Krzysztof Marciniak, Ph.D.

CURRICULUM VITAE (updated August 26, 2025)

Date of birth: May 23, 1968

Address:
Department of Science and Technology
Linköping University
Campus Norrköping
S-601 74 Norrköping
Sweden
Phone: +46 11 363320
email: krzma@itn.liu.se
http://www.itn.liu.se/∼krzma52
https://liu.se/en/employee/krzma52

1. Education

- M.Sc. in theoretical physics, Adam Mickiewicz University, Poznań, Poland (July 26, 1991)
- Fil.lic. (licentiate of philosophy) in applied mathematics, Linköping University, Sweden (March 4, 1996)
- Ph.D. (fil dr) in applied mathematics, Linköping University, Sweden (September 25, 1998)
- Docent in applied mathematics, Linköping University, Sweden (March 18, 2005)

2. Employment

- 1987–1991 assistent at Institute of Physics, A. Mickiewicz University
- 1991–2002 assistent and later adjunkt at Institute of Physics, A. Mickiewicz University
- 1992–1998 Ph.D. student at Department of Mathematics, Linköping University
- 1999 Associate professor (temporary position) at Department of Mathematics, Linköping University, Sweden
- 1999– Associate professor in mathematics at Department of Science and Technology, Linköping University, Sweden

3. Special awards

- 1989-1990 and 1990-1991: scholarship of the Minister of Education, Poland
- 1991: graduation with distinction from Adam Mickiewicz University

4. Publications

4.1 In refereed journals

1. M. Błaszak, K. Marciniak *R-matrix approach to lattice integrable systems.* J. Math. Phys. **35**, (9) 1994 , pp. 4661–4682
2. S. Rauch-Wojciechowski, K. Marciniak, M. Błaszak *Two Newton decompositions of stationary flows of KdV and Harry Dym hierarchies.* Physica A **233**, 1996, pp. 307–330
3. K. Marciniak *Coupled KdV hierarchy with sources and its Newton decomposition.* J. Math. Phys. **38** (11) 1997, pp. 5739–5755
4. K. Marciniak, S. Rauch-Wojciechowski *Two families of nonstandard Poisson structures for Newton equations.* J. Math. Phys. **39** (10), 1998, pp. 5292–5306
5. S. Rauch-Wojciechowski, K. Marciniak, H. Lundmark *Quasi-Lagrangian systems of Newton equations.* J. Math. Phys. **40** (12), 1999, pp. 6366–6398.
6. K. Marciniak, S. Rauch-Wojciechowski *Integrable perturbations of the harmonic oscillator and Poisson pencils.* Inv. Probl. **17**, 2001, pp. 191–209
7. K. Marciniak, S. Rauch-Wojciechowski *On integrable perturbations of harmonic oscillator*, Reports on Mathematical Physics bf 48, 2001, pp. 139–147
8. K. Marciniak, M. Blaszak, *Separation of variables in quasi-potential systems of bi-cofactor form*, J. Phys. A: Math. Gen. **35** (29 March 2002) pp. 2947–2964
9. M. Blaszak, K. Marciniak, *Separability preserving Dirac reductions of Poisson pencils on Riemannian manifolds*, J. Phys. A: Math. Gen. **36** (2003) pp. 1337–1356
10. K. Marciniak, M. Blaszak, *Dirac reduction revisited*, J. Nlin. Math. Phys. **10** No 4 (2003) pp. 451–463
11. M. Blaszak, K. Marciniak, *Dirac reduction of dual Poisson-presymplectic pairs*, J. Phys. A: Math. Gen. **37** (2004) 5173–5187
12. K. Marciniak, M. Blaszak, *Geometric reduction of Hamiltonian systems*, Rep. Math. Phys. **55**(2005) pp. 325–339
13. M. Blaszak, K. Marciniak, *From separation relations to soliton hierarchies*, Czechoslovak Journal of Physics, vol. **55** (2005) No. 11 pp. 1343–1350
14. M. Blaszak, K. Marciniak, *From Stäckel systems to integrable hierarchies of PDE's: Beneti class of separation relations*, J. Math. Phys. **47**, 032904 (2006)
15. K. Marciniak, S. Rauch-Wojciechowski, *Separable systems of coordinates for triangular Newton equations* $\frac{d^2q_i}{dt^2} = M_i(q_1, \ldots, q_i)$, (2007) Studies in Applied Mathematics **118** (1), pp. 45–84.
16. K. Marciniak, M. Blaszak, *Non-hamiltonian systems separable by Hamilton-Jacobi method*, Journal of Geometry and Physics **58** (2008) pp. 557-575 (doi:10.1016/j.geomphys.2007.12.008).
17. M. Blaszak, K. Marciniak, *Stäckel systems generating coupled KdV hierarchies and their finite-gap and rational solutions*, J. Phys A: Math. Theor. **41** (2008) 485202, (doi: 10.1088/1751-8113/41/48/485202)
18. K. Marciniak, M. Blaszak, *Construction of coupled Harry Dym hierarchy and its solutions from Stäckel systems*, Nonlinear Analysis: Theory, Methods and Applications **73** (2010) 3004-3017, http://dx.doi.org/10.1016/j.na.2010.06.067

19. Błaszak, M. and Marciniak, K. (2012), *On Reciprocal Equivalence of Stäckel Systems*. Studies in Applied Mathematics. doi: 10.1111/j.1467-9590.2011.00544.x
20. Błaszak, M. and Marciniak, K. (2013), *Invertible coupled KdV and coupled Harry Dym hierarchies*; Studies in Applied Mathematics. DOI: 10.1111/sapm.12008
21. K. Marciniak and M. Blaszak (2015), *Flat coordinates of flat Stäckel systems,*Applied Mathematics and Computation (2015), pp. 706-716, doi: 10.1016/j.amc.2015.06.099
22. Błaszak M., Marciniak K. and Domanski Z., *Separable quantizations of Stäckel systems*, Annals of Physics **371** (2016) pp. 460-471, doi:10.1016/j.aop.2016.06.007
23. Błaszak M. and Marciniak K., *Classical and quantum superintegrability of Stäckel systems*, Symmetry, Integrability and Geometry: Methods and Applications **13** (2017) 008 doi.org/10.3842/SIGMA.2017.008
24. Marciniak K. and Błaszak M., *Non-Homogeneous Hydrodynamic Systems and Quasi-Stäckel Hamiltonians*, Symmetry, Integrability and Geometry: Methods and Applications **13** (2017) 077 https://doi.org/10.3842/SIGMA.2017.077
25. Błaszak M., Marciniak K. *Stäckel transform of Lax equations*, Studies in Applied Mathematics 2020;1–18. https://doi.org/10.1111/sapm.12315
26. Błaszak M., Marciniak K., Sergyeyev A., *Deforming Lie algebras to Frobenius integrable non-autonomous Hamiltonian systems*, Reports on Mathematical Physics **87** (2021), No. 2, pp. 249-263
27. Błaszak M., Marciniak K. and Domanski Z., *Systematic construction of nonautonomous Hamiltonian equations of Painlevé type. I. Frobenius integrability*, Stud. Appl. Math. 148 (3), 2021, pp. 1208-1250, https://doi.org/10.1111/sapm.12473
28. Błaszak M., Domanski Z. and Marciniak K, *Systematic construction of nonautonomous Hamiltonian equations of Painlevé-type. II. Isomonodromic Lax representation*, Stud. Appl. Math. 149 (2), 2022, pp. 364–415, https://doi.org/10.1111/sapm.12495
29. Błaszak M. and Marciniak K., *Systematic construction of non-autonomous Hamiltonian equations of Painlevé type. III. Quantization*, Stud. Appl. Math. **149** (2), 2022, pp. 416-440, https://doi.org/10.1111/sapm.12514
30. Maniraguha J., Marciniak K. and Kurujyibwami C., *Transforming Stäckel Hamiltonians of Benenti type to polynomial form*, Advances in Theoretical and Mathematical Physics 26 (3) 2022, pp. 711-734, https://dx.doi.org/10.4310/ATMP.2022.v26.n3.a5
31. Marciniak K. and Błaszak M., *Miura maps for Stäckel systems*, J. Math. Phys. **64**, 122903 (2023), https://doi.org/10.1063/5.0169596
32. Błaszak M., Szablikowski B. and Marciniak K., *Stäckel representations of stationary KdV systems*, Reports on Mathematical Physics **92** (3), 2023, pp. 323-346 https://doi.org/10.1016/S0034-4877(23)00083-6
33. Błaszak M. and Marciniak K., *Algebraic curves as a source of separable multi-Hamiltonian systems*, OCNMP (Open Communications in Nonlinear Mathematical Physics) Special Issue 2, 2024, pp. 1-27
34. Szablikowski B., Błaszak M. and Marciniak K., *Stationary coupled KdV systems and their Stäckel representations*, Stud. Appl. Math. **153** (3), 2024 https://doi.org/10.1111/sapm.1269
35. Błaszak M., Marciniak K. and Szablikowski B., *Non-autonomous Soliton Hierarchies*, Symmetry 2025, **17** (7), 1103. https://doi.org/10.3390/sym17071103

36. Błaszak M., Marciniak K. and , Szablikowski B., *Stationary systems of the AKNS hierarchy*, submitted for publication, arXiv:2411.19691

4.2 Papers in refereed conference proceedings

1. K. Marciniak, M. Blaszak, *Geometric reduction of Poisson operators*, Proceedings of the SPT 2004 (Symmetry and Perturbation Theory) Conference in Cala Gonone, Sardinia, Italy. Published by World Scientific (ISBN 981-256-136-6) in January 2005.
2. K. Marciniak, *Geodesically equivalent flat bi-cofactor systems*, Proceedings of the SPT2007 (Symmetry and Perturbation Theory) Conference in Otranto, Italy, published by World Scientific (ISBN 978-981-277-616-7) in November 2007.

4.3 Review articles

S. Rauch-Wojciechowski, K. Marciniak, *Separation of variables for differential equations*, in: J.-P.Francoise, G. Naber and S. Tsun Tsou (eds.), Encyclopedia of Mathematical Physics, Elsevier 2006, ISBN-13: 978-0-12-512660-1.

4.4 Reports

1. S. Rauch-Wojciechowski, K. Marciniak, M. Blaszak, *Two Newton Representations for Stationary Flows of KdV and Harry Dym Hierarchies*, LiTH-MAT-R-95-23, 1995, Linköping University.
2. K. Marciniak, *Coupled KdV and coupled Harry Dym hierarchies with sources.* LiTH-MAT-R-96-03, 1996, Linköping University.
3. K. Marciniak, M. Blaszak, *Separation of variables in quasi-potential systems of bi-cofactor form*, LiTH-ITN-R-2001-8, 2001, Linköping University
4. M. Blaszak, K. Marciniak, *On Dirac reductions of Poisson pencils on Riemannian manifolds that preserve variables of separation*, LiTH-ITN-R-2002-8, 2002, Linköping University.
5. K. Marciniak, M. Blaszak, *Dirac reduction revisited.* LiTH-ITN-R-2002-13, 2002, Linköping University.
6. M. Blaszak, K. Marciniak, *Dirac reduction of dual Poisson-presymplectic pairs*, LiTH-ITN-R-2003-5, 2003, Linköping University.
7. K. Marciniak, M. Blaszak, *Geometric reduction of Hamiltonian systems*, LiTH-ITN-R-2004-2, 2004, Linköping University.
8. M. Blaszak, K. Marciniak, *From Stäckel systems to soliton hierarchies. Benenti class of separation relations.*, LiTH-ITN-R-2005-2, 2005, Linköping University.
9. K. Marciniak, S. Rauch-Wojciechowski, *Separable systems of coordinates for triangular Newton equations* $\frac{d^2q_i}{dt^2} = M_i\left(q_1, \ldots, q_i\right)$, LiTH-ITN-R-2005-4, 2005, Linköping University.
10. M. Blaszak, K. Marciniak, *Non-hamiltonian systems separable by Hamilton-Jacobi method*, LiTH-ITN-R-2007-1, 2007, Linköpng University.

4.4 Other publications

1. K. Marciniak, *Newton Decomposition of Stationary Flows of the Coupled Korteveg - de Vries Hierarchy.* Linköping Studies in Science and Technology. Theses No. 533, 1996.

2. K. Marciniak, *Soliton Methods in the Theory of Integrable Mechanical Systems*. Linköping Studies in Science and Technology. Dissertations No. 539, 1998.

5. Membership in professional societies

- Standing member of the Swedish Mathematical Society (Svenska Matematikersamfundet)
- Member of International Society of Nonlinear Mathematical Physics (since April 12th, 2024)

6. Conference presentations

- *Newton representation of the stationary flows of the coupled KdV hierarchy.* Industrial and Applied Mathematics, June 6-10, 1994, Linköping
- *On a remarkable reparametrization of stationary flows of the coupled KdV hierarchy.* CIMPA-CIMI-UNESCO Winter School on Nonlinear Systems, 8-26 January 1996, Pondicherry, India
- *Two Newton parametrizations of the stationary flows of the KdV hierarchy.* 11-th NEEDS (Nonlinear Evolution Equations and Dynamical Systems) Workshop, 18-28 June 1997, Kolymbari, Crete, Greece
- *New families of Poisson operators for systems of Newton equations.* The XXX Symposium on Mathematical Physics (with special session — Dynamical Systems: From Integrability to Chaos), 26-30 May 1998, Toruń, Poland
- *On integrable perturbations of harmonic oscillator.* The XXXII Symposium on Mathematical Physics (with special session — Symmetries in Nonlinear Systems), June 6-10, 2000, Toruń, Poland
- *Separation of variables in bi-cofactor systems.* Conference on multihamiltonian structures - geometric and algebraic aspects, 9-17 August 2001, Banach Conference Center in Bedlewo, Poland.
- *Separability preserving Dirac reductions of Poisson pencils on Riemanian manifolds.* 16-th NEEDS (Nonlinear Evolution Equations and Dynamical Systems) Conference, 9-16 June 2002, Cadiz, Spain.
- *Separation of variables for triangular cofactor systems.* Conference "State-of-the-art in the classical separability theory for differential equations", January 6-11, Department of Mathematics, Linköping University, Sweden.
- *Geometric reduction of Hamiltonian systems.* SPT 2004 (Symmetry and Perturbation Theory) Conference, May 30 2004 – June 6 2004, Cala Gonone, Sardinia, Italy.
- *Separation curves as a source of soliton hierarchies.* 20th International Workshop on Differential Geometric Methods in Theoretical Mechanics, August 21-27 2005, Ghent University, Belgium.
- *Separation curves and geodesically equivalent bi-cofactor systems.* SPT2007 (Symmetry and Perturbation Theory) Conference, 2-9 June 2007, Otranto, Italy.

- *Stäckel systems, hydrodynamic systems and new solutions of the coupled Korteveg - de Vries hierarchy.* Darboux Days - Second Workshop on Nonlinearity and Geometry, April 13-19, 2008, The Banach Center Conference, Bedlewo, Poland.
- *Stäckel systems and solutions of soliton hierarchies*, NEEDS (Nonlinear Evolution Equations and Dynamical Systems) 2009 Conference, Isola Rossa, Italy, May 16-23, 2009.
- *Solutions of multicomponent Harry Dym hierarchy emerging from Stäckel separable systems*, The Second International Conference on Nonlinear Waves - Theory and Applications, Beijing, China, June 26-29, 2010.
- *Separable Hamiltonian systems as a source of (old and new) solutions of soliton equations*, 7th International Conference on Differential Equations and Dynamical Systems, December 15-18, 2010, University of South Florida, Tampa, Florida, USA
- *Stäckel separable systems and soliton equations*, 4th Integrability Symposium, Zielona Gora University, Poland, May 30-31, 2011
- *Stäckel transform and Stäckel systems*, 6-th ECM (European Congress of Mathematics), Krakow, Poland, July 2-7, 2012
- *Invertible coupled KdV and coupled Harry Dym hierarchies*, Conference on Nonlinear Mathematical Physics: XX years of Journal of Nonlinear Mathematical Physics, Nordfjordeid, Norway, June 4-14, 2013
- *Flat Stäckel systems*, SPT 2014 (Symmetry and Perturbation Theory) conference, 25 May - 1 June 2014 in Cala Gonone, Sardinia, Italy
- *Separable quantizations of Stäckel systems*, PMNP 2015 (Physics and Mathematics of Nonlinear Phenomena) conference, 20-27 of June 2015, Gallipoli, Lecce, Italy
- *Minimal separable quantizations of Stäckel systems*, 8th Symposium on Integrable Systems, July 3 – 4, 2015, University of Łódź, Łódź, Poland
- *Quantum separability*, Workshop "Waves in inhomogoneous media and integrable systems", Gdańsk University of Technology, Poland, 24–26 September 2015
- *Flat Stäckel systems*, Workshop "Waves in inhomogoneous media and integrable systems", Gdańsk University of Technology, Poland, 24–26 September 2015
- *Classical and quantum superintegrability of Stäckel systems*, 9th Symposium on Integrable Systems and XXXVI Max Born Symposium, Wroclaw University, Wroclaw, Poland, June 26-27, 2016
- *Maximally superintegrable classical and quantum Stäckel systems*, PMNP (Physics and Mathematics of Nonlinear Phenomena) 2017 Conference, commemorating 50 years of Inverse Spectral Transform, Gallipoli, Italy, June 17-24, 2017
- *Deforming Poisson algebras to time-dependent Frobenius integrable Hamiltonian systems*, SPT 2018 (Symmetry and Perturbation Theory) Conference, Pula, Sardinia, Italy, June 3-10, 2018
- *Poisson algebras and time-dependent Frobenius integrable Hamiltonian systems*, 11-th Symposium on Integrable Systems, Poznan, Poland, June 29-30, 2018
- *Stäckel transform of Lax equations*, The 2nd JNMP Conference on Nonlinear Mathematical Physics, Santiago, Chile, May 26th-June 4th, 2019

- *Systematic deforming of Stäckel systems to non-autonomous Frobenius integrable Hamiltonian systems of Painlevé type*, 13-th Symposium on Integrable Systems, Zielona Gora, Poland, October 18-19, 2021
- *Minimal quantization of Painlevé-type systems*, 14-th Symposium on Integrable Systems, Lodz, Poland, June 3th-4th, 2022
- *Deformation of Stäckel systems into Painlevé-type systems and non-autonomous soliton hierarchies,* VI International Conference on Finite Dimensional Integrable Systems in Geometry and Mathematical Physics, Tel Aviv, Israel, June 20th-24th, 2022
- *Algebraic curves and Miura maps for Stäckel systems*, 15-th Symposium on Integrable Systems, Bialystok, Poland, June 29-30, 2023
- *Stationary coupled KdV systems and their Stäckel representations*, VII International Conference on FDIS (Finite Dimensional Integrable Systems in Geometry and Mathematical Physics) conference, University of Antwerp, Belgium, August 7-11, 2023
- *Algebraic curves as a source of separable multi-Hamiltonian systems*, 1st OCNMP (Open Communications in Nonlinear Mathematical Physics) Conference, Bad Ems, Germany, June 23-29, 2024
- *Algebraic curves as a source of separable multi-Hamiltonian systems*, XVI-th Symposium on Integrable Systems, University of Warmia and Mazury, Olsztyn, Poland, July 8-9, 2024
- *Stationary systems of the AKNS hierarchy*, XVII-th Symposium on Integrable Systems, Adam Mickiewicz University, Poznan, Poland, July 7-8, 2025
- *Autonomous and non-autonomous restrictions of soliton hierarchies as a source of Stäckel and Painlevé-type systems*, VIII-th Conference on Finite Dimensional Integrable Systems in Geometry and Mathematical Physics (FDIS), CIMAT (Centro de Investigación en Matemáticas) Guanajuato, Mexico, August 4-8, 2025 (Invited speaker)
- Invited participation in the workhop *Integrable Systems, Liouville Foliations, and Nijenhuis Geometry*, August 11–15, 2025, CIMAT (Centro de Investigación en Matemáticas) Guanajuato, Mexico

7. Invited lectures and seminars

- *Poisson structures for systems of Newton equations*, Inst. för Matematik, Kungliga Tekniska Högskolan, Stockholm, 25 November 1998.
- *From Darboux theorem to separation of variables in bi-hamiltonian systems*, Matematiska Institutionen, Linköpings universitet, Linköping, 17 October 2001.
- *Dirac reduction of Poisson operators* Department of Theoretical Physics, Poznan University, Poland, 3 April 2003.
- *Geometric approach to Dirac theory of constrained mathematical systems*, Department of Mathematics, Linköping University, Sweden, 19 May 2004.
- *Mathematics, astronomy and dynamical systems*, Onsala Space Observatory, Chalmers Tekniska Högskola, Sweden, 10 March 2010
- *Bi-cofactor systems and geodesic equivalence*, Tsinghua University, Beijing, China, 21 June, 2010

- *Stäckel separable systems and soliton hierarchies*, Tsinghua University, Beijing, China, 24 June, 2010
- *On how finite dimensional integrable systems generate soliton hierarchies and their solutions*, Physics Department, A. Mickiewicz University, Poznan, Poland, April 27 2012
- *Stäckel transform and Stäckel systems* - a series of lectures given at Matematiska institutionen, Linköpings universitet, Linköping in May 2012.
- *Flat coordinates for flat Stäckel systems*, Matematiska institutionen, Linköpings universitet, Linköping, March 19, 2014
- *Stäckel separable systems*, Department of Mathematics, Rwanda Uniwersity, Kigali, Rwanda, September 13, 2018
- *Stäckel transform of Lax representation of Liouville integrable Hamiltonian systems*, African Mathematical Seminars, University of Nairobi, Kenya, February 3, 2021 (Zoom-seminar)
- *Introduction to the theory of integrable differential equations*, Royal University of Phnom Penh, Kambodja, February 17, 2023
- *Geometric reduction of Hamiltonian systems*, Faculty of Physics, Adam Mickiewicz University, Poznan, Poland, December 1, 2023

8. Referee for journals and professional organisations

1. SIGMA (Symmetry, Integrability and Geometry: Methods and Applications)
2. Journal of Physics A: Mathematics and General
3. Journal of Mathematical Physics
4. Inverse Problems
5. Reports on Mathematical Physics
6. zb MATH (former Zentralblatt MATH)

9. Organization of conferences

- Organization of the conference "State-of-the-art of classical separability theory for differential equations", Department of Mathematics, Linköping University, Sweden, Janury 6 – January 11, 2004.