



Conference on *Nonlinear Mathematical Physics: Twenty Years of JNMP*, June 4 - 14, 2013

The Program

Tuesday June 4: *Arrival Day*

Registration all day.

Lunch and dinner is available at the Sophus Lie Conference Center.

Note: Breakfast is available on 4 - 14 June during **8:00 to 9:00** for those participants who have their accommodation at the Sophus Lie Conference Center.

Wednesday June 5:

08 : 00 – 10 : 40 **Registration**

10 : 15 – 10 : 40 *Coffee/Tea*

Opening Session: Chairperson: Norbert Euler

10 : 40 – 11 : 00 **Jarmo Hietarinta** Opening words

Session 1: Chairperson: Eugene Ferapontov

11 : 00 – 11 : 35 **F. Calogero** Isochronous systems are not rare

11 : 35 – 12 : 10 **B. Kruglikov** Gaps, symmetry, integrability

12 : 10 – 12 : 45 **V. Lychagin** Differential invariants and their applications

Lunch : 13:00 to 14:30

Session 2: Chairperson: Boris Kruglikov

14 : 30 – 15 : 05 **E. Ferapontov** Dispersionless integrable systems in 3D and Einstein-Weyl geometry

15 : 05 – 15 : 40 **B. Doubrov** Flag structures on smooth manifolds: equivalence and applications

15 : 40 – 16 : 15 **A. Kotov** Differential invariants of Riemannian and Einstein manifolds

Coffee/Tea Break : 16:15 – 16:45

Session 3: Chairperson: Alexander Veselov

16 : 45 – 17 : 20 **F. A. Grünbaum** A noncommutative version of the bispectral problem

17 : 20 – 17 : 55 **F. Nijhoff** New variational principle for integrable systems

17 : 55 – 18 : 30 **H. Munthe-Kaas** On Lie-Butcher theory and post-Lie algebras; An introduction to algebraic combinatorics of flows

Dinner : 18:30 to 19:30

Thursday June 6:**Session 1: Chairperson: Jarmo Hietarinta**

- 09 : 00 – 09 : 35 **P. Damianou** Intermediate Toda and Lotka-Volterra systems
- 09 : 35 – 10 : 10 **A. Dzhamay** Discrete Schlesinger transformations and difference Painlevé equations
- 10 : 10 – 10 : 45 **V. Dorodnitsyn** Three approaches to conservation laws for difference ODEs and PDEs

Coffee/Tea Break : 10:45 to 11:15

Session 2: Chairperson: Vladimir Dorodnitsyn

- 11 : 15 – 11 : 50 **K. Maruno** Self-adaptive mesh discrete integrable systems
- 11 : 50 – 12 : 25 **S. Smirnov** Discretizations of two-dimensional Toda lattice: symmetries and integrals
- 12 : 25 – 13 : 00 **P. Xenitidis** Reduction groups and related integrable difference systems of NLS type

Lunch : 13:00 to 14:30

Session 3: Chairperson: Valentin Lychagin

- 14 : 30 – 15 : 05 **M. Oberlack** New conservation laws for helically symmetric flows
- 15 : 05 – 15 : 40 **N. Bogolubov** On some asymptotical solution for some problems
in statistical mechanics
- 15 : 40 – 16 : 15 **V. Kovalev** Approximate RG-symmetries in application to nonlinear
problems of mathematical physics

Coffee/Tea Break : 16:15 to 16:45

Session 4: Chairperson: Frank Nijhoff

- 16 : 45 – 17 : 20 **D. Blackmore** Integrability criteria and wave-like solutions for BSR systems
- 17 : 20 – 17 : 55 **A. Prykarpatski** Lax integrability of new spatially one-dimensional
Riemann type hydrodynamical systems
- 17 : 55 – 18 : 30 **B. Khots** Observer's mathematics approach to the quantum mechanics

Dinner : 18:30 to 19:30

[Poster Session... *turn the page please]*

Thursday June 6: *Evening*

Poster Session (20:30 to 21:30)

List of Posters:

1. **M. Russo and S. R. Choudhury**

Building integrable NLPDE hierarchies with temporally and spatially varying coefficients

2. **A. V. Kiselev and A. O. Krutov**

Non-Abelian Lie algebroids over jet spaces

3. **E. G. Reyes**

Nonlocal equations, fluids and strings

4. **N. Saitoh and S. Saito**

Degeneration of the Julia set of rational maps in integrable limit

Friday June 7:**Session 1: Chairperson: Francesco Calogero**

- 09 : 00 – 09 : 35 **T. Tokihiro** Discrete integrable equations over finite fields
- 09 : 35 – 10 : 10 **A. Carstea** Minimal rational surfaces and discrete Nahm equations
- 10 : 10 – 10 : 45 **O. Mokhov** On commuting ordinary differential operators of arbitrary rank and genus

Coffee/Tea Break : 10:45 to 11:15

Session 2: Chairperson: Maciej Błaszak

- 11 : 15 – 11 : 50 **S. R. Choudhury** Zero curvature representation, bi-hamiltonian structure and an integrable hierarchy for the Zakharov-Ito system
- 11 : 50 – 12 : 25 **A. Sergyeyev** Multidimensional dispersionless integrable hierarchies: recursion operators and all that
- 12 : 25 – 13 : 00 **B. Prinari** On the inverse scattering transform for the defocusing nonlinear Schrödinger equation with non-vanishing boundary conditions

Lunch : 13:00 to 14:30

Session 3: Chairperson: Sandra Carillo

- 14 : 30 – 15 : 05 **K. Marciniak** Invertible coupled KdV and coupled Harry Dym hierarchies
- 15 : 05 – 15 : 40 **R. Kozlov** On symmetries of stochastic differential equations
- 15 : 40 – 16 : 15 **G. Biondini** Scalar and vector nonlinear Schrödinger systems with non-zero boundary conditions

Coffee/Tea Break : 16:15 to 16:45

Session 4: Chairperson: Barbara Prinari

- 16 : 45 – 17 : 20 **E. Poletaeva** On finite W -algebras for Lie superalgebras in the regular case
- 17 : 20 – 17 : 55 **L. Novozhilova** Qualitative analysis of weakly coupled Landau-Lifshits equations with spin-transfer torque terms
- 17 : 55 – 18 : 30 **J. Cieśliński** Structure-preserving dynamic equations on time scales

Dinner : 18:30 to 19:30

Saturday June 8:

Session 1: Chairperson: M. Lakshmanan

- 09 : 00 – 09 : 35 **M. Blaszak** Canonical quantization in curvilinear coordinates
- 09 : 35 – 10 : 10 **Z. Domanski** Canonical quantization in Riemann spaces
- 10 : 10 – 10 : 45 **J. L. Cabrerizo** Magnetic fields on 2D and 3D spheres

Coffee/Tea Break : 10:45 to 11:15

Session 2: Chairperson: Denis Blackmore

- 11 : 15 – 11 : 50 **S. Carillo** Evolution problems in materials with memory:
a singular kernel viscoelasticity problem
- 11 : 50 – 12 : 25 **C. Schiebold** Multiple-pole solutions of the nonlinear Schrödinger equation
- 12 : 25 – 13 : 00 **A. Kazeykina** Solitons and large-time behavior of solutions for the
Novikov-Veselov equation

Lunch : 13:00 to 14:30

Session 3: Chairperson: G. A. Goldin

- 14 : 30 – 15 : 05 **S. Rauch-Wojciechowski** How many integrals are needed for integrability?
- 15 : 05 – 15 : 40 **N. Rutstam** Dynamics of the tippe top
- 15 : 40 – 16 : 15 **V. de Witte** Numerical normal forms for codimension 2 bifurcations
of limit cycles

Coffee/Tea Break : 16:15 to 16:45

Session 4: Chairperson: Pantelis Damianou

- 16 : 45 – 17 : 20 **A. Araslanov** Symmetries and invariant solutions of mathematical models
of plastic flow during linear friction welding
- 17 : 20 – 17 : 55 **L. Galiakberova** Maple software package for computation of conservation laws
of nonlinear self-adjoint systems of differential equations
- 17 : 55 – 18 : 30 **E. Makarevich** Invariant and partially invariant solutions of gas dynamic
equations on three-dimensional subalgebra

Dinner : 18:30 to 19:30

Editorial Board Meeting : 20:30 to 22:00

Sunday June 9:

No talks on this day

Lunch : 10:45 to 12:25

Excursion 1: The Geiranger fjord : 12:30 to 20:00

The **Geiranger fjord** is one of Norway's most visited tourist sites and has been listed as a *UNESCO World Heritage Site* since 2005. A car/bus ferry, which doubles as a sightseeing trip, is operated by Fjord Nordvestlandske. It runs lengthwise along the fjord between the small towns of Geiranger and Hellesylt. Along the fjord's sides are a number of now abandoned farms. Some restoration has been made by the *Storfjordens venner* association. The most commonly visited among these are Skageflå, Knivsflå, and Blomberg. The fjord is also host to several impressive waterfalls.

For our excursion to the Geiranger fjord, the bus will take us to Hellesylt, where we will take the ferry to Geiranger. From Geiranger the bus will drive over the mountains, and back to Nordfjordeid. **The bus will leave the Sophus Lie Conference Center at 12:30 and we will return in time for dinner at around 20:00.**

Dinner : 20:00 to 21:30



Geiranger fjord

Monday June 10:

Session 1: Chairperson: Oleg I. Mokhov

- 09 : 00 – 09 : 35 **A. Veselov** Universal formulae in Lie algebras and Chern-Simons theory
- 09 : 35 – 10 : 10 **E. Reyes** Nonlocal symmetries, integrability of equations of pseudo-spherical type and the Virasoro algebra
- 10 : 10 – 10 : 45 **T. Takagi** Commuting phase flows in the tropical periodic Toda lattice

Coffee/Tea Break : 10:45 to 11:15

Session 2: Chairperson: Enrique Reyes

- 11 : 15 – 11 : 50 **M. Gandarias** New classes of nonlinearly self-adjoint porous medium equation
- 11 : 50 – 12 : 25 **M. S. Bruzón** Nonlinear self-adjointness and conservation laws for a Kuramoto-Sivashinsky equation with dispersive effects
- 12 : 25 – 13 : 00 **V. Rosenhaus** Infinite symmetries and infinite conservation laws

Lunch : 13:00 to 14:30

Session 3: Chairperson: Maria Gandarias

- 14 : 30 – 15 : 05 **A. Zieleniewicz** A new statistical scaling group and its impact on decaying turbulence
- 15 : 05 – 15 : 40 **A. Rosteck** Lie point symmetries for an infinite set of PDEs appearing in the theory of turbulence
- 15 : 40 – 16 : 15 **A. Rosaev** Regular N -gon as a model of discrete gravitational system

Coffee/Tea Break : 16:15 to 16:45

Session 4: Chairperson: Stefan Rauch-Wojciechowski

- 16 : 45 – 17 : 20 **C. Vizman** Dual pairs of momentum maps in fluid dynamics
- 17 : 20 – 17 : 55 **E. Yaşar** On the first integrals of two nonlinear oscillator equations
- 17 : 55 – 18 : 30 **A. Rezounenko** Some approaches to partial differential equations with state-dependent delays

Banquet Dinner : 19:30 to 22:00

Tuesday June 11:**Session 1: Chairperson: Valentin Ovsienko**

- 08 : 30 – 09 : 05 **J. Prada** Lump Solutions in a 2+1 dimensional equation
- 09 : 05 – 09 : 40 **A. Prikhod'ko** Solitons in quantum systems with spectral self-similarity
and complexity of symbolic dynamical systems
- 09 : 40 – 10 : 15 **P. G. Estévez** Interaction of lumps in a Bogoyavlenskii-Kadomtsev-Petviashvili
equation in 2+1 dimensions

Coffee/Tea Break : 10:15 to 10:45

Session 2: Chairperson: P. G. Estévez

- 10 : 45 – 11 : 20 **Y. You** Random attractor of the 3D stochastic convective
Brinkman-Forchheimer Equations
- 11 : 20 – 11 : 55 **F. Bulnes** Geometrical Langlands ramifications and differential operators
classification by coherent D -modules in field theory
- 11 : 55 – 12 : 30 **J.-J. Shu** Asymptotic expansion for the Korteweg-de Vries-Burgers equation

Lunch : 12:30 to 13:50

Excursion 2: The Briksdal glacier : 14:00 to 20:00

The **Briksdal glacier** (or *Briksdalsbreen*) is one of the most accessible and best known arms of the Jostedalbreen glacier. The glacier lies on the north side of the Jostedalbreen, in Briksdalen which is located at the end of the Oldedalen valley, about 25 kilometres south of the village of Olden. It is part of Jostedalbreen National Park. Briksdalsbreen terminates in a small glacial lake, Briksdalsbrevatnet, which lies 346 metres above sea level.

For our excursion to the Briksdal glacier the bus will take us to Briksdalen, where we can walk to the glacier. On the return, the bus will drive the exiting panorama road. **The bus will leave the Sophus Lie Conference Center at 14:00 and we will return in time for dinner at around 20:00.**

Dinner : 20:00 to 21:30

Wednesday June 12:

Session 1: Chairperson: Ralph Willox

- 09 : 00 – 09 : 35 **J. Hietarinta** Discrete Boussinesq equations
- 09 : 35 – 10 : 10 **I. Habibullin** Formal diagonalization of the discrete Lax operators and construction of conserved densities for dynamical systems
- 10 : 10 – 10 : 45 **S. Agafonov** Singular symmetric flat 3-webs and Frobenius 3-folds

Coffee/Tea Break : 10:45 to 11:15

Session 2: Chairperson: Ismagil Habibullin

- 11 : 15 – 11 : 50 **B. Grammaticos** Discretising systematically integrable systems
- 11 : 50 – 12 : 25 **R. Willox** The ultradiscrete sine-Gordon equation and its exotic soliton interactions
- 12 : 25 – 13 : 00 **R. Boll** On Bianchi permutability of Bäcklund transformations for asymmetric quad-equations

Lunch : 13:00 to 14:30

Session 3: Chairperson: Basil Grammaticos

- 14 : 30 – 15 : 05 **S. Saito** Exact triangles and integrability of rational maps
- 15 : 05 – 15 : 40 **G. Goldin** Nonlinear conformal-invariant electrostatics in four and six dimensions
- 15 : 40 – 16 : 15 **K. Toda** The extended Skyrme-Faddeev model and its topological solitons

Coffee/Tea Break : 16:15 to 16:45

Session 4: Chairperson: Satoru Saito

- 16 : 45 – 17 : 20 **P. Selyshchev** Peculiarities of nonlinear dynamics of radiation damage evolution: phase portraits and bifurcations
- 17 : 20 – 17 : 55 **A. H. Sakka** Schlesinger transformations for the second and third members of a third Painlevé hierarchy

Dinner : 18:30 to 19:30

Wednesday June 12: *Evening**A Special Evening Session: Open to the General Public!*

(Note: Admittance is free and no registration is necessary for this evening session.)

Science and Society

Chairperson: Norbert Euler

Programme:

- 20 : 30 – 21 : 15 **Francesco Calogero** A world free of nuclear weapons:
Desirable? Feasible?
- 21 : 15 – 21 : 45 *Coffee/Tea Break*
- 21 : 45 – 22 : 15 **Questions/Discussions**

A World Free of Nuclear Weapons: Desirable? Feasible?

by **Francesco Calogero** (Physics Department, University of Rome "La Sapienza",
Istituto di Fisica Nucleare, Sezione di Roma, Italy)

Summary:

Firstly, the special character of nuclear weapons will be underlined. Secondly, the desirability and the feasibility of a nuclear-weapon-free world will be tersely discussed. Thirdly, some past activities promoting nuclear disarmament and the transition to a nuclear-weapon-free world will be tersely reviewed. Fourthly, the significant development initiated (January 2007) by the Wall Street Journal op-ed authored by Shultz, Perry, Kissinger and Nunn and culminated in the Prague speech (April 2009) by President Obama will be reported. Finally, recent developments and future steps towards a nuclear-weapon-free world will be outlined.

Thursday June 13:
Session 1: Chairperson: Jose L. Cabrerizo

- 09 : 00 – 09 : 35 **M. Lakshamanan** PT(reversible) symmetric nonlinear Liénard-type oscillators:
nonstandard lagrangian/hamiltonian description
and exact quantization
- 09 : 35 – 10 : 10 **M. Kovalevsky** SU(2s+1) symmetry and nonlinear dynamic equations of
spin magnets
- 10 : 10 – 10 : 45 **G. Gubbiotti** Noether symmetries and the quantization of a Liénard-type
nonlinear oscillator

Coffee/Tea Break : 10:45 to 11:15

Session 2: Chairperson: M. C. Nucci

- 11 : 15 – 11 : 50 **P. Morando** Reduction of ODEs: a general approach
- 11 : 50 – 12 : 25 **C. Muriel** Jacobi last multipliers and some classes of nonlocal symmetries
for ODEs
- 12 : 25 – 13 : 00 **H. Winther** Homogeneous almost complex- and related structures in dim 6

Lunch : 13:00 to 14:30

Session 3: Chairperson: Paola Morando

- 14 : 30 – 15 : 05 **G. Moreno** Variational problems with free boundary values:
a geometric perspective
- 15 : 05 – 15 : 40 **M. C. Nucci** Superintegrability? Hidden linearity? Classical quantization?
Symmetries and more symmetries!
- 15 : 40 – 16 : 15 **V. Ovsienko** and Classical algebras understood as graded-commutative
S. Morier-Genoud algebras

Closing: 16:15 *Coffee/Tea:* 16:15 to 16:45

Dinner : 18:30 to 19:30

Friday June 14: *Departure Day*