

# Angelika Manhart

London, July 1, 2019

## Personal Information

Citizenship Austrian

## Scientific Positions

Sept 2019 – **Lecturer in Applied Mathematics**, *University College London*.

2018 – 2019 **Postdoctoral researcher**, *Imperial College London*.

Mentor: [Prof. Pierre Degond](#).

2016 – 2018 **Postdoctoral researcher**, *New York University, Courant Institute*.

Mentor: [Prof. Alex Mogilner](#).

2011–2015 **PhD student in Biomathematics**, *University of Vienna*.

Supervisor: [Prof. Christian Schmeiser](#).

Sum 2009 **Internship**, *Department for Genetic Epidemiology*, *Medical University, Innsbruck*.

2006–2008 **Part-time work**, *Department for Clinical Microbiology*, *AKH (General Hospital), Vienna*.

## Education

Nov 2015 **PhD in Biomathematics**, *University of Vienna*.

Passed with distinction.

Nov 2011 **Master's degree in Mathematics (Magistra)**, *University of Vienna*.

Passed with distinction.

June 2011 **Bachelor's degree in Molecular Biology**, *University of Vienna*.

Passed with distinction.

June 2004 **Graduation at Bilingual (English/German) High School, Draschestraße, Vienna**.

Passed with distinction.

## Scientific Interests

My research centers around formulating and analyzing mathematical models of cell biological phenomena. My research interests include:

**Analysis** Nonlinear partial differential equations, dynamical systems, bifurcations, asymptotic analysis, kinetic equations, long-time behavior, traveling waves

**Modeling** Alignment models, coarse-graining, multi-scale approaches, variational techniques

**Data Analysis** Image analysis, topological data analysis, data-driven modeling

**Biology** Cell migration, cytoskeletal fibers (actin, microtubules), pattern formation (swarming, myxobacteria, phase transitions), organelle positioning (nuclei in muscles, spindle)

**Simulation** Finite element, finite difference and finite volume methods, asymptotics-based schemes, simulating agent-based models

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## Distinctions & Awards

- Aug 2018 **Travel Award, Association for Women in Mathematics, NSF, 880\$.**
- July 2018 **Travel Award, 13th World Congress in Computational Mechanics, New York, USA, ~1400\$.**
- Nov 2015 **Passed with distinction: PhD in Biomathematics, University of Vienna.**
- April 2014 **Group Prize for Best Presentation at the Graduate Modeling Camp 2014, Oxford, UK.**
- Nov 2011 **Passed with distinction: Master's degree in Mathematics, University of Vienna.**
- June 2011 **Passed with distinction: Bachelor's degree in Molecular Biology, University of Vienna.**
- 2010 **Scholarship for Extraordinary Achievements, University of Vienna, 750€, Competing group ~ 600 students.**
- 2007 **Scholarship for Extraordinary Achievements, University of Vienna, 750€, Competing group ~ 600 students.**
- 2006 **Scholarship for Extraordinary Achievements, University of Vienna, 750€, Competing group ~ 600 students.**

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## Talks & Posters

In total I gave more that 15 talks at international conferences, seminars and meetings and 3 poster presentations.

- Aug 2018 **Invited Talk, "*Mathematics of the Cell. Mechanical and Chemical Signaling across Scales*", BIRS, Banff, Canada.**
- May 2018 **Invited Talk, "*Collective dynamics and self-organization in biological sciences*", ICMS, Edinburgh, Scotland.**
- April 2018 **Invited Talk, "*Applied PDEs and kinetic equations: from physics to life sciences and beyond*", University of Vienna, Vienna, Austria.**
- Dec 2017 **Invited Talk, *SIAM PDE, Minisymposium "Kinetic and mean-field models in socio-economics and life sciences"*, Baltimore, USA.**
- Nov 2017 **Invited Talk, *Meeting on Fly Research in the NY Area*, Sloan Kettering Institute, New York, USA.**
- Sept 2017 **Invited Talk, *INdAM Meeting "Mathematical Physics of Living Systems"*, Cortona, Italy.**
- Aug 2017 **Invited Talk, *Applied Mathematics, Modeling and Computational Science*, Waterloo, Canada.**
- May 2017 **Invited Talk, *American Mathematical Society Sectional Meeting*, New York, USA.**
- Aug 2015 **Invited Talk, *International Conference on Industrial and Applied Mathematics*, Beijing, China.**

- Sept 2014 **Invited Talk**, *Mathematical Modeling in Biology and Physiology*, Vienna, Austria.
- June 2014 **Talk**, *European Conference of Mathematical and Theoretical Biology*, Göteborg, Sweden.
- June 2014 **Poster**, *Models and Methods in Kinetic Theory (Summer School)*, Porto Ercole, Italy.
- Jan 2014 **Invited Talk**, *Mathematical Modeling in Biology*, Graz, Austria.
- Jan 2013 **Invited Talk**, *SciComp2013: Software Frameworks for Challenging Computational Problems*, Crete, Greece.
- Jun 2012 **Poster**, *Models and Methods in Kinetic Theory (Summer School)*, Porto Ercole, Italy.
- Sept 2012 **Poster**, *Applied PDEs in Physics, Biology and Social Sciences*, Barcelona, Spain.
- Sept 2011 **Talk**, *Non-linear PDEs arising in Mathematical Biology*, ICMS, Edinburgh, Scotland.

### Research Visits & Seminar Talks

- Sept 2018 **Seminar Talk**, *Math Department Colloquium*, Rensselaer Polytechnic Institute, New York, USA.
- Sept 2018 **Collaboration with A. Lindsay**, University of Notre Dame, South Bend, USA.
- Sept 2018 **Seminar Talk**, *Applied Math Seminar*, University of Notre Dame, South Bend, USA.
- March 2018 **Seminar Talk**, *Computational Biology Colloquium*, Courant Institute, NYU, New York, USA.
- 2014–2017 **Collaboration with P. Degond**, Imperial College, London, UK, 4x1 week, 2 Seminar Talks.
- Dec 2017 **Seminar Talk**, *PDE Afternoon*, Technical University of Vienna, Vienna, Austria.
- Nov 2016 **Seminar Talk**, *Applied Mathematics Colloquium*, Courant Institute, NYU, New York, USA.
- Sept 2016 **Visit of L. Berlyand**, Penn State University, State Coll., USA, 2 Seminar Talks.
- May 2012 **Collaboration with N. Sfakianakis**, Johannes Gutenberg University, Mainz, Germany, 1 Seminar Talk.

### Attended Programs, Summer Schools & Courses

- April 2019 **LMS-CMI Research School**. *PDEs in Mathematical Biology: Modelling and Analysis*, Edinburgh, UK, 1 week,  
*Content*: Asymptotic Methods, Front Propagation, Segregation Patterns.
- June 2018 **Mathematical Research Communities**. *Agent-based Modeling in Biological and Social Systems*, AMS, Rhode Island, USA, 1 week,  
*Content*: Micro-macro descriptions, Topological Data Analysis.

- June 2016 **Course.** *VCell Short Course*, University of Connecticut Health Center, Farmington, USA, 3 days,  
*Content:* The simulation platform VCell, deterministic reaction-diffusion-advection PDEs, stochastic reactions.
- Sept 2014 **Summer School of the Doctoral School** *Dissipation and Dispersion in Nonlinear PDEs*, Weissensee, Austria, 1 week,  
*Content:* Courses on water waves, fractional differential operators, stochastic PDEs.
- June 2014 **Summer School.** *Models & Methods in Kinetic Theory*, Porto Ercole, Italy, 1 week,  
*Course examples:* Boundary layers and internal layers in fluid dynamics and kinetic theories, Large-time behavior in Fokker-Planck equations.
- Apr 2014 **100th European Study Group with Industry**, Oxford, UK, 1 week,  
*Content:* Modeling and analysis of filter design (Pall Corporation).
- Apr 2014 **Graduate Modeling Camp**, Oxford, UK, 1 week,  
*Content:* Modeling, analysis and simulation of efficient airplane boarding.
- June 2012 **Summer Schools.** *Models and Methods in Kinetic Theory*, Porto Ercole, Italy, 1 week,  
*Course examples:* Coagulation-Fragmentation Models, Statistical mechanics and dynamics of long-range interacting systems.
- Sept 2009 **Summer School.** *MathMods*, Alba Adriatica, Italy, 2 weeks,  
*Course examples:* Structured population dynamics in ecology and epidemiology. The many sides of reaction-diffusion systems.

## Communication Skills, Team Management & Personal Development

- April 2019 **Media Skills for Academics**, London, 1 day,  
*Content:* Interview techniques, working with the press office.
- April 2019 **Managing your First Research Group**, London, 2 days,  
*Content:* Leadership, Recruitment, Human Resources, Team Roles.
- June 2018 **Storytelling Workshop**, NYU, New York, 3 days,  
*Content:* Make research accessible, adapt to different audiences, self-editing.
- Mar 2018 **Conflict Resolution Workshop**, NYU Langone Health, New York, 1 day,  
*Content:* Conflicts in work/academia, conflict styles & solution strategies.
- Spring 2017 **Advanced Science Communication Workshop**, Arthur L. Carter Journalism Institute, NYU, New York, 5 weeks,  
*Content:* Character sketches, writing styles, science book reviews.
- Wint 2016 **Basic Science Communication Workshop**, Arthur L. Carter Journalism Institute, NYU, New York, 5 weeks,  
*Content:* Avoiding jargon, word choice, text structure.
- Wint 2014 **Presentation Techniques**, DK Winter Workshop, Hernstein, 1 day.

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## Teaching

In the list of teaching experiences below, I also included some less conventional teaching experiences (marked with \*) that influenced my teaching style.

- Winter 2017 **Mathematical Modeling with Differential Equations**, *College Bridge Course*, [New York Math Circle](#), 5 weeks, Lecturer.  
**Audience:** Gifted high school students and Math Circle instructors, 10 students  
**Responsibilities:** Lecturing, designing course outline, material and homework questions.  
**Course Evaluation:** 4.8 of 5.
- Winter 2017 \*[Access 2017 - Artist and Scientist Collaborations](#), *New York Hall of Science (Science Museum)*, 3 months, Project Mathematician.  
**Audience:** Children and teenagers, several groups of 10-20.  
**Responsibilities:** Together with the game developers *Gigantic Mechanic* and the choreographer *Kate Siccio* designing a physical game & dance to convey the concepts of mathematical modeling using the example of a zombie epidemic and cell movement.
- Summer Term 2017 **Numerical Analysis**, *New York University*, 15 weeks, Lecturer.  
**Audience:** Undergraduate students in Mathematics and Economics, 20 students.  
**Responsibilities:** Lecturing, course design, material selection, homework questions, exam design and marking, co-ordination of Teaching Assistant and grader.  
**Course Evaluation:** 4.6 of 5.
- Sept 2016 **EMBO Practical Course** [Modeling Cellular Processes in Space and Time](#), *Porquerolles, France*, 1 week, Teaching Assistant.  
**Audience:** Graduate students and Post-docs in mathematics, biology and physics.  
**Responsibilities:** Facilitation, assistant to Prof. Mogilner.
- Sept 2015 \***Facilitator at training** *Gender Issues in East Africa*, ([JAMBO project](#)), *Rome, Italy*, 2 weeks, Nonformal education.  
**Audience:** NGO workers from Italy, France and Austria.  
**Responsibilities:** Designing and conducting activities.
- April 2015 \***Facilitator at training** *Project Management and Gender Issues*, ([JAMBO project](#)), *Kampala, Uganda*, 2 weeks, Nonformal education.  
**Audience:** NGO workers from Kenya, Uganda and Tanzania.  
**Responsibilities:** Designing and conducting activities.
- Summer Term 2015 **Mathematics for Molecular Biologists**, *University of Vienna*, 15 weeks, Exercise Classes.  
**Audience:** Undergraduate students of Molecular Biology, 2 groups of 25 students each.  
**Responsibilities:** Designing and grading exercises and exams, conducting the exercise classes.  
**Course Evaluation:** 4.7 of 5.
- Summer Term 2011 **Mathematics for Molecular Biologists**, *University of Vienna*, Teaching Assistant.  
**Audience:** Undergraduate students of Molecular Biology.  
**Responsibilities:** Grading exams.

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## Peer-Review Activity

- Journals *Molecular Biology of the Cell*, *Bulletin of Mathematical Biology*, *AMS Mathematical Reviews*, *AIMS Biophysics*

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## Science Communication, Public Engagement & Outreach

- Aug 2018 **Introduction to Modeling**, *Center for Mathematical Talent*, NYU, New York, 2 part lecture, Highschool students.
- 2017 – **Science Illustrator of *Cooper Square Review***, (*Carter Journalism Institute*), New York.
- Apr 2018 **Modeling Talk**, *HTL Leberstrasse*, Vienna, Highschool students.
- Apr 2018 **Modeling Talk**, *cSplash*, CIMS, NYU, Highschool students.
- Apr 2018 **Panel Discussion: Artist and Science Conversation**, *NY Hall of Science*, New York, Science museum audience.
- Wint 2017 **Access 2017 - Artist and Scientist Collaborations**, *NY Hall of Science (Science Museum)*, Project Mathematician, see [Teaching](#) for details.
- 2017 **Author of two science texts on *Cooper Square Review***, (*Carter Journalism Inst.*), New York,  
Essay: *How to Tame Infinity*  
Book Review: *When America Met Darwin*.

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## Social & Cultural Engagement

- 2016– **Member of Post-doc Council**, NYU, New York.
- 2013–2015 **Editor in Chief of the intercultural magazine *Das Fenster***, (*Verein Grenzenlos*).
- 2011–2015 **Part-time work at *Grenzenlos-Interkultureller Austausch***, Vienna, Co-ordination of volunteering programs to Africa.
- Sept 2015 **Facilitator at training *Gender Issues in East Africa***, (**JAMBO project**), *Rome, Italy*, 2 weeks, see [Teaching](#).
- April 2015 **Facilitator at training *Project Management and Gender Issues***, (**JAMBO project**), *Kampala, Uganda*, 2 weeks, see [Teaching](#).
- 2008 **Voluntary Social Year**, *Kabale, Uganda*, 12 months, Fair-trade development, Multimedia, Management.
- 2002–2003 **Students Exchange**, *Nambour, Australia*, 12 months.

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## Programming & Software Skills

- Languages Matlab, Python, Visual Basic
- Software VCell, Cytosim, FreeFEM
- Other ImageJ, Maple, R, Gimp, Inkscape

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## Languages

- Fluent German & English
- Basic Italian, French & Rukiga