CURRICULUM VITAE

LJUBICA OPARNICA

1. Personal data and contacts

Date and place of birth:	12. May 1972. Novi Sad, Serbia
Nationality:	Serbian
E-mail:	ljubica.oparnica@gmail.com
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2. Education

2006-2008 PhD in Mathematics, University of Vienna, Faculty of Mathematics
Title of PhD thesis: *Generalized functions and differential or fractional differential equations in mechanical models*
Advisor: Ao. Prof. Günther Hörmann

1998-2003 MS in Mathematics, University of Novi Sad, Faculty of Science and Mathematics.
Title of master thesis: *Generalized fractional calculus in mechanical models*,
Advisor: Prof. Stevan Pilipović, Co-advisor: Prof. Teodor Atanacković

1991-1998 BS in Mathematics, University of Novi Sad, Faculty of Science and Mathematics

3. Academic positions/work

- April 2019 - March 2022: Department of Mathematics: Analysis, Logic and Discrete Mathematics, University of Gent, Belgium
  Postdoctoral researcher
- October 2010 - now: Faculty of Education in Sombor, University of Novi Sad:
  Full Professor, April 2020 - now, on leave
  Associate Professor, March 2015 - April 2020, on leave since April 2019
  Assistant Professor (Docent), October 2010 - March 2015
- January 2006 - October 2010: Institute of Mathematics of the Serbian Academy of Science and Art, Belgrade
  Assistant Research Professor, 2009 - 2010
  Research Assistant, 2006 - 2009
- September 1998 - March 2005
  Teaching Assistant at the Faculty of Technical Science and at the Faculty of Agriculture, University of Novi Sad
  Professor in Mathematics in several high schools and a gymnasium

4. Teaching

4.1. At UGent.

2021/22 Co-chair for *Capita Selecta in Analysis* for Master students, with Michael Ruhzansky (chair), and David Rottensteiner(co-chair), and co-chair for *Topology and Metric spaces*, with Hans Vernaeve (chair)

2020/21 Exercises: *Topology and Metric spaces*, with Hans Vernaeve (chair)

Master thesis supervisor: *Multiplication of Distributions* by Robin Blommaert

2019/20 Co-chair for *Capita Selecta in Analysis* for Master students, with Michael Ruzansky (chair), and Jasson Vindas (co-chair)

4.2. **At the Faculty of Education in Sombor.** Courses at Bachelor degree: *Mathematics, Didactics of Mathematics, Mathematics for gifted students, Introductory statistics*, at Master degree: *Contemporary Didactics of Mathematics, Mathematics for gifted students, Introductory statistics*, at Doctoral studies degree: *Selected sections on Applied analysis, Selected sections on Contemporary didactics of Mathematics 2*.

Supervised diploma theses:

Golden ratio, by Ljiljana Mihajlović

Pythagorean theorem by Nevena Salatić

Ordinary differential equations by Miloš Milanković

Real numbers by Sonja Ljatković

Supervised master thesis:

How to recognise gifted students for mathematics, by Dunja Rakić

Mathematical modelling in primary school, by Radoslava Stojanović

Supervise PhD thesis:

Importance of self-regulation of learning while solving mathematical problems in future teachers, by Maja Mihajlović, work in progress

4.3. **Review of PhD thesis or committee member.**

- Suzana Aleksić: *Frames and weighted shift-invariant spaces*, University of Novi Sad
- Laura Muñiz-Rodríguez: *Initial Education of Future Secondary Mathematics Teachers in Spain*, University of Oviedo and Ghent University
- Smiljana Jakšić: *Distributions and ultradistributions on Laguerre expansions with applications to pseudo-differential operators with radial symbols*, University of Novi Sad
- Snežana Gordić: *Generalized Stochastic Processes with Applications in Equation Solving*, University of Novi Sad

5. Scientific Work

5.1. **Scientific Publications.**

Mathematics and Applied Mathematics

[1] F. Broucke, Lj. Oparnica, Distributed-order time-fractional wave equations, arxiv.org/abs/2204.04047, 2022.

[2] S. Gordić, T. Levajković and Ljubica Oparnica, Wick-type stochastic parabolic equations with random potentials, arxiv.org/abs/2204.02696, 2022.

[3] R. Blommaert, S. Lazendić, and Lj. Oparnica. The Euler-Bernoulli equation with distributional coefficients and forces. arXiv:2112.15497, 2021.

[4] F. Broucke, Lj. Oparnica, Micro-local and qualitative analysis of the fractional Zener wave equation. *J. Differ. Equ.* 321, 217–257, 2022.

[5] S. Gordić, T.Levajković and Ljubica Oparnica, Stochastic parabolic equations with singular potentials. *Chaos, Solitons and Fractals*, Vol. 151, 111245, 2021. https://doi.org/10.1016/j.chaos.2021.111245

[6] D. Zorica and Ljubica Oparnica Energy dissipation for hereditary and energy conservation for non-local fractional wave equations. *Phil. Trans. R. Soc. A.* 378: 20190295, 2020.

[7] Ljubica Oparnica and E. Süli. Well-posedness of the fractional Zener wave equation for heterogenous viscoelastic materials *Fractional Calculus and Applied Analysis.* 23(1), 126-166, 2020.

[8] Ljubica Oparnica, Dusan Zorica, and Aleksandar Okuka. Fractional Burgers wave equation *Acta Mechanica.* 230(12), 4321-4340, 2019.

[9] T. M. Atanackovic, Ljubica Oparnica, and Dusan Zorica. Bifurcation analysis of rotating axially compressed imperfect nano-rod. *ZAMM, Z. Angew. Math. Mech.*, 99:e201800284–1–20, DOI: 10.1002/zamm.201800284, 2019.

[10] S. Konjik, Lj. Oparnica, and D. Zorica. Distributed-order fractional constitutive stress-strain relation in wave propagation modeling. *Zeitschrift für angewandte Mathematik und Physik*, 70:51, 2019.

[11] Günther Hörmann, Lj. Oparnica, and D. Zorica. Solvability and microlocal analysis of the fractional Eringen wave equation. *Mathematics and Mechanics of Solids*, 23(10):1420–1430, 2018.

[12] Günther Hörmann, Lj. Oparnica, and D. Zorica. Microlocal analysis of fractional wave equations. *ZAMM, Z. Angew. Math. Mech.*, 97(2):217–225, 2017.

[13] T. M. Atanackovic, M. Janev, Lj. Oparnica, S. Pilipovic, and D. Zorica. Space-time fractional Zener wave equation. *Proc. A.*, 471(2174):20140614, 25, 2015.

[14] Günther Hörmann, Sanja Konjik, and Ljubica Oparnica. Generalized solutions for the Euler-Bernoulli model with Zener viscoelastic foundations and distributional forces. *Anal. Appl. (Singap.)*, 11(2):1350017, 21, 2013.

[15] Teodor Atanacković, Sanja Konjik, Ljubica Oparnica, and Dušan Zorica. The Cattaneo type space-time fractional heat conduction equation. *Contin. Mech. Thermodyn.*, 24(4-6):293–311, 2012.

[16] Sanja Konjik, Ljubica Oparnica, and Dusan Zorica. Waves in viscoelastic media described by a linear fractional model. *Integral Transforms Spec. Funct.*, 22(4-5):283–291, 2011.

[17] Teodor M. Atanacković, Sanja Konjik, Ljubica Oparnica, and Dušan Zorica. Thermodynamical restrictions and wave propagation for a class of fractional order viscoelastic rods. *Abstr. Appl. Anal.*, pages Art. ID 975694, 32, 2011.

[18] T. M. Atanacković, S. Konjik, Lj. Oparnica, and S. Pilipović. Generalized Hamilton's principle with fractional derivatives. *J. Phys. A*, 43(25):255203, 12, 2010.

[19] Sanja Konjik, Ljubica Oparnica, and Dusan Zorica. Waves in fractional Zener type viscoelastic media. *J. Math. Anal. Appl.*, 365(1):259–268, 2010.

[20] Teodor M. Atanackovic, Ljubica Oparnica, and Stevan Pilipović. Semilinear ordinary differential equation coupled with distributed order fractional differential equation. *Nonlinear Anal.*, 72(11):4101–4114, 2010.

[21] Teodor M. Atanackovic, Ljubica Oparnica, and Stevan Pilipović. Distributional framework for solving fractional differential equations. *Integral Transforms Spec. Funct.*, 20(3-4):215–222, 2009.

[22] Günther Hörmann and Ljubica Oparnica. Generalized solutions for the Euler-Bernoulli model with distributional forces. *J. Math. Anal. Appl.*, 357(1):142–153, 2009.

[23] Lj. Oparnica. *Generalized functions in mechanical models, Differential and fractional differential equations.* Verlag Dr. Möler, Berlin, 2009.

[24] Teodor M. Atanacković, Ljubica Oparnica, and Stevan Pilipović. On a nonlinear distributed order fractional differential equation. *J. Math. Anal. Appl.*, 328(1):590–608, 2007.

[25] Günther Hörmann and Ljubica Oparnica. Distributional solution concepts for the Euler-Bernoulli beam equation with discontinuous coefficients. *Appl. Anal.*, 86(11):1347–1363, 2007.

[26] Teodor M. Atanacković, Ljubica Oparnica, and Stevan Pilipović. On a model of viscoelastic rod in unilateral contact with a rigid wall. *IMA Journal of Applied Mathematics*, Volume 71, Issue 1, Pages 1–13, 2006.

[27] Ljubica Oparnica. Generalized fractional calculus with applications in mechanics. Matematički vesnik, volume 54, pages 151–158, 2002.

Didactics of Mathematics

[1] M. Nikolić and Lj. Oparnica. Mišljenje učitelja o ispunjenosti standarda kvaliteta sadržaja odabranih udžbenika matematike (Teachers' opinion on meeting the content quality standards of selected mathematics textbooks) in *Textbooks: Old subject facing the chalanges of the modern age. Editors: Pešikan, A., Stevanović, J. Zbornik instituta za pedagoška istraživanja*, 217–229, 2019.

[2] M. Marić, M. Mihajlović, and Lj. Oparnica. Instrument za procenu motivacije i strategija samoregulacije u učenju matematike (SRUM). (Instrument for assessing motivation and strategy of self-regulation in learning mathematics) *Nastava i Vaspitanje*, 67, 2018.

[3] M. Zobenica and Lj. Oparnica. Neke komponente samoregulacije tokom učenja matematike kod studenata Pedagoškog fakulteta u Somboru. (Some components of self-regulation during learning mathematics in students at Faculty of Education in Sombor) *Inovacije u nastavi*, pages 90–102, 2018.

[4] S. Gordić, M. Mihajlović, and Lj. Oparnica. *Zbirka zadataka iz kombinatorike i verovatnoće, (A collection of exercises in Combinatorics and Probability), on Serbian.* Faculty of Education, University of Novi Sad, Sombor, 2018.

[5] Lj. Oparnica, M. Marić, and M. Mihajlović. Assessing metacognition and self-regulated learning in prospective mathematics teachers in Serbia. In *42nd ATEE Annual Conference 2017: Changing perspectives and approaches in contemporary teaching, Conference proceeding, Editors: Marija Sablić, Alma Škugor, Ivana Djurdjević Babić*, pages 19–34. Association for Teacher Education in Europe (ATEE), Brussels, Belgium, 2018.

[6] Lj. Oparnica, S. Sudžuković, and M. Zobenica. Permutations in lower grades of primary school. *NORMA*, (2):137–149, 2016.

[7] Lj. Oparnica, S. Sudžuković, and M. Zobenica. Probability in primary school. In *Education and the Social Challenges at the Beginning of the 21st century, Editors Petrović, D. Antolović, M.*, number 3-4, pages 121–135. 2016.

[8] Lj. Oparnica. *Kombinatorika i verovatnoća, Teorija, primeri, zadaci, (Combinatorics and Probability, Theory, examples and exercises), on Serbian.* Faculty of Education, University of Novi Sad, Sombor, 2014.

5.2. Scientific Conferences, Workshops, Short visits, most recent.

2021   – ISAAC: 13th International ISAAC Congress, August 2 to August 6, 2021 in Ghent, Belgium, online conference, web

2020   – GF2020: International conference on generalised functions 2020, August 31 – September 4, Ghent, Belgium, web
Research talk: Treating strong singularities in differential equations: very weak solution concept

2019   – ISAAC: 12th International ISAAC Congress, July 29 to August 2, 2019 in Aveiro, Portugal. web
Research talk: Fractional wave equation with discontinuous coefficients
– OXFORD: May, 20–26, Short visit to professor Endre Süli
Research talk on faculty seminar: Fractional wave equations
– ATEE2019: Winter conference of Association for Teacher Education in Europe: Science and Mathematics Education in 21st Century, April, 15–17, Braga, Portugal. web
Research talk: Improving mathematics performance in pre-service teachers: effects of repeated testing and self-regulated instructions

2018   – SMAK: 14th Serbian Mathematical Congress, May 16–19, Kragujevac, Serbia. web
Research talk: Distributed order fractional wave equation
– GF2018: International conference on generalised functions 2018, August, 27–31, Novi Sad, Searbia: web
Research talk: Distributed order fractional wave equation
– WIN 2018: Workshop: Wien – Innsbruck – Novi Sad, February 12–14, University of Innsbruck, Austria.
Research talk: Camassa-Holm equation

5.3. Project participation.

- 2019- now: FWO Odysseus, grant G.0H94.18N: *Analysis and Partial Differential Equations*, Principal investigator: Michael Ruzhansky.
- 2018-2021: Bilateral project Austria–Serbia: *Functional analytic methods for models of wave propagation in viscoelastic media*, Principal investigator for Serbian side: Ljubica Oparnica, for Austrian side: Günther Hörmann.
- 2016-2019: APV 114-451-2167/2011-12 *Methods of Functional Analysis and Fractional Calculus with Applications in Mechanics*, Principal investigator: Sanja Konjik.
- 2011-2019: Ministry of Science project number 174024: *Methods of Functional and Harmonic Analysis and PDE with Singularities*, Principal investigator: Stevan Pilipović.
- 2011-2019: Ministry of Science project number 174005: *Viscoelasticity of Fractional Type and Shape Optimisation in a Theory of Rods*, Principal investigator: Teodor M. Atanacković (up to 2014), Dušan Zorica (since 2014).

5.4. Memberships in Scientific organisations.

- ISAAC - International Society for Analysis its Application and Computation: ISAAC
- International Association for Generalized Functions: IAGF
- Serbian Scientific Mathematical Society

5.5. Referee activity. Composites Part B; Applied and Numerical Harmonic Analysis series; Novi Sad Journal of Mathematics; Zentralblatt MATH; Kragujevac Journal of Mathematics

6. ADMINISTRATIVE EXPERIENCE (AT UNIVERSITY OF NOVI SAD)

- Member of the University Council, 2013–2018
- Professional Council of the University Senate, 2013–2018
- Head of the Department for Mathematics and Didactics at the Faculty of Education, 2016-2017

7. Languages

- Serbian: mother tongue, English: fluent, Dutch: niveau B1-

8. Computer skills end program languages

- Office, LaTeX, MySQL, Python

9. Soft skills

- Problem-solving
- Communication
- Teamwork and Networking
- Dedication, Perseverance, Commitment
- Initiative
- Pragmatic
- Passionate

10. References

- Michael Ruzhansky: Postdoc supervisor, project leader.
  Michael.Ruzhansky@UGent.be, personal webpage
- Leo Storm: Head of Department for Analysis, Logic and Discrete Mathematics.
  Leo.Storme@UGent.be personal webpage
- Günther Hörmann: PhD advisor and co-author.
  guenther.hoermann@univie.ac.at, personal webpage
- Dušan Zorica: co-author
  dusan.zorica@df.uns.ac.rs, personal webpage
- Endre Süli: co-author
  suli@maths.ox.ac.uk, personal webpage