

## Workshop "Algebro-geometric methods in Gauge theory and General Relativity"

Hanse Institute for Advanced Study (Hanse-Wissenschaftskolleg), Delmenhorst, September 12 - 16, 2011

Organisation: Victor Z. Enolski (Kiev), Jutta Kunz (Oldenburg), Claus Lämmerzahl (ZARM, Bremen), Emma Previato (Boston)

### Monday 12 September 2011

- 09:30 - 09:50 Opening
- 09:50 - 10:40 V. Enolskii (Kiev)  
To the Existence of Non-Abelian Monopole: Algebro-Geometric Approach I
- 10:40 - 11:10 Coffee break
- 11:10 - 12:00 V. Enolskii  
To the Existence of Non-Abelian Monopole: Algebro-Geometric Approach II
- 12:00 - 12:50 T. Ioannidou (Thessaloniki)  
Monopoles and the Weyl equation
- 13:00 - 14:30 Lunch
- 14:30 - 15:20 S. Matsutani (Tokyo)  
On a Quantization of a Geometrical Object, Elastica
- 15:20 - 16:10 E. Previato (Boston)  
Special functions in monodromy and physics I
- 16:10 - 16:40 Coffee break
- 16:40 - 17:30 E. Previato  
Special functions in monodromy and physics II
- 17:30 - 18:20 E.-M. Feichtner (Bremen)  
Tropical geometry
- 19:00 - 20:30 Dinner

### Tuesday 13 September 2011

- 09:00 - 09:50 A. Achucarro (Leiden)  
Topology in the sky: Cosmic strings and other defects

- 09:50 - 10:40 V. Matveev (Dijon)  
Degenerate alébro-geometric solutions to the integrable nonlinear PDEs and multiple and extreme rogue waves generation I
- 10:40 - 11:10 Coffee break
- 11:10 - 12:00 V. Matveev  
Degenerate alébro-geometric solutions to the integrable nonlinear PDEs and multiple and extreme rogue waves generation II
- 12:00 - 12:50 F. Mueller-Hoissen (Goettingen)  
The Ernst equation of General Relativity in the bidifferential calculus approach
- 13:00 - 14:30 Lunch
- 14:30 - 15:20 M. Ansorg (Jena)  
The interior of axisymmetric and stationary black holes: Numerical and analytical studies
- 15:20 - 16:10 V. Kagramanova (Oldenburg)  
Inversion of general hyperelliptic integrals
- 16:10 - 16:40 Coffee break
- 16:40 - 17:30 E. Hackmann (ZARM, Bremen)  
Observables for bound orbital motion in axially symmetric space-times
- 17:30 - 18:20 B. Hartmann (Jacobs Univ. Bremen)  
Elliptic integrals/functions and test particle motion in cosmic string space-times
- 19:00 - 20:30 Dinner

### Wednesday 14 September 2011

- 09:00 - 09:50 C. Athorne (Edinburgh)  
Weierstrass gaps and equivariant p-functions
- 09:50 - 10:40 V. Gritsenko (Lille)  
Jacobi theta-series, automorphic discriminants and Borcherds algebras I
- 10:40 - 11:10 Coffee break
- 11:10 - 12:00 V. Gritsenko  
Jacobi theta-series, automorphic discriminants and Borcherds algebras II
- 12:00 - 12:50 P.L. Christiansen (Copenhagen)  
Non-relativistic and relativistic scattering by short-range potentials
- 13:00 - 14:30 Lunch

Excursion to ZARM (drop tower) and City of Bremen and dinner in Bremen

### Thursday 15 September 2011

- 09:00 - 09:50 C. Eilbeck (Edinburgh)  
Generalized Weierstrass functions, Kummer varieties and Coble polynomials
- 09:50 - 10:40 D. Korotkin (Montreal)  
Alébro-geometric solutions of Ernst equation and Schlesinger system I

- 10:40 - 11:00 Coffee break
- 11:00 - 11:50 D. Korotkin  
Algebro-geometric solutions of Ernst equation and Schlesinger system I
- 11:50 - 12:40 F. Hess (Oldenburg)  
TBD
- 12:40 - 14:00 Lunch
- 14:00 - 14:50 J. Gibbons (London)  
Constructing Benney reductions associated with cyclic  $(n,s)$  curves
- 14:50 - 15:40 A. Bobenko (Berlin)  
TBD
- 15:40 - 15:55 Coffee break
- 15:55 - 16:45 H. Uecker (Oldenburg)  
Non-existence of solitons
- 16:45 - 17:35 D. Grieser (Oldenburg)  
Geodesics on singular spaces
- 17:35 - 17:50 Coffee break
- 17:50 - 18:40 R. de Jong (Leiden)  
Green's functions for the Arakelov metric on hyperelliptic Riemann surfaces I
- 19:00 - 20:00 Dinner

**Friday 15 September 2011**

- 09:00 - 09:50 R. de Jong  
Green's functions for the Arakelov metric on hyperelliptic Riemann surfaces II
- 09:50 - 10:40 Y. Fedorov (Barcelona)  
Explicit solutions and complex behavior of some integrable systems with cubic integrals I
- 10:40 - 11:10 Coffee break
- 11:10 - 12:00 Y. Fedorov  
Explicit solutions and complex behavior of some integrable systems with cubic integrals II
- 12:00 - 12:50 E. Belokolos (Kiev)  
Spectra of the Gaudin models I
- 12:50 - 13:00 Coffee break
- 13:00 - 13:50 E. Belokolos  
Spectra of the Gaudin models II
- 13:50 - 14:50 Lunch
- End of workshop