

Andrei Rodin

Contact information:

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Areas of Specialisation:

History of Mathematics, Philosophy of Mathematics, History and Philosophy of Computing, Philosophical Logic, Liberal Arts Mathematics

Areas of Competence:

Mathematics Education, Undergraduate Mathematics for Engineering schools, History and Philosophy of Science.

Current affiliations:

(1) University of Lorraine (Nancy, France), researcher in the Archives Henri-Poincaré (UMR 7117) and lecturer in the Engineering School ENSGSI (temporary joint research and teaching position, ATER) <http://poincare.univ-lorraine.fr/fr/membre-titulaire/andrei-rodin>

(2) Associated Researcher (chercheur associé étranger) in the laboratory SPHERE (Paris), French National Center for Scientific Research (UMR7219) <http://www.sphere.univ-paris-diderot.fr/spip.php?rubrique48&lang=fr>

(3) Smonly Beyond Borders program (SBB) sponsored by Andrew Gagarin Center for Liberal Education; <https://www.smolny.org>

Past affiliations:

September 2012 - June 2022: Saint-Petersburg State University (SPBU, Russia), Smolny College of Liberal Arts and Sciences;

February 2012 - June 2022: Russian Academy of Sciences, Institute of Philosophy (Moscow)

2007-2011: Postdoctoral Fellow at the Department of History and Philosophy of Science of University Paris-Diderot (Paris, France)

2003-2007: Postdoctoral Fellow at the Philosophy Department of Ecole Normale Supérieure (Paris),

2000-2002: Visiting Researcher and Lecturer in the University of Iceland (Reykjavik)

Fall 1998 - Spring 1999 : Fulbright Visiting Scholar at the Department of Philosophy of Columbia University (New York City)

1995-1998: Junior Researcher at the Institute of Philosophy of Russian Academy of Sciences

Academic qualifications:

2020 : Dr. Sc. in Philosophy; Hab. thesis title: “Axiomatic Architecture of Scientific Theories”; defended in Saint-Petersburg State University 23 December 2020 and approved by French National University Committee (CNU) in 2022;

1995 : Ph.D. in Philosophy; Ph.D. thesis title: “First Four Books of Euclid’s Elements in the Context of Plato’s and Aristotle’s Philosophy”; defended in the Institute of Philosophy of Russian Academy of Sciences and approved by French National University Committee (CNU) in 2022

1990 : MA in Mathematics Education. MA thesis title: “A Comparative Analysis of reforms in mathematical education in the USSR, USA and France during the second half of 20th century”; obtained from Moscow Pedagogical Institute.

Teaching (since Fall 2012):

Fall 2022 - Spring 2024:

-**ENSGSI** (undergraduate): Geometry for Physics (20h of lectures and 25h x2 of seminars), Complex Numbers (15h x2), Mathematical Statistics (20h), Experimental Design (30h x2), Data Analysis (20h), Bibliographical Research (40h), Epistemology (14h x2)

-**UL Master-2 Program in Epistemology, Logic and History of Science:** History and Philosophy of Mathematics (Fall 2023, online, 25h)

- **SBB** (undergraduate): Science and War (Fall 2022, online, 20h), Introduction to Liberal Arts Mathematics (Fall 2023, online, 40h), How Did Science Become Mathematical? Historical and Philosophical Perspectives (Spring 2024, online, 40h)

Fall 2012 - Spring 2022:

SPBU Smolny (undergraduate): Introduction to Mathematics and Computer Science (60h x10), Category Theory (60h x3), Proof theory (60h x2), History and Philosophy of Mathematics (60h x4), Philosophy of Computing (60h x2)

SPBU Smolny (master): Philosophy of Science (60h x4)

SPBU Department of Mathematics and Computer Science (master): History and Philosophy of Mathematics (30h x2)

Research:

Research grants (last 10 years):

2023 - Research grant of the Maison de Sciences de l’Homme de Lorraine (House of Social Sciences and Humanities in Lorraine) for the project “Durability of Digital Storages for Archival Purposes” (co-PI with Pierre Williams)

2022-2023: Research grant of Russian Scientific Foundation for the project “Epistemology of Digital Knowledge Representation: empirical conjectures, formal proofs and human understanding” (PI);

2019-2021: Research grant of Russian Foundation for Fundamental Research for the project “Problem of Knowledge Justification in Formal Epistemology” (PI);

2016- 2018: Research grant of Russian Foundation for Fundamental Research for the project “Logical and Epistemological Aspects of Constructive Knowledge” (PI);

2013-2015: Research grant of Russian Foundation for Humanities for the project “Axiomatic Method as a Tool of Scientific Inquiry” (PI);

2013-2015: Research grant of Russian Foundation for Fundamental Research for the project “Epistemic strategies of applications of mathematics in natural sciences” (PI);

2013-2014: Research grant of Saint-Petersburg University for the project “Mathematical and Logical Structures of Knowledge Representation” (PI).

Selected Publications:

in English:

Monograph:

Axiomatic Method and Category Theory (Synthese Library, vol. 364), Springer 2014

Blind-refereed journal articles:

1. “Voevodsky’s Unfinished Project: Filling the Gap between Pure and Applied Mathematics”,

- BioSystems* vol. 204 : 104391 (May 2021, included into the Special Issue on Foundations of Mathematics and Theoretical Biology)
2. "Two "Styles" of axiomatization: Rules versus Axioms. A Modern Perspective." *Bulletin of Symbolic Logic*, vol. 24, no 2 (2018), p. 263-264
 3. "On Constructive Axiomatic Method", *Logique et Analyse*, vol. 61, no 242 (2018), p. 201-231, preprint arXiv:1408.3591
 4. "Venus Homotopically", *IfCoLOg Journal of Logics and their Applications*, vol. 4, n. 4, p. 1427-1446 (open access)
 5. "Elements of Categorical Logic: 50 Years Later" (with Valeria de Paiva), *Logica Universalis* 7(2013), pp. 265-273
 6. "Categories Without Structures", *Philosophia Mathematica* 19(1), 2011, pp. 20-46, preprint arXiv:0907.5143
 7. "How Mathematical Concepts Get Their Bodies", *TOPOI* 29(1), pp. 53-60,
 8. "Identity and Categorification" *Philosophia Scientiae*, 11 (2), 2007, pp. 27-65, preprint arXiv: 0509596

Chapters and other:

1. Kolmogorov's Calculus of Problems and Its Legacy (66 pages), preprint arXiv:2307.09202
2. "One Mathematics or Many? Foundations of Mathematics in the 20th century Mathematical Practice", in B. Sriraman et al. (eds), *Handbook of the History and Philosophy of Mathematical Practice*, Springer, Cham. https://doi.org/10.1007/978-3-030-19071-2_28-1 (2021)
3. Editorial to Special Issue of *BioSystems* on Foundations of Mathematics and Theoretical Biology (May 2021) p. 104416 (co-authored with Elena Fimmel).
4. *Axiomatic Architecture of Scientific Theories* (Habilitation Thesis). Saint-Petersburg University 2020. The English text is followed by the Russian translation. Available at the official site of Saint-Petersburg University: <https://dissert.spbu.ru/zashchita-uchenoj-stepeni-spbgu/369-andrei-v-rodin.html>
5. "Models of HoTT and the Constructive View of Theories", in D. Sarikaya and D. Kant (Eds.) *Reflexions on Foundations of Mathematics*, Springer, the Synthese Library, 2019, pp. 191-219
6. "Extra-logical proof-theoretic semantics in HoTT", in Piecha, Th. and Schroeder-Heister, P. (eds) *Proof-theoretic Semantics: Assessments and Future Perspectives*. p. 765-786, DOI: 10.15496/publikation-35319
7. "Computing in Space and Time", in W. Pietsch et al. (ed.), *Berechenbarkeit der Welt? Philosophie und Wissenschaft im Zeitalter von Big Data*, Springer 2017, pp. 193-207
8. "Did Lobachevsky Have a Model of His Imaginary Geometry?" *Philosophy of Science* (Novosibirsk), 3(66), 2015, preprint arXiv:1008.2667
9. "Constructive Identities for Physics", in: *Proceedings of Science* (online), Proceedings of international conference Frontiers of Fundamental Physics 2014 (Marseille July 15-18, 2014).

in Russian (the titles are translated into English):

Monographs:

1. *Axiomatic Architecture of Scientific Theories*, in press in Saint-Petersburg University Publishing
2. *Euclid's Mathematics in the Context of Plato's and Aristotle's Philosophy*, Moscow, Nauka, 2003

Blind-refereed journal articles:

1. Models of Explanation in Machine Learning (with S.M. Titov), accepted for publication in *Vestnik of Tomsk State University*
2. Computer-assisted proofs and their understanding by a human, *Intellectual Systems: Theory and Applications*, v. 25, n. 4, p. 337-342

3. “Computations in Nature and the Nature of Computations”, *Questions of Philosophy (Voprosi Filosofii)*, 11, 2020, pp. 129-132
4. “Problem of Justification in Knowledge Representation” (with S. Kovalyov), *Vestnik of Tomsk State University*, 46 (2018), p. 22-29
5. “Knowledge and its Representation in the Computer Era” (with S. Kovalyov), *Human (Chelovek)* 30(4), pp. 94-112
6. “Logical and Geometrical Atomism from Leibniz to Voevodsky”, *Questions of Philosophy (Voprosi Filosofii)* N6 (2016), pp. 134-142
7. “Axiomatic Method in Today's Science and Technology: Pragmatic Aspects”, *Epistemology and Philosophy of Science*, 47 (1), 2016, p. 153-169
8. “Programmatic Realism in Physics and Foundations of Mathematics”, *Questions of Philosophy (Voprosi Filosofii)* N4 (2015), p. 58-67 (part 1) and N5 (2015), pp. 58-68 (part 2).
9. “Kant and New Mathematics Hundred Years Later”, *Kant Studies (Kantovskii Sbornik)*, 1(51) (2015), pp. 7-16
10. “Category Theory and New Mathematical Principles of Physics”, *Questions of Philosophy (Voprosi Filosofii)*, 7, 2010, pp. 67-82

Languages: Russian (native), English (fluent), French (fluent), German (reading and basic communication), Latin and Old Greek (scholarly reading)

Professional Societies: (1) Member of Council of Russian Society for History and Philosophy of Sciences (since 2015); (2) Member of Board of Directors of Logica Universalis Association (since 2020)

Member of Editorial Boards: Logica Universalis (Springer)

Invited Editor: (1) Special Issue of *BioSystems* (Elsevier) on Foundations of Mathematics and Theoretical Biology (2021, jointly with Elena Fimmel); (2) Special Issue of Logica Universalis (Springer) on Categorical Logic (2013, jointly with Valeria de Paiva)