



## PROFILE

I am a behavioral and evolutionary ecologist with a focus on animal behavior, cognition, and visual signals. My experience spans from invertebrate to vertebrate systems and I am interested in anti-predator adaptations, the ecology of fear as well as sleep in previously unstudied organisms. My focus on natural history has recently led to the discovery of a REM sleep-like state in spiders with strong parallels to REM sleep in mammals and birds challenging existing views on the origin and evolution of this behavioral state. I use interdisciplinary and integrative approaches in both the laboratory and the field using neural network-based video tracking methods to validate and quantify behavioral data.

## KEY SKILLS

Animal behavior | Diversity | Natural history | Sleep research | Predator-prey interactions | Sensory ecology | Evolutionary ecology | Discovery

## RESEARCH METRICS

Years since PhD: **4**  
Total number of publications: **20**  
Total number of citations: **286**  
H-index: **9**

## INSTITUTE ADDRESS

Zukunftskolleg | University of Konstanz  
Universitätsstr 10  
78464 Konstanz  
Germany

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## WEBSITE

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# Dr. Daniela C. Rößler

**POSTDOCTORAL RESEARCHER | BEHAVIORAL ECOLOGIST**

## RESEARCH & TEACHING POSITIONS

Since 06/2021 | **Postdoctoral Researcher, University of Konstanz & Max Planck Institute of Animal Behavior**

In this independent fellowship from the Zukunftskolleg at the University of Konstanz, I am focusing on spider sleep research. I am leading a research group with student research assistants and an animal facility. I currently supervise several thesis projects addressing questions in animal sleep research as well as in predator-prey interactions.

01/2020 – 06/2021 | **Postdoctoral Researcher, Harvard University**

I was a postdoctoral research fellow in Dr. Paul Shamble's lab at the John Harvard Distinguished Science Fellows Program. My research there centered on behavior, visual signals, and cognition in jumping spiders with a focus on predator-prey interactions.

10/2017 – 12/2019 | **Lecturer, Trier University**

During this lectureship I gave both the lecture and the practical courses in Animal Physiology as well as Animal Anatomy for undergraduate biology students.

07/2014 – 06/2019 (submission) | **PhD in Behavioral Ecology, Trier University**

Title: *Visual ecological aspects in interspecific communication – Examples from predator-prey and parasite-host interactions.*

Supervisors: Prof. Dr. Stefan Lötters (Trier University) and Prof. Dr. Heike Pröhl (University of Veterinary Medicine Hannover). I defended my dissertation on 22/11/2019 and passed my PhD with highest distinction (summa cum laude).

02/2014 – 04/2015 | **Teaching Assignments, Trier University**

Practical Courses on Animal Physiology for undergraduate biology students.

## HIGHER EDUCATION

**Trier University, Doctoral Studies**

2014 – 2019 | Dr. rer. nat. (summa cum laude)

**Trier University, Master of Education**

2011 – 2014 | Master of Education in Anglistics and Biology (Gymnasium)

**Trier University, Bachelor of Education**

2008 – 2011 | Bachelor of Education in Anglistics and Biology (Gymnasium)

FIELD RESEARCH  
& RESEARCH  
VISITS

01/2024 – 02/2024 | **Research Visit** to Smithsonian Tropical Research Institute (STRI), Panama  
Since 2014 | **Tropical Field Research**  
I was involved in as well as led several field expeditions to the tropics including to Peru, Brazil, French Guiana, Panama, Rwanda and Uganda.  
02/2018 | **Research Visit** to Prof. Dr. Johanna Mappes, Jyväskylä, Finland

TENURE TRACK  
APPLICATION

10/2023 | Shortlisted for Maria Sibylla Merian Professorship (W1, Tenure Track) at the University of Münster (219 applicants)

LEADERSHIP &  
MENTORSHIP  
EXPERIENCE

Since 2021 | Active as a mentor in the *Animal Behavior Collective* to two female mentees.  
Since 06/2021 | Leading an **independent research group**. Supervising theses and projects as well as welcoming international interns for short-term projects at Uni Konstanz / MPI Animal Behavior.

EQUITY, DIVERSITY  
& INCLUSION

Belonging to the LGBTQ+ community, equity, diversity, and inclusion (EDI) are key elements in my understanding of good and fair science. Acknowledging my privileged position of being a white woman from a high-income nation, my aim is to listen to and amplify voices of underrepresented groups. I want to contribute to make science fairer and accessible to all. In effort of this, I published a correspondence article in *Nature* on EDI issues in the publication system and how scientific journals can contribute to lead a much-needed change. In response to this, numerous high-impact journals now ask authors about this information and publish it alongside the manuscripts (e.g. Cell).

**Rößler, D.C.**, Lötters, S., Marin Da Fonte, L.F., 2020. Author declaration: have you considered equity, diversity and inclusion? *Nature*, 585(7822). <https://doi.org/10.1038/d41586-020-02429-8>

SUPERVISED  
THESES

- 2022 | Hidden in plain sight? Testing eye camouflage in jumping spiders (Zoe Umbach, BA, University of Konstanz) \*
- 2021 | Assessing predation in aposematic poison frogs: an eDNA -based approach with clay models in *Ameerega trivittata* (Christopher Heine, BA, Trier University)
- 2021 | Defense mechanisms in a neotropical poison frog (Hannes Heister, BA, Trier University)
- 2021 | Do jumping spiders distinguish different types of conspecifics based on static visual stimuli? (Anna Stanton, BA, University of Konstanz) \*
- 2020 | The function of bright coloration in prey capture and predator avoidance behaviour in the wasp spider *Argiope bruennichi* (Milena Greis & Eva Schmitt, BA, Trier University, 2020)
- 2019 | Color traits in the neotropical toad genus *Atelopus*: connections to morphology and habitat (Linda-Mali Weißenfels, BA, Trier University)
- 2019 | Are fire salamanders (*Salamandra salamandra*) aposematic? A pilot study using clay models to genetically assess potential predators (Tatjana Walter, MA, Trier University) \*
- 2019 | Is the fire salamander (*Salamandra salamandra*) aposematic? A predation experiment using clay models-a pilot study (Charlene Peters, BA, Trier University) \*
- 2019 | The function of fire salamander coloration (Michèle Fugmann, MA, Trier University) \*
- 2017 | Conspicuousness of dorsal patterns of Amazonian *Atelopus* populations in relation to body size (Katrin Puffay, MA, Trier University) \*

\* not an official referee, but contributed significantly to study design and realization

## WORKSHOPS & OUTREACH

- 2023 | 2-day project on the scientific method including field and lab work, Max-Planck-Gymnasium Trier, Germany
- 2023 | Outreach seminar on rainforests for kindergarten children, KiTa Trier, Germany
- 2022 | Outreach seminar on spiders for 6<sup>th</sup> graders at the IGS Hermeskeil, Germany
- 2021 | Visual signals and their function: Introduction to scientific research. Max-Planck-Gymnasium Trier, Germany (online workshop). For all pupils in advanced biology courses.
- 2019 | Workshop on invertebrate biodiversity (Kinder-Uni, Trier University)
- 2014 | Workshop on marine plastic pollution (Ozeaneum Stralsund)
- 2013 | Workshop on marine plastic pollution (Girls Day, Trier University & several schools)

## ATTENDED WORKSHOPS & TRAINING

- 2023 | Wilderness first aid course (via Max Planck Institute of Animal Behavior)
- 2020 | Supporting a Harassment-Free Community (Harvard University)
- 2020 | Laboratory Biosafety & General Laboratory Safety (Harvard University)
- 2018 | Advanced Training in University Didactics (Trier University) ('E-Learning', 'Project-oriented learning' and 'Key competences in teaching')

## LANGUAGE & SKILLS

### Languages

English, excellent  
French, good  
Portuguese, basic  
German, mother tongue

### Software & Programming Skills

RStats | Python | Adobe Illustrator | Meshmixer

### Technical Skills

3D printing (resin & filament) | Laser cutting

### Animal Husbandry

Poison frogs | Harlequin toads | Jumping spiders

## AWARDS, GRANTS, FUNDING & SCHOLARSHIPS

### Total grant income, > 85.000€ + three years postdoctoral salary (TVL E13 100%)

- 2023 | Finalist of the 2022 PNAS Cozzarelli Prize (National Academy of Sciences) recognizing publications of outstanding scientific quality and originality.
- 2023 | Co-funding by the Zukunftskolleg (total 17.800€)
- 2022 | Co-funding by the Zukunftskolleg (total 6.300€)
- 2022 | Young Scholar Fund (9,200€)
- 2021 | Investment Programme for Research (10.820€)
- 2021 | Co-funding by the Zukunftskolleg (1.450€)
- 2021 | Independent two-year postdoctoral fellowship at the highly competitive Zukunftskolleg (University of Konstanz) (140 applicants)
- 2020 | Outstanding dissertation award, Trier University (2.000€)
- 2019 | Best poster award, ESEB meeting in Turku, Finland (European Society for Evolutionary Biology) (ca. 300€)
- 2018 | Travel award, ISBE meeting in Minneapolis, USA (International Society for Behavioral Ecology) (1.200 US\$)
- 2015 – 2017 | PhD fellowship from the Scholarship foundation Rhineland-Palatinate (total 34.000 €)
- 2014 – 2018 | Several travel & conference grants awarded by the research fund of Trier University (total 3.400 €)

## SCIENTIFIC OUTPUT TOP 5 PUBLICATIONS

- Rößler, D.C.**, Kim, K., De Agrò, M., Jordan, A., Galizia, C.G., Shamble, P.S., 2022. Regularly occurring bouts of retinal movements suggest an REM sleep-like state in jumping spiders. **PNAS**, 119(33). <https://doi.org/10.1073/pnas.2204754119>
- Rößler, D.C.**, De Agrò, M., Kim, K., Shamble, P.S., 2022. Static visual predator recognition in jumping spiders. **Functional Ecology**, 36(3). <https://doi.org/10.1111/1365-2435.13953>

- Rößler, D.C.**, De Agrò, M., Biundo, E., Shamble, P.S., 2021. Hanging by a thread: unusual nocturnal resting behavior in a jumping spider. **Frontiers in Zoology**, 18(1).  
<https://doi.org/10.1186/s12983-021-00410-3>
- Rößler, D.C.**, Lötters, S., Veith, M., Fugmann, M., Peters, C., Künzel, S., Krehenwinkel, H., 2020. An amplicon sequencing protocol for attacker identification from DNA traces left on artificial prey. **Methods in Ecology and Evolution**, 11(10). <https://doi.org/10.1111/2041-210X.13459>
- Rößler, D.C.**, Lötters, S., Mappes, J., Valkonen, J., Menin, M., Lima, A.P., Pröhl, H., 2019. Sole coloration as an unusual aposematic signal in a Neotropical toad. **Scientific Reports**, 9(1).  
<https://doi.org/10.1038/s41598-018-37705-1>
- Plate, J. & **Rößler, D.C.**, (2024). Variation in predator recognition across three species of jumping spiders (Salticidae). **Animal Behavior and Cognition**, 11(1).  
<https://doi.org/10.26451/abc.11.01.03.2024>
- Plewnia, A., Lötters, S., Gomides, S., De Agrò, M. & **Rößler D.C.** (2024). Sex-specific ventral dichromatism and melanization in harlequin toads (*Atelopus*): a common but overlooked character of unknown function. **Evolutionary Ecology**. <https://doi.org/10.1007/s10682-024-10288-2>
- Lötters, S., Plewnia, A., [...], **Rößler, D.C.**, [...] & La Marca, E. (2023). The amphibian extinction crisis is still an emergency. **Communications Earth & Environment**, 4(1).  
<https://doi.org/10.1038/s43247-023-01069-w>
- Kikuchi, D.W., [...] **Rößler, D.C.**, Rowe, C. Rowland, H.M., Roy, A., Schaal, K.A., Sherratt, T.N., Skelhorn, J., Smart, H.R., Stankowich, T., Stefan, A.M., Summers, K., Taylor, C.H., Thorogood, R., Umbers, K., Winters, A.E., Yeager, J., Exnerová, A., (2023). The evolution and ecology of multiple antipredator defences. **Journal of Evolutionary Biology**, 36(7).  
<https://doi.org/10.1111/jeb.14192>
- Longbottom, C., Falk, J., Greenway, E.V., Johnson, M., **Rößler, D.C.**, Somjee, U., 2022. Why does the matador bug (*Anisoscelis alipes*) wave its brightly-colored legs? **Journal of Insect Behavior**, 35.
- De Agrò, M., **Rößler, D.C.**, Kim, K., Shamble, P.S., 2021. Perception of biological motion in a jumping spider. Preliminarily accepted in **PLOS Biology**, 19(7).  
<https://doi.org/10.1371/journal.pbio.3001172>
- Ringler, M., Himmel, T., Werner, P., Luger, M., **Rößler, D.C.**, Ringler, E., Lötters, S., 2022. Male life history of a harlequin toad from French Guiana. **Salamandra**, 58(3).
- Rößler, D.C.**, Ogan, S., Curio, E., Krehenwinkel, H., 2019. Ability makes a thief: vision, learning and swift escape help kleptoparasitic hover wasps (*Parischnogaster* sp.) not to fall prey to their spider hosts. **Behavioral Ecology and Sociobiology**, 73(152).  
<https://doi.org/10.1007/s00265-019-2767-8>
- Portik, D.M., Bell, R.C., Blackburn, D.C., Bauer, A.M., Barratt, C.D., Branch, W.R., Burger, M., Channing, A., Colston, T.J., [...] **Rößler, D.C.**, Sinsch, U., Rödel, M.O., Veith, M., Vindum, A.G., Zassi-Boulou, J., McGuire, J.A., 2019. Sexual dichromatism drives diversification within a major radiation of African amphibians. **Systematic Biology**, sys023.  
<https://doi.org/10.1093/sysbio/syz023>
- Mebs, D., Lorentz, M., Yotsu-Yamashita, M., **Rößler, D.C.**, Ernst, R., Lötters, S., 2018. Geographic range expansion of tetrodotoxin in amphibians – First record in *Atelopus hoogmoedi* from the Guiana Shield. **Toxicon**, 150. <https://doi.org/10.1016/j.toxicon.2018.05.011>
- Rößler, D.C.**, Pröhl, H., Lötters, S., 2018. The future of clay model studies. **BMC Zoology**, 3(1).  
<https://doi.org/10.1186/s40850-018-0033-6>

Lorentz, M.N., Stokes, A.N., **Rößler, D.C.**, Lötters, S., 2016. Tetrodotoxin. **Current Biology**, 26(19).  
<https://doi.org/10.1016/j.cub.2016.05.067>

**Rößler, D.C.**, 2017. *Atelopus spumarius* (Pebas Stubfoot Toad). Behavior. **Herpetological Review**, 48(3).

Schulte, L.M. & **Rößler, D.C.**, 2013. Do poison frogs recognize chemical cues of the other sex or do they react to cues of stressed conspecifics? **Behavioural Processes**, 100.  
<https://doi.org/10.1016/j.beproc.2013.07.016>

#### PREPRINTS

**Rößler, D.C.** & Herberstein, M.E. (2023). A state with increased arousal threshold in *Araneus diadematus* (Araneidae) measured in the wild: new evidence for sleep in spiders. **BioRxiv**.  
<https://doi.org/10.1101/2023.10.19.563109>

De Agró, M., **Rößler, D.C.** & Shamble, P.S. (2023). Eye-specific detection and multi-eye integration model of biological motion in jumping spiders. **BioRxiv**.  
<https://doi.org/10.1101/2023.09.24.559175>

#### UNDER REVIEW / IN REVISION

De Agró, M., **Rößler, D.C.** & Shamble, P.S. (in revision). Eye-specific detection and multi-eye integration model of biological motion in jumping spiders. **In revision in Journal of Experimental Biology**.

#### CONFERENCE CONTRIBUTIONS ORGANIZATION

Symposium organization at the international *Behaviour* conference in Bielefeld in August 2023. Title: *Embracing diversity: comparative sleep research in non-model organisms*, invited speaker: Prof. Dr. Niels Rattenborg. Lead organizer: **Daniela C. Rößler**, co-organizers: Meg Crofoot, Pritish Chakravarty

#### INVITED PLENARY

**Rößler, D.C.**, 02/2024. The spider sleeps tonight: an exceptional framework for comparative sleep research. Plenary talk at the meeting of the Ethological society. Invited by Prof. Dr. Melanie Dammhahn

#### INVITED SYMPOSIUM TALK

**Rößler, D.C.**, 09/2022. Strong behavioral evidence of an REM sleep-like state in jumping spiders. Hot Topic Symposium at the closing session of the European Sleep Research Society (ESRS) conference in Athens, Greece. Invited by Prof. Dr. Tom de Boer

#### CONTRIBUTED TALKS

**Rößler, D.C.**, Kim, K., De Agrò, M., Jordan, A., Galizia, C.G., Shamble, P.S., 2022. Dream research! Evidence for REM-like sleep in jumping spiders. Animal Behavior Society (ABS) 2022 Virtual Meeting. Online Conference.

**Rößler, D.C.**, De Agrò, M., Kim, K., Shamble, P.S., 2021. Arachno-Arachnophobia! Static visual predator recognition in jumping spiders. European Society for Evolutionary Biology (ESEB), Satellite Symposium – Evolution of multiple prey defenses: from predator cognition to community ecology. Online Conference.

**Rößler, D.C.**, De Agrò, M., Kim, K., Shamble, P.S., 2021. Arachno-Arachnophobia! Static visual predator recognition in jumping spiders. Animal Behavior Society (ABS) 2021 Virtual Meeting. Online Conference.

**Rößler, D.C.**, Lötters, S., Mappes, J., Valkonen, J., Menin, M., Lima, A.P., Pröhl, H., 2018. These soles are made for warning: an uncommon case of aposematism in a Neotropical toad. ISBE (International Society for Behavioral Ecology), Minneapolis, USA.

#### POSTERS

Umbach, Z. & **Rößler D.C.**, 2023. Hidden in plain sight? Testing eye camouflage in jumping spiders. Behaviour conference in Bielefeld. This poster won second place for best poster.

INVITED  
SEMINARS &  
LECTURES

Hirschhorn, C., Uyehara, K.I. & **Rößler D.C.**, 2023. Shake that thing! Abdominal bobbing as a dynamic visual signal in a jumping spider. Behaviour conference in Bielefeld.

**Rößler, D.C.**, Lötters, S., Fugmann, M., Peters, C., Veith, M., Krehenwinkel, H., 2019. Bite me! Predator identification from salivary DNA left on artificial prey. ESEB (European Society for Evolutionary Biology), Turku, Finland. This poster won the first prize by public choice.  
[10.6084/m9.figshare.9698618.v1](https://doi.org/10.6084/m9.figshare.9698618.v1)

**Rößler, D.C.**, 11/2023. Sleep diversity—what can we learn from non-model organisms? *An eight-legged example*. Seminar series Center for Chronobiology, University of Basel. Invited by Dr. Carolin Reichert

**Rößler, D.C.**, 06/2023. Sleep diversity—what can we learn from non-model organisms? *An eight-legged example*. Seminar series at the Max Planck Institute for Chemical Ecology in Jena. Invited by Dr. Alfonso Aceves

**Rößler, D.C.**, 05/2023. Sleep diversity—what can we learn from non-model organisms? *An eight-legged example*. Lecture Series in Behavioral, Theoretical, and Evolutionary Biology at University of Bern. Invited by Prof. Dr. Eva Ringler

**Rößler, D.C.**, 12/2022. All animals sleep—do all animals *dream*? Biological seminar series Trier University. Invited by Prof. Dr. Stefan Lötters

**Rößler, D.C.**, 10/2022. All animals sleep—do all animals *dream*? Seminar series at the Centre for Behaviour and Evolution at Newcastle University, UK (online seminar). Invited by Dr. Vivek Nityananda

**Rößler, D.C.**, 02/2022. All animals sleep—do all animals *dream*? Invited lecture in Contemporary Questions in Behavioral Ecology course at LMU Munich, Germany (online lecture). Invited by Prof. Dr. Niels Dingemans

**Rößler, D.C.**, 10/2022. All animals sleep—do all animals *dream*? Biology colloquium at Goethe University Frankfurt, Germany. Invited by Prof. Dr. Lisa Schulte

**Rößler, D.C.**, 06/2021. Unusual or simply overlooked? Natural history lessons from common jumping spiders. Smithsonian Tropical Research Institute (STRI) Behavior group, Gamboa, Panama (online seminar). Invited by Dr. Ummat Somjee

**Rößler, D.C.**, 05/2020. Arachno-Arachnophobia! Visual predator recognition in jumping spiders. Stonehill College, Boston, USA (online seminar). Invited by Prof. Dr. Bronwyn Bleakley  
*scheduled*

**Rößler, D.C.**, 2024. The spider sleeps tonight: an exceptional framework for comparative sleep research. Seminar at the VetMedUni Vienna. Invited by Prof. Dr. Bibiana Rojas (date: 2024/04/03)

**Rößler, D.C.**, 2024. The spider sleeps tonight: an exceptional framework for comparative sleep research. Seminar at the University of Hamburg. Invited by Prof. Dr. Jutta Schneider (date: 2024/04/30)

REVIEWER  
ACTIVITY  
JOURNALS

Animal Conservation | Animal Behaviour | Behavioral Ecology | Biotropica | Functional Ecology | Journal of Animal Ecology | Methods in Ecology and Evolution | PeerJ | Proceedings of the Royal Society B | Sleep Advances

GRANTS &  
FELLOWSHIPS

2023 | ZUKOnnect Fellowships  
2022 | ZUKOnnect Fellowships  
2022 | ABS Student Research Grants

## EDITORIAL ACTIVITY

**Guest editor** in the not-for-profit, open access journal [In&Vertebrates](#) for a **special issue** called: “Undocumented animal behaviors—reviving natural history”

## SOCIETY MEMBERSHIPS

Animal Behavior Society (ABS), Association for the Study of Animal Behaviour Society (ASAB), International for Behavioral Ecology (ISBE)

## RESEARCH NETWORK

Prof. Dr. Barrett Klein (University of Wisconsin LaCrosse, USA)  
Prof. Dr. Giovanni Galizia (Konstanz University, Germany)  
Prof. Dr. Marie Herberstein (Macquarie University, Australia)  
Dr. Paul Shamble (Yale University, USA)  
Dr. Ummat Somjee (Smithsonian Tropical Research Institute, Panama)  
Dr. Jay Stafstrom (Cornell University, USA)  
Dr. Massimo De Agrò (Sant’Anna Institute of Advanced Studies, Italy)  
Prof. Dr. Johanna Mappes (Helsinki University, Finland)  
Prof. Dr. Bibiana Rojas (Vetmed University Vienna, Austria)  
Dr. Jonas Wolff (University of Greifswald, Germany)  
Dr. Lauren Sumner-Rooney (MfN Berlin, Germany)  
Prof. Dr. Armin Bahl (Konstanz University, Germany)  
Prof. Dr. Meg Crofoot (Max Planck Institute of Animal Behavior, Germany)  
Dr. Alex Jordan (Max Planck Institute of Animal Behavior, Germany)

## MEDIA ATTENTION

08/2023 | Do spiders dream? What about cuttlefish? Bearded dragons? [Knowable Magazine](#)  
07/2023 | Sleep like a log; What the duck?! [ABC Podcast](#), hosted by Ann Jones  
02/2023 | Mentioning of my research in the popular German Quiz show (“Wer weiß denn sowas?” on ARD (episode aired February 1<sup>st</sup> 2023)  
12/2022 | Appearance in the German popular science TV show “Galileo” on ProSieben (episode aired December 7<sup>th</sup> 2022)  
12/2022 | Listed among [National Geographic’s](#) “22 most amazing discoveries of 2022”  
09/2022 | Podcast on jumping spider sleep research ([Tiny Matters](#))  
08/2022 | Numerous (> 300) international news articles on my research on an REM sleep-like state in jumping spiders including [The New York Times](#), [National Geographic](#), [Science](#), [Wall Street Journal](#), [Scientific American](#), [Popular Science](#), [Harvard Gazette](#).  
10/2021 | Interview about my research on static visual predator recognition on the science podcast Short Wave by [NPR \(National Public Radio\)](#)  
05/2021 | Several news articles covered the finding from our paper on nocturnal resting in a jumping spider including [Popular Science](#), [NPR \(National Public Radio\)](#) and [Ethologisch](#)  
01/2021 | Coverage of Cell’s implementation of the “Inclusion and Diversity Statement” in [Science](#)  
11/2020 | Blogpost in the “Methods in Ecology and Evolution”-[Blog](#) on our eDNA-clay protocol