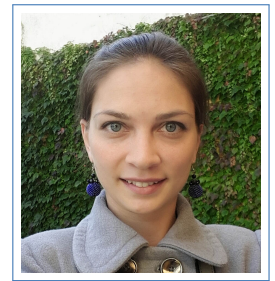


# Anna Buchynskaja (Zubkova)

University of Graz  
Institute for Mathematics  
and Scientific Computing  
Mozartgasse 14  
8010 Graz, Austria  
☎ +43 681 814 849 53  
✉ [anna.zubkova@uni-graz.at](mailto:anna.zubkova@uni-graz.at)  
🏠 [homepage.uni-graz.at/anna.zubkova](http://homepage.uni-graz.at/anna.zubkova)



Birthdate: 12 April 1990, Bijsk, Russia, citizenship: Russian

## Education

- 2014–2019 **PhD Student in Mathematics**,  
*University of Graz, Austria*,  
Supervisor: V. A. Kovtunenکو.
- 2013–2014 **PhD Student in Differential Equations, Dynamical Systems, and Optimal Control**,  
*Lavrentyev Institute of Hydrodynamics Siberian Branch RAS, Russia*,  
Supervisor: S. A. Sazhenkov.
- 2011–2013 **M.Sc. in Mechanics and Mathematical Modeling**,  
*Novosibirsk State University, Russia*, Department of Mechanics and Mathematics (4.94 points of 5.0),  
Supervisor: S. A. Sazhenkov.
- 2007–2011 **B.Sc. in Mechanics**, *Novosibirsk State University*, Department of Mechanics and Mathematics (4.41 points of 5.0),  
Supervisor: S. A. Sazhenkov.

## Scientific Degrees

- PhD, 2019 Thesis: “Homogenization and Singular Perturbation Methods for the Poisson–Nernst–Planck Equations”.
- Graduate, 2013 Master in Mathematics, Thesis: “Homogenization of dynamic equations of multi-phase media by the two-scale convergence method of Allaire–Nguetseng”.
- Undergraduate, 2011 Diploma in Mathematics, Thesis: “Homogenization of the turbulent diffusion problem in multiscale case”.

## Professional Experience

- 2015–present International Research Training Group, IGDK 1754 Munich–Graz, Associated graduate student
- 2014–present University of Graz, Austria, Institute for Mathematics and Scientific Computing, Project Research Assistant
- 2013–2014 Lavrentyev Institute of Hydrodynamics, Russia, Senior Laboratory Assistant
- 2012–2014 Alawar (Computer Software), Novosibirsk, Russia, Junior Analyst
- 2011–2012 Lavrentyev Institute of Hydrodynamics, Junior Laboratory Assistant

## Awards

- 2013 1<sup>st</sup> prize certificate of LI International Scientific Students Conference, Novosibirsk, Russia,  
for the conference presentation: “Homogenization of an isothermic three-phase poroelastic problem under Rakhmatullin’s scheme”.

---

## Publications

- Article V. A. Kovtunenکو, A. V. Zubkova, *Homogenization of the generalized Poisson–Nernst–Planck problem in a two-phase medium: correctors and estimates*, Appl. Anal., DOI: 10.1080/00036811.2019.1600676.
- Chapter E. Bauer, Victor A. Kovtunenکو, P. Krejčí, N. Krenn, L. Siváková, and A. Zubkova, *Modified model for proportional loading and unloading of hypoplastic materials*, Trends in Mathematics: Research Perspectives CRM Barcelona, Summer 2018, Springer-Birkhäuser, Basel, accepted.
- Chapter A. V. Zubkova, *The two-scale periodic unfolding technique*, Trends in Mathematics: Research Perspectives CRM Barcelona, Summer 2018, Springer-Birkhäuser, Basel, accepted.
- Article, 2018 V. A. Kovtunenکو, A. V. Zubkova, *Mathematical modeling of a discontinuous solution of the generalized Poisson–Nernst–Planck problem in a two-phase medium*, Kinet. Relat. Mod., Vol. 11, 2018, pp. 119–135.
- Article, 2017 V. A. Kovtunenکو, P. Krejčí, E. Bauer, L. Siváková and A. V. Zubkova, *On Lyapunov stability in hypoplasticity*, Proc. Equadiff 2017 Conference, K. Mikula, D. Ševčovič, J. Urbán (Eds.), pp. 107–116, Slovak University of Technology, Bratislava, 2017.
- Article, 2017 V. A. Kovtunenکو, A. V. Zubkova, *Solvability and Lyapunov stability of a two-component system of generalized Poisson–Nernst–Planck equations*, in: Recent Trends in Operator Theory and Partial Differential Equations (The Roland Duduchava Anniversary Volume), V. Maz’ya, D. Natroshvili, E. Shargorodsky, W.L. Wendland (Eds.), Operator Theory: Advances and Applications 258, pp. 173–191, Birkhaeuser, Basel, 2017.
- Article, 2017 V. A. Kovtunenکو, A. V. Zubkova, *On generalized Poisson–Nernst–Planck equations with inhomogeneous boundary conditions: a-priori estimates and stability*, Math. Meth. Appl. Sci., Vol. 40, 2017, pp. 2284–2299.
- Chapter, 2016 A. V. Zubkova, *The generalized Poisson–Nernst–Planck system with nonlinear interface conditions*, In: A. Korobeinikov (eds) Extended Abstracts Summer 2016. Trends in Mathematics, vol 10. Birkhäuser, Cham, 101–106.
- Article, 2014 S. A. Sazhenkov, E. V. Sazhenkova, A. V. Zubkova, *Small perturbations of two-phase fluid in pores: Effective macroscopic monophasic viscoelastic behavior*, Siberian Electronic Mathematical Reports, Vol. 11, 2014, pp. 127–158.
- Article, 2012 A. V. Zubkova, S. A. Sazhenkov, *Effective Equation of a Turbulent Diffusion in a Cracky–Porous Media*, In: The News of the Altai State University, Barnaul, 2012, Iss. 1(73), pp. 47–54.

---

## Scientific activities

- Poster, 2018 V. A. Kovtunenکو, A. V. Zubkova, *Two-scale convergence of the generalized Poisson–Nernst–Planck problem in a two-phase medium*. AMaSiS 2018: Applied Mathematics and Simulation for Semiconductors, WIAS, Berlin, Germany, 8–10 October
- Presentation, 2018 A. V. Zubkova, *Homogenization of the generalized Poisson–Nernst–Planck problem in a two-phase medium*. Workshop on Multi-Rate Processes and Hysteresis, and Hysteresis and Slow-Fast Systems (MURPHYS-HSFS-2018), Centre de Recerca Matemàtica, Bellaterra (Barcelona), Spain, 28 May – 1 June
- Presentation, 2018 A. V. Zubkova, *Homogenization of interface problems in two-phase domains*. The Ninth International Conference “Inverse Problems: Modeling and Simulation” (IPMS-2018), Malta, 21–25 May
- Presentation, 2017 A. V. Zubkova, *Homogenization of the generalized Poisson–Nernst–Planck system with nonlinear interface conditions*. Seminar of the research group Partial Differential Equations, WIAS, Berlin, Germany, 24 October

- Poster, 2017 A. V. Zubkova, *Homogenization of the generalized Poisson–Nernst–Planck problem in a two-phase medium*. Homogenization Theory and Applications (HomTAp), WIAS, Berlin, Germany, 4–6 October
- Presentation, 2017 A. V. Zubkova, *Homogenization of the generalized Poisson–Nernst–Planck system with nonlinear interface conditions*, Salzburg, Austria, 11–15 September
- Poster, 2017 V. A. Kovtunenکو, A. V. Zubkova, *On generalized Poisson–Nernst–Planck equations*. Workshop on PDEs: Modelling, Analysis and Numerical Simulation (PDE-MANS 2017), Granada, Spain, 19–23 June
- Presentation, 2016 A. V. Zubkova, *On generalized Poisson–Nernst–Planck equations with inhomogeneous boundary conditions*. 9th Workshop on Analysis and Advanced Numerical Methods for Partial Differential Equations (not only) for Junior Scientists (AANMPDE(JS)-9-16), Strobl, Austria, 4–8 July
- Presentation, 2016 V. A. Kovtunenکو, A. V. Zubkova, *The generalized Poisson–Nernst–Planck system with nonlinear interface conditions*. Workshop on Multi-Rate Processes and Hysteresis, and Hysteresis and Slow-Fast Systems (MURPHYS-HSFS-2016), Centre de Recerca Matemàtica, Bellaterra (Barcelona), Spain, 13–17 June
- Poster, 2015 V. A. Kovtunenکو, A. V. Zubkova, *On generalized Poisson–Nernst–Planck equations*. PDE 2015 Theory and Applications of Partial Differential Equations, Berlin, Germany, 30 November – 4 December
- Poster, 2015 V. A. Kovtunenکو, A. V. Zubkova, *On generalized Poisson–Nernst–Planck equations*. Workshop on Optimal Control of Partial and Ordinary Differential Equations, Ecole Polytechnique - Palaiseau, France, 16–17 November
- Poster, 2015 V. A. Kovtunenکو, A. V. Zubkova, *On generalized Poisson–Nernst–Planck equations*. From Grain Boundaries to Stochastic Homogenization: PIRE Workshop, Leipzig, Germany, 20–23 July
- Presentation, 2015 A. V. Zubkova, *On generalized Poisson–Nernst–Planck equations*. Workshop on Numerical Methods for Optimal Control and Inverse Problems (OCIP2015), Munich, Germany, 9–11 March
- Presentation, 2013 A. V. Zubkova, *Homogenization of an isothermic three-phase poroelastic problem under Rakhmatullin’s scheme*. LI International Scientific Students Conference, Novosibirsk, Russia, 12–18 April
- Presentation, 2012 S. A. Sazhenkov, E. V. Sazhenkova, A. V. Zubkova, *Homogenization of a three-phase isothermal poroelastic model*. Lomonosov Readings in Altai–2012, Barnaul, Russia, 20–23 November
- Presentation, 2012 A. V. Zubkova, *Homogenization of the model of a two-phase compressible fluid in porous medium*. Regional Conference on Mathematics (MAK–2012), Barnaul, Russia, 22–24 June
- Presentation, 2011 A. V. Zubkova, *Homogenization of the turbulent diffusion equation in multi-phase case*. XLIX International Scientific Students Conference, Novosibirsk, Russia, 16–20 April

---

## Summer schools

- May, 2017 Advanced School & Workshop on Nonlocal Partial Differential Equations and Applications to Geometry, Physics and Probability, ICTP Trieste, Italy.
- September, 2016 Summer School on Applied Analysis, Technische Universität Chemnitz, Germany.
- October, 2015 IGDK Summer Workshop, Ramsau/Dachstein, Austria, the topic: Characterization of I-sets and Besov spaces.

---

## Research fields

- Analysis
- Partial differential equations,
  - Asymptotic analysis,
  - Homogenization.

- Applications
- Multi-phase fluids,
  - Porous media,
  - Micro- and inhomogeneous structures.

---

## IT Skills

Software     $\LaTeX$ , Office, Mathematica, Matlab, C, Pascal, Bitrix

---

## Hobbies and additional information

Hobbies    Fitness, painting, dancing

Languages:

Russian    Native

English    Upper-Intermediate

German    Intermediate

---

## References

Sergey A. Dr. Habil., Docent at Novosibirsk State University, Senior Researcher at Lavren-  
Sazhenkov tyev Institute of Hydrodynamics, Russia, sazhenkovs@yandex.ru

Victor A. Dr. Habil., Docent at University of Graz, Austria, victor.kovtunenکو@uni-graz.at  
Kovtunenکو

Klemens Fellner Univ.-Prof. Dipl.-Ing. Dr.techn., Professor at University of Graz, Austria,  
klemens.fellner@uni-graz.at