Steffen Plunder

PhD candidate in Mathematics

Curriculum vitae

1.10.2019 – present	**PhD candidate**, *University of Vienna*, Supervised by Dr. Sara Merino-Aceituno. Kinetic theory and applications to biology, Estimated date of completion: October 2022
1.12.2018 to 30.9.2019	**Researcher and teaching assistent**, TU Kaiserslautern, Supervised by Prof. Bernd Simeon. AG Differential-Algebraische Systeme
2016 – 2018	**M.Sc. mathematics**, TU Kaiserslautern, Final grade: 1,1. Specialisation: Partial differential equations, Application subject: Physics, Thesis: Fiber based Lagrangian Modelling and Simulation of Skeletal Muscle Tissue.
WS 2016/2017	**ERASMUS semester**, TU Delft.
2013 – 2016	**B.Sc. mathematics**, TU Kaiserslautern, Final grade: 1,1. Specialisation: Modelling and scientific computing, Application subject: Physics, Thesis: Molecular Dynamical Simulation for Polymers.
2004 – 2013	**Gymnasium**, Trifels Gymnasium Annweiler, Final grade: 1,6.

Information: The German grading system ranges from 1.0 (very good) to 6.0 (insufficient) with 4.0 (sufficient) being the last passing grade.

Experience

Teaching

WS 2022 — **Short programming course: Python**, *Vienna School of Mathematics*.
Introduction to scientific python for PhD students.

WS 2022 — **Short programming course: Julia**, *University of Vienna*.
One week introduction to Julia for Univ.-Prof. Dr. Radu Ioan Boţ's research group.

WS 2018/2019 — **Organisation and Tutor**, *TU Kaiserslautern*.
Computer lab: Numerical methods for linear algebra and analysis

WS 2017/2018 — **Tutor**, *TU Kaiserslautern*.
Numerical methods for linear algebra and analysis

2014-2016 — **Tutor**, *TU Kaiserslautern*.
Höhere Mathematik I: Analysis (for enginieers)
Foundation of Mathematics I (for Mathematicians and Physicists)
Foundation of Mathematics II (for Mathematicians and Physicists)

Programming

2012 – 2016 — **Programming assistent**, *Fraunhofer ITWM, Kaiserslautern*, Department of Image Processing.
GUI programming (Qt) and bug fixing within a C++ project.

2016 – 2017 — **Programming assistent**, *TU Kaiserslautern and TU Delft*,
Research group for differential algebraic systems.
Algorithms for parameterisation and optimisation of NURBS surfaces with C++ and G+SMo (Geometry, Simulation and Modelling).

Research stays

5.9.2021 – 18.9.2021, 21.11.2021 – 18.12.2021 — **Academic visit**, Paul Sabatier University, Toulouse, France.
Project: Together with Dr. Eric Theveneau, we studied the role of heterogeneity of cell dynamics and tissue mechanics during epithelial-to-mesenchymal transitions (EMT).

1.10.2018 – 30.11.2018 — **Academic visit**, Haussdorf Center of Mathematics, Bonn, Germany.
Project: Extension of a multiphase material simulation.
Supervised by Prof. Martin Rumpf and Dr. Behrend Heeren.

1.3.2018 – 13.6.2018 — **Academic visit**, University of Auckland, New Zealand.
Project: Multiscale simulation of flows in saliva glands.
Supervised by Prof. James Sneyd.

Workshops and conferences

25.05.2022 – 29.05.2022 — **VSM Mini-course: String theory for mathematicians**, *Vienna School of Mathematics*.

10.1.2022 – 14.1.2022 — **Tissue growth and movement**, *online (Institut Henri Poincaré)*.

19.9.2021 – 25.9.2021 — **VSM summer school**, *Weißensee, Austria*.

14.12.2020 – 18.12.2020 — **MAFRAN Winter School 2020**, *online (Cambridge Kinetic Group)*.

8.7.2019 – 12.7.2019	**Tutorial workshop of Isaac Newton Institute programm on Geometry, compatibility and structure preservation in computational differential equations**, *Cambridge, UK*.
18.3.2019 – 20.3.2019	**DESCRIPTOR**, *Paderborn, Germany*. Talk: Partially mesoscopic and Lagrangian systems
18.2.2019 – 22.2.2019	**GAMM, 90th Annual Meeting**, *Vienna, Austria*. Talk: Lagrangian perspective on skeletal muscle models
27.9.2017 – 29.9.2017	**Networks and Uncertainty**, *Felix-Klein-Zentrum, Kaiserslautern, Germany*.
11.9.2017 – 14.9.2017	**19th ÖMG Meeting and Annual DMV Meeting**, *Salzburg, Austria*. Talk during the Students conference: Symplectic molecular dynamics.
9.3.2017 – 10.3.2017	**Models and Methods of Robust Optimization**, *Fraunhofer ITWM, Kaiserslautern, Germany*.
28.9.2016 – 30.9.2017	**Mathematische Methoden in Big Data**, *Felix-Klein-Zentrum, Kaiserslautern, Germany*.
30.1.2017 – 2.2.2017	**G+SMo Developer Days**, *TU Delft*. Talk: Optimization of B-Spline Parametrizations using G+SMo and IPOPT

Organisation

2017 – 2019	**Student talks**, I was the initiator and organisor of a voluntary series of talks.
1.6.2021	**VSM workshop: A PhD in mathematics – career possibilities & gender aspects**, Co-organisor.
25.5.2022 – 29.5.2022	**VSM Mini-course: String theory for mathematicians**, Co-organisor.

Languages

German	mother tongue	
English	fluently	*Level: C1*
Chinese (Mandarin)	beginner	*Level: A1*

Computer skills

OS	Linux (very good), Windows (good)
Database	SQL
Tools	Inkscape (good), LaTeX (good), GIMP (good), HTML, CSS
Programming languages	Julia (very good), C++ (very good), Javascript (very good), Python (very good), MATLAB (good), C (good), C#, Java, Lua, R, SINGULAR.
Frameworks	Qt/PyQt (very good), DifferentialEquations.jl (very good), numpy/scipy (very good), FEniCS (good), boost (good), Eigen (good), OpenGL (good), OpenMPI (good), G+SMo, IPOPT, VTK, SFML, SDL.

Activities

22.5.2022	**"Long night of science"**, *Vienna*. Public science presentations. I implemeted a computer game based on the cell migration from my research.
since 2020	**Speaker of the Vienna School of Mathematics (VSM)**. Organisation and initiation of events such as a mini course on string theory, workshop on carrer possibilities for PhD students and gender aspects, various social events. I was member of the doctoral study committee.
since 2017	**Member of the Social Democratic Party in Germany (SPD)**.
2015 – 2018	**Various university commissions**, *TU Kaiserslautern*. I was part of the following committees as a student member: Department council (math), libary commission (senat), committee for studying and teaching (math), student representativ in the examinations board (math)
2014 – 2018	**Fachschaftsrat (student council)**, *TU Kaiserslautern*.

Publications

Conference preceeding (peer-reviewed)

2020	Plunder, S. and Simeon, B. (2020). *Coupled Systems of Linear Differential-Algebraic and Kinetic Equations with Application to the Mathematical Modelling of Muscle Tissue.* In Reis, T., Grundel, S., and Schops, S., editors, *Progress in Differential-Algebraic Equations II*, Differential-Algebraic Equations Forum, pages 357–395, Cham. Springer International Publishing

Pre-prints

2022	S. Plunder, B. Simeon, *The mean-field limit for particle systems with uniform full-rank constraints.* [submitted].
2022	S. Plunder, U. M. Lauer, T. Helling, S. Venturelli, L. Marongiu, *Identification of viral dose and administration time in simulated phage therapy occurrencess.*

Awards, funding and grants

2021	**EMBO Scientific Exchange Grant**, 2700 €. Travel grant for establishing new collaborations. I went in 2021 for 6 weeks to Paul Sabatier University, Toulouse, to collaborate with Dr. Eric Theveneau. We studied the role of heterogeneity of cell dynamics and tissue mechanics during epithelial-to-mesenchymal transitions.

Funding

2019 – 2022	PhD position funded by WWTF (Vienna Science and Technology Fund)

Scholarships and awards

2018	DAAD-PROMOS scholarship (academic visit in Auckland)
2017	Main award on the DMV students conference 2017 (award for a two months research trip to Bonn)

2016 – 2018	Felix-Klein scholarship by Fraunhofer ITWM (scholarship for master students)
2014 – 2016	Deutschlandstipendium (scholarship for bachelor students)
2013	Abiturpreis Mathematik, Abiturpreis Physik. (Price for maths and physics after secondary school.)

List of collaborators

I am deligthed that I could collaborate with the following researchers: Prof. Sara Merino-Aceituno (University of Vienna), Dr. Eric Theveneau (Paul Sabatier University), Prof. Pierre Degond (Institut Mathématiques de Toulouse), Dr. Marinna A. Ferreira (University of Helsinki), Dr. Diane Peurichard (INRIA Paris), Dr. Luigi Marongiu (University Hohenheim), Prof. James Sneyd (University of Auckland), Prof. Bernd Simeon (Technische Universität Kaiserslautern).

References

Prof. Sara Merino-Aceituno (professor)
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Dr. Eric Theveneau (group leader)
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Université Paul Sabatier
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31062 Toulouse, France
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Prof. James Sneyd (professor)
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University of Auckland
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1010, Auckland, New Zealand
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(All reference contacts agreed to be contacted via email.)