CURRICULUM VITAE

MARKUSS G. ĶĒNIŅŠ

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Education: bachelor. Mathematics.

- Institution: University of Groningen — Groningen, the Netherlands
- Date: (*expected*) July 2026 — Start date: Sep. 2023
- Diploma: (*expected*) Summa cum laude [[avg. **9.3** (current)]]
  (*req.*: average and thesis grade at least 9 out of 10)
- Main courses:

• Geometry	grade 10	• Dynamical systems	grade 9.5
• Multivariable analysis	grade 10	• Group theory	grade 9.5
• Partial differential equations	grade 10	• Analysis on manifolds	[pending]

- Specialisation: Double Bachelor's degree with particle physics

Education: bachelor. Physics.

- Institution: University of Groningen — Groningen, the Netherlands
- Date: (*expected*) July 2026 — Start date: Sep. 2022
- Diploma: (*expected*) Summa cum laude [[avg. **9.3** (current)]]
  (*req.*: average and thesis grade at least 9 out of 10)
- Main courses:

• Advanced mechanics	grade 10	• Mechanics and relativity	grade 9.5
• Symmetry in physics	grade 9	• Relativistic quantum mechanics	[pending]
• Structure of matter	grade 9	• Advanced electrodynamics	[pending]

- Specialisation: Double Bachelor's degree with pure mathematics

Education: ⊕ Honours College (bachelor excellence programme).

- Institution: University of Groningen — Groningen, the Netherlands
- Date: June 2025 — Start date: Jan. 2023
- Supervisor: Prof. Dr. Thomas La Cour Jansen — E-mail: `t.l.c.jansen@rug.nl`
  Phone: +31 6 3192 1919 — Staff page: `https://www.rug.nl/staff/t.l.c.jansen/`
- Project: 'Computational 2D infrared spectroscopy to observe ring puckering in sugar molecules in solvent' — Collaborators (exp.): Prof. Dr. Henrike Müller-Werkmeister & group

Education: high school.

- Institution: Riga State Gymnasium No. 1 *Anno 1211* — Riga, Latvia
- Date: July 2022 — Start date: Sep. 2019
- Diploma: Red cover & Golden stipend [[avg. **9**]]
  (*req.* (red cover): significant achievements in Olympiads and competitions)
  (*req.* (golden st.): **top 20** students in the city of Riga)
- Main courses: Mathematics (grade 10), Calculus (10), Physics (10), Chemistry (10), Biology (10)
- Specialisation: Mathematics and Natural sciences — school specialised in maths
- School ranking: Best school in Latvia
  2025 rating: #**1 national** [default] & #**1 international** ['star']; determined by results in Olympiads & research competitions `https://www.skolureitings.lv/?page_id=1418` [default] and `https://www.skolureitings.lv/?p=1385` ['star']

Olympiads: master-level.

2026: [[*pending*]] **PLANCKS** (May, 2026) – International physics Olympiad for master *and* bachelor teams (shared leaderboard). ◦ Webpage: `https://iaps.info/events/plancks/`

2025: [[**1st place** bachelor; 2nd overall]] **PION** ('Project Interuniversitaire Olympiade Naturkunde') – Netherlands physics Olympiad for teams of master *and* bachelor teams.

2024: [[**2nd place** bachelor]] **PION**, *ditto.*

2023: [[participated]] **PION**, *ditto.*

Olympiads & competitions: bachelor-level.

2024 [[**silver**]] University Physics Competition – International physics competition for bachelor teams: 48 hours, 1 open problem. ◦ Webpage: `https://uphysicsc.com/`

- [[rank 35/233; best Dutch team]] Physics Brawl Online – International physics competition for university & high school teams. Categ. 'O'. ◦ Webpage: `https://physicsbrawl.org/`

Olympiads & competitions: international high-school-level.

2022: [[**bronze**]] 33rd International Biology Olympiad

- [[upper bracket statistics]] ISEF – Regeneron International Science and Engineering Fair
- [[**silver**]] IGP of IBO – International Group Project as part of the 33rd IBO: research proposal

2021: [[**bronze**]] 32nd International Biology Olympiad

Olympiads & competitions: national high-school-level.

2022: [[**silver**]] 46th Latvian Conference of Student Research; qualified for ISEF

- [[**gold**]] 46th Riga Conference of Student Research
- [[**gold**]] 3rd Latvian Teams Physics Olympiad; ⊕ spec. prize for best experiment
- [[**merit**]] 47th Latvian Open Physics Olympiad
- [[**merit**]] 72nd Riga State Physics Olympiad
- [[**silver**]] 44th Latvian State Biology Olympiad
- [[**gold**]] 44th Riga State Biology Olympiad
- [[**bronze**]] 63rd Latvian State Chemistry Olympiad
- [[**gold**]] 63rd Riga State Chemistry Olympiad

2021: [[**silver**]] 43rd Latvian State Biology Olympiad

- [[**gold**]] 43rd Riga State Biology Olympiad
- [[**merit**]] 62nd Riga State Chemistry Olympiad

2020: [[**bronze**]] 42nd Latvian State Biology Olympiad

- [[**gold**]] 42nd Riga State Biology Olympiad
- [[**silver**]] 61st Riga State Chemistry Olympiad

Invited plenary talks at symposia & colloquia.

2024: Physics, Astronomy, and Mathematics Symposium, UG, Groningen, the Netherlands
◦ Title: Heat transfer simulations using discrete random processes
◦ Collaborators: Stanislavs Dubrovskis, Eduard Mrug, Toms Ozoliņš ◦ Audience: ca. 600
◦ Note: The plenary talk was given as the winning first-year research project in physics

Talks at conferences, symposia, and research group meetings.

2025: Theory of Condensed Matter Jansen group, Zernike Institute for Advanced Materials, University of Groningen (UG), Groningen, the Netherlands [CONFIRM !!!!!]
◦ Title: Computational spectroscopy of sugar molecules III
◦ Supervisor: Prof. Dr. Thomas L.C. Jansen ◦ Type: Presentation ◦ Audience: ca. 20

- **Honours Closing Symposium**, UG, Groningen, the Netherlands
  ◦ Title: Computational spectroscopy of sugar molecules II
  ◦ Supervisor: Prof. Dr. Thomas L.C. Jansen ◦ Type: Poster ◦ Audience: ca. 100
- **at lecture: 'Physics Lab: Research Project'** , UG, Groningen, the Netherlands
  ◦ Title: How to design your first-year research project? Our winning project
  ◦ Collaborators: S. Dubrovskis, E. Mrug, T. Ozoliņš ◦ Type: Presentation ◦ Audience: ca. 100

2024: Physics, Astronomy, and Mathematics Symposium, UG, Groningen, the Netherlands
◦ Title: Heat transfer simulations using discrete random processes
◦ Supervisor: Ena Salihovic ◦ Collaborators: S. Dubrovskis, E. Mrug, T. Ozoliņš
◦ Type: Poster (⊕ cf. plenary talk) ◦ Audience: ca. 600

- **Honours Closing Symposium**, UG, Groningen, the Netherlands
  ○ Title: Computational spectroscopy of sugar molecules I
  ○ Supervisor: Prof. Dr. Thomas L.C. Jansen ○ Type: Poster ○ Audience: ca. 200

2023: **Computational Biotechnology Fürst group**, Groningen Biomolecular Sciences and Biotechnology Institute, UG, Groningen, the Netherlands
○ Title: Evaluation of methods of structure preparation in comp. enyme eng.
○ Supervisor: Prof. Dr. Maximilian J.L.J. Fürst ○ Type: Presentation ○ Audience: ca. 30

2022: **Regeneron International Science and Engineering Fair (ISEF)**, Atlanta, Georgia, US
○ Title: Biotin consumption in baker's yeast *Saccharomyces cerevisiae* strains auxotrophic for biotin ○ Supervisor: Dr. Jānis Liepiņš ○ Type: Poster○ Audience: ca. 1700

- **Latvian Conference of Student Research**, University of Latvia, Riga, Latvia
  ○ Title: Biotin consumption in baker's yeast *Saccharomyces cerevisiae* strains auxotrophic for biotin ○ Supervisor: Dr. Jānis Liepiņš ○ Type: Poster○ Audience: ca. 100
- **IBO International Group Project**, Yerevan State University, Yerevan, Armenia
  ○ Title: A proposal for inducing controllable magnetotactic movement in the ciliate *T. Thermophila* ○ Supervisor: Arman Simonyan ○ Type: Poster ○ Audience: ca. 200

Independent self-study and reading. [The date indicates the earliest reading date.]

2025: Differential geometry:
○ 'Modern geometric structures and fields' (AMS grad. stud. in math. Vol. 71; §§ 5–13), S. P. Novikov, I. A. Taimanov, [[Advanced material; part of Master's course]]
○ 'Tensor calculus on manifolds' (lecture notes 2017, UG), Dr. Arthemy V. Kiselev (sel. §§),
○ 'Lectures in Geometry, Sem. II: Linear algebra and differential geometry' (§§ L10+), M. M. Postnikov, English translation, 1982,
○ 'Geometry' (lecture notes 2021, UG), Prof. Dr. Roland van der Veen,

- Advanced calculus:
  ○ 'Calculus on Manifolds', Michael Spivak,
  ○ 'Multivariable analysis' (lecture notes 2021, UG), Prof. Dr. Roland van der Veen,
  ○ 'Lectures in Geometry, Sem. II: Linear algebra and differential geometry' (§§ L1–L9), M. M. Postnikov, English translation, 1982,

2024: Calculus of variations and Lagrangian mechanics:
○ 'Calculus of Variations', (§§ 1–15), I. M. Gel'fand, S. V. Fomin, English translation, 1963,
○ 'Course of theoretical physics, Vol. I, "Mechanics" ', L. D. Landau, E. M. Lifshitz, English translation, 1969,
○ 'Course of theoretical physics, Vol. II, "The classical theory of fields" ' (§§ 1–14; Ch. 1–2), L. D. Landau, E. M. Lifshitz, English translation, 1971,

- Quantum mechanics:
  ○ 'Modern quantum mechanics' (revised ed.; red cover; sel. §§), J. J. Sakurai, 1995,

Notable extracurricular courses.

2026: Advanced logic, Prof. Dr. L.C. Verbrugge ○ Semester: II-a[1] ○ Load: 5 ECTS
○ Programme: `https://ocasys.rug.nl/current/catalog/course/WBAI017-05`

2025: Geometry and Topology, [[**master's course**[2]]] Dr. Arthemy V. Kiselev, ○ Semester: I-b
○ Programme: `https://ocasys.rug.nl/current/catalog/course/WMMA018-05`

- Functional Programming, Dr. Arnold Meijster ○ Semester: I-b ○ Load: 5 ECTS
  ○ Programme: `https://ocasys.rug.nl/current/catalog/course/WBCS002-05`
- Introduction to Logic, Prof. Dr. Davide Grossi ○ Semester: I-b ○ Load: 5 ECTS
  ○ Programme: `https://ocasys.rug.nl/current/catalog/course/WBAI012-05`

Teaching.

Teaching qualifications.

2024: 'Teaching assistant training' awarded by: University of Groningen, Faculty of Science and Engineering. ○ Topics: Didactics, feedback, group dynamics, cultural diversity, exam &

[1]The academic year consists of two semesters (I – autumn & II – spring), each divided in half into terms 'a' and 'b'.
[2]By law a master's course cannot appear on a bachelor diploma. I followed the lectures, but cannot obtain credits.

assignment assessment. ◦ Examiner: Dr. Agata M. Szperl ◦ Load: 21 h ◦ Date: Oct. 2024

Lectures read.

2025: 'Einstein's special relativity' (24 Oct.; 1h 45 min) ◦ Course: Mechanics and relativity
◦ Topics: **§1** – overview of material from kinematics (postulates, fundamental effects, Lorentz & Einstein transformations); **§2** – energy and momentum for massive particles and photons; transformations; **§3** – conservation of 4-momentum; **§4** – collision problems; **§5** – acceleration and force, energy gradient; **§6** – reformulation & generalisation to 4-vector formalism.
◦ Lecture transcript: ADD-LINK-TO-WEBSITE ◦ Audience: ca. 200
◦ Prepared problems: ADD-LINK-TO-WEBSITE

- 'Magnetostatics' (4 Apr.; 1 h 15 min) ◦ Course: Electricity and magnetism
◦ Topics: **§1** – Lorentz force law, right hand rule; **§2** – Biot-Savart law; **§3** – Ampere's law; **§4** – Magnetisation, bound currents, dia-/para-/ferromagnets; **§5** – Linear magnetics.
◦ Lecture transcript: ADD-LINK-TO-WEBSITE ◦ Audience: ca. 120

Lecture notes written. [[As teaching staff.]]

2025: 'Multivariable Analysis' ◦ Course: Multivariable Analysis ◦ Link: ADD-LINK-TO-WEBSITE
- 'Electrostatics' ◦ Course: Electricity and Magnetism ◦ Link: ADD-LINK-TO-WEBSITE

2024: 'Special Relativity' ◦ Course: Mechanics and Relativity ◦ Link: ADD-LINK-TO-WEBSITE

Lecture transcripts written. [[As a student.]]

2025: Geometry and Topology, [[**master's course**[2]]] Dr. Arthemy V. Kiselev, ◦ Semester: I-b
◦ Transcript link: ADD-LINK-TO-WEBSITE

Courses taught as teaching assistant **University of Groningen.** [3]

General duties: [2 h session]: 20–30 min recapitulation of the previous lecture, 1–2 h assistance with solving exercises; exam and homework assignment grading; hearing appeals at exam review sessions.
Load: contact 4 h/week, preparation & grading 2–5 h/week; for students 5 ECTS per term ('a'/'b').

	Sem.	[[∗: re-hired, ∗∗: re-h. other[3]]]	Lecturer(-s) [PROGRAMME?]
2026:	II	Electricity and Magnetism*	Prof. Dr. Maxim S. Pchenitchnikov, Dr. Jelle Aalbers
2025:	I-b	Multivariable Analysis	Dr. Hildeberto Jardon Kojakhmetov
•	I-b	Complex Analysis**	Prof. Dr. Oliver Lorscheid, Dr. Cagri Karakurt
•	I-b	Advanced Mechanics	Dr. Emanuela Dimastrogiovanni
•	I-b	Electricity and Magnetism**	Dr. Myroslav Kavatsyuk
•	I-a	Mechanics and Relativity*	Prof. Dr. Diederik Roest, Dr. Daan Meerburg
•	I-a	Metric & Topological spaces	Dr. Arthemy V. Kiselev
•	I-a	Calculus 2	Dr. Cagri Karakurt
•	II	Electricity and Magnetism	Prof. Dr. Maxim S. Pchenitchnikov, Dr. Jelle Aalbers
•	II-b	Linear Algebra	Dr. Ekin Özman
•	II-b	Physics lab: Research Project	Dr. Jelle Blijleven
•	II-a	Fundamentals of Electronics	Prof. Dr. Elisabetta Chicca
2024:	I	Mechanics and Relativity	Prof. Dr. Diederik Roest, Dr. Daan Meerburg
•	I-a	Computational Methods 2	Dr. Myroslav Kavatsyuk

1. Administrative experience

2. Personal profile

[3]Explanations in table: "*": Re-hired for the same course again. "**": Hired for the course by a professor with whom I taught a different course before.