

ADAM DOLIWA

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PERSONAL

Date and place of birth: 28 February 1965, Elk (Poland)
Marital status: married, daughter Joanna (born 2001), son Jan (born 2004)

EDUCATION

- 2002 Habilitation (D.Sc.) in Mathematical Physics, Warsaw University
Integrable discrete geometry
- 1995 Ph.D. in Theoretical Physics, Warsaw University, Thesis Advisor: A. Sym
Methods of soliton geometry in the theory of harmonic mappings
- 1988 M.Sc. in Physics, Warsaw University, Thesis Advisor: A. Sym
Soliton geometry in the periodic sector

ACADEMIC & RESEARCH POSITIONS

- Sept. 2005 – present Deputy Dean for Research and International Cooperation
- Oct. 2002 – present Extraord. Professor, Fac. Math. & Comp. Sc., Univ. Warmia & Mazury
- May. 2005 – Dec. 2005 Scientific Collab., DFG Research Center MATHEON, Techn. Univ. Berlin
- Oct. 1998 – Oct. 2002 Assistant Professor, Institute of Theoretical Physics, Warsaw University
- Oct. 1996 – Sept. 1998 Postdoctoral Fellow, Italian Nat. Inst. for Nucl. Physics, Rome Section
- Oct. 1988 – Oct. 1998 Assistant, Institute of Theoretical Physics, Warsaw University

TEACHING EXPERIENCES

- graduate level monographic courses: *Methods of Algebraic Geometry in Soliton Theory, Geometry and Integrable Systems, Elements of Soliton Theory, Elements of the Theory of Elliptic Functions*
- undergraduate level courses: *Linear Algebra with Geometry, Mathematical Analysis, Complex Analysis, Differential Geometry, Elements of Theoretical Physics*
- recitations for courses of analytical mechanics, mathematical methods of physics, mathematical analysis, linear algebra, mathematical methods of geophysics, differential geometry, complex analysis

RESEARCH

- Differential Geometry & Soliton Systems
 - Integrable dynamics of curves and submanifolds
 - Harmonic maps and Toda systems
 - Conjugate nets and multicomponent Kadomtsev–Petviashvili hierarchy
- Integrable Discrete Geometry
 - Geometric discretizations of integrable PDE's
 - Analytic and algebraic methods in theory of integrable lattices
 - Geometric interpretation of the integrability scheme
- Soliton Theory in Finite Fields
 - Algebro-geometric techniques in integrable cellular automata

1998-2003 co-leader (with A. Sym) of the seminar **Geometry and Nonlinearity**
2003 – The **Wacław Sierpiński Prize** in Mathematics of the Polish Academy of Sciences.

FOREIGN LANGUAGES

- good: English, Italian
- familiar with: French, German, Russian

PUBLICATIONS

1. A. Doliwa, *The C-(symmetric) quadrilateral lattice, its transformations and the algebro-geometric construction*, J. Geom. Phys. (accepted) [arXiv:0710.5820](#) [nlin.SI].
2. A. Doliwa, *Desargues maps and the Hirota–Miwa equation*, Proc. R. Soc. A (in print) [arXiv:0906.1000](#) [nlin.SI].
3. A. Doliwa & M. Nieszporski, *Darboux transformations for linear operators on two dimensional regular lattices*, J. Phys. A: Math. Theor. **42** (2009) 454001 (27 pp.).
4. A. Doliwa, *On τ -function of the quadrilateral lattice*, J. Phys. A: Math. Theor. **42** (2009) 404008 (9 pp.).
5. P. M. Santini, A. Doliwa & M. Nieszporski, *Integrable dynamics of Toda-type on the square and triangular lattices*, Phys. Rev. E **77** (5): art. no. 056601 Part 2 MAY 2008.
6. A. Doliwa, M. Nieszporski & P. M. Santini, *Integrable lattices and their sub-lattices II. From the B-quadrilateral lattice to the self-adjoint schemes the triangular and the honeycomb lattices*, J. Math. Phys. **48** (11): art. no. 113056 NOV 2007.
7. A. Doliwa, *Generalized isothermic lattices*, J. Phys. A: Math. Theor. **40** (2007) 12539-12561.
8. A. Doliwa, P. Grinevich, M. Nieszporski & P. M. Santini, *Integrable lattices and their sub-lattices: from the discrete Moutard (discrete Cauchy–Riemann) 4-point equation to the self-adjoint 5-point scheme*, J. Math. Phys. **48** (1): art. n. 013513 JAN 2007.
9. A. Doliwa, *The B-quadrilateral lattice, its transformations and the algebro-geometric construction*, J. Geom. Phys. **57** (2007) 1171–1192.
10. A. Doliwa, *On τ -function of conjugate nets*, J. Nonlin. Math. Phys. **12** Supplement (2005) 244–252.
11. P. M. Santini, M. Nieszporski & A. Doliwa, *Integrable generalization of the Toda law to the square lattice*, Phys. Rev. E. **70** (5): art. no. 056615 Part 2 NOV 2004.
12. A. Doliwa, *The normal dual congruences and the dual Bianchi lattice*, Glasgow Math. J. **47A** (2005) 51–63.
13. M. Białecky & A. Doliwa, *Algebro-geometric solution of the discrete KP equation over a finite field out of a hyperelliptic curve*, Comm. Math. Phys. **253** (2005) 157–170.
14. A. Doliwa, P. M. Santini & M. Nieszporski, *Geometric discretization of the Bianchi system*, J. Geom. Phys. **52** (2004) 217–240.
15. M. Nieszporski, P. M. Santini & A. Doliwa, *Darboux transformations for 5-point and 7-point self-adjoint schemes and an integrable discretization of the 2D Schrödinger operator*, Phys. Lett. A. **323** (2004) 241–250.
16. M. Białecky & A. Doliwa, *The discrete KP and KdV equations over finite fields*, Theor. Math. Phys. **137** (2003) 1412–1418.
17. A. Doliwa, M. Białecky & P. Klimczewski, *The Hirota equation over finite fields. Algebro-geometric approach and multisoliton solutions*, J. Phys. A **36** (2003) 4827–4839.

18. A. Doliwa, *Geometric discretization of the Koenigs nets*, J. Math. Phys **44** (2003) 2234–2249.
19. A. Doliwa, M. Nieszporski & P. M. Santini, *Asymptotic lattices and their integrable reductions I: the Bianchi and the Fubini-Ragazzi lattices*, J. Phys. A **34** (2001) 10423–10439.
20. A. Doliwa, *The Darboux-type transformations of integrable lattices*, Rep. Math. Phys. **48** (2001) 59–66.
21. A. Doliwa, *Discrete asymptotic nets and W -congruences in Plücker line geometry*, J. Geom. Phys. **39** (2001) 9–29.
22. A. Doliwa & P. M. Santini, *The symmetric, D -invariant and Egorov reductions of the quadrilateral lattice*, J. Geom. Phys. **36** (2000) 60–102.
23. A. Doliwa, P. M. Santini & M. Mañas, *Transformations of Quadrilateral Lattices*, J. Math. Phys. **41** (2000) 944–990.
24. A. Doliwa, M. Mañas, L. Martínez Alonso, *Generating quadrilateral and circular lattices in KP theory*, Phys. Lett. A **262** (1999) 330–343.
25. A. Doliwa, *Quadratic Reductions of Quadrilateral Lattices*, J. Geom. Phys. **30** (1999) 169–186.
26. A. Doliwa, M. Mañas, L. Martínez Alonso, E. Medina & P. M. Santini, *Charged Free Fermions, Vertex Operators and Transformation Theory of Conjugate Nets*, J. Phys. A. **32** (1999) 1197–1216.
27. A. Doliwa, S. V. Manakov & P. M. Santini, *$\bar{\partial}$ -Reductions of the Multidimensional Quadrilateral Lattice: the Multidimensional Circular Lattice*, Comm. Math. Phys. **196** (1998) 1–18.
28. J. Cieśliński, A. Doliwa & P. M. Santini, *The Integrable Discrete Analogues of Orthogonal Coordinate Systems are Multidimensional Circular Lattices*, Phys. Lett. A **235** (1997) 480–488.
29. A. Doliwa, *Geometric discretisation of the Toda system*, Phys. Lett. A **234** (1997) 187–192.
30. A. Doliwa & P. M. Santini, *Multidimensional Quadrilateral Lattices are Integrable*, Phys. Lett. A **233** (1997) 365–372.
31. M. Mañas, A. Doliwa & P. M. Santini, *Darboux Transformations for Multidimensional Quadrilateral Lattices. I*, Phys. Lett. A **232** (1997) 99–105.
32. A. Doliwa, *Holomorphic curves and Toda systems*, Lett. Math. Phys. **39** (1997) 21–32.
33. A. Doliwa, *Harmonic maps and Toda systems*, J. Math. Phys. **38** (1997) 1685–1691.
34. A. Doliwa & P. M. Santini, *Integrable dynamics of a discrete curve and the Ablowitz-Ladik hierarchy*, J. Math. Phys. **36** (1995) 1259–1273.
35. A. Doliwa & P. M. Santini, *An elementary geometric characterization of the integrable motions of a curve*, Phys. Lett. A **185** (1994) 373–384.
36. A. Doliwa & A. Sym, *Non-linear σ -Models on Spheres and Toda Systems*, Phys. Lett. A **185** (1994) 453–460.

BOOKS

1. A. Doliwa & P. M. Santini, *Integrable Systems and Discrete Geometry*, [in:] Encyclopedia of Mathematical Physics, J. P. Francoise, G. Naber and T. S. Tsun (eds.) Vol. III, pp. 78–87, Elsevier, 2006.

CONFERENCE MATERIALS & PREPRINTS

1. A. Doliwa, *Geometric algebra and quadrilateral lattices*, arXiv:0801.0512 [nlin.SI].
2. M. Nieszporski, A. Doliwa & P. M. Santini, *The integrable discretization of the Bianchi-Ernst system*, arXiv:nlin.SI/0104065.
3. A. Doliwa, *Integrable Multidimensional Discrete Geometry: Quadrilateral Lattices, their Transformations and Reductions*, [in:] *Integrable Hierarchies and Modern Physical Theories* H. Aratyn & A. S. Sorin (eds.), Kluwer, Dordrecht, 2001 pp. 355–389.
4. A. Doliwa, *The Ribaucour congruences of spheres within Lie sphere geometry*, [in:] *Bäcklund and Darboux Transformations: The Geometry of Soliton Theory, Halifax, 1999*, C. Rogers & P. Winternitz (eds.) CMR Proceedings and Lecture Notes **29**, pp. 159–166, AMS, Providence, 2001.
5. A. Doliwa, *Asymptotic Lattices and W -Congruences in Integrable Discrete Geometry*, [in:] *Proceedings of the 13th Workshop NEEDS'99*, B. Pelloni, M. Bruschi and O. Ragnisco (eds.), Journal of Nonlinear Mathematical Physics **8** Supplement (2001) 88–92.
6. A. Doliwa & P. M. Santini, *Integrable Discrete Geometry: the Quadrilateral Lattice, its Transformations and Reductions*, [in:] *SIDE III – Symmetries and Integrability of Difference Equations*, D. Levi, & O. Ragnisco (eds.), CMR Proceedings and Lecture Notes, Vol. 25, AMS, Providence, 2000 pp. 101–119.
7. A. Doliwa, *Lattice geometry of the Hirota equation*, [in:] *SIDE III – Symmetries and Integrability of Difference Equations*, D. Levi, & O. Ragnisco (eds.), CMR Proceedings and Lecture Notes, Vol. 25, AMS, Providence, 2000 pp. 93–100.
8. A. Doliwa, *Minimal Surfaces, holomorphic curves and Toda systems*, [in:] *Proceedings of the 1st NOSONGE, Warsaw '95*, J. Cieśliński & D. Wójcik (eds.), pp. 227–236, Polish Scientific Publishers, Warsaw 1998.
9. A. Doliwa & P. M. Santini, *Geometry of Discrete Curves and Lattices and Integrable Difference Equations*, [in:] *Discrete Integrable Geometry and Physics*, A. Bobenko & R. Seiler (eds.), Oxford University Press, 1999.
10. A. Doliwa, *Integrable Discrete Geometry with Ruler and Compass*, [in:] *Symmetries and Integrability of Difference Equations*, P. Clarkson & F. Nijhoff (eds.), pp. 122–136, University Press, Cambridge, 1999.
11. A. Doliwa, *Teoria solitonów i geometria, (Soliton theory and geometry)*, [in:] *Fizyka Teoretyczna Lat 90-tych, Sympozjum Instytutu Fizyki Teoretycznej UW 14–16 grudnia 1995*, P. Klimczewski & S. G. Rohozinski (eds.) pp. 41–53, Zakład Graficzny UW, Warszawa 1996 (in Polish).
12. A. Doliwa & P. M. Santini, *The Integrable Dynamics of a Discrete Curve*, [in:] *Symmetries and Integrability of Difference Equations*, D. Levi, L. Vinet & P. Winternitz (eds.), CMR Proceedings and Lecture Notes, Vol. 9, AMS, Providence, 1996, pp. 91–102.
13. A. Doliwa, *What distinguishes soliton equations from other partial differential equations?*, [in:] *Bulletin of the Student Nonlinear Physics Research Group No. 1*, P. Goldstein, M. Pycia & D. Wójcik (eds.) pp. 28–35, Zakład Graficzny UW, Warszawa 1995.
14. A. Doliwa & A. Sym, *Minimal Surfaces in S^{2m} and Toda Systems*, Warsaw University Preprint IFT 11/92.

15. A. Doliwa & A. Sym, *Constant Mean Curvature Helicoids in E^3 as an Example of Soliton Surfaces*, [in:] *Nonlinear Evolution Equations and Dynamical Systems*, M. Boiti, L. Martina & F. Pompinelli (eds.), pp. 111-117, World Scientific, Singapore 1992.
16. A. Doliwa & A. Sym, *On Kida Class of Vortex Filament Motion*, [in:] *Symmetries in Science III*, B. Gruber & S. Iachello (eds.), Plenum Press, New York 1989.

CONFERENCE PRESENTATIONS & TALKS

- Nonlinear Waves and Integrable Systems, Rome, Italy (February 2009)
- Nonlinear Waves–Theory and Applications, Beijing, China (June, 2008)
- Nonlinear Integrable Dynamical Systems: Theory and Applications, Gdańsk, Poland (September, 2007)
- ISLAND 3: Integrable Systems: Linear and Nonlinear Dynamics, Port Ellen, Isle of Islay, UK (July, 2007)
- Nonlinear Evolution Equations and Dynamical Systems, L’Ametlla de Mar, Spain (June, 2007)
- Methods of Integrable Systems in Geometry, Durham, UK (August, 2006)
- Symmetries and Integrability of Difference Equations VII, Melbourne, Australia (July, 2006)
- Discrete Differential Geometry, Oberwolfach, Germany (March, 2006)
- Geometry and Integrable Systems, Berlin, Germany (June, 2005)
- Symmetries and Integrability of Difference Equations VI, Helsinki, Finland (June, 2004)
- Quantum Aspects of Soliton Theory, Gdańsk, Poland (September, 2003)
- ISLAND 2: Integrable Systems: Linear and Nonlinear Dynamics, Isle of Arran, UK (June, 2003)
- Nonlinear Evolution Equations and Dynamical Systems, Cadiz, Spain (June, 2002)
- Geometry and Topology of Manifolds, Krynica Górska, Poland (May, 2002)
- Symmetries and Integrability of Difference Equations IV, Tokyo, Japan (November, 2000)
- NATO ARW: Integrable Hierarchies and Modern Physical Theories, Chicago, USA (July, 2000)
- RCP264: Inverse Problems and Nonlinearity, Montpellier, France (June, 2000)
- XXXII Symposium on Mathematical Physics, Toruń, Poland (May, 2000)
- Nonlinear Evolution Equations and Dynamical Systems, Kolymbari, Greece (June, 1999)
- Bäcklund and Darboux Transformations: The Geometry of Soliton Theory, Halifax, Canada (June, 1999)
- Nonlinear Evolution Equations and Dynamical Systems, Leeds, UK (June, 1998)
- Integrable Systems: Solutions and Transformations, Guardamar, Spain (June, 1998)
- Dynamical Systems: From Integrability to Chaos, Toruń, Poland (May, 1998)

- Symmetries and Integrability of Difference Equations III, Sabaudia, Italy (May, 1998)
- Nonlinear Systems, Solitons and Geometry, Oberwolfach, Germany (October, 1997)
- Nonlinear Evolution Equations and Dynamical Systems, Kolymbari, Greece (June, 1997)
- Symmetries and Integrability of Difference Equations II, Canterbury, UK (July, 1996)
- Condensed Matter Physics and Discrete Geometry, Wien, Austria (February, 1996)
- Theoretical Physics of 90's, Warszawa, Poland (December, 1995)
- First Non-Orthodox School on Nonlinearity and Geometry, Warszawa, Poland (September, 1995)
- Nonlinear Evolution Equations and Dynamical Systems, Gallipoli, Italy (September, 1994)
- Discrete Geometry and Quantum Field Theory, Międzyzdroje, Poland (May, 1994)
- Differential Geometry and Its Applications, Opava, Czech Rep. (August, 1992)
- Harmonic Maps and Integrable Systems, Leeds, UK (May, 1992)
- International Congress on Mathematical Physics, Leipzig, Germany (August, 1991)
- Nonlinear Evolution Equations and Dynamical Systems, Gallipoli, Italy (June, 1991)