Evaluation Board Decision on the Nomination for Appointment to Professor

Masaryk University

Faculty	Faculty of Science
Procedure field	Mathematics - Geometry
Applicant	doc. Anton Galaev, Dr. rer. nat.
Applicant's home unit, institution	Department of Mathematics, Faculty of Science, University of Hradec Králové
Board members	
Chair	prof. RNDr. Josef Janyška, DSc.
	Faculty of Science, Masaryk University
Members	prof. RNDr. Jan Slovák, DrSc.
	Faculty of Science, Masaryk University
	prof. RNDr. Miroslav Doupovec, CSc.
	Faculty of Mechanical Engineering, Brno University of Technology
	prof. RNDr. Vladimír Souček, DrSc.
	Faculty of Mathematics and Physics, Charles University
	Prof. Anna Maria Fino, Ph.D.
	Department of Mathematics "Giuseppe Peano", University of Turin, Italy

Evaluation of the applicant's scholarly/artistic qualifications

Doc. Anton Galaev, Dr. rer. nat., received his Master's degree in 2003 from Saratov State University (Russia), and the doctoral degree Dr. rer. nat. (equivalent of Ph.D.) in 2006 in the field of Mathematics at Humboldt University (Berlin, Germany, thesis: Holonomy groups and special geometric structures of pseudo-Kählerian manifolds of index 2, under the supervision of Helga Baum). He received the title of associate professor (doc.) in 2014 in the field of Mathematics – Geometry at Masaryk University (habilitation thesis: Theory of Holonomy Groups for Supermanifolds). He received the title of Doctor of Science (equivalent to DSc.) in 2014 at Lomonosov State University (Moscow, Russia, thesis: Holonomy groups of Lorentzian and supermanifolds).

His professional experience includes researcher (2003) at the Institute of Mathematics, Humboldt University in Berlin (Germany), research and development worker (2007-2016) at the Department of Mathematics and Statistics, Faculty of Science, Masaryk University, Brno, Czech Republic, and since 2014 he works as an associate professor at the Department of Mathematics, Faculty of Science, University of Hradec Králové, Czech Republic.

Since the days of his doctoral studies, the main area of scientific interest of A. Galaev has been the study of holonomic groups in differential geometry, especially in the area of pseudo-Riemannian manifolds and, in particular, of Lorentzian manifolds. He was able to make many remarkable and widely recognized contributions in this area. Among his first major results was the construction of Lorentzian metrics with prescribed holonomy and the complete classification of holonomic groups for Lorentzian manifolds. He also achieved significant results in the study of Lorentz connections. Furthermore, he has systematically developed the holonomy theory of superconnections on supermanifolds. One of his main results in supergeometry is a Berger classification for Riemannian supermanifolds. These examples demonstrate the extraordinary breadth of his research in holonomy theory, an area with important applications in general relativity and mathematical physics. Another milestone in his work is his investigation of non-Ricci-flat pseudo-Riemannian Einstein manifolds. He shows that its holonomy algebra contains a significant reductive subalgebra, which is again the holonomy algebra of an Einstein pseudo-Riemannian manifold, and this holonomy algebra is known. This allows us to get a complete description of the holonomy algebras of such manifolds in arbitrary signature. The papers of A. Galaev have a great response not only among mathematicians but also among theoretical physicists in the field of general relativity. A. Galaev became an internationally acknowledged expert in the field of holonomy theory and pseudo-Riemannian manifolds, which is documented by the offer to write a chapter about this topic in the Handbook of pseudo-Riemannian geometry and supersymmetry.

A. Galaev is the author or co-author of 37 original scientific articles, of which 35 are in the WoS database. In the WoS database, his articles have 298 citations of which 199 without self-citations, his h-index is 10. His papers are published in very good journals, e.g., Journal of the Institute of Mathematics of Jussieu, Documenta Mathematica, Classical and Quantum Gravity, Journal of Geometric Analysis, Journal of the London Mathematical Society, Letters in Mathematical Physics, Russian Mathematical Surveys, Differential Geometry and its Applications.

A. Galaev has a very wide international cooperation, which is evidenced by more than 10 short-term stays (in addition to participation in conferences) at European universities and three long-term stays at Erwin Schrödinger International Institute for Mathematical Physics, Vienna, Austria (2005, 5 months), ETH Zürich, Zürich, Switzerland (2006, 5 months) and Technische Universität Wien, Vienna, Austria (2019, 6 months).

At the University of Hradec Králové, he created a scientific team consisting of guests on long-term stays, postdoctoral fellows and doctoral students of A. Galaev. The team received a grant from the University in Hradec Králové and a GAČR junior project. The team members have published more than 60 papers.

A. Galaev was a supervisor of 2 PhD students, namely Andrei Dikarev (successfully defended 2022, MU) and Igor Ernst (successfully defended 2023, MU).

A. Galaev was the principal investigator of two grants of the Czech Science Foundation (GAČR 18-00496S "Singular spaces from special holonomy and foliations", 2018–2020, GAČR GP201/09/P039 "Holonomy of Riemannian supermanifolds and related geometric structures",

2009–2011) and a member of the research team of the project CZ.1.07/2.3.00/20.0003 "Algebraic methods in geometry with potentials in applications", 2011–2014.

A. Galaev is also active in the organizational field connected with scientific activity. He was a member of the Mathematical panel (201) of the Czech Science Foundation (GAČR, 2017–2020). He is a member of the editorial board of the journal Analysis and Mathematical Physics (since 2020). He was the main organizer and chair of the following international conferences: International Conference Differential Geometry and its Applications (Hradec Králové, 2019 and 2022), online Summer School on Geometry and Topology (2021), Summer School Geometry and Topology (Hradec Králové, 2019), Spring School Geometry and Topology (Hradec Králové, 2018).

In 2016 he received the award of the rector of University of Hradec Králové and Česká spořitelna for high results in publication activity.

The Evaluation Board states that A. Galaev is a high-quality scientist widely respected by the mathematical community.

Conclusion: The applicant's scholarly/artistic capabilities **meet** the requirements expected of applicants participating in a professor appointment procedure in the field of Mathematics - Geometry.

Evaluation of the applicant's pedagogical experience

During A. Galaev's tenure at Masaryk University, he participated in teaching the courses Mathematical Analysis II (tutor), Global Analysis (lecturer and tutor), and Symplectic Geometry (lecturer). At the University of Hradec Králové he lectured and tutored the courses Algebra 1, 2, 3, Introduction to Topology, Introduction to Algebraic Geometry, Introduction to Algebraic Topology, Matrix Calculus. He prepared two texts to support his lectures. He guarantees 18 courses in total.

He was the supervisor of 2 successfully completed bachelor theses, 1 master thesis, and 2 doctoral theses mentioned above.

Conclusion: The applicant's pedagogical capabilities **meet** the requirements expected of applicants participating in a professor appointment procedure in the field of Mathematics - Geometry.

Evaluation of the applicant as a respected and recognized scholarly or artistic figure in a given field

Based on the documents submitted by A. Galaev, letters of recommendation, publication results, and the public lecture, the Evaluation Board states that A. Galaev is a mature mathematician who has a very good reputation in the scientific community in the field of differential geometry. His works are published in high-quality scientific journals and receive high acclaim. His pedagogical activity is also at a high level. There is no doubt that he meets the requirements for appointment as a professor in the field of Mathematics - Geometry.

Conclusion: The applicant **is** a respected and recognized scholarly figure in his/her field. The applicant **has** made a significant contribution to the development of his/her field. The applicant **constitutes** a leading figure in his/her field of scholarship or research.

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**Evaluation Board Decision on the
Nomination for Appointment to Professor**

Secret vote results

Voting took place: electronically

Number of board members		5
Number of votes cast		5
of which	in favour	5
	against	0

Board decision

Based on the outcome of the secret vote and following an evaluation of the applicant's scholarly or artistic qualifications, pedagogical experience and role as a respected and recognized scholarly or artistic figure, the board hereby submits a proposal to the Scientific Board of the Faculty of Science of Masaryk University to **appoint the applicant professor** of Mathematics - Geometry.

In Brno on 07.03.2024

prof. RNDr. Josef Janyška, DSc. ....