sep	Free discussion				
23 Sep Mon	S10 Kodama	Tea break	S11 Maruno	Tea break	S12 Ohta
24 Sep Tue	S13 Kodama	Tea break	S14 Ohta	Tea break	S15 Maruno
25 Sep Wed	S16 Kodama	Tea break	S17 Hone	Tea break	S18 van der Kamp
26 Sep Thu	S19 van der Kamp	Tea break	S20 Hone	Tea break	S21 Joshi (public talk for students)
27 Sep Fri	S22 Hone	Tea break	S23 Nijhoff	Tea break	S24 Atkinson
28 Sep Sat	S25 Joshi	Tea break	S26 Roffelsen	Tea break	S27 Atkinson
29 Sep Sun	S28 Joshi	Tea break	S29 Roffelsen	Tea break	S30 Peng

Titles:

1. **James Atkinson**: [2*S] **Extended lattices of integrable equations: towards unification**
2. **Anton Dzhamay**: [3*S] **Geometric deautonomization from a QRT map to a discrete Painlevé equation**
3. **Andrew N. W. Hone**: [3*S] **Elliptic & hyperelliptic analogues of Chebyshev polynomials, and related discrete integrable systems**

4. Nalini Joshi: [2*S] Dynamics on and out of elliptic curves: from Newton to Okamoto
5. Yuji Kodama: [3*S] KP solitons, the Riemann theta functions and the vertex operators
6. Kenichi Maruno: [2*S] Constructions of integrable self-adaptive moving mesh schemes and delay soliton equations [September 24 (S13), 25(S16, S17), 26(S20, S21)]
7. Frank Nijhoff: Topic (1): [1*S] Elliptic integrable lattice equations: an overview and open problems.
   Topic (2): [1*S] The elliptic lattice KdV revisited: challenges and redeeming features
8. Yasuhiro Ohta: [2*S] Special function type solutions for soliton equations and bilinear method
9. Linyu Peng: [1*S] Discrete moving frames and the invariant discrete Noether's theorem
10. Pieter Roffelsen: [2*S] On connection problems and algebraic equations over fields of elliptic functions
11. Alexander Stokes: [3*S] Deautonomisation of integrable mappings and degree growth
12. Daisuke Takahashi: [2*S] On equations defined by max operators.
13. Peter van der Kamp: Topic (1): [1*S] A proof of the Cayley-Bacharach theorem and some of its consequences;
    Topic (2): [1*S] QRT maps and generalizations