Radosław A. Kycia, PhD
kycia.radoslaw@gmail.com
+48 607 73 74 92
ORCID ID: orcid.org/0000-0002-6390-4627
ResearcherID: J-4397-2015

Preferred Order of Projects

1. Tobias Fritz, Simplifying quantum circuits using the ZX-calculus

2. David Spivak, Toward a mathematical foundation for autopoiesis

3. Mehrnoosh Sadrzadeh, Traversal optics and profunctors

4. David Spivak, Formal and experimental methods to reason about dialogue and discourse using categorical models of vector spaces

5. Pieter Hofstra, Partial evaluations, the bar construction, and second-order stochastic dominance

Justification:

1. I have strong background in physics and interest in this area.

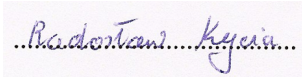
2. I am interested in my recent research in self-organization and complex systems description.

3. Functional approach in data analysis is also one of my current research interest.

4. This subject is interesting as an example of describing complex phenomena and good tutorial introduction.

5. I would like to learn more on partial evaluation since I plan to do research in describing distributions (Schwartz) in such a way.

Yours sincerely,



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Research Interests

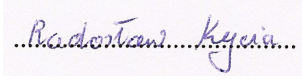
I obtained PhD degree from theoretical physics (General Relativity, nonlinear differential equations and numerical simulations). I have also experience in theoretical particle physics as well as in multidisciplinary projects including cancer therapy optimization methods or meteorological experiments – I organized student's balloon mission to stratosphere with European Space Agency.

Currently I started my second PhD studies from mathematics as I need more mathematical tools in my work and it is the fastest way to get it. During the studies I became more and more interested in categorical way to describe our world. I started to do research in this area and I published recently my first work in this subject:

Radosław A. Kycia, "Landauer's Principle as a Special Case of Galois Connection", *Entropy* **2018**, *20*(12), 971; doi:10.3390/e20120971

Currently I try to gain more knowledge and experience in applied category theory and start my own independent/collaborative research in this area. Since I am interested mostly in applied multidisciplinary projects the categorical approach seems to be the most general way to find and describe patterns in such kind of tasks. Participation in the ACT2019 School would give me an unique opportunity to increase my experience and skills.

Yours sincerely,



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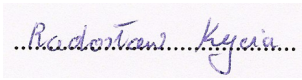
Funding options

I have the following funding options:

1. Joint funding form Masaryk University and Cracow University of Technology, which should cover my expenses to some extend. I will apply for this after acceptance.

2. Application for funding to external funding agencies – this is long lasting way and relies on the scientific success of the project (papers, schools like ACT 2019, conferences). It will be an alternative to 1.

Yours sincerely,



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Background

I have a strong background in physics (theoretical) since I obtained my PhD (2012) in this field and I have a long publication record (ORCID ID: orcid.org/0000-0002-6390-4627, ResearcherID: J-4397-2015) in this field. Currently I also do the second PhD in mathematics (differential geometry, expected end: 2021) and during this studies my interest is also focusing on categorification of physical phenomena.

During my mathematical studies I finished Basic course on category theory – level of the book Steve Awodey, “Category Theory”, Oxford University Press (2010), and Advanced Seminar on Category Theory – webpage with outline and projects:

http://www.math.muni.cz/~diliberti/Teaching/Teaching%20Brno/Topics/2018/Topics2018.html

I presented a talk on application of exponential objects and monads in Functional Programming.

I also teach currently Functional Programming and basics of Category Theory at Cracow University of Technology – the webpage of the course:

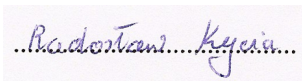
http://fizyk.ifpk.pk.edu.pl/~rkycia/classes/2019/ProgramowanieFunkcyjne.html

This is beginning of my stuidies in this discipline since I am learning it for one year, however I try to do some research on categorification in physics. I published my first paper in this subject:

Radosław A. Kycia, “Landauer’s Principle as a Special Case of Galois Connection”, *Entropy* **2018**, *20*(12), 971; doi:10.3390/e20120971

Summing up, I offer my multidisciplinary background and my will to gain experience in applied category theory.

Yours sincerely,



Curriculum Vitae

Personal details

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Education

Faculty of Science, Masaryk University, Brno, Czech Republic

2017-2021(expected)	PhD in Mathematics (Geometry)

Faculty of Physics, Astronomy and Computer Science, Jagiellonian University, Kraków, Poland

2008-2012	PhD degree – Theoretical physics
2008-2010	Bachelor degree – Computer science
2003-2008	Master degree – Theoretical physics (graduated with honors)

Professional experience

Research experience

1.10.2017-30.09.2018	Grant ‘A phantom for exploitation tests of medical radiotherapy devices’ POIR.04.01.04-00-0014/16, The National Centre for Research and Development, Principal Investigator
2017	Grant ‘Matematické struktury 6’ MUNI/A/1103/2016, Masaryk University, Contractor under the contract work.
2013	Grant *The Limits of Scientific Explanation* The John Templeton Foundation Contractor under the contract work.

2011-2012	Project “Global Dynamics of the Solutions of Einstein's Equations and Other Geometric, Nonlinear Evolutionary Equations”, National Science Center NN202 030740 Contractor under the contract work.
2010-2011	Project “The Analysis of Nonlinear Stability of Stationary Solutions of Einstein's Equations and Other Nonlinear Wave Equations”, Ministry of Science and Higher Education NN202 079235 Contractor under the contract work.

Work experience

1.03.2018 – present	Department of Mathematics and Statistics, Masaryk University, Brno, Czechia
1.10.2014 – 30.09.2021	Adiunct/Assistant Professor at the Tadeusz Kościuszko Cracow University of Technology (research and teaching)
1.08.2013-31.07.2014	Adiunct/Postdoctoral fellow KNOW at the Faculty of Mathematics, Informatics and Mechanics of the University of Warsaw
11.10.2012 – 30.09.2014	Assistant at the Tadeusz Kościuszko Cracow University of Technology (research and teaching)
2.07.2012-2.10.2012	Software Engineer at Motorola Solutions, Kraków (C++ programming)

Workshops, Practices, Schools

6-7.10.2017	,,ECI & JCMF Workshop’’, Telc
28.08-6.09.2017	Workshop „Summer school on geometrical methods in control theory and mathematical physics” by Valentin Lychagin and Olga Rossi, Ustroń, Poland; Help in organizing;
1-10.07.2016	Workshop „Lie pseudo-groups and their invariants” by Valentin Lychagin, Wisła, Poland
27.06-02.07.2016	CNRS-PAN Mathematics Summer Institute, Kraków
29.06-06.07.2014	Workshop „Introduction to the geometry of jet spaces and nonlinear differential equations”, Wisła

26-27.02.2014	Workshop on Differential-Delay Equations: theory and applications, University College London
8-17.07.2013	“Summer School on Dynamical Systems”, Gdynia
19-30.09.2011	Summer Internship at the Henryk Niewodniczański Institute of Nuclear Physics of the Polish Academy of Science, Kraków

References

The following people can provide references:

prof. dr hab. Jan Slovak (slovak@muni.cz)
prof. dr hab. Josef Silhan (silhan@math.muni.cz)
prof. dr hab. Henryk Żołądek (H.Zoladek@mimuw.edu.pl)
prof. dr hab. Piotr Bizoń(bizon@th.if.uj.edu.pl)

I hereby authorize you to process my personal data included in my job application for the needs of the recruitment process (in accordance with the Personnel Protection Act of 29.08.1997 no 133 position 883).