

# MARTIJN SCHENKEL

## CONTACT DETAILS:

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|-----------------|--|----------|---|
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| Mobile:         | +316 52 66 57 93   | ORCID:   | <a href="https://orcid.org/0000-0002-7721-319X">0000-0002-7721-319X</a>   |
| Google Scholar: | <a href="#">Link</a>   |          |   |

## EDUCATION:

|                    |  |   |
|--------------------|--|---|
| <b>2021 – 2022</b> | <b>University Teaching Qualification</b><br>Portfolio available on request.  | <b>University of Groningen</b>  |
| <b>2016 – 2021</b> | <b>PhD</b><br>Thesis: Evolutionary genetics and dynamics of transitions in sex determination.<br>Submitted: December 24 <sup>th</sup> , 2020. Defended: May 14 <sup>th</sup> , 2021<br>Advisors: Leo W. Beukeboom, Ido Pen & Jean-Christophe Billeter. | <b>University of Groningen</b>  |
| <b>2013-2015</b>   | <b>Master of Science</b><br>Top Programme Evolutionary Biology   | <b>University of Groningen</b><br>Grade average: 8.5/10 ( <i>cum laude</i> , top 10%) |
| <b>2009 – 2013</b> | <b>Bachelor of Science</b><br>Double major in Ecology & Evolution and Marine Biology<br>Minor in Biomedicine, Behaviour & Neuroscience   | <b>University of Groningen</b><br>Grade average: 7.1/10                               |

## ACADEMIC EMPLOYMENT:

|                    |   |   |
|--------------------|---|---|
| <b>2024 – 2025</b> | <b>Visiting researcher</b><br>Host: Hanna Kokko.  | <b>Johannes Gutenberg-Universität Mainz</b>                       |
| <b>2022 – 2024</b> | <b>Postdoctoral fellow</b><br>Advisors: Manus M. Patten (Georgetown University) & J. Arvid Ågren (Cleveland Clinic Foundation). | <b>Georgetown University &amp; University of Groningen</b>        |
| <b>2021 – 2022</b> | <b>Lecturer</b>   | <b>School of Science and Engineering, University of Groningen</b> |
| <b>2015 – 2016</b> | <b>Technical editor</b>   | <b>Entomologia Experimentalis et Applicata</b>                    |
| <b>2015 – 2016</b> | <b>Research assistant</b>   | <b>University of Groningen</b>                                    |

## TEACHING & SUPERVISION:

### Courses:

| Name  | Level    | Students | Involvement  | Year                  |
|---|----------|----------|--|-----------------------|
| <a href="#">Advanced Topics in Evolution</a>                    | Graduate | 5-10     | Guest lecturer   | 2023/'24,<br>2022/'23 |
| <a href="#">Programming C++ for Biologists</a>                  | BSc/MSc  | 50       | Practical assistance, project supervision  | 2021/'22              |
| <a href="#">Modelling Life</a>                                  | BSc      | 230      | Working group coordinator, practical assistance  | 2021/'22              |
| <a href="#">Genetics, Ecology and Evolution</a>                 | BSc      | 300      | Course coordinator and lecturer  | 2021/'22              |
| <a href="#">Evolutionary Processes</a>                          | BSc      | 60-80    | Course coordinator and lecturer (2021/'22); tutorial development and coordination (2019/'20) | 2021/'22,<br>2019/'20 |
| <a href="#">First Year Symposium</a>                            | BSc      | 3        | Project supervisor   | 2021/'22              |
| <a href="#">MEME Summer School</a>                              | MSc      | 60       | Co-chair   | 2021/'22              |
| <a href="#">Evolutionary Ecology</a>                            | BSc      | 50       | Guest lecturer   | 2019/'20              |
| <a href="#">Ecological &amp; Evolutionary Genetics Research</a> | BSc      | 2        | Research project supervisor  | 2018/'19,<br>2017/'18 |
| <a href="#">Genes &amp; Evolution</a>                           | BSc      | 70       | Practical assistant  | 2016/'17              |

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## Individual project supervision:

| Name                 | Level          | Title   | Year     |
|----------------------|----------------|---|----------|
| Naomi Greenberg      | Under-graduate | Remote-controlled meiotic drive of sex chromosomes                      | 2023/'24 |
| Femke Noorman        | BSc            | Parental antagonism as a driver of transitions in sex determination     | 2022/'23 |
| Stefan ter Haar      | MSc            | Mating behaviour of houseflies under different social conditions        | 2021/'22 |
| Tomás Rocha da Cunha | MSc            | Male fitness components in houseflies                                   | 2017/'18 |
| Julia Camacho Garcia | MSc            | Artificial selection for female fitness in houseflies                   | 2016/'17 |
| Martine van Beem     | BSc            | Maintenance of life history variation in <i>Drosophila melanogaster</i> | 2015/'16 |

## Individual essay supervision:

| Name                     | Level | Title   | Year     |
|--------------------------|-------|---|----------|
| Ekaterine (Kato) Kikodze | MSc   | Sex determination   | 2023/'24 |
| Stefan ter Haar          | MSc   | Adult sex ratios affect mating behaviour in the common housefly <i>Musca domestica</i> L. (Diptera; Muscidae) | 2022/'23 |

## Pedagogical training & self-development:

| Name  | Level         | Description   | Year     |
|---|---------------|---|----------|
| <a href="#">Open Pedagogy</a>                     | Post-doctoral | Participant in workshop on open pedagogy and developing open education resources              | 2023/'24 |
| <a href="#">Active Bystander Training</a>         | Post-doctoral | Participant in workshop on becoming an active bystander and fostering a safe work environment | 2022/'23 |
| <a href="#">University Teaching Qualification</a> | Post-doctoral | Participant (9 workshops and portfolio development; completed October 2022)                   | 2021/'22 |
| <a href="#">Teaching for PhDs</a>                 | PhD           | Participant (3 workshops)   | 2016/'17 |

## FUNDING:

### Granted (total: €1.067.700; total to me: €336.500):

- 2024-2027. "Internal conflict and the origins of collective agency in biology and economics". John Templeton Foundation. Co-applicant (PI: Manus Patten, Georgetown University). ~€306.000 (\$329.497) to me; ~€812.000 (\$878.583) total.
- 2023-2029. "Internal conflicts and organismal adaptation". ESEB Special Topics Network. €30.000 total (€10.000 per 2-year period; renewable up to 6 years). Lead applicant.
2022. Travel support grant for ESEB2022 attendance. Uyttenboogaert-Eliassen Stichting. €500. Individual applicant.
- 2016-2020. "Reproductive parasitism in a love triangle - *Wolbachia*, master manipulator or microbe mediator?". Adaptive Life Program, University of Groningen. €225.000. Co-applicant (PI: Leo Beukeboom, University of Groningen).

## PROFESSIONAL SERVICE:

### Service & outreach:

|  |              |
|--|--------------|
| Symposium co-organizer "Within-organism conflicts", Joint Congress on Evolution, Montreal, Canada <a href="#">[link]</a> . | 2024         |
| Network leader, ESEB Special Topic Network "Internal Conflict and Organismal Adaptation" <a href="#">[link]</a> .          | 2023-current |
| Postdoc Perspectives Q&A for 'Agency, Directionality & Function' blog <a href="#">[link]</a> .                             | 2023         |
| Contributor, "Levels of selection" for NLSEB parasitoid lab practicals for teaching <a href="#">[link]</a> .               | 2022         |
| BioNieuws (12-02-2022). 'Genregulatie stuurt evolutie XY-chromosomen'. Professional comment.                               | 2022         |
| Guest editor, 'The Evolutionary Life Cycle of Sex Chromosomes', <i>Genes</i> <a href="#">[link]</a> .                      | 2018         |
| Internship host for local high school students   | 2018         |

### Journal reviewing:

BioEssays; Entomologia Experimentalis et Applicata; Heredity; Journal of Evolutionary Biology; Nature Communications; PeerJ; Proceedings of the Royal Society B-Biological Sciences.

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## Funding agencies reviewing:

ERC Starting Grant; ERC Advanced Grant; MAESTRO National Science Center, Poland.

## Publishing houses reviewing:

CRC Press; Harvard University Press.

## Extracurricular & miscellaneous activities:

|  |             |
|--|-------------|
| Council member, faculty council Mathematics & Natural Sciences | 2012/'13    |
| Chairman, board of Betastuf                                    | 2012/'13    |
| Assessor education, board of GLV Idun                          | 2011/'12    |
| Student member, course committee Life Sciences                 | 2011/'12    |
| Teaching assistant, Yoo Sin Groningen                          | 2006 – 2012 |

## PROFESSIONAL MEMBERSHIP:

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European Society for Evolutionary Biology  
Society for the Study of Evolution

## PUBLICATIONS:

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\* denotes equal contributions; # denotes BSc/MSc student author.

### Under review:

2. **Schenkel, M.A.**, Patten, M.M. & Ågren, J.A. Quantifying internal conflicts and their threats to organismal form and fitness. [\[preprint\]](#).
1. **Schenkel, M.A.**, Ross, L. & Wedell, N. Selfish genetic elements and the evolution of sex determination and inheritance mechanisms. In: J.A. Ågren & M.M. Patten (Eds.), *The Paradox of the Organism: Adaptation and Internal Conflict*. Cambridge, MA, USA; Harvard University Press.

### Journal papers (peer-reviewed):

9. **Schenkel, M.A.** (2024; in press). Transitions in sex determination mechanisms through parental and sexual antagonism. *Heredity* vol: pp-pp. [\[link\]](#).
8. Li, X., Visser, S., Son, J.H., Geuverink, E., Kivanc, E.N.#, Wu, Y., Schmeing, S., Pippel, M., Anvar, S., **Schenkel, M.A.**, Marec, F., Robinson, M., Meisel, R., Wimmer, E., van de Zande, L., Bopp, D. & Beukeboom, L.W. (2024). Divergent evolution of male-determining loci on different proto-Y chromosomes of the housefly. *Nature Communications* **15**: 5984. [\[link\]](#).
7. ter Haar, S.#, Billeter, J.-C., Francuski, L., Beukeboom, L.W.\* & **Schenkel, M.A.\*** (2023). Adult sex ratios affect mating behaviour in the common housefly *Musca domestica* L. (Diptera; Muscidae). *Behaviour* **160**: 1329-1357. [\[link\]](#).
6. Patten, M.M., **Schenkel, M.A.** & Ågren, J.A. (2023). Adaptation in the face of internal conflict: the paradox of the organism revisited. *Biological Reviews* **98**: 1796-1811. [\[link\]](#).
5. **Schenkel, M.A.**, Billeter, J.-C., Beukeboom, L.W.\* & Pen, I.\* (2023). Divergent evolution of genetic sex determination mechanisms along environmental gradients. *Evolution Letters* **7(3)**: 132-144. [\[link\]](#). *Nominated for the NLSEB Evolutionary Biology Prize 2023*.
4. Chen, F.Y., **Schenkel, M.A.**, Geuverink, E., van de Zande, L. & Beukeboom, L.W. (2022). Absence of complementary sex determination in two *Leptopilina* species (Figitidae, Hymenoptera) and a reconsideration of its incompatibility with endosymbiont-induced thelytoky. *Insect Science* **29**: 900-914. [\[link\]](#).
3. **Schenkel, M.A.**, Beukeboom, L.W. & Pen, I. (2021). Epistatic interactions between the sex chromosomes and autosomes can affect the stability of sex determination systems. *Journal of Evolutionary Biology* **34**: 1666-1677. [\[link\]](#). *Editor's Pick, November 2021*.
2. **Schenkel, M.A.**, Pen, I., Beukeboom, L.W. & Billeter, J.-C. (2018). Making sense of intralocus and interlocus sexual conflict. *Ecology & Evolution* **8**: 13035-13050. [\[link\]](#).
1. Parratt, S.R., Frost, C.L., **Schenkel, M.A.#**, Rice, A., Hurst, G.D.D.\* & King, K.C.\* (2016). Superparasitism drives heritable symbiont dynamics and host sex ratio in a wasp. *PLoS Pathogens* **12(6)**: e1005629. [\[link\]](#).

### Book chapters (peer-reviewed):

2. Kikodze, E.# & **Schenkel, M.A.** (in press). Sex determination. In: C. Russo & J.B. Wolf (Eds.), *Encyclopedia of Evolutionary Biology* (2<sup>nd</sup> ed.). London, UK; Academic Press.

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1. **Schenkel, M.A.**<sup>#</sup> & Beukeboom, L.W. (2016). Sex chromosome evolution: birth, maturation, decay and rebirth. In: R.M. Kliman (Ed.), *Encyclopedia of Evolutionary Biology* (1<sup>st</sup> ed.), vol. 4, pp. 72-80. London, UK; Academic Press. [\[link\]](#).

## Miscellaneous:

2. Chen, F.Y., **Schenkel, M.A.**, van de Zande, L. & Beukeboom, L.W. (2021). Absence of complementary sex determination in two *Leptopilina* species (Figitidae, Hymenoptera). Chapter in PhD thesis of Fangying Chen. University of Groningen; Groningen, the Netherlands. [\[link\]](#).
1. **Schenkel, M.A.** (2021). Evolutionary genetics and dynamics of transitions in sex determination. PhD thesis; University of Groningen; Groningen, the Netherlands. [\[link\]](#).

## PRESENTATIONS:

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### Conference contributions:

13. Joint Congress on Evolutionary Biology; Montreal, QC, Canada (2024). "Selfish elements, internal conflicts, and the quantification of organismality". Presentation [\[link\]](#).
12. Agency, Directionality & Function Final Summit; Minneapolis, MN, USA (2024). "Postdoctoral Researchers and Interdisciplinarity". Invited panel discussant.
11. Annual Symposium of the Dutch Entomological Society; Ede, the Netherlands (2023). "Sex ratio effects on housefly courtship and mating". Presentation.
10. Modeling Agency Formally meeting; Seattle, WA, USA (2023). "Quantifying internal conflicts and their threats to organismal form and fitness". Invited presentation.
9. Evolution 2023; Albuquerque, NM, USA (2023). "Formalization of the paradox of the organism". Presentation.
8. Paradox of the Organism symposium; Washington, D.C., USA (2022). "Formalizing the paradox of the organism". Invited presentation.
7. ESEB 2022; Prague, Czech Republic (2022). "Divergent evolution of genetic sex determination mechanisms along environmental gradients". Poster.
6. EMBL Symposium: The Molecular Basis and Evolution of Sexual Dimorphism; virtual conference (2020). "Divergent evolution of genetic sex determination mechanisms along environmental gradients". Poster.
5. GELIFES Adaptive Life Day; Groningen, the Netherlands (2020; cancelled due to COVID-19). "Evolution of housefly sex determination mechanisms". Invited presentation.
4. Annual Symposium of the Dutch Entomological Society; Ede, the Netherlands (2018). "Making new sex chromosomes in houseflies". Poster.
3. ESEB 2017; Groningen, The Netherlands (2017). "Sex-specific adaptation at sexually antagonistic loci through single-sex experimental evolution in the housefly *Musca domestica*". Poster.
2. Annual Symposium of the Dutch Entomological Society; Ede, the Netherlands (2016). "Persistence of lifespan differences in selected strains of *Drosophila melanogaster*". Presentation.
1. Annual Symposium of the Dutch Entomological Society; Ede, the Netherlands (2015). "Host shifts and the performance of the reproductive parasite *Arsenophonus nasoniae* in *Nasonia vitripennis*". Presentation.

### Seminars:

16. Johannes Gutenberg-Universität Mainz, Institute for Organismic and Molecular Evolution (2024). "The paradox of the organism: internal conflicts, selfish elements and the evolution of individuality".
15. University of Groningen; Evolutionary Genetics, Development and Behaviour cluster (2024). "Remote-control meiotic drive of sex chromosomes".
14. University of Groningen; Theoretical Research in Evolutionary Life Sciences cluster (2024). "How to quantify organismal unity in the face of internal conflicts".
13. Special Topic Network "Internal Conflicts and Organismal Adaptation" seminar series (2024). "Introducing the Internal Conflicts and Organismal Adaptation STN".
12. University of Groningen; Evolutionary Genetics, Development and Behaviour cluster (2024). "Quantifying internal conflicts and their threats to organismal form and fitness".
11. University of Groningen; Evolutionary Genetics, Development and Behaviour cluster (2023). "Transitions in sex determination mechanisms through parental antagonism".
10. University of Rochester; Department of Biology (2022). "The paradox of the organism: Selfish elements and the evolution of organismality".
9. Harvard University; Museum of Comparative Zoology (2022). "Organismality in the light of internal conflict".
8. University of Maryland; Department of Biology (2022). "Evolution of polymorphic sex determination in the housefly *Musca domestica*".

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7. University of Groningen; Evolutionary Genetics cluster (2022). "Paradox of the organism".
6. University of Groningen; Evolutionary Genetics, Development and Behaviour cluster (2020). "Evolution of sex determination mechanisms in heterogeneous environments".
5. University of Groningen; Theoretical Research in Evolutionary Life Sciences cluster (2016). "Testing theories of sex chromosome evolution using houseflies".
4. University of Groningen; Evolutionary Genetics cluster (2015). "Post-host shift performance of *Arsenophonus nasoniae*".
3. University of Liverpool; Evolution, Ecology, and Behaviour group (2015). "Post-host shift performance of *Arsenophonus nasoniae*".
2. University of Groningen; Evolutionary Genetics cluster (2014). "Characterization of sex determination genes in the housefly *Musca domestica*".
1. University of Göttingen; Musca meeting (2014). "Genomic localization of autosomal M-factors in houseflies".

## **Guest lectures & workshops**

6. University of Groningen; Internal Conflicts and Organismal Adaptation workshop I (2024; forthcoming). Workshop organisation & speaker.
5. University of Groningen; Evolutionary Genetics cluster (2023). "Adaptation in the face of internal conflict: The paradox of the organism revisited". Writing workshop (part 2/2).
4. Georgetown University, Advanced Topics in Evolution course (2023). "Genetic conflict and the evolution of sex and hereditary mechanisms". Guest lecture.
3. University of Groningen; Evolutionary Genetics cluster (2023). "The paradox of the organism revisited: Adaptation in the face of internal conflict". Writing workshop (part 1/2).
2. Georgetown University, Advanced Topics in Evolution course (2022). "Organisms and internal conflicts". Guest lecture.
1. University of Groningen, Evolutionary Ecology course (2020). "Evolution of polymorphic sex determination mechanisms". Guest lecture.