

Prof'in Dr. Anita Winter (she/they)

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Education

FAU Erlangen Nürnberg	Habilitation	01/2008
FAU Erlangen Nürnberg	Promotion <i>"Multiple Scale Analysis of Branching Processes under the Palm Distribution"</i>	07/1999
Humboldt-Universität Berlin	Diplom Mathematik	07/1995
EOS Heinrich-Hertz Berlin	Abitur	07/1990

Academic Positions

W3-Professur für "Stochastik", Universität Duisburg-Essen	since 09/2010
Vertretung W3-Professur "Wahrscheinlichkeitstheorie", TU München	10/2009-08/2010
Akademische Oberrätin, FAU Erlangen Nürnberg	04/2008-09/2009
Wissenschaftliche Assistentin, FAU Erlangen Nürnberg	01/2008-03/2008
Aly Kaufman Visiting Scientist Fellowship, Technion Haifa,	10/2006-12/2007
Wissenschaftliche Assistentin, FAU Erlangen Nürnberg	06/2003-09/2006
Research Grant of the DFG (German Science Foundation), UC Berkeley	09/2002-05/2003
Wissenschaftliche Assistentin, FAU Erlangen Nürnberg	04/2000-08/2002
Wissenschaftliche Mitarbeiterin, FAU Erlangen Nürnberg	08/1995-03/2000

Research Interests

Random Trees, Markov Processes, Dirichlet forms, Martingale Problems, Branching processes,
Stochastic Analysis, Mathematical population genetics, Metric Geometry, Random Media,
Interacting Particle Systems, Evolving Trees, Evolving Graphs

Publications

• Articles (peer-reviewed)

- 24.) (with Clément Foucart and Victor Rivero) Conditioning the logistic continuous-state branching process on non-extinction via its total progeny, accepted at *Annals of Applied Probability*.
- 23.) (with Andreas Greven, Frank den Hollander and Anton Klimovsky) Continuum graph dynamics via population dynamics: well-posedness, duality and equilibria, *Stochastic Processes and their Applications*, Vol. 188 (2025), 104670.
- 22.) (with Andreas Greven, Frank den Hollander and Anton Klimovsky) The grapheme-valued Wright-Fisher diffusion with mutation, *Theoretical Population Biology*, Vol. 158 (2024), 76-88.
- 21.) (with Josué Nussbaumer and Tran Viet Chi) Algebraic two-level measure trees, *Electronic Journal of Probability*, Vol. 167, No. 29 (2024), 1-37.
- 20.) (with Gabriel Berzunza and Anja Sturm) Trait-dependent branching particle systems with competition and multiple offspring, *Electronic Journal of Probability*, Vol. 26, No. 153 (2021), 1-41.
- 19.) (with Anja Sturm) Multitype branching models with state-dependent mutation and competition in the context of phylodynamic patterns, in: *Probabilistic Structures in Evolution* (Ellen Baake and Anton Wakolbinger, eds.), EMS Press, Berlin, (2021), 337-362.
- 18.) Algebraic measure trees: Statistics based on sample subtree shapes and sample subtree masses, in: *Probabilistic Structures in Evolution* (Ellen Baake and Anton Wakolbinger, eds.), EMS Press, Berlin, (2021), 451-475.
- 17.) (with Wolfgang Löhr) Spaces of algebraic measure trees and triangulations of the circle, *Bulletin de la Société Mathématique de France*, 149 (1) (2021), 1-63.
- 16.) (with Wolfgang Löhr and Leonid Mytnik) The Aldous chain on cladograms in the diffusion limit, *Annals of Probability*, Volume 48, Number 5 (2020), 2565-2590.
- 15.) (with Sandra Kliem) Evolving phylogenies of trait-dependent branching with mutation and competition. Part I: Existence, *Stochastic Processes and their Applications*, Volume 129(12) (2019), 4878-4925.
- 14.) (with Siva Athreya and Wolfgang Löhr) Invariance principle of variable speed random walks on trees, *Annals of Probability*, Volume 45(2) (2017), 625-667.
- 13.) (with Andreas Greven and Rongfeng Sun) Continuum Space Limit of the Genealogies of Interacting Fleming-Viot Processes on $\mathbb{Z}$, *Electronic Journal of Probability*, Vol. 21, No. 58 (2016), 1-64.
- 12.) (with Siva Athreya and Wolfgang Löhr) The gap between Gromov-vague and Gromov-Hausdorff-vague topology, *Stochastic Processes and their Applications*, Vol. 126 (9) (2016), 2527-2553.

- 11.) (with Wolfgang Löhner and Guillaume Voisin) Convergence of bi-measure $\mathbb{R}$ -trees and the pruning process, *Annales de l'Institut Henri Poincaré (B) Probabilités et Statistiques*, Vol. 51, No. 4 (2015), 1342-1368.
- 10.) (with Andreas Greven and Peter Pfaffelhuber) Tree-valued resampling dynamics: Martingale Problems and applications, *Probability Theory and Related Fields*, Vol. 155 (3-4) (2013), 789-838.
- 9.) (With Siva Athreya and Michael Eckhoff) Brownian motion on $\mathbb{R}$ -trees, *Transaction of American Mathematics Society*, Vol 365, (2013) 3115-3150.
- 8.) (with Andreas Greven and Lea Popovic) Genealogy of catalytic branching models, *Annals of Applied Probability*, Vol 19, Nr. 3, (2009) 1232–1272.
- 7.) (with Andreas Greven and Peter Pfaffelhuber) Convergence in distribution of random metric measure spaces; The Λ -coalescent measure tree, *Probability Theory and Related Fields*, Vol 145, (2009) 285–322.
- 6.) (with Steven N. Evans) Subtree prune and re-graft: a reversible real tree valued Markov process, *Annals of Probability*, Vol. 34, Nr. 3, (2006) 918-961.
- 5.) (with Janos Engländer) Law of large numbers for a class of superdiffusions, *Annales de l'Institut Henri Poincaré (B)*, Vol 46 (2006), Pages 171-185.
- 4.) (with Steven N. Evans und Jim Pitman) Rayleigh processes, real trees, and root growth with re-grafting, *Probability Theory and Related Fields*, Vol 134, Nr 1, January (2006), 81 - 126.
- 3.) (with Andreas Greven und Vlada Limic) Representation theorems for interacting Moran models and interacting Fisher-Wright models, and applications, *Electronic Journal of Probability*, Vol. 10 (2005), Paper Nr. 19, 1286-1358.
- 2.) (with Siva Athreya) Spatial coupling of neutral measure-valued population models, *Stochastic Processes and their Applications*, Vol 115, Nr. 6, (2005), 891-906.
- 1.) Multiple Scale Analysis of Branching Processes under the Palm Distribution, *Electronic Journal of Probability*, Vol. 7, Nr. 13 (2002), 1-72.
- 0.) PhD thesis, <http://www.mi.uni-erlangen.de/~winter/>

• **Articles (submitted)**

-) (with Osvaldo Angtuncio Hernández and Gabriel Berzunza Ojeda) Scaling limit of the Aldous-Broder chain on regular graphs: the transient regime, arXiv:2502.06680.
-) (with Gabriel Berzunza Ojeda) Convergence of the pruning processes of stable Galton-Watson trees and other $\mathbb{R}$ -trees, arXiv:2304.10489.
-) (with Josué Nussbaumer) The algebraic α -Ford tree under evolution, arXiv:2006.09316, under revision.
-) (with Luis Osorio) Two level branching model for virus population under cell division, arXiv:2004.14352.

• **Other publications**

-) with (Fatma Batur, Aylin Kilic, Catrin Opheys, Nicolle Pfaff, Hannah Sawall) Editorial In: Unikate: Berichte aus Forschung und Lehre 2025, Nr. 62: Offen(er) im Blick : Diversity Management und Diskriminierungskritik an der Universität
-) (with Martin Hutzenthaler) Zufällige Strukturen in der Evolutionsbiologie : Ohne Zufall keine Evolution In: Unikate: Berichte aus Forschung und Lehre (2019) Nr. 53: Mathematik - Herausforderung des Nichtlinearen, pages 79 – 88 ISBN: 978-3-934359-53-6 ISSN: 0944-6060; 1869-3881.
-) (with Andreas Greven, Anja Sturm and Iljana Zähle) Multi-type spatial branching models with local self-regulation I: Construction and an exponential duality, arXiv: 1509.04023
-) Habilitation thesis “*Tree-valued Markov limit dynamics*”, (2008), FAU Erlangen-Nürnberg, available at my homepage.
-) (with Andreas Greven and Vlada Limic) Coalescent processes arising in the study of diffusive clustering, arXiv:0703875.

Grants

DFG-Schwerpunktprogramm 2265 “ <i>Random Geometric Systems</i> ”	Postdoc, 3 Jahre appr. 260.000 Euro	01/2024-12/2027
DFG-Schwerpunktprogramm 2265 “ <i>Random Geometric Systems</i> ”	Postdoc, 3 Jahre appr. 240.000 Euro	10/2020-09/2023
DFG-Schwerpunktprogramm 1590 “ <i>Probabilistic Structures in Evolution</i> ”	PhD Student, 3 Jahre appr. 160.000 Euro	06/2017-11/2021
DFG-Graduiertenkolleg 2131 “ <i>Highdimensional Phenomena</i> ” “ <i>in Probability</i> ”	shared with other PIs from University Alliance Ruhr appr. 4.300000 Euro (shared)	06/2017-11/2021
DFG-Schwerpunktprogramm 1590 “ <i>Probabilistic Structures in Evolution</i> ”	Postdoc, 3 Jahre 232.350 Euro	01/2012-03/2015
Project in SFB/TR 12 “ <i>Large deviations and fluctuations in stochastic systems away from equilibrium</i> ”	PhD student, 3 Jahre 151.883 Euro	07/2011-06/2015
DFG-Research Fellow	9 Months at UC Berkeley appr. 27.000 Euro	09/2002-05/2003

Advising

I have advised several postdocs and PhD students.

- **Postdocs**

- Roman Gambelin, since 12/2024
- Osvaldo Angtuncio Hernandez, 10/2020-03/2023, now CIMAT (Mexico)
- Anton Klimovsky, Habilitation 09/2019, now Universität Würzburg (Germany)
- Wolfgang Löhr, Habilitation 10/2020
- Sandra Kliem, now Universität Leipzig (Germany)
- Guillaume Voisin, now Université du Mans (France)

- **PhD students**

- Fabian Gerle, “*On the convergence of Feller processes*”, 02/2024.
- Josué Nussbaumer, “Algebraic and nested tree-valued processes”, Université de Lille and University of Duisburg-Essen, co-supervised together with Tran Viet Chi, 05/2022.
- Roland Meizis, “*Metric two-level measure spaces: A state space for modeling evolving genealogies in host-parasite systems*”, 02/2019.

Invited talks (since 2015)

2026

ICTS Bangalore, “*ICTS-TIFR and NETWORKS workshop*”

2025

One World Probability Seminar (online) • TU Dresden, *German Probability and Stochastics Days* • TU München “*Women in Random Geometric Systems*” • TU Braunschweig, “*Stochastic Processes on Random Geometries*” • Orsay, “*Conférence annuelle du GDR branchement*”

2024

ICTS Bangalore, “Challenges in networks” • Hokkaido University Sapporo, “2024 Open German-Japanese Conference on Stochastic Analysis and Applications” •

• • Herrsching, “Random walk, scaling limits and criticality” • University of Oxford, “*Evolution in structured populations: recent progress and new challenges*”

2023

École Polytechnique, “Séminaire du pôle Probabilités” • Universität Köln, “Geometric and Topological Properties of Random Algebraic Varieties.” • TU Dortmund, “Random graphs 2023” • Edinburgh, 11th International Conference on Stochastic Analysis and its Applications (ICSAA) • Angers, “Branching processes and their applications” • Manchester, “UK Easter Probability meeting”

2022

Eurandom “Recent Developments in Stochastic Duality” • Bonn, “From Dirichlet Forms to Wasserstein Geometry” (declined due to a parallel memorial meeting for Dima Joffe at the Technion) • Hausdorff-Zentrum Bonn, “Random geometries and stochastic interacting processes”

2021

Lunteren, Dutch Stochastics Meeting • Bielefeld, “Analysis of Population Models with Interaction: New Trends and Developments”

2020

Sorbonne Paris Nord, Probability Seminar • Bernoulli-IMS One World Symposium (online) • Bangalore, Discussion Meeting

2019

Warwick, “Models and Inference in Population Genetics” • Oberwolfach, “Heat Kernels, Stochastic Processes and Functional Inequalities” • Prag, “Workshop on complex systems” • São Carlos, “XXIII Escola Brasileira de Probabilidade” • Beijing, 5th Workshop “Branching processes and related topics” • Erlangen, “Spatial population models: from configurations to genealogies and back”

2018

Dresden, “Stochastic processes and random trees” • Seoul, Joint Meeting DMV and KMS • NUS Seoul, 12th “KMS Probability Workshop” • ECNU Shanghai, “Branching processes and related topics” • Erlangen, “Genealogies, lines of descent and duality in population models”

2017

Bochum, RTG-Seminar • Freiburg, Mathematisches Kolloquium • Singapore, “Genealogies of Interacting Particle Systems” • Erlangen, Probability Seminar • München, Women in Probability • Bielefeld, European Women in Mathematics • Paderborn, Probability Seminar

2016

Oberwolfach, “Heat Kernels, Stochastic Processes and Functional Inequalities” • Karlsruhe, Probability Seminar

2015

ISI Bangalore, Probability Seminar • Beijing Normal, Probability Seminar • Hamburg, “Current Trends in Stochastic Analysis and Related Topics” • Bielefeld, “Probabilistic Structures of Evolution” • Augsburg, Mathematisches Kolloquium • Warwick, “Random walks on graphs and potential theory”

Organized conferences and sessions

2026

Member of the Scientific Committee of the 45th Conference on “*Stochastic Processes and Their Applications*” 2026, Cornell University

2024

Member of the local organization committee of the Bernoulli-IMS 11th World Congress in Probability and Statistics 2024 in Bochum • (with Axel Bücher) Local organizer of the Pre-Meeting for Young Researchers, University Essen • (with Zhen-Qing Chen, Michael Röckner and Masayoshi Takeda) Oberwolfach Meeting on “Recent Developments in Dirichlet Form Theory and Related Fields”

2023

Member of the local organization committee of the 13th German Open Stochastic Days, Essen

2022

(with Frank den Hollander and Anja Sturm) Oberwolfach Meeting on “Population Dynamics and Statistical Physics in Synergy”

2018

(with Martin Hutzenthaler) of Mini-Workshop “Evolutionary forces and genealogical trees” • (with Wolfgang Löhner) of Workshop of the RTG 2131 on “Markov processes on metric measure spaces and Gaussian fields” • Member of Scientific committee of the 13th German Open Stochastic Days Freiburg

2017

(with Anja Sturm) of Mini-Workshop “Probabilistic models in evolutionary biology”, Göttingen

2014

(with Anja Sturm) of Mini-Workshop “Genealogies of population models with competition”, Essen • (with Achim Klenke and Peter Pfaffelhuber) of Mini-Workshop “From interacting particle systems to population genetics”, Erlangen

2010

(with Silke Rolles), Workshop “Women in probability” (first workshop of this kind in Germany)

Refereeing Habilitation and PhD thesis

2024

Reviewer of the habilitation thesis of Hélène Leman, “*Stochastic models of evolving populations: diversity, spatial structures, cooperative behaviors and mating preferences*”, ENS Lyon

2023

Member of the jury for the Marc Yor Prize 2023 of the Académie des sciences (France)

2022

Exam committee of the habilitation theses of Eva Kopfer, “Wärmeﬂuss auf singulären Räumen: diskret, zeitabhängig und pfadabhängig”, Universität Bonn

2021

Exam committee of the PhD theses of Margriet Oomen, “*Spatial populations with feed bank*”, Leiden University, November 2021

2019

Referee of the habilitation theses of Christoph Schumacher, “Concentration inequalities in random Schrödinger operators”, TU Dortmund • Referee of the habilitation thesis of Anton Klimovsky, “Stochastic models of inhomogeneous complex systems: Emergence of multi-scale hierarchies”, • Referee of the PhD thesis of Sacha Kissel, “Hard-core and soft-core Widom-Rolinson models in various geometries”; Ruhr Universität Bochum

2017

Exam committee of the PhD theses of Max Grieshammer “Measure representation of genealogical processes and applications to Fleming-Viot models”; Universität Erlangen

2016

Exam committee of the PhD theses of Martina Baar; “Stochastic individual-based models of adaptive dynamics and applications to cancer immunotherapy”

2014

Exam committee of the PhD theses of Peter Seidel “The historical process of the spatial Moran model with selection and mutation”; Universität Erlangen • Exam committee of l’Habilitation à diriger des recherches of Tran Viet Chi “Téoremes limites pour des populations structurées et leurs généalogies, étude probabiliste et statistique de modèles SIR en épidémiologie, contributions à la géométrie alatoire”

2012

Exam committee of the PhD theses of Thomas Rippl “Pathwise Uniqueness of the Stochastic Heat Equation with Hölder continuous diffusion coefficient and colored noise”; Universität Göttingen

2010

Exam committee of the PhD theses of Sven Piotrowiak “Dynamics of Genealogical Trees for Type- and State-dependent Resampling Models”; Universität Erlangen

2008

Exam committee of the master theses of Roman Berezin “Limiting Behavior of Contact Random Walk”; Technion Haifa

Academic Self-Governance and Citizenship

(Co-)Editor of *Unikate Offen(er) im Blick: Diversity Management und Diskriminierungskritik an der Universität*, ISBN 1869-3881, (2025).

- head of **Antidiskriminierungsbeschwerdekommision** at the UDE since 2025
- member of the **University Committee for Diversity Management** elected by the Senat since 2014
- head of the University Commission for Diversity Management at the UDE since 2021
- **Equal Opportunity Representative of the Faculty of Mathematics** since 2020
- initiated and supported by the DIM Commission: recommendations for action for *Inclusive Teaching* and *Inclusive Learning in the Digital World*, the recommendations for action on *Language Sensitivity*, the *Anti-discrimination strategy and complaints procedure*; All gender toilets on the campuses of Duisburg and Essen; implementation of changes in personal status law; barrier-free guidance system; consideration of diversity aspects in appointments; offerings for (not only) students and researchers who have fled Ukraine, ...
- elected member of the **Fakultätsrat** of the Faculty of Mathematics at UDE continuously since 2012
- member of the board of the Stochastic Section of the German Mathematical Society (**Fachgruppe Stochastik** der DMV), 2016-2020
- spoke person of the board of the Stochastic Section of the German Mathematical Society (**Fachgruppe Stochastik** der DMV), 2018-2020
- **senate rapporteur** of appointment procedures (Berufungskommissionen) at UDE since 2020

Teaching experience

I have a lot of teaching experience addressing students in different programs:

- **Service teaching** *Statistics for Economists* (TUM: SS 2010), *Statistics for Medical Biologists, Biologists and Water Scientists* (DUE: WS 2011/12)

- **Lectures for bachelor and teacher students** *Markov chains* (FAU: SS 2004; TUM: SS 2010; DUE: WS 2010/11, WS 2012/13, WS 2013/14, SS 2023), *Introduction into Stochastics* (UDE: WS 2013/14, SS 2016, WS 2016/17, WS 2019/20, WS 2021/22, WS 2024/25), *Probability I* (measure theoretic probability theory; DUE: SS 2011, SS 2012, SS 2014, SS 2015, SS 2017, SS 2018, SS 2020, SS 2022, SS 2025)
- **Lectures for master students** *Probability II* (Martingale Theory, CLT, Brownian motion, Invariance Principle; FAU: SS 2006; UDE: SS 2009, WS 2010/11, WS 2011/12, WS 2012/13, WS 2015/16, WS 2017/18, WS 2018/19, WS 2020/21, WS 2022/23), *Theory of Large Deviations* (FAU: WS 2008/09, SS 2009; TUM: WS 2009/10; UDE SS 2012), *Gaussian Processes and Local Times* (UDE: SS 2015, SS 2018, SS 2022), *Theory of Markov processes* (FAU (with Jan Swart): WS 2004/05; UDE (with Wolfgang L  hr): SS 2013),
- **Graduate Courses (for PhD students and advanced master students)** *Population models and measure valued processes* (with Leonid Mytnik, Technion Haifa: SS 2007), *Schramm-Loewner Evolutions* (FAU: SS 2008), *Stochastic processes on trees* (DUE/RUB (with Christof K  lske): SS 2016), *Branching Brownian Motion* (DUE (with Martin Huttenh  ler): WS 2018/19), *Random Walks on Graphs and Heat Kernel Estimates* (DUE WS 2019/20 (with Wolfgang L  hr), SS 2023), *Mathematical Population Genetics* (DUE/RUB (with Maite Wilke Berenguer: SS 2020), *Uniform Spanning Trees* (with Osvaldo Angtuncio-Hern  ndes), *Random Graphs and Complex Networks* (DUE (with Anton Klimovsky and Osvaldo Angtuncio-Hern  ndes): WS 2021/22), *Fundamentals of the Stein method* (UDE: SS 2024), *Levy processes* (UDE (with Roman Gambelin): SS 2025)
- **Bachelor Seminars** *Graphical Models in Applied Multivariate Statistics* (TUM: WS 2009/10), *Extreme value theory* (UDE: WS 2012/13) *Stein's method for Poisson approximation* (UDE: WS 2014/15), *Random Matrices* (UDE: WS 2015/16), *Concentration inequalities* (UDE: WS 2018/19), *Poisson processes* (UDE: WS 2019/20), *Interacting Particle Systems* (UDE: WS 2020/21), *Special Topics in Markov chains* (UDE: WS 2022/23)
- **Master Seminars** *Probabilistic Models for DNA sequence evolution* (TUM: SS 2010), *Probability Theory on Trees and Networks* (UDE: WS 2011/12), *The Voter Model* (UDE: SS 2012), *Random Walks in Random Environment* (UDE: WS 2013), *Gaussian Approximation with Mallivian Calculus* (UDE: WS 2016/17), *Regularity of Gaussian Processes* (UDE: WS 2018)
- **Supervised theses** Over the years I have supervised 5 Diploma thesis, 34 Bachelor thesis, 25 Master thesis and 3 thesis for Staatsexamen (teacher students).