CURRICULUM VITAE

Anastasia DOIKOU, PhD

Reader (Associate Professor)

Department of Mathematics

Heriot-Watt University, Edinburgh

Edinburgh 2013

Personal information

Name:	Anastasia DOIKOU
Birth Date:	4 May 1970
Birth Place:	Greece
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Address:	Department of Mathematics, Heriot-Watt University
	EH14 4AS, Edinburgh, Scotland, UK
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Education

1997-1999:	PhD in Physics, University of Miami, USA, grade 4/4
Thesis title:	*Integrable quantum spin chains*
Supervisors:	Professor R. Nepomechie, Professor L. Mezincescu
1995-1997:	Msc in Physics, University of Miami, USA, grade 4/4
1988-1993:	BSc in Physics University of Athens, Greece, grade 8/10
Thesis title:	*Study of axial fermionic anomaly*
Supervisor:	Professor Christos Ktorides

Employment

2013-	**:**	Reader (Associate Professor), Department of Mathematics, Heriot-Watt University, Edinburgh, Scotland UK
2012-	**:**	Assistant Professor, Department of Engineering Sciences, University of Patras, Greece
2008- 2012:		Lecturer, Department of Engineering Sciences, University of Patras, Greece
2005-2007:		INFN Researcher, Department of Physics, University of Bologna, Italy
2002-2005:		EUCLID Network Researcher & CNRS Researcher, LAPTH, Annecy-Le-Vieux, France
2000-2002:		EPSRC Fellow, Department of Mathematics, University of York, UK
		Individual Research Fellowship
1999-2000:		TMR Network Researcher, Department of Mathematics, University of Durham, UK
1995-1999:		Teaching assistant, Department of Physics, University of Miami, USA

Teaching

- 2011: Graduate course "*Integrable Systems*", University of Patras, Department of Physics, duration 20-22 hours, number of students : ~10
- 2012: Series of Lectures (graduate course), "*Special topic in classical and quantum integrability*", University of Oldenburg, Physics Department, Germany, duration 10-12 hours, number of students: ~10
- 2007 and 2009: Series of Lectures (Graduate course), "*Introduction to quantum integrability*", University of Bologna, Department of Physics, Italy and University of Patras, Department of Engineering Sciences, Greece , duration 10-12 hours, number of students : ~10
- 2008-present: Physics I, lectures, Fall Semester, Univesrity of Patras, Department of Engineering, duration 50-54 hours, number of students: ~100
- 2008-present: Physics II, lectures, Spring Semester, University of Patras, Department of Engineering Sciences, duration 50-54 hours, number of students: ~100
- 2008-present: Physics I, laboratories, Fall Semester, Univesrity of Patras, Department of Engineering, duration 32-34 hours, number of students: ~40
- 2008-present: Physics II, laboratories, Spring Semester, University of Patras, Department of Engineering Sciences, duration 32-34 hours, number of students: ~40
- 2001, 2002: Analytical Mechanics (tutorial), Spring Term, University of York , Mathematics Department, UK, duration: 22-24 hours, number of students: ~30
- 2001: Differential Equations (tutorial), Summer Term, University of York, Mathematics Department, UK, duration: 22-24 hours, number of students: ~30
- 1995-1999: General Physics I, II, laboratories, University of Miami, Physics Department, USA, duration: 90 hours per semester (2 semesters), number of students: ~40

Supervising

- 2011-: Member of the 3-member committee (internal examiner) of the PhD student G. Itsios, "*Integrable structures in string and gauge theories*" advisor Professor K. Sfetsos, University of Patras, Dept. of Engineering Sciences
- 2009-: Member of the 3-member committee (examiner) of the PhD student E. Charalampides, "*Soliton Solutions of Partial Differential Equations*", advisor Professor T. Ioannidou, Aristotle University of Thessaloniki, Department of Mathematics, Physics and Computational Sciences
- 2008-: Member of the 3-member committee and co-advisor of the PhD student N. Karaiskos (*graduated 2012*) , "*Topics in integrable models and string theory*", advisor Professor K. Sfetsos, University of Patras, Dept. of Engineering Sciences
- 2011: Member of the 7-member committee (examiner) of the PhD student T. Kouloukas, (*graduated 2011*) "*Yang-Baxter Maps, Poisson Structures and Integrability*", advisor Professor V. Papageorgiou, University of Patras, Department of Mathematics
- 2009: Member of the 7-member committee (examiner) of the PhD student K. Siampos, (*graduated 2009*) "*String theory applications in gravitational problems and gauge theories*", advisor Professor

K. Sfetsos, University of Patras, Department of Engineering Sciences
- 2002-2005: Collaboration with two PhD students LAPTH, Annecy-Le-Vieux: N. Crampe, Z. Nagy.

Fellowships/Awards

- Awarded the *Karatheodoris* grant, "*Integrable systems and application in high energy physics and statistical physics*" from University of Patras (value 33,0000 euros) for the appointment of the PhD student N. Karaiskos
- Awarded personal EPSRC postdoctoral Fellowship, (*Individual Research Fellowship)*, "*Integrable models with boundaries*", (value 65,000£), 2000-2002
- Awarded the "S*ummer Research Award"* from the University of Miami for two consecutive years 1997, 1998
- Awarded the "*Best Teaching Assistant*" title from the University of Miami, for the year 1996-1997
- Awarded *research and teaching Fellowship and Studentship* from the University of Miami for the completion of MSc and PhD, 1995-1999

Participation in research programms/Funding

- *Karatheodoris* grant "*Integrable systems and application in high energy physics and statistical physics*" from University of Patras (value 33,0000 €) for the appointment of the PhD student N. Karaiskos, 2010-2013
- INFN Research Fellowship and funding 2005-2007
- CNRS Research Fellowship and funding 2004-2005
- EC FP5 network EUCLID "*Integrable models and applications: from strings to condensed matter*" 2002-2005,
  contract no: HPRN-CT-2002-00325.
- EPSRC personal grant (*Individual Research Fellowship*) , "*Integrable models with boundaries", (*value 65,000£), 2000-2002
- EC FP4 TMR network "*Integrablility non-perturbative effects and symmetry in quantum field theory*" 1999-2000, contract no: FMRX-CT96-0012.

Short Visits

- July 2011, Visiting Professor, University of Oldenburg, Germany
- June 2008-2010, Sept. 2011, Visiting Professor, University of Cergy, France
- 2003-present, frequent invited visitor, University of Cergy, France, collaboration with J. Avan, G. Rollet
- 2001-2004, frequent invited visitor, City University London, UK, collaboration with P.P. Martin
- November 2003, invited visitor, University of Tours, France, collaboration with P. Baseilhac
- November 2003, invited visitor, University of Bologna, Italy, collaboration with F. Ravanini
- June 2000, visit within the TMR Network, ENS Lyon, France, J.M. Maillet

Research Interests

- Quantum algebras: (deformed) Lie algebra, Yangians, twisted Yangians, reflection algerbas
- Braid groups, (affine) Hecke algebras, (boundary) Temperley-Lieb algebras, etc.
- Classification of representations of Yang–Baxter and reflection algebras, (semi)dynamical algebras.
- Integrable quantum spin chains (1D statistical systems): algebraic, analytical Bethe ansatz, thermodynamic Bethe ansatz
- Integrable field theories: Hamiltonian formulation, (boundary) Lax pairs
- Algebraic approach on exact bulk, boundary S-matrices and defects
- Monopoles and integrability

Conferences/Talks

2012

- *Quantum Integrable Systems and Geometry,* 3-7 September 2012, Olhao, Portugal, invited speaker, I presented [54].
- *Integrable systems and quantum symmetries '12,* 17-23 June 2012, Prague, Czech Republic, invited speaker, I presented [55].

2011

- *8th Bologna Workshop on CFT and Integrable Models*, 12-15 July 2011, Bologna, Italy, I presented [51]

2010

- *10th Corfu Summer Institute,* 5-12 September, Corfu, Greece, invited speaker [P8]
- *Classical and Quantum Integrable Models,* (short course, graduate level) 19-23 July, Canterbury, UK *invited lecturer*, I presented series of lectures based on [44]
- RAQIS'10 - *Recent Advances in Quantum Integrable Systems,* 15-18 June, Annecy, France, I presented [45]

2009

- *9th Corfu Summer Institute,* 6-20 September, Corfu, Greece, invited speaker [40]

2007

- *Integrable Models and related mathematical structures,* 7-10 November, Tours, France, invited
- *RAQIS'07 - Recent Advances in Quantum Integrable Systems,* 11-14 September 2007, LAPTH Annecy-le-Vieux, France, invited speaker [P6]

2006

- *4th Annual Meeting of the EUCLID Network,* 11-16 September 2006, Lyon, France, invited speaker [31]
- *7th Bologna Workshop on CFT and Integrable Models,* 5-8 July 2006, Bologna, Italy (*co-organizer*)

2005

- *3rd Annual EUCLID Network Meeting*, 12-16 September, Santiago de Compostela, Spain, invited speaker [29]
- *RAQIS'05 - Recent Advances in Quantum Integrable Systems,* 6-9 September, Annecy, France, invited

speaker [25, 26]

- *XIVth International Colloquium on Integrable systems,* 16-18 June, Prague, Czech Republic, invited speaker [P4]
- *9th UK Meeting on Integrable Systems, 2*2-23 April 2005, City University London, UK, invited speaker [24]

2004

- *EUCLID network Midterm-Review,* 29-30 November 2004, York, UK, invited speaker [24]
- *6th Bologna workshop on CFT and Integrable models,* 21-25 September 2004, Bologna, Italy, invited speaker [24]
- *2nd EUCLID Network School: Modern Problems in Theoretical Physics and Integrable Systems* 17-22 May, Montpelier, France, invited

2003

- *1st annual EUCLID network meeting,* 15-20 September, Florence, Italy, nvited speaker [16]
- *Recent Advances in the Theory of Quantum Integrable Systems,* International Workshop*,* 25-28 March 2003, LAPTH, Annecy-le-Vieux, France

2001

- *ICMS meeting in Edinburgh,* 2-8 December, Edinburgh, UK, invited speaker [13]
- *5th Bologna workshop on CFT and Integrable models,* 26-29 September, Bologna, Italy, invited speaker [11]
- *Como Conference on Statistical Field Theory (NATO),* 18-22 June, Como Italy, invited

2000

- *5th informal UK meeting on 2D integrable models and conformal field theory,* 19 May, London, UK, invited speaker [11]
- *4th annual TMR network meeting 2000,* 7-13 September, ENS-Paris, France, invited speaker [P2]
- *TMR Montpelier summer school: Recent advances and applications of CFT,* 21-28 May, Sete, France, invited
- *Workshop on quantum algebras and integrability,* 2-24 April, Montreal, Canada, invited speaker [9]
- *4th informal UK meeting on 2D integrable models and conformal field theory, 2*4-25 March, Edinburgh, UK, invited

1999

- *4th Bologna Workshop on Integrability,* Bologna, Italy, June, I presented [7]

1998

- *Southeastern Section of the American Physical Society,* 11-15 November, Miami, USA, I presented [5]
- *III Trieste Conference on Statistical Field Theory,* June, Trieste Italy

*The references [no] can be found in my list of publications

Invited Seminars

2013

- *Physical and algebraic aspects of integrable systems,* University of Patras, Greece, May 2013

2012

- *On Liouville integrable defects:*
1. City University, London, May 2012,
2. University of York, May 2012

2011

- *Defects in the discrete NLS model,* University of Cegy, France, September 2011
- *Series of Lectures: Selected Topics on Quantum and Classical Integrability*, University of Oldenburg, Germany, July 2011

2010

- *Systematic derivation of boundary Lax pairs,* University of Thessaloniki, Greece, October 2010

2009

- *Series of Lectures: Introduction to quantum integrability,* University of Patras, Greece, May 2009

2008

- A*n Toda field theories with integrable boundary conditions revisited,* University of Cergy, France, June 2008

2007

- *Series of Lectures: Introduction to quantum integrability,* University of Bologna, Italy, November 2007

2005

- *Physical and algebraic aspects of integrable systems,* University of Thessaloniki, Greece, October 2005
- *Hecke algebras and boundary symmetries*, University of Paris VI, France, March 2005
- *Quantum integrability and Bethe ansatz,* University of Paris XI, Orsay, France, March 2005

2004

- *Boundary symmetries*, University of Cergy, France, October 2004

2003

- *Quantum integrability and algebraic Bethe ansatz:*
1. University of Cergy, France, June 2003
2. University of Tours, France, November 2003
3. University of Bologna, Italy, November 2003
4. National Technical University of Athens, Greece, December 2003
5. University of Patras, Greece, December 2003

2002

- *Integrability with non-trivial boundary conditions*, City University-London, UK, November 2002
- *Two dimensional quantum integrable systems,* University of Kent, UK, March 2002

2001

- *Principal chiral model scattering and integrable spin chains*, University of York, UK, May 2001

2000

- *Algebraic Bethe ansatz method,* Cambridge University, UK, November 2000
- *Solving the Bethe ansatz equations ,* University of York, UK, February 2000

1999

- *Integrable quantum spin chains,* University of Durham, UK, October 1999

1998

- *Integrable quantum spin chains:*
1. University of Athens, Greece, January 1998
2. University of Miami, USA, May 1998

Referee for Scientific Journals

- Nuclear Physics B
- Journal of Statistical Mechanics
- Journal of High Energy Physics
- Journal of Physics A
- Journal of Physics Cond. Mat.
- Journal of Mathematical Physics
- Physics Letters A
- Annales Henri Poincare
- Symmetry Integrability and Geometry: Methods and Applications (SIGMA)
- Philosophical Transactions of the Royal Society A (Mathematical, Physical & Engin. Sciences)

Referee for funding councils

- EPSRC (Engineering and Physical Sciences Research Council)

Conference organization

Member of the organizing committee of two international conferences:

1. EUCLID Spring School, Berlin, 6-11 April, 2006
2. [7th Bologna Workshop on CFT and Integrable Models: 3-8 July 2006](#)

Administration duties

- Member of the general assembly of the faculty of the Dept. of Engineering Sciences of U. of Patras, since 2008
- Member of the committee of the internal evaluation of the Dept. of Engineering Sciences. U. of Patras, 2010-2012
- Member of the committee receiving office supplies at the Dept. of Engineering Sciences. U. of Patras, since 201

Past and present collaborators

- D. Arnaudon (LAPTH)
- J. Avan (University of Cergy, CNRS)
- A. Babichenko (Weizmann Institute of Science)
- A. Bytsko (Steklov Mathematics Institute, St. Petersburg)
- N. Crampe (University of Montpelier, CNRS)
- L. Frappat (LAPTH)
- D. Fioravanti (University of Bologna)
- T. Ioannidou (Aristotle University of Thessaloníki)
- N. Karaiskos (Leibniz University Hannover)
- P.P. Martin (University of Leeds)
- L. Mezincescu (University of Miami)
- Z. Nagy (University of Cergy)
- R.I. Nepomechie (University of Miami)
- V. Papageorgiou (Univerity of Patras)
- E. Ragoucy (LAPTH)
- F. Ravanini (University of Bologna)
- G. Rollet (University of Cergy)
- K. Sfetsos (University of Patras and University of Surray)

Publications Summary

- Number of Publications in Refereed Journals: **58** (in **19** articles the sole author)
- Number of Conference Proceedings: **10**
- Citation profile available at:

http://scholar.google.co.uk/citations?user=X3wy5wYAAAAJ&hl=en

References

- **J. Avan**, Directeur de Recherche CNRS, Universite de Cergy Pontoise (St Martin II), LPTM2 avenue Adolphe Chauvin 95032 Cergy-Pontoise, France, *tel. no: +33 13425 7503, fax no: +33 13425 7500 , e-mail: avan@u-cergy.fr*
- **E. Corrigan,** Professor, University of York, Department of Mathematics, York YO10 5DD, UK*, tel. no: +44 1904 433074, e-mail: ec9@york.ac.uk*
- **F. Ravanini,** Assoc. Professor, University of Bologna, Physics Department, Bologna 40126, Italy, *tel. no: +39 051 2091045, fax no: +39 051 244101, e-mail: ravanini@bo.infn.it*

LIST OF PUBLICATIONS
Anastasia Doikou

Refereed Journal Articles

[60]   *A note on gl_n type-I integrable defects*
         A. Doikou,
         arXiv:1308.1790 under review.

[59]   *Type-I integrable quantum impurities in the Heisenberg model*
         A. Doikou,
         arXiv:1307.2752, accepted for publication in Nucl. Phys. B.

[58]   *Transmission matrices in gl_n & $U_q(gl_n)$ quantum spin chains,*
         A. Doikou,
         arXiv:1304.5901, JHEP 08 (2013) 103.

[57]   *Transmission amplitudes from Bethe ansatz equations,*
         A. Doikou, N. Karaiskos,
         arXiv:1212.0195, JHEP 02 (2013) 142.

[56]   *Sigma models in the presence of dynamical point-like defects,*
         A. Doikou, N. Karaiskos,
         arXiv:1207.5503, (2012), Nucl. Phys. B867 [FS] (2013) 872-886.

[55]   *The sine-Gordon model with integrable defects revisited,*
         J. Avan, A. Doikou,
         arXiv:1205.1661, JHEP 11 (2012) 008, (20pp).

[54]   *Solutions of the generic non-compact Weyl equation,*
         A. Doikou, T. Ioannidou,
         arXiv:1201.6135, JHEP 04 (2012) 141, (10pp).

[53]   *Liouville integrable defects: the non-linear Schrodinger paradigm,*
         J. Avan, A. Doikou,
         arXiv:1110.4728, JHEP 01 (2012) 040, (19pp).

[52]   *Selected Topics in Classical Integrability,*
         A. Doikou,
         arXiv:1110.4235, Int. J. Mod. Phys. A27 (2012) 1230003 (34 pp).

[51] *Defects in the discrete Non-Linear Schroedinger model,*
A. Doikou,
arXiv:1106.1602, Nucl. Phys. B854 (2012) 153-165.

[50] *Generalized Landau-Lifshitz models on the interval,*
A. Doikou, N. Karaiskos,
arXiv:1105.5042, Nucl. Phys. B853 (2011) 436-460.

[49] *BPS Monopoles and Open Spin Chains,*
A. Doikou, T. Ioannidou,
arXiv:1010.5076, J. Math. Phys. 52 (2011) 093508, (10 pp).

[48] *The non-compact Weyl equation,*
A. Doikou, T. Ioannidou,
arXiv:1012.5643, JHEP 04 (2011) 072, (9pp).

[47] *Weyl Equation and (Non)-Commutative SU(n + 1) BPS Monopoles,*
A. Doikou, T. Ioannidou,
arXiv:1005.5345, JHEP 08 (2010) 105, (13pp).

[46] *Systematic classical continuum limits of integrable spin chains and emerging novel dualities,*
J. Avan, A. Doikou, K. Sfetsos,
arXiv:1005.4605, Nucl. Phys. B840 [FS] (2010) 469-490.

[45] *Junction type representations of the Temperley-Lieb algebra and associated symmetries,*
A. Doikou, N. Karaiskos,
arXiv:1005.4338, SIGMA (Symmetry, Integrability and Geometry: Methods and Applications)
6 (2010) 089, (19pp).

[44] *Introduction to Quantum Integrability,*
A. Doikou, S. Evangelisti, G. Feverati, N. Karaiskos,
arXiv.0912.3350, Int. J. Mod. Phys. A25 (2010) 3307-3351.

[43] *On boundary super symmetries,*
A. Doikou,
arXiv:0910.1203, J. Math. Phys. 51 (2010) 043509, (16pp).

[42]   *New reflection matrices for the $U_q(gl(m|n))$ case,*
         A. Doikou, N. Karaiskos,
         arXiv:0907.3408,   J. Stat. Mech. (2009) L09004, (11pp).

[41]   *Boundary Lax pairs from non-ultra local Poisson algebras,*
         J. Avan, A. Doikou,
         arXiv:0905.4134, J. Math. Phys. 50:113512 (2009), (10pp).

[40]   *Contracted and expanded integrable structures,*
         A. Doikou, K. Sfetsos,
         arXiv:0904.3437, J. Phys. A 42 (2009) 475204, (17pp).

[39]   *Murphy elements from the double-row transfer matrix,*
         A. Doikou,
         arXiv:0812.0898, J. Stat. Mech. (2009) L03003, (11pp).

[38]   *Boundary Lax pairs for the $A^{(1)}_n$ Toda field theories,*
         J. Avan, A. Doikou,
         arXiv:0809.2734, Nucl. Phys. B 821 (2009) 481-505.

[37]   *$A^{(1)}_n$ affine Toda field theories with integrable boundary conditions revisited,*
         A. Doikou,
         arXiv:0803.0943, JHEP05 (2008) 091, (26pp).

[36]   *Non-diagonal reflection for the non-critical XXZ model,*
         A. Doikou,
         arXiv:0712.2918, J. Phys. A41 (2008) 194007, (6pp).

[35]   *Generic boundary scattering in the open XXZ chain,*
         A. Doikou,
         arXiv:0711.0716, Phys. Lett. A372 (2008) 4144-4150.

[34]   *Integrable boundary conditions and modified Lax equations,*
         J. Avan, A. Doikou,
         arXiv:0710.1538, Nucl. Phys. B800 (2008) 591-612.

[33]   *The generalized non-linear Schroedinger model on the interval,*
         A. Doikou, D. Fioravanti, F. Ravanini,
         arXiv:0706.1515, Nucl. Phys. B790 (2008) 465-492.

[32] *A note on the boundary spin s XXZ chain,*
A. Doikou,
hep-th/0612268, Phys. Lett. A 366 (2007) 556-562.

[31] *(Quantum) twisted Yangians: symmetry, Baxterisation and centralizers,*
N. Crampe, A. Doikou,
math-ph/0611030, J. Math. Phys. Vol. 48, 023511 (2007), (18pp).

[30] *Asymmetric twin representation: the transfer matrix symmetry,*
A. Doikou,
math-ph/0606040, SIGMA (Symmetry, Integrability and Geometry: Methods and Applications)
3 (2007) 009, (19pp).

[29] *The open XXZ and associated models at q root of unity,*
A. Doikou,
hep-th/0603112, J. Stat. Mech. (2006) P09010, (32pp).

[28] *Spectrum and Bethe ansatz equations for the Uq(gl(N)) closed and open spin chains in any representation,*
D. Arnaudon, N. Crampe, A. Doikou, L. Frappat, E. Ragoucy,
math-ph/0512037, Annales Henri Poincare 7 (2006) 1217-1268.

[27] *On quantum group symmetry and Bethe ansatz for the asymmetric twin spin chain with integrable boundary,*
A. Doikou, P.P. Martin,
hep-th/0503019, J. Stat. Mech. (2006) P06004, (43pp).

[26] *Analytical Bethe ansatz for open spin chains with soliton non-preserving boundary conditions,*
D. Arnaudon, N. Crampe, A. Doikou, L. Frappat, E. Ragoucy,
math-ph/0503014, Int. J. Mod. Phys. 21 No. 7 (2006) 1537.

[25] *Analytical Bethe ansatz for closed and open gl(N) spin chains in any representation,*
D. Arnaudon, N. Crampe, A. Doikou, L. Frappat, E. Ragoucy,
math-ph/0411021, J. Stat. Mech. (2005) P02007, (28pp).

[24] *From affine Hecke algebras to boundary symmetries,*
A. Doikou,
math-ph/0409060, Nucl. Phys. B725 (2005) 493-530.

[23] *General boundary conditions for the sl(N) and sl(M/N) open spin chains*,
D. Arnaudon, J. Avan, N. Crampe, A. Doikou, L. Frappat, E. Ragoucy,
math-ph/0406021, J. Stat. Mech. (2004) P08005, (36pp).

[22] *On reflection algebras and twisted Yangians*,
A. Doikou,
hep-th/0403277, J. Math. Phys. 46, (2005) 053504, (14pp).

[21] *Commuting quantum traces for quadratic algebras*,
Z. Nagy, J. Avan, A. Doikou, G. Rollet,
math.QA/0403246, J. Math. Phys. 46 (2005) 083516.

[20]   *Boundary non-local charges from the open spin chain*,
A. Doikou,
math-ph/0402067, J. Stat. Mech. (2005) P12005, (17pp).

[19] *Thermodynamics and conformal properties of XXZ chains with alternating spins*,
A. Bytsko, A. Doikou,
hep-th/0312012, J. Phys. A37 (2004) 4465-4492.

[18] *Bethe anastz equations and exact S matrices for the osp(m/n) open super spin chain*,
D. Arnaudon, J. Avan, N. Crampe, A. Doikou, L. Frappat, E. Ragoucy,
math-ph/0310042, Nucl. Phys. B687 (2004) 257-278.

[17]   *Commuting quantum traces: The case of reflection algebras*,
J. Avan, A. Doikou,
math.QA/0305424, J. Phys. A37 (2004) 1603-1616.

[16] *Classification of reflection matrices related to (super) Yangians and application to open spin chain models*,
D. Arnaudon, J. Avan, N. Crampe, A. Doikou, L. Frappat, E. Ragoucy,
math.QA/0304150, Nucl. Phys. B668 (2003) 469-505.

[15] *Fused integrable lattice models with quantum impurities and open boundaries*,
A. Doikou,
hep-th/0303205, Nucl. Phys. B668 (2003) 447-468.

[14]   *Thermodynamics of the critical RSOS(q1; q2; q) model,*
         A. Doikou,
         hep-th/0206134, J. Phys. A36 (2003) 329-344.

[13]   *Hecke algebraic approach to the reflection equation for spin chains,*
         A. Doikou, P.P. Martin,
         hep-th/0206076, J. Phys. A36 (2003) 2203-2226.

[12]   *The XXX spin s quantum chain and the alternating s1, s2 chain with boundaries,*
         A.Doikou,
         hep-th/0201008, Nucl. Phys. B634 (2002) 591-610.

[11]   *Principal chiral model scattering and the alternating quantum spin chain,,*
         A. Doikou, A. Babichenko,
         hep-th/0105033, Phys. Lett. B515 (2001) 220-230.

[10]   *Quantum spin chain with "soliton non-preserving" boundary conditions,*
         A. Doikou,
         hep-th/0006197, J. Phys. A33 (2000) 8797-8808.

[9]   *Fusion and analytical Bethe ansatz for the $A^{(1)}_n$ open spin chain,*
         A. Doikou,
         hep-th/0006081, J. Phys. A33 (2000) 4755-4766.

[8]   *Soliton S matrices for the critical $A^{(1)}_n$ chain,*
         A. Doikou, R.I. Nepomechie,
         hep-th/9906069, Phys. Lett. B462 (1999) 121-131.

[7]   *Direct Calculation of Breather S Matrices,*
         A. Doikou, R.I. Nepomechie,
         hep-th/9903066, J. Phys. A32 (1999) 3663-3680.

[6]   *Discrete Symmetries and S Matrix of the XXZ Chain,*
         A. Doikou, R.I. Nepomechie,
         hep-th/9808012, J. Phys. A31 (1998) L621-L628.

[5] *Duality and quantum-algebra symmetry of the $A^{(1)}_n$ open Spin Chain with diagonal boundary fields*,
A. Doikou, R.I. Nepomechie,
hep-th/9807065, Nucl. Phys. B530 (1998) 641-664.

[4] *Bulk and Boundary S Matrices for the SU(N) Chain*,
A. Doikou, R.I. Nepomechie,
hep-th/9803118, Nucl. Phys. B521 (1998) 547-572.

[3] *Boundary S matrix for the XXZ Chain*,
A. Doikou, L. Mezincescu, R.I. Nepomechie,
hep-th/9708145, J. Phys. A31 (1998) 53-59.

[2] *Factorization of Multi-particle Scattering in the Heisenberg Spin Chain*,
A. Doikou, L. Mezincescu, R.I. Nepomechie,
hep-th/9707155, Mod. Phys. Lett. A12 (1997) 2591-2598.

[1] *Simplified Calculation of Boundary S Matrices*,
A. Doikou, L. Mezincescu, R.I. Nepomechie,
hep-th/9705187, J. Phys. A30 (1997) L507-L512.

Conference Proceedings

[P10] *The sine-Gordon model in the presence of defects*,
J. Avan, A. Doikou,
arXix:1302.2456, Journal of Physics: Conference Series **411** (2013) 012003,
Proceedings of the "Integrable systems and quantum symmetries", Prague, 12-16 June 2012.

[P9] *Weyl equation and BPS Monopoles,*
A. Doikou, T. Ioannidou,
AIP Conf. Proc. 1389 (2011) 676-679,
Proceedings of the ICNAAM 2011, "9th International Conference of Numerical Analysis and Applied Mathematics," 19-25 September 2011, Halkidiki, Greece.

[P8] *Integrable quantum spin chains and their classical continuous counterparts ,*
J. Avan, A. Doikou, K. Sfetsos,
arXiv:1102.0425, PoS (CNCFG2010) 016, (13pp),
Special Issue: Proceedings of the Corfu Summer Institute on Elementary Particle Physics and Gravity - "Workshop on Non Commutative Field Theory and Gravity", 8-12 September 2010, Corfu, Greece.

[P7]   *Contracted and expanded quantum algebraic structures,*
         A. Doikou, K. Sfetsos,
         arXiv:1002.3714, Forts. Phys. 58 (2010) 879-882,
         Special Issue: Proceedings of the Corfu Summer Institute "Schools and Workshops on
         Elementary Particle Physics and Gravity", August 30th - September 13th 2009, Corfu, Greece.

[P6]   *Systematic derivation of boundary Lax pairs*,
         J. Avan, A. Doikou,
         arXiv:0712.1416, Proceedings contribution RAQIS'07, September 2007, Annecy, France.

[P5]   *Analytical Bethe ansatz in gl(N) spin chains*,
         D. Arnaudon, N. Crampe, A. Doikou, L. Frappat, E. Ragoucy,
         math-ph/0510018, presented at ISQG14, Prague, June 2005, Czech J. Phys. 56 (2006) N02 141.

[P4]   *On the symmetries of integrable systems with boundaries*,
         A. Doikou,
         hep-th/0509162, presented at ISQG14, Prague, June 2005, Czech J. Phys. 55 (2005) No. 11   1397.

[P3]   *On osp(M/2n) integrable open spin chains* ,
         D. Arnaudon, J. Avan, N. Crampe, A. Doikou, L. Frappat, E. Ragoucy,
         math-ph/0409076, presented at ISQG13, Prague, June 2004, Czech. J. Phys. 54 (2004) No. 11
         1153.

[P2]   *New boundary conditions in integrable lattice models*,
         A. Doikou,
         hep-th/0104083, published in JHEP, "Paris 2000, Non-perturbative quantum effects" 054.

[P1]   *Parity and Charge Conjugation Symmetries and S Matrix of the XXZ Chain*,
         A. Doikou, R.I. Nepomechie,
         hep-th/9810034, published in Festschrift "Statistical Physics on the Eve of the 21st Century".

Dissertations

[D2]   *Integrable quantum spin chains*,
         A. Doikou,
         UMI-99-38319-mc, (1999) PhD Thesis, University of Miami,
         URL: http://scholarlyrepository.miami.edu/dissertations/3757/
         Supervisors: Professors R.I. Nepomechie, L. Mezincescu.

[D1]   *Study of the axial fermionic anomaly,*
        A. Doikou,
        (1993) Diploma Thesis, Univesity of Athens, Supervisor: Professor C. Ktorides.

All my preprints may be found in: http://arxiv.org/find/grp_physics/1/au:+doikou/0/1/0/all/0

Past Research track

The computation of exact S-matrices is one of the main challenges in the context of quantum integrability. Exact S-matrices describe the interaction among the excitations displayed by integrable models, and hence they are of great physical importance. Extensive investigations on exact S-matrices were carried out in a series of articles in collaboration with R. Nepomechie, and also as personal projects and in collaboration with L. Mezincescu, while I was a PhD student in U. of Miami [1-8]. We used the existing symmetries to classify excitations, and we computed the S-matrix elements corresponding to these states. More precisely, in the open SU(N) integrable chains with diagonal boundary magnetic fields were also investigated. Due to the boundary magnetic fields the quantum group symmetry SU(N) breaks to a lower symmetry. Using the residual symmetries, we computed the corresponding boundary S-matrices. This was the first direct calculation of boundary S-matrices for a model with symmetry algebra of rank greater than one. This path of research was also continued while I was a research fellow in York [11, 12] where exact boundary and bulk S matrices associated to certain principal chiral models were computed via the Bethe ansatz methodology. Moreover as a postdoctoral researcher in Bologna I was involved with the computation of Bethe ansatz equations for spin chains with non-diagonal boundary conditions for generic representations [29, 32, 35, 36].

The thermodynamic Bethe ansatz (TBA) method is a powerful means for investigating the thermodynamic and conformal properties of integrable systems. Such studies were initiated as a personal project although part of it was done in collaboration with A. Bytsko from Steklov Math. Inst., St Petersburg, while I was a research fellow in U. of York and LAPTH [14, 15, 19]. The TBA method was implemented to various discrete integrable models. The high and low temperature behavior was investigated, and the central charge of the effective conformal field theory was derived. Furthermore, generalized spin chains in the presence of a quantum impurity and open boundary conditions were investigated. The boundary free energy due to the non trivial boundaries was derived, its low and high temperature behavior was specified and the relevance to certain boundary conformal field theories was discussed. Note that the thermodynamics of spin chains with non-diagonal boundaries were investigated for the first time.

Also, in collaboration with the Annecy group and J. Avan from the LPTM-U-Cergy, while I was a research fellow in LAPTH, we presented a classification of reflection matrices related to (super) Yangian R-matrices. The analytical Bethe Ansatz resolution was formulated for periodic and open spin chains with diagonal boundary conditions, and the spectrum and Bethe ansatz equations were derived [16, 18]. These results have immediate relevance to the gauge theories in the AdS/CFT context. Moreover, within the context of extracting Bethe ansatz equations for models with non trivial boundary conditions [9, 10] I introduced novel boundary conditions (soliton non-preserving) for generalized higher rank spin chains, and I also generalized the analytical Bethe ansatz methodology in order to solve such models. This line of research also continued with the Annecy group [23, 25, 26, 28].

As a part of my collaboration with P.P. Martin from City U. London, and also as a personal project, while a research fellow in U. of York and later in LAPTH-Annecy, and as a stuff member in U. Patras we developed a systematic means for solving the reflection equation. We exploited the structural similarities between the so-called cylinder braid group and the reflection and Yang-Baxter equations to solve these equations at the algebraic

level [13, 17, 20, 21, 22, 24, 27, 30, 31, 39]. The knowledge of such solutions is essential for deriving exact S-matrices of the relevant physical systems. The investigation of the underlying symmetry of the associated physical models was also carried out. This was a personal project primarily motivated by the role of the quantum inverse scattering method in the formulation of quantum groups. Such an analysis from the spin chain viewpoint offers a novel, essential link between the boundary quantum algebras and the so-called affine Hecke algebras. More precisely, the *duality* of the two algebras was shown for the first time. This is a remarkable connection facilitating the study of the spectrum of the relevant physical models.

Derivation of solutions of the reflection equations via representations of the (super) Hecke algebras and study of the underlying super-algebras was done pertly in collaboration with the PhD student N. Karaiskos in U. Patras [42, 43, 45]. Also applications of the quantum algebras as well as integrable structures emerging within AdS/CFT were studied in collaboration with J. Avan and K. Sfetsos from U. Patras and are presented in [40, 46]. A systematic means to obtain consistent continuum limits that preserve integrability and lead to special sigma models arising also within the AdS/CFT correspondence was proposed.

Partly in collaboration with J. Avan, N. Karaiskos and the Bologna group [33, 34, 37, 38, 41, 50, 51, 53, 55, 56] and as a personal project a wide range of classical integrable models with non trivial boundary conditions that preserve integrability, such as the generalized non-linear Schrodinger model (NLS), the ATFT's and the generalized (an)isotropic Landau- Lifshitz (L-L) models, were investigated. These investigations were based on the so called Hamiltonian formalism of classical integrable models associated to the existence of a classical r-matrix. Within this context novel expressions of local integrals of motions as well as of the associated Lax pairs were derived from first principles based on the underlying Poisson algebra. In particular, in ATFT's the notion of soliton-preserving boundary conditions was introduced for the firs time, whereas the already known soliton non-reserving conditions were recovered from first principles. In the generalized NLS models both types of integrable boundary conditions were examined, while in the L-L model soliton preserving boundaries were basically discussed. In the same spirit the problem of a single integrable point-like defect was investigated in the frame of the discrete and continuum NLS, novel fundamental expressions were extracted and the integrability was systemically proven. Again the whole analysis was based on the Hamiltonian formalism. A consistent algebraic description of classical integrable defects in the context of classical integrable field theories was also proposed with particular emphasis in the NLS, sine-Gordon and Landau-Lifshitz models. Moreover, in [57]-[60] partly in collaboration with N. Karaiskos the study of quantum integrable defects and the derivation of the transmission amplitudes in the frame of integrable quantum spin chains was achieved for the first time via the Bethe ansatz formulation for a variety of integrable lattice models

In collaboration with T. Ioannidou from Aristotle University of Thessaloniki [47, 48, 49, 54] we applied the ADHMN construction to obtain the SU(n+1) spherically symmetric BPS monopoles with minimal symmetry breaking. In particular, the problem simplifies by solving the Weyl equation. This construction was also generalized for non-commutative SU(n+1) BPS monopoles. We also solved the full Weyl equation by exploiting the existence of open spin chain-like part within the Weyl equation so quantum integrability techniques apply. A non-compact version of the Weyl equation was proposed, based on the infinite dimensional spin zero representation of the sl(2) algebra. Solutions of the aforementioned equation were obtained in terms of the Kummer functions. Pedagogical reviews on quantum and classical integrable models are presented in [44, 52].

*The [#] refer to my list of publications see my CV.