# CURRICULUM VITAE

ARTHEMY V. KISELEV

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| ◇ Title: | dr., docent (dr. hab.) | | |
| ◇ First name: | Artemiy (Arthemy) | ◇ Initials: | A. V. |
| ◇ Surname: | Kiselev | | |
| ◇ Date and place of birth: | 5 April 1978, Ivanovo, Russia | ◇ Gender: | M |
| ◇ Nationality: | Russian | | |
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**Education: master.**

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| University/College of Higher Education: | Moscow State University, Russia, 1995–2001 |
| Date: | 31 January 2001 |
| Study/main subject: | Mathematical physics |
| Diploma: | Summa cum laude (all grades 'excellent') |
| University/College of Higher Education: | Independent University of Moscow, Russia |
| Term: | 1995–1999. |

**Education: doctorate.**

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| University/College of Higher Education: | Moscow State University, Russia |
| Date: | 22 April 2004 |
| Title of thesis: | Methods of geometry of differential equations in analysis of integrable models of field theory |
| Supervisor: | prof. dr. I. S. Krasil'shchik |
| Reading committee: | prof. dr. V. V. Sokolov, prof. dr. A. V. Samokhin |
| Speciality: | 01.01.03 – Mathematical physics |

**Teaching and research title: docent (habilitation)**

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| Awarded by: | Ministry of Education, Russia |
| Date: | 16 December 2009 |
| Chair: | Higher mathematics. |

**Current employment** (permanent since 1 January 2017)**.**

Jan 2017 – now**:** **Assistant professor** with tenure (UD1),
Jan 2011 – Dec 2016**:** Tenure-track **Assistant professor** (UD2),
Bernoulli Institute for Mathematics, Computer Science and Artificial Intelligence, Nijenborgh 9, 9747 AG Groningen, The Netherlands.

**Work experience since completing the PhD** (all fixed-term)**.**

Dec 2009 – Aug 2012**: Associate professor** (**Docent** with title and PhD promotion status),

Dec 2007 – Dec 2009**: Associate professor**,
Sep 2005 – Dec 2007**: Assistant professor** (50%-time equivalent; 344 lecture hrs/year), Department of Higher Mathematics, Ivanovo State Power University (ISPU), Rabfakovskaya str. 34, Ivanovo, 153003 Russia.
Jan 2008 – Dec 2010**: Postdoctoral researcher** (fte), Mathematical Institute, Utrecht University, P.O.Box 80.010, 3508 TA Utrecht, The Netherlands.
Apr – Sep 2007**: Postdoctoral researcher** (fte), Department of Mathematics and Statistics, University of Montréal, CP 6128 centre-ville, Montréal, Québec, H3C 3J7 Canada.
Nov 2005 – Apr 2006**: Postdoctoral researcher** (fte), Department of Physics, Middle East Technical University (METU), Ankara, 06531 Turkey.
Sep 2004 – Jun 2005**: Postdoctoral researcher** (fte), Dept. Mathematics, Brock University, 500 Glenridge ave., St. Catharines, Ontario, L2S 3A1 Canada.
Aug 2004 – Dec 2006**: Scientific researcher** (50%-time equivalent), Institute for Modelling and Computer Experiment, Ivanovo State Power University (ISPU), Rabfakovskaya str. 34, Ivanovo 153003, Russia.
Jun – Jul 2004**: Researcher** (fte), Department of Matematics 'Ennio De Giorgi', University of Lecce, Via per Arnesano, 73100 Lecce, Italy.

***Visiting positions*:**

Nov 2022 – Jan 2023**:** IHÉS, Bures-sur-Yvette, France.[1]
Nov – Dec 2019**:** IHÉS, Bures-sur-Yvette, France.[2]
Apr – May 2017**:** IHÉS, Bures-sur-Yvette, France.[3]
Jan – Mar 2017**:** Max Planck Institute for Mathematics, Bonn, Germany.
Nov – Dec 2016**:** IHÉS, Bures-sur-Yvette, France.[3]
Mar – May 2013**:** IHÉS, Bures-sur-Yvette, France.
Feb – Mar 2011**:** IHÉS, Bures-sur-Yvette, France.
Nov 2009**:** Max Planck Institute for Mathematics, Bonn, Germany.
Apr 2009**:** Centre de Recherches Mathématiques, Montréal, Canada.
Nov – Dec 2008**:** IHÉS, Bures-sur-Yvette, France.
Feb – Mar 2007**:** Utrecht University, The Netherlands.
Nov – Dec 2006**:** IHÉS, Bures-sur-Yvette, France.
Sep – Nov 2006**:** Max Planck Institute for Mathematics, Bonn, Germany.
Jul 2006**:** Brock University, St. Catharines, Ontario, Canada.
Jun – Aug 2002, Jun – Jul 2003**:** University of Salerno, Italy (INTAS YS).
Apr – May 2003**:** University of Lecce, Italy (INTAS YS).
Nov 2002**:** University of Twente, Enschede, The Netherlands (INTAS YS).

***Short-term invited visits* ($\leqslant$ *2 weeks*):**

Nov 2026**:** ETH Zürich, Switzerland. Nov 2026**:** Reims, France.
May 2026**:** Faculty of Mathematics, Charles University Prague, Czech Republic.
Apr 2025**:** Faculty of Physics, University of Warsaw, Poland.
Oct 2013**:** Bogolyubov ITP NAS, Kiev, Ukraine.
Jun 2008, Jun 2010**:** SISSA, Trieste, Italy.

[1]Followed in 2023–2026 by brief visits (2–3 days…1 week) for research collaboration and invited conference talks: 4 weeks in total.

[2]In 2019, I was the only visitor invited to the IHÉS from the Netherlands. (Source: IHÉS Annual report 2019, pp. 38–39)

[3]In both 2016 and 2017, I was the only visitor invited to the IHÉS from the Netherlands. (Source: IHÉS Annual report 2017, pp. 35–36)

**Scholarships, grants, and prizes:** 21.

Sep 2026**:** Bernoulli Swiss scientific travel fellowship, Switzerland.

**IHÉS:** Visitor grants 2006, 2008, 2011, 2013, 2016,[3] 2017,[3] 2019,[2] 2022 (Institut des Hautes Études Scientifiques, Bures-sur-Yvette, France), supported by Nokia Fund in 2019, 2023.

**Teacher of the Year 2018/19** in (Applied) Mathematics**:** University of Groningen, NL.[4]

**MPIM:** Visitor grants 2006, 2009, 2017 (Max Planck Institute for Mathematics, Bonn, Germany).

Jan 2008 – Dec 2010**: NWO VENI** postdoctoral grant 639.031.623, Utrecht University, The Netherlands.[5]

Feb – Mar 2007**: NWO** Visitor grant B61–609, The Netherlands.

Nov 2005 – Apr 2006**: TUBITAK** Postdoctoral research grant, NSF, Turkey.

Jun – Jul 2004**:** University of Lecce visitor grant 650 CP/D 31/05/2004.

Mar 2002 – Feb 2004**: INTAS** grant YS 2001/2 033.

Sep 2002 – Aug 2003**: PhD scholarship** 3645/5 of the Government of Russia.

Sep 1999 – Jan 2001**: Lomonosov scholar** at the Lomonosov MSU.

Jan – Dec 1996**: ISSEP** grant 96-s1656.

**Member of Editorial Board**

- *Open Communications in Nonlinear Mathematical Physics* (OCNMP): since March 2021.
- *Journal of Nonlinear Mathematical Physics* (JNMP): 15 Aug 2016 – 30 Sep 2020.

**Referee** in *Ann. Phys.*, *Math. Annalen*, *Ann. Inst. H. Poincaré*, *J. Geom. Phys.*, *J. Math. Phys.*, *J. Math. Anal. Appl.*, *Int. J. Mod. Phys.* A, *SIGMA* – Symmetry, Integrability and Geometry: Methods and Applications, *J. Geom. Mech.*, *J. Lie Theory*, *J. Phys.*: *Conf. Ser.*, *Nuovo Climento* B, *Acta Appl. Math.*, *Indag. Math.*

**Referee** in the Times Higher Education (THE) university ranking: 2020–2024.

**Research interests:** Mathematical physics, geometry of differential equations, integrable systems, Batalin–Vilkovisky (BV) quantization, Lie algebras, gauge systems, geometry of interaction, Poisson geometry, deformation quantization, graph theory, Kontsevich graph complex, combinatorial topology, visualization.

**Brief summary of research over the past five years:** [6,7]

- New positive integer sequence OEIS A392 714, arising in [42, 62] from a natural generalisation of the Lie bracket for vector fields $\vec{\mathcal{X}} \in \mathrm{D}_{p=1}(\mathbb{R}^1)$ where $\boldsymbol{c}(p=1)=1$, is computed in [1, 2] as far as $\boldsymbol{c}(18) = 4.8813\ldots\cdot 10^{462}$. The 206-decimal digit factor of $\boldsymbol{c}(14)$ is a new prime.
- I proved in [31, 42, 45] that (in)complete generalised Wronskians for functions in many variables, viewed as $N$-ary multi-linear antisymmetric brackets, satisfy the table of Jacobi identities for strong homotopy Lie algebras with zero differential. All finite-dimensional polynomial algebras $\mathcal{A} \supseteq \Bbbk_k[x^1, \ldots, x^d]$ – with complete generalised Wronskians of differential order $k \geqslant 1$ over dimension $d \geqslant 1$ as the brackets – are explicitly described in [4].

[4]Nominated (1/3) for the final of Teacher of the Year 2024/25; shared 1st – 2nd place in students' main vote.

[5]Project page: `http://www.nwo.nl/onderzoek-en-resultaten/onderzoeksprojecten/i/49/3249.html`

[6]During the first year of Covid-19, knowledge transfer was a natural aim, see [103–104] and [105–106] (audiocourses), also [99]. Both courses [103–104] are unique in NL.

[7]During the second year of Covid-19, I designed two new courses [97–98], supervised three lengthy projects ([8, 50] and [10] on p. 12) and supervised the final stage of a PhD dissertation (660 pages, see pp. 11–11 below).

- The class of Nambu–determinant Poisson bi-vectors $\mathcal{P} = \mathrm{d}\boldsymbol{a}/\mathrm{d}vol(\boldsymbol{x})$ on $\mathbb{R}^3$ and $\mathbb{R}^4$ is stable under the Kontsevich tetrahedral $\gamma_3$-flow and (on $\mathbb{R}^3$) under the pentagon-wheel flow [8]; the $\gamma_3$-flows over $\mathbb{R}^3$ and $\mathbb{R}^4$ are Poisson-cohomology trivial (for $\mathbb{R}^3$, trivializing vector fields are obtained in [8, 68]; for $\mathbb{R}^4$, in [32, 63, 64–66]).
- A new class of high-degree differential-polynomial identities for Jacobian determinants is discovered in [32, 63–64].
- Jointly with my team [9, 38] I expressed the Kontsevich associative $\star$-product up to $\bar{o}(\hbar^4)$ and, in [7], the affine $\star_{\mathrm{aff}}$ mod $\bar{o}(\hbar^7)$ for affine Poisson brackets (e.g., Kirillov–Kostant linear brackets on $\mathfrak{g}^*$) and its reduction – by using the Jacobi identity – to $\star_{\mathrm{aff}}^{\mathrm{red}}$ mod $\bar{o}(\hbar^7)$ with only rational coefficients but without $\zeta(3)^2/\pi^6$. The associativity mechanism of $\star_{\mathrm{aff}}$ mod $\bar{o}(\hbar^7)$ is contrasted in [67] with the easy factorization – via the Jacobi identity – of the associator for $\star$ mod $\bar{o}(\hbar^6)$. The graphs in expansion $\star$ mod $\bar{o}(\hbar^4)$ are drawn in [50] using the algorithm from [91].

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- I verified the main properties of the Batalin–Vilkovisky Laplacian and Schouten bracket within a variational extension [11, 40] of the Kontsevich formal noncommutative symplectic supergeometry to infinite jet spaces for maps of the free algebra quotients over the linear relation of equivalence under cyclic shifts to sheaves of associative algebras of walks on affine manifolds.
- By combining elements of Gel'fand's calculus of singular linear integral operators with algebraic technique of Kontsevich's weighted graphs, I lifted the procedure of deformation quantisation $\cdot \mapsto \star_\hbar$ from finite-dimensional Poisson manifolds to the construction of associative, not necessarily commutative star-products $\star_\hbar$ in unital algebras of local functionals – for field theory models equipped with variational Poisson structures [37].
- I proved that the construction of the Batalin–Vilkovisky (BV) Laplacian $\Delta$ does not require *post hoc* regularisation (e.g., using $\boldsymbol{\delta}(0) := 0$ for the Dirac $\boldsymbol{\delta}$-function) and I justified the relation of $\Delta$ to the variational Schouten bracket ([77] and [39,74]).
- I defined Lie algebroids over spaces of infinite jets of sections in vector bundles and obtained their representation through homological evolutionary vector fields [16]. This gives a variational Lie algebroid interpretation of the variational noncommutative Poisson structures [40], evolutionary BRST-differential [80], and zero-curvature representations [14] (the space of gauge automorphisms for the quantum BV-cohomology groups is endowed with the structure of classical Lie algebroid [14, 77]).
- Together with my team and using technique from [9, 38], I proved that the ratio $1 : \frac{6}{2}$ is the only balance at which the Kontsevich two-component tetrahedral flow does preserve the space of Poisson bi-vectors on any finite-dimensional affine manifold [13, 73]. The pentagon-wheel flow is obtained in [36]. The heptagon-wheel cocycle in the graph complex is presented in [12,72]. The orientation morphism that sends graphs to Poisson cocycles is explained in [33, 70].
- Gardner's deformations of the $N$=2 super-KdV [10,15,17], Krasil'shchik–Kersten [75], and (Kaup–)Boussinesq [22,24] equations were constructed (this solves P. Mathieu's Open Problem 2); the concept of adjoint systems was introduced in [22, 76].
- I described in [18,26] the higher symmetry algebras of the 2D Toda chains associated with the root systems of complex semi-simple Lie algebras: the commutation relations between the generators are calculated explicitly [83].
- New multi-supersoliton solutions that are subject to nonlinear superposition, but collide as point particles or decay spontaneously, were obtained in [20] for the $N = 2$ supersymmetric Korteweg–de Vries equations.
- I obtained new spiral minimal surfaces using geometric and topological methods [21,41,85].

## International activities.

### *Plenary and invited talks and colloquia.*

⋆ Nov 26–27, 2026**:** 'Combinatorics & arithmetic for Physics: special days', IHÉS, Bures-sur-Yvette, France.

Nov 19–21, 2025**:** 'Combinatorics & arithmetic for Physics: special days', IHÉS, Bures-sur-Yvette, France. video

Jul 7–11, 2025**:** Conference 'Integrable systems & quantum symmetries', ČVUT Prague, CZ.

Nov 20–22, 2024**:** 'Combinatorics & arithmetic for Physics: special days', IHÉS, Bures-sur-Yvette, France. video

Jul 1–5, 2024**:** Conference 'Integrable systems & quantum symmetries', ČVUT Prague, CZ.

Jun 30, 2023**:** Symposium 'A bridge between Lie theory and Integrable systems', Utrecht, NL.

Nov 28–29, 2022**:** 'Combinatorics & arithmetic for Physics: special days', IHÉS, Bures-sur-Yvette, France. video

Jun 5–10, 2022**:** Workshop 'Poisson geometry, Lie groupoids and differentiable stacks', Banff (BIRS), Canada (hybrid; joint talk given on-site by R. Buring).

Jun 25, 2021**:** Symposium 'Fundamentals of the Universe' (Astro–Math–Phys), University of Groningen, NL.

Sep 2020**:** Invited lecture at National Mathematics Symposium 'Searching for shapes', Groningen, NL. (event cancelled due to Covid-19)

Nov 6–8, 2019**:** 'Combinatorics & arithmetic for Physics: special days', IHÉS, Bures-sur-Yvette, France.

Jul 1–5, 2019**:** Geometry & Quantum Theory cluster (GQT) conference, Den Dolder, NL.

Sep 16–22, 2018**:** 'Homotopy algebras, deformation theory and quantization', Bedlewo, Poland.

Sep 22, 2017**:** Colloquium day 'Graphs, deformations & singularities', Institut für Mathematik, Johannes Gutenberg–Universität Mainz, Germany.

Jul 3–7, 2017**:** Geometry & Quantum Theory cluster (GQT) conference, Den Dolder, NL.

Feb 14, 2017**:** Invited lecture at National Mathematics Symposium 'Back to the roots', Utrecht University, NL.

Dec 24–27, 2013**:** Invited lecture at Conf. Young Sci. 'Problems of Theoretical Physics', Bogolyubov ITP Kiev, Ukraine.

Jan 16–17, 2009**:** 37th Seminar 'Sophus Lie', University of Paderborn, Germany.

Dec 13–15, 2006**:** Twente 2006 Conference on Lie Groups, University of Twente, NL.

Jun 7–8, 2005**:** CMS workshop 'Formal geometry of PDE and Integrability', Brock University, Canada.

### *Talks at conferences and workshops.*

**2003:** 'Current Geometry', Naples, Italy.

**2004:** 'Nonlinear Physics: Theory and Experiment III', Gallipoli (Lecce), Italy.
- 'Physics of fundamental interactions', ITEP, Moscow, Russia.
- 'Differential Geometry and its applications', Charles Univ., Prague, Czech Republic.

**2005:** 6th Conference 'Symmetry in nonlinear mathematical physics', Kiev, Ukraine.
- 'Supersymmetry and quantum symmetries', Dubna, Russia.

**2006:** 'Nonlinear Physics: Theory and Experiment IV', Gallipoli (Lecce), Italy.
- Workshop 'Quantization, Dualities, and Integrable Systems', Pamukkale Univ., Denizli, Turkey.
- 'Differential Geometry and its Applications', Odessa, Ukraine.
- 'Symmetries and Overdetermined Systems of PDE', IMA, University of Minnesota, USA.

**2007:** 7th Conference 'Symmetry in nonlinear mathematical physics', Kiev, Ukraine.
- Conference 'Dynamics and Hamiltonian systems', Utrecht University, The Netherlands (attended).
- The J. McKay conference on Groups and Symmetries, University of Montréal, Canada (attended).

**2008:** 'Nonlinear Physics: Theory and Experiment V', Gallipoli (Lecce), Italy.
- Workshop 'Integrability in the AdS–CFT correspondence', Utrecht University, The Netherlands (attended).
- 4th Int. Workshop 'Group analysis of differential equations and integrable systems', Protaras, Cyprus.
- Workshop 'Integrable systems in Quantum Theory', Lorentz Centre, Leiden, The Netherlands (attended).

**2009:** 8th Conference 'Symmetry in nonlinear mathematical physics', Kiev, Ukraine.
- 'Supersymmetry and quantum symmetries', JINR, Dubna, Russia.

- Workshop 'Geometric aspects of Quantum Theory and Integrable systems', University of Amsterdam, The Netherlands (attended).

**2010:** 'Nonlinear Physics: Theory and Experiment VI', Gallipoli (Lecce), Italy.
- Workshop 'The interface of Integrability and Quantization', Lorentz Centre, Leiden, The Netherlands.
- Dutch Mathematical Congress, Utrecht, The Netherlands (attended).
- 5th Int. Workshop 'Group analysis of differential equations and integrable systems', Protaras, Cyprus.
- Conference 'Geometry and Quantum Theory', Nijmegen, The Netherlands (attended).

**2011:** Workshop 'Quantum Theory and Symmetries', Prague, Czech Republic.
- 'The Legacy of deformation quantization', Ascona, Switzerland (attended).
- 'Supersymmetry and quantum symmetries', JINR, Dubna, Russia.
- Workshop 'Special functions and orthogonal polynomials of Lie groups and their applications', Děčín, Czech Republic.

**2012:** Int. Workshop 'Noncommutative algebraic geometry and its applications to Physics', Lorentz Centre, Leiden, The Netherlands. **Team:**
- 6th Int. Workshop 'Group analysis of differential equations and integrable systems', Protaras, Cyprus. **2 talks**

**2013:** 'Physics and Mathematics of nonlinear phenomena', Gallipoli (Lecce), Italy.
- 'Integrable systems & quantum symmetries', CVUT Prague, Czech Republic.
- 'Symmetries of discrete systems & processes II', CVUT Děčín, Czech Republic.
- 'Supersymmetry and quantum symmetries', JINR, Dubna, Russia. **2 talks**
- Int. workshop 'Symmetry & integrability of equations of Mathematical Physics' in honour of prof. W. Fushchych, IM NAS Kiev, Ukraine.
- Jubilee workshop 'Nonlinear Mathematical Physics: 20 Years of JNMP', Sophus Lie Centre, Nordfjørdeid, Norway (poster).
- Int. Conf. 'Quantum groups & quantum integrable systems', ITP Kiev, Ukraine (poster).

**2014:** 7th Int. Workshop 'Group analysis of differential equations and integrable systems', Larnaca, Cyprus. **2 talks**
- Int. workshop 'Integrability & isomonodromy in Mathematical Physics', Lorentz Centre, Leiden, The Netherlands (attended).

**2015:** 'Integrable systems & quantum symmetries', CVUT Prague, Czech Republic.
- 'Supersymmetry and quantum symmetries', JINR, Dubna, Russia.
- 'Physics and Mathematics of nonlinear phenomena', Gallipoli (Lecce), Italy (peer-selected, event overlapped with ISQS'23 in CVUT Prague).

**2016:** 'Integrable systems & quantum symmetries', CVUT Prague, Czech Republic.
- 50th Seminar 'Sophus Lie', Bedlewo, Poland (poster).

**2017:** 'Integrable systems & quantum symmetries', CVUT Prague, Czech Republic.
- 'Symmetries of discrete systems & processes IV', CVUT Děčín, Czech Republic. **2 talks**
- 'Supersymmetry and quantum symmetries', JINR, Dubna, Russia.
- 'Physical Mathematics' (Arbeitstagung 2017) in honor of Yu. Manin, MPIM Bonn, Germany (attended).
- 'Resurgence & quantisation', IHÉS, Bures-sur-Yvette, France (attended).

**2018:** 32nd International colloquium on group theoretical methods in Physics (Group32), Prague, Czech Republic. **3 talks**
- Int. workshop 'Homotopy algebras, deformation theory and quantization', Bedlewo, Poland. **2 talks**
- Int. workshop 'Symmetries & integrability of equations of Mathematical Physics', IM NAS Kiev, Ukraine (invited).

**2019:** 'Integrable systems & quantum symmetries', CVUT Prague, Czech Republic.
- 'Supersymmetry and quantum symmetries', Yerevan, Armenia.
- 'Problems of Theoretical & Mathematical Physics', IM & Bogolyubov ITP NAS Kyiv, Ukraine.
- The 2nd JNMP conference on Nonlinear Mathematics Physics, Santiago, Chile (poster).

**2020:** 10th Int. Workshop 'Group analysis of differential equations and integrable systems', Kiev, Ukraine (event cancelled).
- 'Integrable systems & quantum symmetries', CVUT Prague, Czech Republic (event postponed).

**2022:** 34th International colloquium on group theoretical methods in Physics (Group34), Strasbourg, France. **2 talks**
- Workshop 'Poisson geometry, Lie groupoids and differentiable stacks', Banff (BIRS), Canada (hybrid; joint result presented on-site by R. Buring).

- Int. workshop 'Symmetries & integrability of equations of Mathematical Physics', IM NAS Kiev, Ukraine.

**2023:** Symposium 'Quantum Theory and Symmetries' (QTS 12), Prague, Czech Republic.

**2024:** 'Integrable systems & quantum symmetries', CVUT Prague, Czech Republic. **4 talks**

- 'Combinatorics & arithmetic for Physics: special days', IHÉS, Bures-sur-Yvette, France.
- ISNMP Conference on Nonlinear Mathematical Physics, Bad Ems, Germany.
- 'Problems of Theoretical & Mathematical Physics', IM & Bogolyubov ITP NAS Kyiv, Ukraine. **2 talks**
- 'Mathematics on the crossroad of centuries', IHÉS, Bures-sur-Yvette, France (attended).

**2025:** 'Integrable systems & quantum symmetries', ČVUT Prague, Czech Republic. **3 talks**

- Symposium 'Quantum Theory & Symmetries' (QTS 13), Yerevan, Armenia (hybrid). **2 talks**
- 'Combinatorics & arithmetic for Physics: special days', IHÉS, Bures-sur-Yvette, France.
- Int. online workshop 'Symmetries & integrability of equations of Mathematical Physics' (on occasion of the 80th anniversary of A. G. Nikitin *et al.*), IM NAS Kiev, Ukraine (poster [86]).

**2026:** 2nd ISNMP Conf. on Nonlinear Mathematical Physics, Bad Ems, Germany. **2 talks**

⋆ 'Combinatorics & arithmetic for Physics: special days', IHÉS, Bures-sur-Yvette, France.

⋆ **2027:** 1st ISNMP Virtual Conference on Nonlinear Mathematical Physics (on-line).

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**2007:** 1st Montréal industrial problem solving workshop, CRM, University of Montréal, Canada.

***Reports at research seminars*:** 135.

- Oberseminar, Max Planck Institute for Mathematics, Bonn, Germany.
- Algebra, Geometry and Physics seminar, MPIM, Bonn, Germany.[8]
- Mathematics seminar, IHÉS, Bures-sur-Yvette, France.
- Deformation theory seminar, University of Pennsylvania, Philadelphia, USA.[9]
- Talks in Mathematical Physics, ETH Zurich & University of Zürich (joint seminar), CH.
- Mathematical physics seminar, CRM, University of Montréal, Canada.
- Mathematical physics seminar, SISSA, Trieste, Italy.
- Colloquium, Geometry & topology, Geometry & Algebra + Geometry & Analysis, and Dynamical Systems / Mathematics of Complex Systems seminars, Mathematical Institute, Utrecht University, The Netherlands.
- Mathematical physics and Representation theory seminars and Math. colloquium, Korteweg–de Vries Institute for Mathematics, University of Amsterdam, The Netherlands.
- Math. colloquium and FMF math-phys colloquium, Algebra[10] and Floris Takens Dynamical systems seminars, Bernoulli Institute for Mathematics, Computer Science & Artificial Intelligence, University of Groningen, NL.
- Quantum gravity seminar, Institute for Mathematics, Astrophysics and Particle Physics (IMAPP), Radboud University Nijmegen, The Netherlands.
- String theory seminar, Spinoza Institute for Theoretical Physics, Utrecht University, The Netherlands.
- String theory seminar, High-Energy Theoretical Physics section, University of Groningen, The Netherlands.
- Mathematical physics seminar, Steklov MI RAS, Moscow, Russia.

[8] Talks given in Dec 2008, Dec 2009, Dec 2010, Jan 2012, Feb 2013, Apr 2014, May 2015, July 2016, Nov 2017, and Nov 2018.

[9] Three-talk mini-series in March–April 2022.

[10] Four-talk mini-series in May–June 2022.

- Quantum field theory seminar, I. E. Tamm Theoretical department, Lebedev IP RAS, Moscow, Russia.
- Seminar 'Geometry of differential equations', Independent University of Moscow.
- Seminar 'Lie algebras, Riemannian geometry, and mathematical physics', Independent University of Moscow, Russia.
- String theory seminar, Bogoliubov Lab for Theoretical Physics, JINR, Dubna, Russia.
- PDE seminar, Landau Institute for Theoretical Phisics, Moscow, Russia.
- Geometry & mathematical physics seminar, IM Jussieu, Univ. Paris VII, Paris, France.
- Polynomial systems & Experimental Math seminar, INRIA–Jussieu–IHP, Palaiseau, FR.
- Mathematics seminar, University of Reims, France.
- Mathematical physics seminar, University of Burgundy, Dijon, France.
- Mathematical physics seminar, University of Lille, France.
- Mathematical physics & algebraic topology seminar, University of Angers, France.
- Department of Mathematical Physics seminar, IM NAS Kiev, Ukraine.
- Mathematical physics seminar, Faculty of Mathematics and Mechanics, Taras Shevchenko National University, Kiev, Ukraine.
- Doppler Institute seminar, Doppler Institute for Mathematical Physics & Applied Mathematics CAS, Prague, Czech Republic.
- Prague Mathematical Physics seminar, Charles University, Prague, Czech Republic. video
- Analysis, geometry and string theory colloquium, University of Hannover, Germany.
- Algebraic geometry, topology and number theory colloquium, University of Mainz, Germany.
- Geometry and I-AIM Interdisciplinary Math seminars, University of Toronto, Canada.
- Mathematical physics seminar, Laval University, Canada.
- PDE seminar, McMaster University, Hamilton, Canada.
- Gravity, fields & particles seminar, Faculty of Physics, University of Belgrade, Serbia.
- General Math seminar, University of Luxembourg, Luxembourg.
- Mathematical physics and Geometry & topology seminars, Middle East Technical University, Ankara, Turkey.
- Applied Math and General Math seminars, Dept. of Mathematics, Bilkent University, Ankara, Turkey.
- Geometry seminar, Department of Mathematics, University of Lecce, Italy.

**Other academic activities**

- Bernoulli Institute math colloquium co-organizer (RUG, 2011–2026).
- Member of the faculty Library committee (RUG, 2017–2023).
- Organizer of Math movie nights: IHÉS, Utrecht, Groningen, ISPU.
- Member of the Geometry & Quantum Theory cluster (The Netherlands, `www.gqt.nl`).
- Member of PhD defence committees:
  - · Johann Bernoulli Institute for Mathematics & Computer Science (JBI RUG) – 2011, 2013, 2024;
  - · Van Swinderen Institute for Particle Physics & Gravity (VSI RUG) – 2018.

**Reviewer** in Mathematical Reviews (AMS): **101**.

***Teaching experience*:**

Mar 2001 — Mar 2002**:** Teaching assistant (Lomonosov MSU, Moscow):
- Analysis-III, Ordinary differential equations (2nd year);
- Partial differential equations of mathematical physics (3rd year).

Jul 2002, 2003**:** Teaching assistant, assistant lecturer (5, 6th Diffiety Schools, Italy):
- Geometry of Differential Equations (PhD students).

Sep 2004 – Apr 2005**:** Instructor (Brock University, Canada):
- Differential Equations (2nd year),
- Advanced Differential Equations (3rd year).

May – Aug 2005**:** Lecturer (ISPU, Russia):
- Geometry of nonlinear differential equations (MSc students),
- Computer methods in geometry of Hamiltonian differential equations.

Sep 2005 – Dec 2010**:** Assistant professor, Associate professor (ISPU, Russia):
- Differential Equations (2nd year),
- Equations of Mathematical Physics (3rd year, see [56]),
- Functional Analysis (3rd year),
- Tensor Calculus on Manifolds (3rd year, see [57]),
- Lagrangian and Hamiltonian Mechanics (4th year, see [55]),
- LaTeX'$2_\varepsilon$ – Modern Information Technology in Education (3rd+4th year, see [58]).

May 2009**:** Lecturer, Utrecht University: 'Geometric mechanics' (MSc, see [6, 55]).

| Jan 2011 – now**:** Assistant professor, University of Groningen:[11, 12] | ♯ students | Mark | |
|---|---|---|---|
| • Differential & integral calculus and ODE (1st year): | 140 | n/a | REN |
| • Metric and topological spaces (2nd year, see [105]): | 140 | A+ | REN |
| • Linear algebra & ODE systems (2nd year): | 50 | A+ | REN |
| • Multivariate- and Fourier analysis (2nd year): | 110 | n/a | REN |
| • ODE and Fourier series (2nd year): | 110 | n/a | NEW |
| • Complex analysis (2nd year): | 90 | n/a | |
| • Group theory (2nd year): | 110 | B | |
| • Coding and cryptography (3rd year): | 40 | A+ | |
| • Geometry of curves and surfaces (3rd year, see [101]): | 40 | A+ | REN |
| • Graph theory and network flows (MSc, see [106]): | 20 | A | NEW |
| • Galois theory (MSc): | 10 | n/a | |
| • Doing Math: academic norms, practices & culture[13] (MSc, see p. 24): | 100 | | NEW |

(*The interdependence of lecture courses is displayed on pp.* 22–23.)

**QU** – **Quantum Universe** MSc programme (Groningen, bi-annual):

| | | | | |
|---|---|---|---|---|
| | 1a Riemannian geometry (see [57]): | 40 | A+ | NEW |
| | 1b Poincaré topology (see [99]): | 20 | A+ | NEW |
| | 1c Fibre bundles, multi-vectors and supergeometry (see [11, 14, 16]): | 10 | n/a | NEW |
| | 2a Geometry of ordinary differential equations (see [94]): | 25 | A+ | NEW |
| | 2b Geometry of partial differential equations (see [6, 104]): | 25 | A+ | NL |
| | 2c Nonlinear waves and solitons (see [20]). | | | |
| NEW | 3a Lagrangian celestial mechanics (see [55, 96]): | 20 | A | |
| REN | 3b Hamiltonian mechanics (see [100]): | 15 | A | |
| NEW | 3c Poisson algebra and geometry (see [92, 103]): | 40 | A+ | |
| NEW | 4a Roots, lattices and (quasi)crystals (see [98]): | 15 | A+ | |
| NEW | 4b Lie groups, Lie algebras and gauge fields (see [97]): | 15 | A | |

[11] Since 2013, courses may be evaluated by students: the mark scale is A+ (highest), A, B, C, and F (lowest).

[12] On the margin, NEW means that the course is new at RuG; NL shows that my course is unique in the Netherlands; REN means that a pre-existing local course is renovated.

[13] Mentioned in students' nomination for the Teacher of the Year 2024/25 final; content alternating bi-annually.

4c Global variational problems (see [11, 77, 80]).

**GQT** – Lecturer in **MasterMath** programme (advanced level M2), Netherlands:
2018: Symmetries & conservation laws of nonlinear PDE (45 hrs, Amsterdam), see [6, 104]. NL
2020: Deformation quantization, graph complex & Number Theory (51 hours, Utrecht), see [103] and [9, 12, 13]. NL

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Oct 2013**:** Invited lecturer (Taras Shevchenko National University, Kiev, Ukraine):
- Geometry of Lagrangian and Hamiltonian models of field theory (see [77]).

⋆ Autumn 2014**:** Invited lecturer (UPenn, Philadelphia, USA):
- Geometry of differential equations (MSc, full semester; see [6]).[14]

Dec 2018**:** Lecturer, IMPRS minicourse at Max Planck Institute for Mathematics (MPIM Bonn, Germany):
- The Kontsevich (un)oriented graph complexes (5 hours, see [12, 13, 36, 70, 71]).

video May 2019**:** Lecturer, 3-day course at Independent University of Moscow (IUM, Russia):[15]
- The Kontsevich (un)oriented graph complexes (10 hours, see [12, 71], [13, 36], and [33, 70]).

Nov – Dec 2019**:** Lecturer, 4-day course at the IHÉS (Bures-sur-Yvette, France):
- Symmetries of Poisson brackets: the graph complex and orientation morphism (12 hours, see [12, 71], [13, 36], [33, 70], and [34, 69]).

Apr 2025**:** Lecturer, 3-day course at the University of Warsaw (PL):
- Kontsevich graph complex and deformation quantisation (6 hours, see [7, 9] and [64–67]).

***Basic Teaching Qualification* (*BKO*)**. Awarded by: University of Groningen, NL (2 Jun 2014).

***Professionalisation and trainings*** (*selected*)**:**
- Presentation Techniques (June 2010, Utrecht NL) by Boertingroep.
- Leadership & Management Skills (April 2016, Groningen NL) by HFP Consulting Heidelberg.
- The Hague International Model United Nations (THIMUN): Ecology & Environment committee, delegate in 1993, 1994, 1995 (January, agenda of the UN General Assembly from the Autumn session) — 3 × one-year trainings, organisation of MUN satellite conference (Nov 1994).

· Rules of parliamentary procedure;
· Diplomatic English and drafting resolutions;
· Speech-writing and public speech;
· Negotiations and teaming;
· Coaching & mentoring, inspiring criticism, refereeing.
· Communication, internationalisation, and pluralism.

Twelve graduate schools in Geometry & Quantum Theory and fifteen conferences of the GQT-cluster (The Netherlands, `www.gqt.nl`) attended in 2014–2026.

***PhD and M. Sci. supervision*:**

[1] *Krutov A. O.*, Deformations of equations and structures in nonlinear models of mathematical physics. PhD thesis, JBI RUG (13 June 2014, Groningen, The Netherlands), 136 p. (Master's thesis, ISPU, 2009); publications [10, 14, 15, 17, 75, 76, 90].

[14] The course, for 2 groups of students and with 2 teaching assistants, was scheduled for the Autumn semester 2014 and announced in the UPenn Math programme but not read due to delayed travel arrangements.

[15] http://www.mathnet.ru/php/conference.phtml?option_lang=rus&eventID=25&confid=1591 (in English)

Reading committee: acad. A. G. Nikitin (IM Kiev), prof. dr. D. A. Leites (Stockholm), prof. dr. A. C. D. van Enter (RUG).

[2] *Ringers S.*, Quantization using jet space geometry and Identity management using credential schemes. PhD thesis, JBI RUG (7 October 2016, Groningen, The Netherlands; co-supervised with J.-H. Hoepman), 222 p.; publication [79] and arXiv:1302.4388 [math.DG].
Reading committee: prof. dr. S. Gutt (UL Brussels), prof. dr. B. De Decker (UC Leuven), prof. dr. G. R. de Lavalette (RUG).

[3] *Buring R.*, The Kontsevich graph complex action on Poisson brackets and star-products: an implementation. PhD thesis *summa cum laude* (13 October 2022, Johannes Gutenberg–Universität Mainz, Germany), 660 p. (Master's thesis, JBI RUG, 2017); publications [7, 8, 9, 12, 13, 33, 34, 35, 36, 38, 67, 68, 70, 72] and [87].
Reading committee: prof. dr. J. D. Stasheff (UPenn), prof. dr. S. Shadrin (UvA Amsterdam), prof. dr. D. van Straten (Mainz).

- Dissertation prize JGU Mainz (Year 2023).

R. Buring gave talks at the conf. 'Symmetries of discrete systems & processes' (3–7 Aug 2015, CVUT Děčín, CZ), at the 8th conf. 'Group analysis of differential equations & Integrable systems' (12–16 Jun 2016, Larnaca, CY), at 32nd colloquium Group32 on group-theoretic methods in physics (9–13 July 2018, CVUT Prague, Czech Republic), and at the international conference 'Symmetry & integrability of equations of Mathematical Physics' (22–23 Dec 2018, IM NASU Kiev, Ukraine). R. Buring presented a poster about [9] at the workshop 'Homotopy algebras, deformation theory and quantization' (16–22 Sep 2018, Bedlewo, Poland).

R. Buring spoke at the symp. 'Groningen Deformation Day' (7 Oct 2016, JBI RUG), at the symp. 'Advances in semi-classical methods in mathematics and physics' (19–21 Oct 2016, Groningen, NL), at the GQT cluster schools in geometry & quantum theory (3–7 Jul 2017 and 1–3 Jul 2019, NL), at the graduate school 'Enumerative invariants from differential graded Lie algebras and categories' (25–31 March 2018, Montegufoni, Italy), and at two SFB Transregio-45 PhD meetings (26–29 Jan 2018 in Physikzentrum Bad Honnef and 1–3 Feb 2019 in Universität Duisburg–Essen, Germany).

R. Buring gave talks at Junior Math seminar in Oxford (3 May 2017, UK), at the Intercity Number Theory Seminar (7 Apr 2017, Groningen, NL), the Floris Takens dynamical systems seminar (11 Sep 2018, BI RUG), at the Grothendieck–Teichmüller working group seminar (12 Dec 2018 in MPIM Bonn, Germany), and twice at the seminar on the mathematical aspects of scattering amplitudes (9 Jan 2019 and 15 May 2019) in Mainz, Germany.

R. Buring participated in the VIIth Heidelberg Laureate Forum (September 2019, Germany), where he was selected further –10/200– to be interviewed. In 2022, R. Buring was selected to attend and presented a poster at the workshop 'Poisson geometry, Lie groupoids and differentiable stacks' in Banff (5–10 June, BIRS, Canada); he spoke also at the 34th International colloquium on group theoretical methods in Physics (Group34, 18–22 July in Strasbourg, France). R. Buring visited the IHÉS during the weeks 18–22 April 2017, 9–13 December 2019, and 28 Nov – 2 Dec 2022.

***Realised PhD themes*:**

- Lie algebroids over infinite jet spaces (ISPU, 2008–2009): papers [16, 18, 19, 81, 83] and [14, 80].
- Intrinsic regularisation of the Batalin–Vilkovisky formalism (JBI RUG, 2011): papers [77] and [39, 74].
- The lift of deformation quantisation to Poisson field models (NWO 2011): papers [37, 77].
- Calculus of variations in the noncommutative geometry of cyclic words (GQT 2011/12): papers [11, 40] and [78, 78].

[4] *Karabanova I. V.*, Reconstruction of the ambient Euler-type equations for a chain of the modified Kaup–Boussinesq equations. Master's thesis, ISPU, 2005.
[5] *Lebedev S. A.*, Integrable hierarchies of the Kaup-Broer and nonlinear Schrödinger-type equations viewed as symmetry flows on hyperbolic systems. Master's thesis, ISPU, 2005.
[6] *Sokhryakova D. V.*, Factorizations of polynomial pre-Hamiltonian structures. Master's thesis, ISPU, 2006.
[7] *Brodowski M. A.*, Analytic methods for constructing Gardner's deformations of integrable supersymmetric systems. Master's thesis, ISPU, 2007.
[8] *Moreva E. N.*, Involutive distributions in nonlinear problems of mathematical physics. Master's thesis, ISPU, 2008.
[9] *Bouisaghouane A.*, The Kontsevich tetrahedral flow and infinitesimal deformations of Poisson structures. Master's thesis, JBI RUG, 2017; cf. [13, 73] and arXiv:1702.06044 [math.DG].

A.Bouisaghouane gave two talks at the conf. 'Symmetries of discrete systems & processes' (SDSP III, 3–7 Aug 2015, CVUT Děčín, CZ), a talk at the 8th conf. 'Group analysis of differential equations & Integrable systems' (GADEIS VIII, 12–16 Jun 2016, Larnaca, CY), and a talk at the symp. 'Advances in semi-classical methods in mathematics and physics' (19–21 Oct 2016, Groningen, NL).

[10] *de Kok W.*, The relation between Feynman diagrams and Kontsevich graphs in non-commutative star products. Master's thesis, BI & VSI RUG, 2021.
[11] *Schipper F. M.*, Kontsevich (micro)graph invariants in the geometry of Nambu–Poisson brackets: their nature and constraints. Master's *summa cum laude*, BI RUG, 2024, cf. [64–66].

F. Schipper gave a talk at the conf. 'Integrable systems & quantum symmetries – ISQS28' (1–5 July 2024, CVUT Prague, CZ).

[12] *Jagoe Brown M. S.*, Kontsevich's graph flows of Nambu-determinant Poisson brackets in 4D: their (non)triviality. Master's thesis, BI RUG, 2025, cf. [32, 86] and [63–66, 89].

M. Jagoe Brown gave **6** talks: at Int. conf. 'Integrable systems & quantum symmetries – ISQS28' (1–5 Jul 2024, CVUT Prague, CZ) and at ISQS29 (7–11 Jul 2025, CVUT Prague, CZ), at conf. 'Problems of Theoretical & Mathematical Physics' (24–26 Sep 2024, IM and Bogolyubov ITP NAS Kyiv, UA), at international symposium 'Quantum Theory & symmetries – QTS13' (28 Jul – 1 Aug 2025, Yerevan, Armenia), and in NL at the Poisson seminar (27–28 Jun 2024, Nijmegen & Utrecht) and Algebra seminar (25 Feb 2025, BI RUG, Groningen).

[13] *Supernak M. A. A.*, Topological defects in quantum gravity. Master's thesis, BI & Kapteyn Inst. RUG, 2026 (in progress).

***Bachelor supervision*** (*selected*)**:**

- *Golovko V. A.*, On geometric properties of the Toda equations associated with the semisimple Lie algebras. Lomonosov MSU (2002–2003) Moscow, Russia; cf. [28].
- *van Breukelen R.*, Topological and non-topological solitons, JBI & VSI RUG (2012) Groningen, The Netherlands.
- *Boer M.*, Lie algebras and the transition to affine Lie algebras in 2D maximal supergravity, JBI & VSI RUG (2012/13) Groningen, The Netherlands.
- *Bouisaghouane A.*, Finding new digits to replace *A*-*F* in the hexadecimal numeral system, JBI RUG (2013) Groningen, The Netherlands. — Problem 3.3 from [59].
- *Hakvoort K. J. D.*, Classical tests for very special relativity, JBI & VSI RUG (2014) Groningen, The Netherlands.
- *Griffioen S.*, Maximizing colour difference in metro maps. Bachelor's *summa cum laude*, JBI RUG (2014) Groningen, The Netherlands. — Problem 3.2 from [59], cf. [51].

- *Elbers W.*, Non-linear realisations of supersymmetry, JBI & VSI RUG (2016), Groningen, The Netherlands.
- *Mifsud P.*, Knot theory, the Jones polynomial and Chern–Simons theory, JBI & VSI RUG (2018), Groningen, The Netherlands.
- *Rutten N. J.*, Unoriented and oriented Kontsevich graph cocycles: Finding infinitesimal deformations of Poisson structures, JBI RUG (2018), Groningen, The Netherlands; cf. [12, 36, 71, 72].

N. Rutten gave four talks: at the conference SDSP IV 'Symmetries of discrete systems & processes' (12–16 June 2017, CVUT Děčín, Czech Republic), 22nd summer school 'Global analysis & applications' (21–25 August 2017, Jagiellonian University in Krakow, Poland), at 27th winter school on Mathematical Physics (22–26 January 2018, Janské Lázně, Krkonoše, Czech Republic), and 32nd colloquium GROUP32 on group-theoretical methods in Physics (9–13 July 2018, CVUT Prague, Czech Republic).

- *Kleinsmit A. A. T.*, Probability of magnon decay when scattering off magnetic domain walls, ZIAM & BI RUG (co-supervised with prof. M. V. Mostovoy, 2019), Groningen, The Netherlands.
- *Kerkhove S. S.*, Drawing the Kontsevich graphs in LaTeX, BI RUG (2020), Groningen, The Netherlands; cf. [50, 91].
- *Lipper D.*, A hidden symmetry of Kontsevich's tetrahedral flow on the space of rescaled 3D and 4D-determinant Nambu–Poisson brackets, BI RUG (2021), Groningen, The Netherlands; cf. [8].
- *Malai V.*, Local and global symmetries of PDEs, VSI & BI RUG (2022), Groningen, The Netherlands.
- *Ķēniņš M. G.*, Wronskian determinants over $\mathbb{R}^d$ as $N$-ary Lie brackets: identities, asymptotics, and topological connections to magnetic Skyrmions. Bachelor's *summa cum laude*, BI & ZIAM RUG (2026), Groningen, The Netherlands; cf. [4, 5, 61].

M. G. Ķēniņš gave **2** talks: at the Algebra seminar (16 June 2026, BI RUG, Groningen) and at the 36th international colloquium GROUP36 on group theoretic methods in Physics (13–17 July 2026, Valladolid, Spain).

***Honours College project supervision:***[16]

- *Werkman E. K.*, Drawing (beautiful) Kontsevich graphs in LaTeX, *Honours college UG* (2023/24), Groningen, The Netherlands; cf. [50].
- *Shah K. C.*, The alternating compositions of weighted differential operators yield the weights' Wronskian with which constant ? *Honours college UG* (2025/26), Groningen, The Netherlands; cf. [1, 2, 3, 60].

K. C. Shah gave **3** talks: at the 36th international colloquium GROUP36 on group theoretic methods in Physics (13–17 July 2026, Valladolid, Spain), at the GQT colloquium (24–28 Aug 2026 in Malden near Nijmegen, NL) and at the Algebra seminar in Bernoulli Institute (3 Nov 2026, Groningen, NL); K. C. Shah presented a poster at the 17th Algorithmic Number Theory symposium (6–11 July 2026, Groningen, NL).

[16] The Honours College at RuG ceased to exist as of 31 August 2026.

## List of publications

In 2011–15 in Groningen (NL) I was under contract[17] to key-author **2** articles per year in conference proceedings or journals; the overall number of my publications must be at least **3** per year on average. I had **15**: namely [14–16, 39–40, 55, 59, 75–82].

In 2016–20 in Groningen (NL) I was under contract[18] to key-author **2** articles per year in conference proceedings or journals; the overall number of my publications must be at least **3** per year on average. I had **19**: namely [9–13, 33–38, 51, 69–74, 90], and one interview; see also [99–102] and [103–106].

Since 1 June 2023, current version of tenure-track criteria at FSE RuG abolished the previously agreed norms and principles of evaluation for promotion — by introducing new ones.[19]

In 2021–25, my **13** journal publications and **2** preprints are [7–9, 31–33] and [62–68], also [89] and [86] as poster,[20] see also [92–98] and [104].

### Preprints


[1] *Shah K. C., Kiselev A. V.* (2026) The alternating compositions of weighted differential operators yield the weights' Wronskian with which constant ? *Preprint* `arXiv:2605.11137` [math.CO], 22 p.

[2] *Shah K. C., Kiselev A. V.* (2026) New integer sequence OEIS A392 714 counts Wronskians: fast evaluation via late-growing permutations, *Preprint* `arXiv:2610.08636` [math.NT], 30 p.

[3] *Shah K. C., Kiselev A. V.* (2026) The counts of parity-odd *vs* even late-growing permutations in the group $\mathbb{S}_{2p-1}$ differ by $(-1)^p$, *Preprint* `arXiv:2610.35779` [math.CO], 21 p.

[4] *Ķēniņš M. G., Kiselev A. V.* (2026) Explicit class of finite-dimensional polynomial algebras with Wronskians over $\mathbb{R}^d$ as $N$-ary Lie brackets: beyond $\mathfrak{sl}(2)$, *Preprint* `arXiv:2605.27305` [math.RA], 44 p.

[5] *Ķēniņš M. G., Kiselev A. V.* (2026) Iterate the Wronskians over $\mathbb{R}^d$ as the $N$-ary brackets on $\mathbb{R}[x^1, \dots, x^d]$: why the $N$-bonacci numbers bound the highest total degrees, *Preprint* `arXiv:2607.26039` [math.RA], 13 p.

[6] *Kiselev A. V.* (2012) The twelve lectures in the (non)commutative geometry of differential equations, *Preprint* IHÉS/M/12/13 (Bures-sur-Yvette, France). — 140 p., in preparation for: ISNMP Diamond OA Book Series (2026).


### International (refereed) journals


[7] *Buring R., Kiselev A. V.* (2024) Kontsevich's star-product up to order 7 for affine Poisson brackets: where are the Riemann zeta values ? *Open Comm. Nonlin. Math. Phys.*, Special Issue **2**, 190–233. `arXiv:2209.14438` [q-alg]

[8] *Buring R., Lipper D., Kiselev A. V.* (2022) The hidden symmetry of Kontsevich's graph flows on the spaces of Nambu-determinant Poisson brackets, *Open Comm. Nonlin. Math. Phys.* **2**, 186–216. `arXiv:2112.03897` [math.SG]

[9] *Buring R., Kiselev A. V.* (2022) The expansion $\star$ mod $\bar{o}(\hbar^4)$ and computer-assisted proof schemes in the Kontsevich deformation quantization, *Experimental Math.* **31**:3, 701–754. `arXiv:1702.00681` [math.CO]


[17] Tenure-track criteria at FMNS RuG (edition **3**, 2010): `http://www.rug.nl/fwn/organization/vacatures/vacatures/binb_engels_versie3__mei_2010.doc`

[18] Tenure-track criteria at FSE RuG (edition **4**, 2018): `https://www.rug.nl/fse/organization/vacatures/vacatures/career-paths-in-science-edition-4`

[19] Tenure-track criteria at FSE RuG (edition **5**, 2023): `https://www.rug.nl/fse/meet-the-faculty/vacatures/vacatures/careerpathsinscienceandengineering/documents`

[20] Text [50] prepared in 2022/23 for the IHÉS preprint series that ceased to expand since 2023.

[10] *Kiselev A. V., Krutov A. O.* (2019) On the (non)removability of spectral parameters in $\mathbb{Z}_2$-graded zero-curvature representations and its applications, *Acta Appl. Math.* **160**:1, 129–167. arXiv:1301.7143 [math.DG]

[11] *Kiselev A. V.* (2018) The calculus of multivectors on noncommutative jet spaces, *J. Geom. Phys.* **130**, 130–167. arXiv:1210.0726 [math.DG]

[12] *Buring R., Kiselev A. V., Rutten N. J.* (2017) The heptagon-wheel cocycle in the Kontsevich graph complex, *J. Nonlin. Math. Phys.* **24**, Suppl. 1 'Local & Nonlocal Symmetries in Mathematical Physics', 157–173. arXiv:1710.00658 [math.CO]

[13] *Bouisaghouane A., Buring R., Kiselev A.* (2017) The Kontsevich tetrahedral flow revisited, *J. Geom. Phys.* **119**, 272–285. arXiv:1608.01710 [q-alg]

[14] *Kiselev A. V., Krutov A. O.* (2014) Non-Abelian Lie algebroids over jet spaces, *J. Nonlin. Math. Phys.* **21**:2, 188–213.[Editor's choice] arXiv:1305.4598 [math.DG]

[15] *Kiselev A. V., Krutov A. O.* (2012) Gardner's deformations of the graded Korteweg–de Vries equations revisited, *J. Math. Phys.* **53**:10, Paper 103511 (18 p.) arXiv:1108.2211 [nlin.SI]

[16] *Kiselev A. V., van de Leur J. W.* (2011) Variational Lie algebroids and homological evolutionary vector fields, *Theor. Math. Phys.* **167**:3 *Nonlinear Physics: Theory & Experiment VI*, 772–784. arXiv:1006.4227 [math.DG]

[17] *Hussin V., Kiselev A. V., Krutov A. O., Wolf T.* (2010) $N$=2 supersymmetric $a$=4-KdV hierarchy derived via Gardner's deformation of Kaup–Boussinesq equation, *J. Math. Phys.* **51**:8, Paper 083507 (19 p.) arXiv:0911.2681 [nlin.SI]

[18] *Kiselev A. V., van de Leur J. W.* (2010) Symmetry algebras of Lagrangian Liouville-type systems, *Theor. Math. Phys.* **162**:3, 149–162. arXiv:0902.3624 [nlin.SI]

[19] *Kiselev A. V., van de Leur J. W.* (2009) A family of second Lie algebra structures for symmetries of a dispersionless Boussinesq system, *J. Phys. A*: *Math. Theor.* **42**:40 *Nonlinearity & geometry: connections with integrability*, Paper 404011 (8 p.) arXiv:0903.1214 [nlin.SI]

[20] *Kiselev A. V., Hussin V.* (2009) Hirota's virtual multi-soliton solutions of $N = 2$ supersymmetric KdV equations, *Theor. Math. Phys.* **159**:3 *Nonlinear Physics: Theory and Experiment V*, 832–840. arXiv:0810.0930 [nlin.SI]

[21] *Kiselev A. V., Varlamov V. I.* (2008) The spiral minimal surfaces and their Legendre and Weierstrass representations, *Diff. Geom. Appl.* **26**:1, 23–41. arXiv:math.DG/0602435

[22] *Kiselev A. V.* (2007) Algebraic properties of Gardner's deformations for integrable systems, *Theor. Math. Phys.* **152**:1 *Nonlinear Physics: Theory and Experiment IV*, 963–976. arXiv:nlin.SI/0610072

[23] *Kiselev A. V., Wolf T.* (2007) Classification of integrable super-systems using the SsTools environment, *Comput. Phys. Commun.* **177**:3, 315–328. arXiv:nlin.SI/0609065

[24] *Karasu A., Kiselev A. V.* (2006) Gardner's deformations of the Boussinesq equations, *J. Phys. A*: *Math. Gen.* **39**:37, 11453–11460. arXiv:nlin.SI/0603029

[25] *Kiselev A. V., Wolf T.* (2006) Supersymmetric representations and integrable fermionic extensions of the Burgers and Boussinesq equations, *SIGMA – Symmetry, Integrability and Geometry*: *Methods and Applications* **2** *Symmetry in Nonlinear Mathematical Physics*, Paper 30 (19 p.). arXiv:math-ph/0511071

[26] *Kiselev A. V.* (2005) Hamiltonian flows on Euler-type equations, *Theor. Math. Phys.* **144**:1 *Nonlinear Physics: Theory and Experiment III*, 952–960. arXiv:nlin.SI/0409061

[27] *Kiselev A. V.* (2004) On conservation laws for the Toda equations, *Acta Appl. Math.* **83**:1-2 *Geometry of PDE in action: zero–curvature representations, recursion operators, and control systems*, 175–182.

[28] *Kiselev A. V., Golovko V. A.* (2004) On non–abelian coverings over the Liouville equation, *Acta Appl. Math.* **83**:1-2 *Geometry of PDE in action: zero–curvature representations, recursion operators, and control systems*,25–37.

[29] *Kiselev A. V., Ovchinnikov A. V.* (2004) On Hamiltonian hierarchies associated with the hyperbolic Euler equations, *J. Dynam. Control Systems* **10**:3, 431–451.

[30] *Kiselev A. V.* (2002) On the geometry of Liouville equation: symmetries, conservation laws, and Bäcklund transformations, *Acta Appl. Math.* **72**:1-2 *Symmetries of differential equations and related topics*, 33–49.

**National (refereed) journals**

[31] *Kiselev A. V.* (2025) Jacobi identities for Wronskian determinants over multidimension, *Bulgarian J. Phys.* **52**-s1 Quantum Theory & Symmetries, 102–107. `arXiv:2511.03848` [math.RA]

[32] *Jagoe Brown M. S., Kiselev A. V.* (2025) Kontsevich graphs act on Nambu–Poisson structures, VI. Open problems, *Bulgarian J. Phys.* **52**-s1 Quantum Theory & Symmetries, 90–95. (*Preprint* `arXiv:2511.06121` [math.CO], 8 p.; App. A published in [86])

[33] *Kiselev A. V., Buring R.* (2021) The Kontsevich graph orientation morphism revisited, *Banach Center Publ.* **123** *Homotopy algebras, deformation theory & quantization*, 123–139. `arXiv:1904.13293` [math.CO]

[34] *Buring R., Kiselev A. V.* (2020) Universal cocycles and the graph complex action on homogeneous Poisson brackets by diffeomorphisms, *Physics of Particles and Nuclei Letters* **17**:5 *Supersymmetry and Quantum Symmetries'2019*, 707–713. `arXiv:1912.12664` [math.SG]

[35] *Buring R., Kiselev A. V.* (2019) Formality morphism as the mechanism of $\star$-product associativity: how it works, *Collected works Inst. Math., Kyiv* **16**:1 *Symmetry & Integrability of Equations of Mathematical Physics*, 22–43. `arXiv:1907.00639` [q-alg]

[36] *Buring R., Kiselev A. V., Rutten N. J.* (2018) Poisson brackets symmetry from the pentagon-wheel cocycle in the graph complex, *Physics of Particles and Nuclei* **49**:5 *Supersymmetry and Quantum Symmetries'2017*, 924–928. `arXiv:1712.05259` [math-ph]

[37] *Kiselev A. V.* (2017) The deformation quantization mapping of Poisson to associative structures in field theory, *Banach Center Publ.* **113** *50th Sophus Lie Seminar*, 219–242. `arXiv:1705.01777` [q-alg]

[38] *Buring R., Kiselev A. V.* (2017) On the Kontsevich $\star$-product associativity mechanism, *Physics of Particles and Nuclei Letters* **14**:2 *Supersymmetry and Quantum Symmetries'2015*, 403–407. `arXiv:1602.09036` [q-alg]

[39] *Kiselev A. V.* (2014) The Jacobi identity for graded-commutative variational Schouten bracket revisited, *Physics of Particles and Nuclei Letters* **11**:7 *Supersymmetry and Quantum Symmetries'2013*, 950–953. `arXiv:1312.4140` [math-ph]

[40] *Kiselev A. V.* (2012) On the variational noncommutative Poisson geometry, *Physics of Particles and Nuclei* **43**:5 *Supersymmetry and Quantum Symmetries'2011*, 663–665. `arXiv:1112.5784` [math-ph]

[41] *Kiselev A. V.* (2006) Minimal surfaces associated with nonpolynomial contact symmetries, *Fundam. Appl. Math.* **12**:7 *Hamiltonian & Lagrangian systems and Lie algebras*, 93–100 (in Russian; English transl.: *J. Math. Sci.* (2008) **151**:4, 3133–3138). `arXiv:math.DG/0603424`

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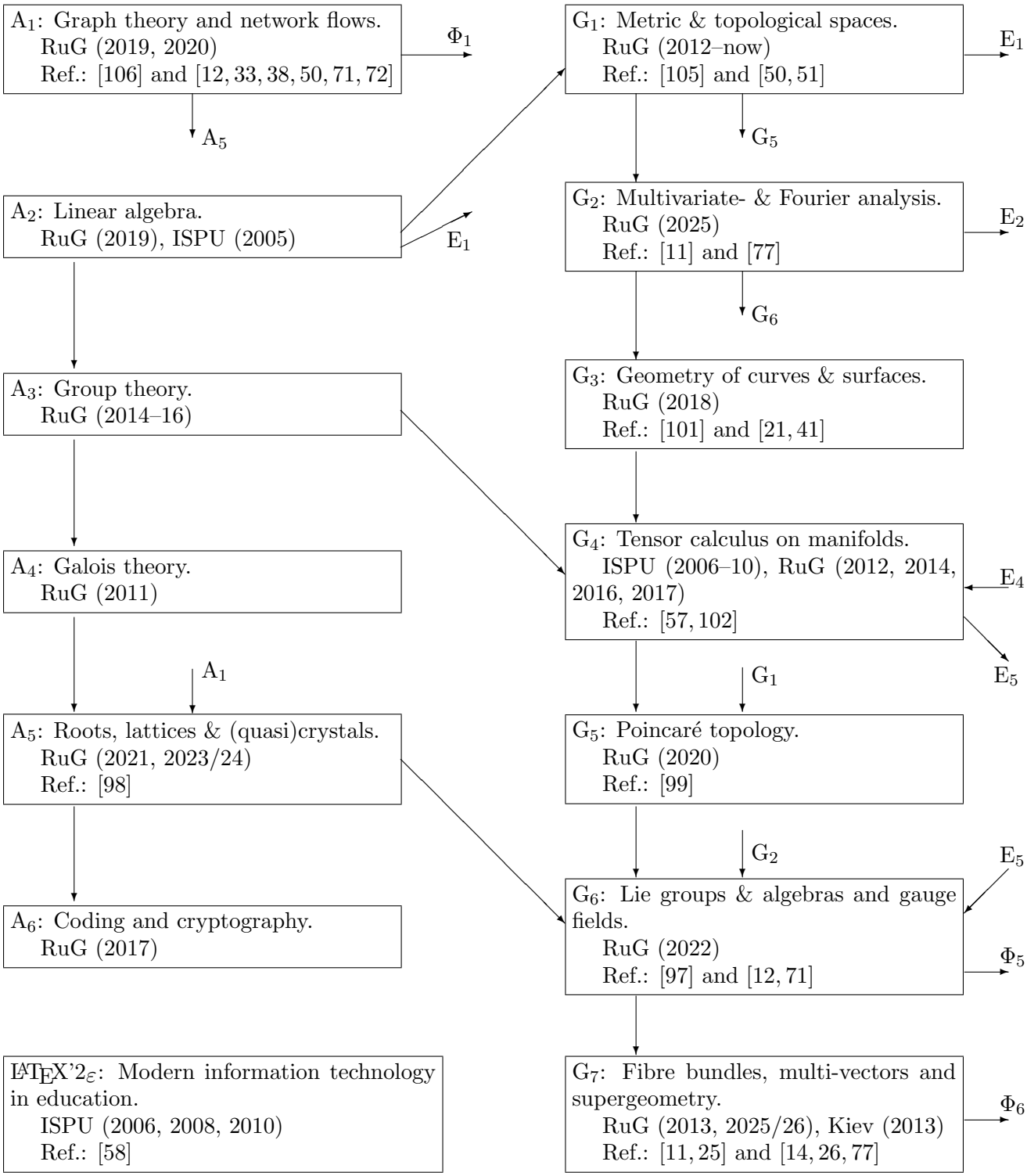
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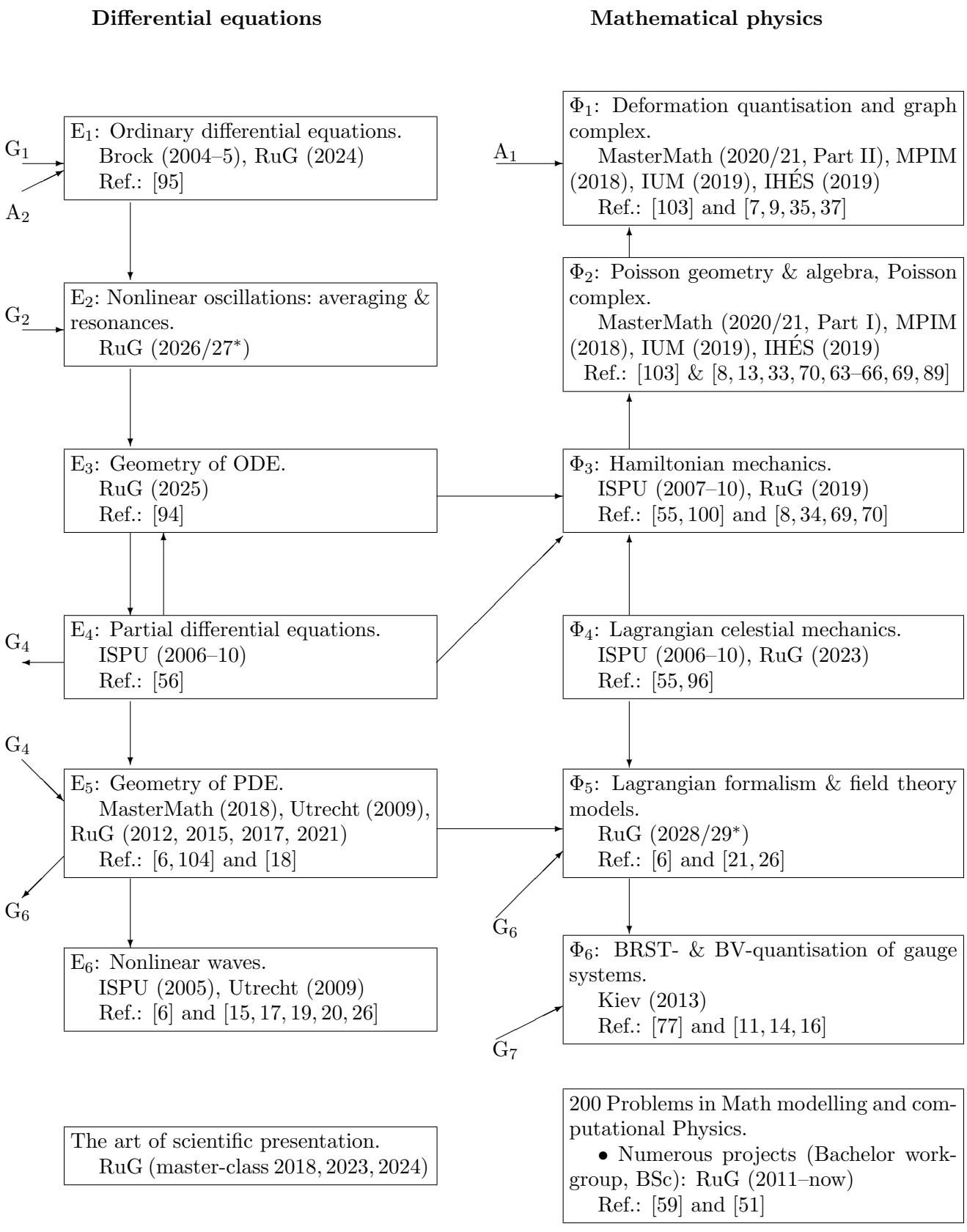
The interdependence of lecture courses and their relation to publications are displayed on pp. 22–23 (see below.)

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Name: Arthemy V. Kiselev
Place: Groningen, The Netherlands
Date: 19 November 2026.

**Algebra and combinatorics** **Geometry and topology**




Differential equations
Mathematical physics
G1
A2
E1: Ordinary differential equations.
Brock (2004–5), RuG (2024)
Ref.: [95]
G2
E2: Nonlinear oscillations: averaging & resonances.
RuG (2026/27*)
E3: Geometry of ODE.
RuG (2025)
Ref.: [94]
G4
E4: Partial differential equations.
ISPU (2006–10)
Ref.: [56]
G4
G6
E5: Geometry of PDE.
MasterMath (2018), Utrecht (2009), RuG (2012, 2015, 2017, 2021)
Ref.: [6, 104] and [18]
E6: Nonlinear waves.
ISPU (2005), Utrecht (2009)
Ref.: [6] and [15, 17, 19, 20, 26]
The art of scientific presentation.
RuG (master-class 2018, 2023, 2024)
A1
Φ1: Deformation quantisation and graph complex.
MasterMath (2020/21, Part II), MPIM (2018), IUM (2019), IHÉS (2019)
Ref.: [103] and [7, 9, 35, 37]
Φ2: Poisson geometry & algebra, Poisson complex.
MasterMath (2020/21, Part I), MPIM (2018), IUM (2019), IHÉS (2019)
Ref.: [103] & [8, 13, 33, 70, 63–66, 69, 89]
Φ3: Hamiltonian mechanics.
ISPU (2007–10), RuG (2019)
Ref.: [55, 100] and [8, 34, 69, 70]
Φ4: Lagrangian celestial mechanics.
ISPU (2006–10), RuG (2023)
Ref.: [55, 96]
Φ5: Lagrangian formalism & field theory models.
RuG (2028/29*)
Ref.: [6] and [21, 26]
G6
Φ6: BRST- & BV-quantisation of gauge systems.
Kiev (2013)
Ref.: [77] and [11, 14, 16]
G7
200 Problems in Math modelling and computational Physics.
• Numerous projects (Bachelor workgroup, BSc): RuG (2011–now)
Ref.: [59] and [51]

## Soft skills: academic norms, good practices & culture.

Master-classes (2 years × 8 sessions × 3 hours, duration whole year): since 2022/23.

***Introduction.***

- (Sep). MasterMath programme in NL: research clusters and lecture courses.
- (Feb). Scientific landscape in NL: research clusters and scientific schools.

***Master-classes in Groningen.***

| **Year A.** | **Year B.** |
|---|---|
| ***Your research project*:** | |
| • Choosing the supervisor; interaction with the supervisor and within a team. | • Scientist: personality types & comfort zone at workplace. |
| • Time-, task-, risk-, and stress management during diploma project. | • Dealing with setbacks: gap or error in research, rejected manuscript or application, failing an exam. |
| • The art of reading scientific texts. | • Tracking the source: scientific review databases MathSciNet, ZentralblattMath. |
| • The TEXnology of scientific writing: LaTeX'2$_\varepsilon$ (cf. [58]). | • Diagrams, figures, and graphics in LaTeX'2$_\varepsilon$ (cf. [58]). |
| ***Your scientific results*:** | |
| • The technology of scientific writing: Plan was first. | • Title page, abstract (verbs). |
| • Autoreferat & structure of thesis. | • Mathematical English: 'How to write a mathematical article in English'. |
| • The art of scientific presentation. | • Poster and 5-minute talk. |
| • Going to a conference & giving a talk. | • Webinars and on-line talks. |
| • `arXiv`: posting a preprint. | • Getting results published: scientific journals, conference proceedings; manuscript workflow. |
| ***Your academic career*:** | |
| • CV. | • Self-identity as a scientist; how flexible to be, choosing the path ? |
| • Letter of motivation. | • Academic job interview. |
| • Research grants: PhD and beyond. | • Good practices in academia: research, education and the spirit of science. |