CURRICULUM VITAE

Anton Nedelin

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PERSONAL DATA

Name:	Anton Nedelin
Degree:	PhD in theoretical physics
Place of birth:	Tashkent city, Uzbekistan
Date of birth:	29 November 1987
Nationality:	Greece, Russian Federation
Marital Status:	married

WORK EXPERIENCE

Since Oct.2023:	Research Associate, King's College London (Mathematics Department)[1], UK
Sep. 2021 - Aug.2023:	Research Assistant, Geneva University (Mathematics Department)[2], Switzerland
Oct. 2018 - Sep.2021:	Postdoctoral Researcher, Israeli Institute of Technology (Technion)[3], Israel
Sep. 2015 - Oct. 2018:	Postdoctoral Researcher, University of Milano-Bicocca[4], Italy
May-Sep. 2015 :	Researcher, Uppsala University[5], Sweden

EDUCATION

PhD in Physics	Uppsala University[5], March 2015 Thesis Title: *"Exact Results in Five-Dimensional Gauge Theories: On Supersymmetry, Localization and Matrix Models"* Supervisor: *Prof. Joseph Minahan*
MSc in Applied Mathematics and Physics	Moscow Institute of Physics and Technology[6], June 2010 Thesis Title: *"Topological Defects with nontrivial Hopf Index"*
BSc in Applied Mathematics and Physics	Moscow Institute of Physics and Technology[6], June 2008 Thesis Title: *"Topological Defects in Abelian two-component Higgs Model"*

RESEARCH INTERESTS

- Supersymmetric localization and matrix models
- Integrability techniques and exactly solvable models
- Supersymmetric gauge theories

- Black Holes in AdS space

[1]Mathematics Department, King's College London, Strand Building, WC2R 2LS London, UK.
[2]Section de mathématiques, rue du Conseil-Général 7-9, 1205 Geneva, Switzerland.
[3]Faculty of Physics, Lidow Physics Complex, Technion, 3200003 Haifa, Israel
[4]Dipartimento di Fisica, Edificio U2 - Università degli Studi di Milano-Bicocca - Piazza della Scienza, 3 - 20126 Milano (MI) - Italy
[5]Uppsala University, Department of Physics and Astronomy, Box 516, S-751 20 Uppsala, Sweden
[6]MIPT: Moscow Institute of Physics and Technology, Institutskii per. 9, Dolgoprudny, 141700, Moscow region, Russia

PUBLICATIONS IN PEER-REVIEWED JOURNALS

1. B. Nazzal, A. Nedelin and S. S. Razamat,
"Ground state wavefunctions of elliptic relativistic integrable Hamiltonians,"
Nucl. Phys. B **996** (2023), 116364, arXiv:2305.09718 [hep-th].

2. B. Nazzal and A. Nedelin,
"C_2 generalization of the van Diejen model from the minimal (D_5, D_5) conformal matter,"
Lett. Math. Phys. **113** (2023) no.5, 94, arXiv:2303.07368 [hep-th].

3. B. Nazzal, A. Nedelin and S. S. Razamat,
"Minimal (D, D) conformal matter and generalizations of the van Diejen model"
SciPost Phys. **12**, 140 (2022), arXiv:2106.08335 [hep-th].

4. J. A. Minahan and A. Nedelin,
"Five-dimensional gauge theories on spheres with negative couplings,"
JHEP **02** (2021), 102, arXiv:2007.13760 [hep-th].

5. A. Lanir, A. Nedelin and O. Sela,
"Black hole entropy function for toric theories via Bethe Ansatz,"
JHEP **04** (2020), 091, arXiv:1908.01737 [hep-th].

6. N. Bobev, P. Bomans, F. F. Gautason, J. A. Minahan and A. Nedelin,
"Supersymmetric Yang-Mills, Spherical Branes, and Precision Holography,"
JHEP **03**, (2020), 047, arXiv:1910.08555 [hep-th].

7. A. Amariti, M. Fazzi, N. Mekareeya and A. Nedelin
"New 3d $\mathcal{N} = 2$ SCFT's with $N^{3/2}$ scaling,"
JHEP **12** (2019), 111, arXiv:1903.02586 [hep-th].

8. A. Nedelin, S. Pasquetti and Y. Zenkevich
"$T[SU(N)]$ duality webs: mirror symmetry, spectral duality and gauge/CFT correspondences,"
JHEP **1902**, 176 (2019), arXiv:1712.08140 [hep-th].

9. S. M. Hosseini,A. Nedelin and A. Zaffaroni
"The Cardy limit of the topologically twisted index and black strings in AdS_5,"
JHEP **1704**, 014 (2017), arXiv:1611.09374 [hep-th].

10. A. Nedelin, F. Nieri and M. Zabzine
"q-Virasoro modular double and 3d partition functions,"
Commun. Math. Phys. **353**, no. 3, 1059 (2017), arXiv:1605.07029 [hep-th].

11. A. Nedelin and M. Zabzine
"q-Virasoro constraints in matrix models,"
JHEP **1703**, 098 (2017), arXiv:1511.03471 [hep-th].

12. A. Nedelin
"Phase transitions in 5D super Yang-Mills theory"

JHEP **1507**, 004 (2015), arXiv:1502.07275 [hep-th].

13. J. A. Minahan and A. Nedelin
"Phases of planar 5-dimensional supersymmetric Chern-Simons theory"
JHEP **1412**, 049 (2014), arXiv:1408.2767 [hep-th].

14. J. A. Minahan, A. Nedelin and M. Zabzine
"5D super Yang-Mills theory and the correspondence to AdS_7/CFT_6"
J. Phys. A **46**, 355401 (2013), arXiv:1304.1016 [hep-th].

15. J. Kallen, J. A. Minahan, A. Nedelin and M. Zabzine
"N^3-behavior from 5D Yang-Mills theory"
JHEP **1210**, 184 (2012), arXiv:1207.3763 [hep-th].

16. M. N. Chernodub and A. S. Nedelin
"Phase diagram of chirally imbalanced QCD matter"
Phys. Rev. D **83**, 105008 (2011), arXiv:1102.0188 [hep-ph].

17. M. N. Chernodub and A. S. Nedelin
"Pipelike current-carrying vortices in two-component condensates"
Phys. Rev. D **81**, 125022 (2010), arXiv:1005.3167 [hep-th].

PROCEEDINGS

1. J. A. Minahan, A. Nedelin and M. Zabzine
"5D super Yang-Mills theory and the correspondence to AdS_7/CFT_6"
PoS EPS **-HEP2013**, 544 (2013).

CONFERENCE AND WORKSHOP PRESENTATIONS

June 2023: Workshop "Lie Theory and Its Applications in Physics",Varna, Bulgaria:
"Elliptic integrable models and their spectra from superconformal indices."

November 2020: Workshop "Supersymmetric Black Holes, Holography and Microstate Counting", Simons Center, New-York, USA (moved to ZOOM):
"Black holes, Bethe Ansatz and toric geometry"

July 2018: Workshop "Supersymmetric theories, Dualities and Deformations", Bern, Switzerland:
"$T[SU(N)]$ duality webs II: gauge/CFT correspondence and 2d limit"

July 2017: International Conference on String Theory and Quantum Gravity, Ascona, Switzerland:
"q-Virasoro constraints for 3d partition functions "

February 2017: European String Workshop: The String Theory Universe, Milan, Italy:
"q-Virasoro constraints and 3d partition functions "

November 2013: 29th Nordic Network Meeting on "Strings, Fields, and Branes", Stockholm, Sweden:
"5d super Yang-Mills and it's relation with 6d superconformal theories"

July 2013: EPS-HEP 2013, Stockholm, Sweden:
"5d super Yang-Mills and the correspondence to AdS_7/CFT_6"

May 2010: Joint Materials Theory - Theoretical Physics Workshop, Uppsala, Sweden:
"Bogomolny vortices in two-gap superconductors"

TEACHING EXPERIENCE

Uppsala University (2010-2015)

2010-2011: TA(Tutorials) in *"Dynamical Systems and Chaos" (1FA152)*

2011-2012: TA(Tutorials) in *"Quantum Physics" (1FA521)*, *"Mathematical Methods in Physics" (1FA121)* and *"Dynamical Systems and Chaos" (1FA152)*

2012-2013: TA(Tutorials) in *"Quantum Physics" (1FA521)* and *"Special Relativity and Analytical Mechanics" (1FA154)*

2013-2014: TA(Tutorials) in *"Quantum Physics" (1FA521)* and *"Special Relativity and Analytical Mechanics" (1FA154)*

2014-2015: TA(Tutorials) in *"Special Relativity" (1FA156)*, Lectures in *"Symmetry in Physics" (1FA158)*

University of Milano-Bicocca (2015-2018)

2017-2018: TA in *"Introduction to Conformal Field Theory"(master/PhD course)*

Geneva University (Since 2021)

2021-2022: TA(tutorials) in *"Quantum Mechanics for Mathematicians" (13M071)*

2022-2023: TA(tutorials) in *"Analysis I and Algebra I (combined)" (11M020 and 11M010)*
TA(tutorials) in *"Analysis II: real analysis " (12M025)*
TA(tutorials) in *"Quantum Mechanics for Mathematicians" (13M071)*

STUDENT SUPERVISION EXPERIENCE

Uppsala University (2010-2015)

2014-2015: *Patrik Lidén*: 15hp Bachelor Project *"Renormalization group approach to statistical systems"*
Simon Taylor: 15hp Bachelor Project *"Quantum Hall effect"*
Joe Liang: 15hp Bachelor Project *"Solution methods to the Ising Model"*
John Paton: 3hp Master Project *"On the Large-N Limit of Gauge Theories"*

ACADEMIC GRANTS AND AWARDS

2015: Bjurzons premium for an excellent thesis, Uppsala University, Sweden.
2009, 2010: Personal grant of the "Dynasty Foundation", Russia.
2009, 2010: Personal grant of the ITEP Research and Educational Center, ITEP[7], Russia.
2007, 2008: Phystech Foundation scholarship for outstanding undergraduate students, MIPT[6].

OTHER PROFESSIONAL ACTIVITIES

Since 2014: Referee for *Annals of Physics*, *JHEP*, *Journal of Physics A*.
2013 - 2015: Organizer of *"Theoretical Physics Journal Club"* at Uppsala University.
2014 - 2015: Major reconstruction and maintenance of Uppsala Theoretical Physics Division website.
2014 - 2015: Creation of website for "Geometry and Physics" project funded by "Knut and Alice Wallenberg Foundation".
Since 2022: Organizer of biweekly "Physical Mathematics" seminars at the University of Geneva .

ADDITIONAL SKILLS

- Languages: Russian (native), English (fluent), Greek (intermediate), French(lower intermediate).
- Advanced programming experience in *Mathematica*, basic experience in *Maple* and *Matlab*.
- Basic programming experience in C, Fortran, Python, HTML, PHP.
- Experienced user of Linux/Unix systems.

[7]Institute for Theoretical and Experimental Physics, ul. Bolshaya Cheremushkinskaya, 25, 117218, Moscow, Russia

MAJOR COLLABORATORS

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DETAILS OF TEACHING EXPERIENCE

Below I specify some of the details about the courses I taught in the past. For many of the courses I also have student evaluations (mostly in Swedish) which can be presented upon a request.

Uppsala University (2010-2015)

- ***Dynamical Systems and Chaos (1FA152)*: 2011, 2012**

  This master level course was covering wide range of topics in the subject of dynamical systems. We taught student to treat physical and biological systems described by linear and nonlinear ODEs, explained concept of chaos and it's relation to fractals. The course was based on the book "Nonlinear dynamics and Chaos" by S.Strogatz. Course consisted of 15 lectures and 15 tutorials (30 academic hours each). Head teacher of the course was Prof. Antti Niemi while I was giving tutorial classes. In my tutorial classes I was additionally actively using *Wolfram Mathematica* to illustrate some of the dynamical system properties. I have also participated in designing and grading exams for the course.

- ***Quantum Physics (1FA521)*: 2011, 2013, 2014**

  This is the standard undergraduate Quantum Mechanics course taught at Uppsala University. The course was based on notes and problems written specifically for it. The course consists of 20 lectures and 20 tutorials. In the Fall 2011 I assisted Prof. Joseph Minahan who was teaching half of this course to the engineering physics students. I taught 10 tutorials (20 academic hours) to two groups of 20 students each. In the Spring of 2013 and 2014 I assisted Prof. Joseph Minahan in teaching the full course of 20 lectures to physics students. In these two years I also participated in designing and grading exams. Also in 2014 I have taught additionally 4 collective problem solving sessions which are described in more details in my teaching statement.

- ***Mathematical Methods in Physics (1FA121)*: 2012**

  The course is a standard undergraduate course covering theory of PDEs. It was based on the book "Applied partial differential equations " by R.Haberman. The course consisted of 10 lectures and 10 tutorials (20 academic hours each). The head teacher was Prof. Maxim Zabzine. I taught tutorials and graded exams.

- ***Special Relativity and Analytical Mechanics (1FA154):* 2012, 2013**

  This is the master course that unites standard courses of Analytical Mechanics and Special Relativity. Analytical Mechanics part was based on the "Classical mechanics" by Goldstein et. al. and consisted of 10 lectures and 10 tutorials (20 academic hours each). The head teacher of this part was Prof. Ulf Lindström. Special Relativity part was based on the notes of Prof. Joseph Minahan who was the head teacher of this part. It also consisted of 10 lectures and 10 tutorials. I taught tutorials for both parts and participated in designing and grading exams.

- ***Special Relativity (1FA156)*: 2014**

  This course appeared after "Special Relativity and Analytical Mechanics" was split into two separate courses in 2014. This was standard Special Relativity course based on "Introduction to Special Relativity" book by W.Rindler. Course consisted of 10 lectures and 10 tutorials (20 academic hours each). The head teacher was Assoc.Prof. Lisa Freyhult. I taught tutorials for the course. Just as in "Quantum Physics" course I also incorporated 2 additional problem solving sessions into this course.

- ***Symmetry in Physics (1FA158)*: 2015**

  This master level course was designed from scratch and taught by me. The course was focused on gauge theories and in particular on their non-perturbative aspects. It consisted of 15 lectures (30 academic hours). For this course I wrote my own notes using "Aspects of Symmetry" by S.Coleman, "Classical theory of gauge fields" by V.Rubakov and Preskill's "Lecture notes on QFT". There was no exam and grades were based on several sets of homeworks. Also based on the material of the course I proposed to students a number of small projects for extra points. One of the students, John Paton, completed one of these projects "On the large-N limit of gauge theories".

University of Milano-Bicocca (2015-2018)

- ***Introduction to Conformal Field Theory*: 2018**

  This is the standard graduate-level introductory course in CFT based on the book by Di Francesco et.al. The course was taught by Prof. Sara Pasquetti and me. It contained 6 lectures (12 academic hours). I taught first three lectures covering conformal algebra, trace anomalies and correlators in CFT. The exam was in the form of the student presentations on the topics chosen from the list proposed by me and Prof. Pasquetti.

Geneva University (Since 2021)

- ***Quantum Mechanics for Mathematicians (13M071)*: 2022, 2023**

  The course is an obligatory course for the students of Math Department at the University of Geneva. The head teacher is Prof. Alba Grassi. The course takes more axiomatic approach to Quantum Mechanics consisting of more formal approach with the heavier use of linear algebra and functional analysis then the standard physics QM course and has less physics content. I taught part of the problem solving sessions (15 hours out of total 24 hours). Part of the session time was devoted to the review of more physical concepts of QM (black body radiation, photoeffect, paradoxes of QM etc.) missing in the lectures. This reviews were prepared by me from the scratch in the form of lecture material. Also my duty was to grade weekly homeworks for the course.

- ***Analysis I and Algebra I (11M020 and 11M010)*: 2022**

  This is standard basic course in Analysis and Algebra for first-year math students. My duty in this course was teaching so-called practical work sessions (42 hours). In Geneva University for these basic courses math students are split into groups of 3-4. My goal is to give them problems to solve in front of me, help and guide them through the solutions and control that students understand new material in the course. During this classes I guide three groups in separate times.

- ***Analysis II: real analysis (12M025)*: 2022**

  The course is taught for the second-year math students. It includes vector analysis, analysis on manifolds, differential forms and their use in physics and ordinary differential equations. My duty is teaching standard problem solving sessions (28 hours), i.e. demonstrating students solutions to various problems in the course. Another duty is to grade weekly homeworks.