

# Curriculum Vitae

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## PD Dr. rer. nat. habil. Simon Poppinga

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[Plant biomechanics, functional morphology, and biomimetics](#)



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### Personal status

Born 13.12.1979 in Aurich, Germany. Married, two children (\*2012, 2014).

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### Current and previous positions

- since 2022: Head of the Botanical Garden of the TU Darmstadt
- 2017-2021: Honorary curator at the Botanic Garden Freiburg
- 2013-2021: Group leader at the Botanic Garden Freiburg
- 2009-2013: Research assistant at the Botanic Garden Freiburg
- 2007-2009: Coordinator of the carnivorous plants workgroup at the Nees Institute for Biodiversity of Plants (University of Bonn)

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### Academic degrees

- 2020: Habilitation and *Venia legendi* (PD Dr. rer. nat. habil.) in Botany (University of Freiburg).  
2022 Umhabilitation at TU Darmstadt.
- 2013: PhD (Dr. rer. nat.) in Biology, final mark: *summa cum laude* (with highest praise). Supervisor: Prof. Thomas Speck, Botanic Garden, University of Freiburg.
- 2007: Diploma (Dipl.-Biol.) in Biology, final mark: *sehr gut* (A, excellent). Supervisor: Prof. Wilhelm Barthlott, Nees Institute for Biodiversity of Plants, University of Bonn.

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### Prizes and awards

#### Research awards

- 2020: Publication award 2020 of the University of Stuttgart
- 2017: Third place of the Innovationspreis 2017 (category: "Forschung/Wissenschaft") awarded by the AVK (Industrievereinigung Verstärkte Kunststoffe e. V. und AVK-TV GmbH) for the development of the biomimetic façade shading element Flectofold (together with project partners).
- 2013: Gips-Schüle-Forschungspreis by the Gips-Schüle-Foundation, endowed with 40.000 €, for „Flectofin® - Bio-inspirierte, wandelbare technische Systeme“ (together with project partners).

- 2012: International Bionic Award, endowed with 10.000 € by the Schauenburg-Foundation and awarded by VDI e.V. (Association of German Engineers) for "Flectofin® - a hinge-less flapping mechanism inspired by nature" (together with project partners).
- 2011: TechTextile Innovationprize (category: Architecture) for the development of "Bionic facades shading based on the model of the *Strelitzia*" (Flectofin®) (together with project partners).
- 2010: 1<sup>st</sup> poster prize (endowed with 200 €) for the two posters "Gelenkfreie Klappen bei *Strelitzia reginae*" and "Optimierung und Weiterentwicklung des Flectofin®" at the 5. Bremer Bionik Kongress, Patente aus der Natur, Bremen (together with project partners).

#### Teaching awards

- 2019: First teaching prize from the student council "Biology" for the Biologische Grundpraktikum II B „Morphologie und Systematik der Angiospermen" (together with other lecturers).
- 2018: Second teaching prize from the student council "Biology" for the Biologische Grundpraktikum II B „Morphologie und Systematik der Angiospermen" (together with other lecturers).
- 2017: First teaching prizes from the student council "Biology" for the Biologische Grundpraktikum II B „Morphologie und Systematik der Angiospermen" and for the Grundmodul "Pflanzenphysiologie" (both together with other lecturers) (SS 2017 & WS 2016/17).
- 2015: First teaching prizes from the student council "Biology" for the Bachelor-Vertiefungsmodul "Funktionelle Morphologie, Biomechanik und Bionik" and for the Grundmodul "Pflanzenphysiologie" (both together with other lecturers) (both WS 2014/15).

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#### **Received funding / current research projects**

- 2019: "Bio-inspirierte elastische Materialsysteme und Verbundkomponenten für nachhaltiges Bauen im 21ten Jahrhundert (BioElast)", granted by MWK Baden-Württemberg (Schwerpunktbereich: Aufbau und Stärkung der Forschungsinfrastruktur im Bereich der Mikro- und Nanotechnologie sowie der neuen Materialien). Co-applicant (with Thomas Speck) for „Projekt 3: Entwicklung von Materialsystemen für flächige Bauelemente mit autonom-adaptiver Formveränderung inspiriert von den passiven, mehrstufigen Bewegungen von flächigen Pflanzenstrukturen" (subsidy amount: 97,842 EUR, reference number: Az.: 33-7533.-30-121/15/3C, runtime: 01.06.2019 – 31.05.2021).
- "Bio-inspirierte elastische Materialsysteme und Verbundkomponenten für nachhaltiges Bauen im 21ten Jahrhundert (BioElast)", granted by MWK Baden-Württemberg (Schwerpunktbereich: Aufbau und Stärkung der Forschungsinfrastruktur im Bereich der Mikro- und Nanotechnologie sowie der neuen Materialien). Co-applicant (with Thomas Speck) for „Projekt 2: Kinematische Prinzipien und Bewegungsdesign bei sich durch Verformung bewegenden Pflanzenstrukturen als Ideengeber für bioinspirierte Materialsysteme und Bauelemente in der Architektur" (subsidy amount: 156,000 EUR, reference number: Az.: 33-7533.-30-121/15/3B, runtime: 01.06.2019 – 31.05.2021).
- 2018: „JONAS research initiative: Joint research network on advanced materials and systems - Smart materials for sustainable architecture (smartSUS)", granted by BASF-SE and the MWK Baden-Württemberg. Co-applicant (with Thomas Speck) for the extension of the smartSUS-project „Bio-inspired fiber-reinforced flap and scale structures for self-adaptive heat and humidity regulation" (subsidy amount: 250,000 EUR, reference number: AZ: 7713.1-11/2.1.6, runtime: 01.08.2018 – 31.04.2021).

“BiVaS – Energiereduktion in der Vakuumhandhabung durch Reduzierung von Totvolumina mittels bionischer Wirkprinzipien“, granted by the BMWi within the 6. Energieforschungsprogramm. Lead-PI and main applicant for the sub-project “Bionischer Vakuumgreifer“(subsidy amount: 199,700 EUR, reference number: 03ET1559 C, runtime: 01.05.2018 – 30.04.2021).

“Transregio SFB TRR 141: Biological design and integrative structures“, Collaborative Research Center granted by the DFG. Co-applicant (with Thomas Speck) for extension of the sub-project A04 “Kinematics of planar, curved and corrugated plant surfaces as concept generators for deployable systems in architecture” (subsidy amount: 91,400 EUR, runtime: 01.07.2018 – 30.06.2019).

- 2017: “Personalisierter 3D- und 4D-Druck von programmier-und schaltbaren sowie selbstregulierend multifunktionalen Materialsystemen für Sport und Medizin“, granted by the Baden-Württemberg-Stiftung. Co-applicant (with Thomas Speck) for the sub-project “Analyse biologischer Vorbilder und biomimetischer 3D-/4D-Druck” (subsidy amount: 141,000 EUR, reference number: IAF-2 / 4D-multiMATS, runtime: 01.05.2017 – 30.04.2020).
- 2015: „JONAS research initiative: Joint research network on advanced materials and systems - Smart materials for sustainable architecture (smartSUS)“, granted by BASF-SE and the MWK Baden-Württemberg. Co-applicant (with Thomas Speck) for the extension of the smartSUS-project „Bio-inspired fiber-reinforced flap and scale structures for self-adaptive heat and humidity regulation“ (subsidy amount: 250,000 EUR, reference number: AZ: 7713.1-11/2.1.6, runtime: 01.08.2015 – 31.07.2018).
- 2014: “Transregio SFB TRR 141: Biological design and integrative structures“, Collaborative Research Center granted by the DFG. Co-applicant (with Thomas Speck) for the sub-project A04 “Kinematics of planar, curved and corrugated plant surfaces as concept generators for deployable systems in architecture” (subsidy amount: 241,100 EUR, runtime: 01.10.2014 – 30.06.2018).
- 2012: “Trap diversity and evolution in carnivorous bladderworts (*Utricularia*)“. Co-applicant (with Thomas Speck) for the research proposal funded by the Innovationsfonds Forschung of the University of Freiburg (subsidy amount: 17,100 EUR, reference number: 7441.1, runtime: 31.03.2013 bis 31.08.2013)

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## Activities as Editor

- since 2022 *Editorial Board Member for Bioinspiration & Biomimetics*
- since 2018 *Associate Editor for the American Journal of Botany*
- 2021 *Guest Associate Editor for the Journal of Experimental Botany*
- 2018-2019 *Guest Associate Editor for Frontiers in Plant Science*
- 2018 *Guest Associate Editor for AoB PLANTS*

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## Organized scientific sessions and symposia

- 2022: Symposium „Mechanical ecology - taking biomechanics to the field“ at the Annual Meeting of the Society for Experimental Biology (SEB) in Montpellier, France (Jul 5-8) (with Ulrike Bauer, University of Bristol). Funding for this symposium was provided by the New Phytologist Trust, Company of Biologists, Journal of Experimental Botany, and Functional Ecology.

- 2020: Symposium „Form, structure and function: how plants vs. animals solve physical problems“ at the Annual Meeting of the Society for Integrative and Comparative Biology (SICB) in Austin, TX, USA (Jan 3-7, 2020) (together with Ulrike Müller, California State University Fresno). Funding for this symposium was provided by the Society for Integrative and Comparative Biology (DCE, DIZ, DVM), the American Microscopical Society (AMS), the National Science Foundation (NSF IOS award number 1930744), and the Company of Biologists.
- 2017: Symposium „Carnivorous plants - Physiology, ecology, and evolution“ at the annual main meeting of the Society for Experimental Biology (SEB) in Gothenburg, Sweden (06.07.2017).
- 2015: „Young Scientist’s Forum“ at the 8<sup>th</sup> Plant Biomechanics Conference in Nagoya, Japan (30.11.-04.12.2015) (together with Naomi Nakayama & Kentaro Abe).

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## Reviewing and consulting activities

### Reviews for grant agencies:

Austrian Science Fund, German Research Foundation (DFG), Japan Society for the Promotion of Science (JSPS), National Science Foundation (NSF), National Science Centre Poland

### Reviews for journals:

ACS Applied Materials & Interfaces; Acta Biomaterialia; Advanced Science; Advanced Materials Technologies; Annals of Botany; Aquatic Botany; Arthropod-Plant Interactions; Australian Journal of Botany; Beilstein Journal of Nanotechnology; Bioelectrochemistry; BioEssays; Bioinspiration & Biomimetics; Biomechanics and Modeling in Mechanobiology; Biomimetics; Botany; Carnivorous Plant Newsletter; Construction & Building Materials; Current Biology; Ecology and Evolution; Food Webs; Freshwater Biology; Frontiers in Plant Science; Fundamental and Applied Limnology; Insects; Integrative & Comparative Biology; Interface Focus; International Journal of Molecular Sciences; Journal of Experimental Botany; Journal of Experimental Zoology Part A; Journal of Plankton Research; Journal of Plant Research; Journal of the Royal Society Interface; Nature Communications; New Phytologist; Perspectives in Plant Ecology, Evolution and Systematics; Physiology and Molecular Biology of Plants; Plant Physiology and Biochemistry; Plant Biology; Plant Signaling & Behavior; Plants; Plants, People, Planet; PLoS ONE; Proceedings of the National Academy of Sciences of the United States of America (PNAS); Proceedings of the Royal Society: B; Protoplasma; Royal Society Open Science; Sensors; Science; Scientific Reports; Smart Materials and Structures

### Reviews for book publishers:

Oxford University Press

### Consulting for book publishers:

Jim Pattison Group (Guinness World Records 2021)

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## Teaching

### Lectures, courses, and seminars:

@ TU Darmstadt

- Modul “Biodiversität und Phylogenie“: Weekly lecture during the semester with written exam.

*More to come!*

@ University of Freiburg:

- Biologisches Grundpraktikum II B "Morphologie und Systematik der Angiospermen": Instructor for the course weeks "Rosaceae, Caryophyllaceae, Brassicaceae - Früchte" (one day in 2016), "Bestäubung" (SS 2012-2017, 2019-2021, one day in 2018), "Pseudanthien" (SS 2012-2014, 2016-2021), and "Monocotyledonen" (SS 2015, one day in 2018). The course includes lectures, practical examination of plant material, and plant identification exercises.
- Grundmodul "Physiologie": Pflanzenphysiologischer Grundkurs für Bachelor-und Lehramts-Studierende der Biologie. Course instructor for "Wasserhaushalt der Pflanze" (WS 2012/2013-2018/2019) and "Biomechanik der Pflanzen: Zug-und Biegeversuch" (WS 2012/2013). The course includes lectures, experimental examination of plant material, and evaluation of scientific protocols.
- Bachelor-Vertiefungsmodul "Funktionelle Morphologie, Biomechanik und Bionik". Instructor for the course week "Haftung" (WS 2013-2021). The course includes seminars, lectures, experimental examination of plant material, SEM introduction, and evaluation of scientific protocols.
- Master-Orientierungsmodul "Angewandte Biowissenschaften –Translational Biology": Co-course instructor for "Gelenkfreie Bewegungen und wandelbarer Leichtbau" and "Verzweigte Faserverbünde in Natur und Technik" (WS 2012/2013, 2013/2014, 2015/2015, 2015/2016) (lecture "Pflanzenbewegungen & Bionik"2016/2017). The course includes lectures and experimental examination of plant material.
- Master-Orientierungsmodul "Pflanzenwissenschaften": Co-course instructor for "Form-und Gewichtsoptimierung bei Pflanzen nach Mattheck" (WS 2012/2013-2014/2015). The course includes lectures and experimental examination of plant material.
- Lehramtsmodul Biotechnologie: "Funktionelle Morphologie, Biomechanik und Bionik": Co-course instructor for "Gelenkfreie Bewegungen und wandelbarer Leichtbau" (SS 2013). The course includes lectures and experimental examination of plant material.

#### Advanced training in university didactics

I successfully participated in the following advanced training courses at the "Abteilung Hochschuldidaktik" of the University of Freiburg:

- Durch aktivierende Methoden kompetenzorientiertes Lernen fördern
- Fit für die Lehre I
- Fit für die Lehre II
- Forschendes Lernen
- Haus- und Abschlussarbeiten didaktisch gut anleiten und bewerten
- Lehrveranstaltungen (lern-)zielgerecht planen
- Praxisberatung
- Prüfen mit Multiple-Choice-Fragen

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#### **Memberships**

- Botanical Society of America (BSA)
- Deutsche Gesellschaft für fleischfressende Pflanzen (GFP)
- Deutsche Kakteen-Gesellschaft (DKG)
- Deutsche Orchideen-Gesellschaft (DOG)
- Deutscher Hochschulverband (DHV)
- Freundeskreis Botanischer Garten Darmstadt
- Freundeskreis Botanische Gärten Bonn
- International Carnivorous Plant Society (ICPS)
- Society for Experimental Biology (SEB)