

## Publications, patents, talks, and other contributions

### Dr. rer. nat. Simon Poppinga

Last update: 17 September 2018

Group leader at the Plant Biomechanics Group Freiburg  
Honorary curator for carnivorous plants at the Freiburg Botanic Garden  
Associate Editor for the *American Journal of Botany*

Plant Biomechanics Group Freiburg  
& Freiburg Materials Research Center  
Botanic Garden  
Schänzlestrasse 1  
D-79104 Freiburg i.Br.



Email: [simon.poppinga \[at\] biologie.uni-freiburg.de](mailto:simon.poppinga@biologie.uni-freiburg.de)  
Phone: ++49-(0)761-203-2999  
Fax: ++49-(0)761-203-2880

ORCID ID: [orcid.org/0000-0001-5341-9188](https://orcid.org/0000-0001-5341-9188)

[GoogleScholar](#)

[ResearchGate](#)

[ResearcherID](#)

\* Corresponding author

---

### Patent

2011: EP 2 320 015 - Hingeless, infinitely deformable folding mechanism (Gelenkloser, stufenlos verformbarer Klappmechanismus). Inventors: Knippers J, Lienhard J, Schleicher S, Poppinga S, Masselter T, Speck T. Filing: 10.11.2009, EP20060743126. Disclosure: 11.05.2011, EP 2 320015 A2.

---

### Peer-reviewed original articles

\* corresponding author; # equal contribution

- 2018: **Kampowski T\***, Demandt S, Poppinga S, Speck T (2018) Kinematical, structural and mechanical adaptations to desiccation in poikilohydric *Ramonda myconi* (Gesneriaceae) (under review)
- Westermeier AS\*#**, Sachse R\*#, Poppinga S, Vögele P, Adamec L, Speck T, Bischoff M (2018) How the carnivorous waterwheel plant (*Aldrovanda vesiculosa*) snaps. *Proceedings of the Royal Society B: Biological Sciences* 285(1878): 20180012. doi: 10.1098/rspb.2018.0012.
- Gallenmüller F\***, Langer M, Poppinga S, Kassemeyer H-H, Speck T (2018) Spore liberation in mosses revisited. *AoB PLANTS* 10: plx075. doi: 10.1093/aobpla/plx075
- Kampowski T\***, Mylo MD, Poppinga S, Speck T (2018) How water availability influences morphological and biomechanical properties in the one-leaf plant *Monophyllaea horsfieldii* R.Br.. *Royal Society Open Science* 5: 171076. doi: 0.1098/rsos.171076
- Körner A\***, Born L, Mader A, Sachse R, Saffarian S, Westermeier AS, Poppinga S, Bischoff M, Gresser GT, Milwich M, Speck T, Knippers J (2018) Flectofold – A biomimetic compliant shading device for complex free form facades. *Smart Materials and Structures* 27: 017001. doi: 10.1088/1361-665X/aa9c2f
- 2017: **Kampowski T\***, Mylo MD, Speck T, Poppinga S (2017) On the morphometry, anatomy and water stress behaviour of the anisocotyledonous *Monophyllaea horsfieldii* (Gesneriaceae) and their eco-evolutionary significance. *Botanical Journal of the Linnean Society* 185(3): 425-442. doi: 10.1093/botlinnean/box063

**Westermeier AS, Fleischmann A, Müller K, Schäferhoff B, Rubach C, Speck T, Poppinga S\* (2017)** Trap diversity and character evolution in carnivorous bladderworts (*Utricularia*, Lentibulariaceae). *Scientific Reports* 7: 12052. doi:10.1038/s41598-017-12324-4

**Poppinga S\*, Daber LE, Westermeier AS, Kruppert S, Horstmann M, Tollrian R, Speck T (2017)** Bio-mechanical analysis of prey capture in the carnivorous Southern bladderwort (*Utricularia australis*). *Scientific Reports* 7: 1776. doi: 10.1038/s41598-017-01954-3

**Poppinga S\*, Nestle N, Šandor A, Reible B, Masselter T, Bruchman B, Speck T (2017)** Hygroscopic motions of fossil conifer cones. *Scientific Reports* 7: 40302. doi: 10.1038/srep40302

2016: **Adamec L\*, Poppinga S (2016)** Measurement of the critical negative pressure inside traps of aquatic carnivorous *Utricularia* species. *Aquatic Botany* 133: 10-16. doi: 10.1016/j.aquabot.2016.04.007.

**Poppinga S\*, Kampowski T, Metzger A, Speck O, Speck T (2016)** Comparative kinematical analyses of Venus flytrap (*Dionaea muscipula*) snap-traps. *Beilstein Journal of Nanotechnology* 7: 664-674 (part of the thematic series "Biological and biomimetic materials and surfaces"). doi:10.3762/bjnano.7.59

**Kampowski T\*, Eberhard L, Gallenmüller F, Speck T, Poppinga S (2016)** Functional morphology of suction discs and attachment performance of the Mediterranean medicinal leech (*Hirudo verbana* CARENA). *Journal of the Royal Society Interface* 13: 20160096. doi: 10.1098/rsif.2016.0096

2015: **Poppinga S\*, Haushahn T, Warnke M, Masselter T, Speck T (2015)** Sporangium exposure and spore release in the Peruvian maidenhair fern (*Adiantum peruvianum*, Pteridaceae). *PLOS ONE* 10(10): e0138495. doi: 10.1371/journal.pone.0138495

**Schleicher S\*, Lienhard J, Poppinga S, Speck T, Knippers J (2015)** A methodology for transferring principles of plant movements to elastic systems in architecture. *Computer-Aided Design* 60: 105-117 (part of the special issue "Material ecology: design and computational issues"). doi: http://dx.doi.org/10.1016/j.cad.2014.01.005

2013: **Hartmeyer S\*, Hartmeyer I, Masselter T, Seidel R, Speck T, Poppinga S (2013)** Catapults into a deadly trap: The unique prey capture mechanism of *Drosera glanduligera*. *Carnivorous Plant Newsletter* 42(1): 4-14 (with cover picture).

2012: **Poppinga S\*, Hartmeyer S, Seidel R, Masselter T, Hartmeyer I, Speck T (2012)** Catapulting tentacles in a sticky carnivorous plant. *PLOS ONE* 7(9): e45735. doi: 10.1371/journal.pone.0045735

2011: **Poppinga S, Joyeux M\* (2011)** Different mechanics of snap-trapping in the two closely related carnivorous plants *Dionaea muscipula* and *Aldrovanda vesiculosa*. *Physical Review E* 84: 041928. doi: 10.1103/PhysRevE.84.041928

**Lienhard J, Schleicher S, Poppinga S, Masselter T, Milwich M, Speck T, Knippers J\* (2011)** Flectofin: a hinge-less flapping mechanism inspired by nature. *Bioinspiration & Biomimetics* 6: 045001 (part of the special section "Biomimetics of movement"). doi: 10.1088/1748-3182/6/4/045001

**Vincent O, Weißkopf C, Poppinga S, Masselter T, Speck T, Joyeux M, Quilliet C, Marmottant P\* (2011)** Ultra-fast underwater suction traps. *Proceedings of the Royal Society B* 278(1720): 2909-2914. doi: 10.1098/rspb.2010.2292

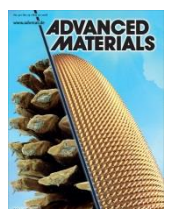
2010: **Poppinga S, Koch K, Bohn H, Barthlott W\* (2010)** Comparative and functional morphology of hierarchically structured anti-adhesive surfaces in carnivorous plants and kettle trap flowers. *Functional Plant Biology* 37(10): 952-961. doi: 10.1071/FP10061

**Rembold K\*, Irmer A, Poppinga S, Rischer H, Bringmann G (2010)** Propagation of *Triphyophyllum pelatum* (Dioncophyllaceae) and observations on its carnivory. *Carnivorous Plant Newsletter* 39(3): 71-77 (with cover).

---

## Peer-reviewed (research) review articles

2018: **Poppinga S\*, Zollfrank C, Prucker O, Rühle J, Menges A, Cheng T, Speck T (2018)** Toward a new generation of smart biomimetic actuators for architecture. *Advanced Materials* 30(19): 1703653 (Special Issue:



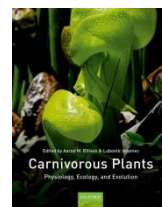
Bioinspired Materials). doi: 10.1002/adma.201703653. **Back cover for article:** *Advanced Materials* 30(19): 1870135. doi: 10.1002/adma.201870135

- 2016: **Poppinga S\*, Weißkopf C, Westermeier AS, Masselter T, Speck T (2016)** Fastest predators in the plant kingdom: Functional morphology and biomechanics of suction traps found in the largest genus of carnivorous plants. *AoB PLANTS* 8: plv140. doi:10.1093/aobpla/plv140
- 2013: **Poppinga S\*, Hartmeyer S, Masselter T, Hartmeyer I, Speck T (2013)** Trap diversity and evolution in the family Droseraceae. *Plant Signaling & Behavior* 8(7): e24685 (invited review). doi: 10.4161/psb.24685
- Poppinga S\*, Masselter T, Speck T (2013)** Faster than their prey: New insights into the rapid movements of active carnivorous plants traps. *BioEssays: News and Reviews in Molecular, Cellular and Developmental Biology* 35: 649-657 (invited review; issue highlight). doi: 10.1002/bies.201200175

---

## Peer-reviewed book chapters

- 2018: **Speck T\*, Bauer G, Masselter T, Poppinga S, Schmier S, Thielen M, Speck O (2018)** Biomechanics and functional morphology of plants – inspiration for biomimetic materials and structures. In: A. Geitmann, J. Gril (eds.), *Plant Biomechanics*. Springer International Publishing AG, pp. 399-422. doi: 10.1007/978-3-319-79099-2\_18
- Poppinga S\*, Bauer U, Speck T, Volkov AG (2018)** Motile traps. In: Ellison AM, Adamec L (eds.) *Carnivorous plants - Physiology, ecology, and evolution*. Oxford University Press, pp. 180-193. doi: 10.1093/oso/9780198779841.003.0014
- Bauer U\*, Jetter R, Poppinga S (2018)** Non-motile traps. In: Ellison AM, Adamec L (eds.) *Carnivorous plants - Physiology, ecology, and evolution*. Oxford University Press, pp. 194-206. doi: 10.1093/oso/9780198779841.003.0015
- 2016: **Poppinga S\*, Körner A, Sachse R, Born L, Westermeier AS, Hesse L, Knippers J, Bischoff M, Gresser GT, Speck T (2016)** Compliant mechanisms in plants and architecture. In: Knippers J, Speck T, K. Nickel (eds.), *Biomimetic research for architecture and building construction: biological design and integrative structures*. Biologically-inspired systems, Springer, Heidelberg, Berlin, pp. 169-193. doi: 10.1007/978-3-319-46374-2\_9
- 2011: **Masselter T, Barthlott W, Bauer G, Bertling J, Cichy F, Ditsche-Kuru P, Gallenmüller F, Gude M, Haushahn T, Hermann M, Immink H, Knippers J, Lienhard J, Luchsinger R, Lunz K, Mattheck C, Milwich M, Mölders N, Neinhuis C, Nellesen A, Poppinga S, Rechberger M, Schleicher S, Schmitt C, Schwager H, Seidel R, Speck O, Stegmaier T, I. Tesari, Thielen M, Speck T (2011)** Biomimetic products. In: Y. Bar-Cohen (ed.), *Biomimetics - Nature Based Innovation*, pp. 377-429. CRC Press, Pasadena.



---

## Peer-reviewed conference proceedings

- 2018: **Nestle N\*, Šandor1 A, Bruchmann B, Speck T, Gallenmüller F, Poppinga S (2018)** Fossilized but functional – Tomographic insights into nature’s most resilient actuators. *Proceedings of the Bruker Micro-CT User Meeting 2018*: 49-55.
- 2017: **Bischoff M\*, Sachse R, Westermeier AS, Körner A, Born L, Poppinga S, Gresser GT, Speck T, Knippers J (2017)** Modeling and analysis of the trapping mechanism of *Aldrovanda vesiculosa* as biomimetic inspiration for façade elements. In: A. Bögle, M. Grohmann (eds.) IASS Annual Symposium 2017 Interfaces: architecture.engineering.science, 25–28th September, Hamburg, Germany.
- Born L\*, Körner A, Schieber G, Westermeier AS, Poppinga S, Sachse R, Bergmann P, Betz O, Bischoff M, Speck T, Knippers J, Milwich M, Gresser GT (2017)** Fiber-reinforced plastics with locally adapted stiffness for bio-inspired hingeless, deployable architectural systems. In: Herrmann A (eds.) 21st Symposium on Composites, Vol. 742: Trans Tech Publications (Key Engineering Materials), pp. 689-696. doi: 10.4028/www.scientific.net/KEM.742.689
- 2016: **Speck T\*, Masselter T, Poppinga S, Thielen M, Bauer G, Bunk K, Hesse L, Schmier S, Westermeier AS (2016)** Fibres in biology and technology: smart fibre-reinforced materials and structures inspired by

plants and animals. *Proceedings of the ECCM17 - 17th European Conference on Composite Materials Munich*, Germany, 26-30th June 2016 (ISBN 978-3-00-053387-7).

- 2011: **Schleicher S, Lienhard J, Knippers J, Poppinga S, Masselter T, Speck T (2011)** Bio-inspired kinematics of adaptive shading systems for free form facades. In: D. Nethercot et al. (eds), *Proceedings of the 35th Annual Symposium of IABSE / 52nd Annual Symposium of IASS / 6th International Conference on Space Structures 'Taller Longer Lighter - Meeting growing demand with limited resources'*, London, UK, 0551.
- Schleicher S\*, Lienhard J, Poppinga S, Masselter T, Speck T, Knippers J (2011)** Adaptive façade shading systems inspired by natural elastic kinematics. *Proceedings of the International Adaptive Architecture Conference IAAC* (2011), London, pp. 2-12.
- 2010: **Marmottant P\*, Vincent O, Quilliet C, Weißkopf C, Poppinga S, Masselter T, Speck T, Joyeux M (2010)** The ultrafast valve of an aquatic carnivorous plant. *Bulletin of the American Physical Society* 55(16), 63rd Annual Meeting of the APS Division of Fluid Dynamics 2010, Long Beach, California.
- Lienhard J\*, Schleicher S, Knippers J, Poppinga S, Speck T (2010)** Form-finding of nature inspires kinematics for pliable structures. In: Q. Zhang et al. (eds.), *Proceedings of the International Symposium of the International Association of Shell and Spatial Structures (IASS)*, Spatial Structures Temporary and Permanent, Shanghai, China, pp. 2545-2554.
- Poppinga S, Lienhard J, Masselter T, Schleicher S, Knippers J, Speck T\* (2010)** Biomimetic deployable systems in architecture. In: C. T. Lim, J. C. H. Goh (eds.), *IFMBE Proceedings 31*, 6th World Congress on Biomechanics (WCB) 2010, Singapore, pp. 40-43. doi: 10.1007/978-3-642-14515-5\_11
- Poppinga S, Masselter T, Lienhard J, Schleicher S, Knippers J, Speck T (2010)** Plant movements as concept generators for deployable systems in architecture. In: C. A. Brebbia (ed.), *Design & Nature V: Comparing Design in Nature with Science and Engineering*, WIT Press, Southampton, Boston, pp. 403-409. doi: 10.2495/DN100351
- Lienhard J, Poppinga S, Schleicher S, Speck T, Knippers J (2010)** Elastic architecture: nature inspired pliable structures. In: C. A. Brebbia (ed.), *Design & Nature V: Comparing Design in Nature with Science and Engineering*, WIT Press, Southampton, Boston, pp. 469-477. doi: 10.2495/DN100421
- Schleicher S, Lienhard J, Poppinga S, Speck T, Knippers J (2010)** Abstraction of bio-inspired curved-line folding patterns for elastic foils and membranes in architecture. In: C. A. Brebbia (ed.), *Design & Nature V: Comparing Design in Nature with Science and Engineering*, WIT Press, Southampton, Boston, pp. 479-489. doi: 10.2495/DN100431
- 2009: **Lienhard J, Poppinga S, Schleicher S, Masselter T, Speck T, Knippers J (2009)** Abstraction of plant movements for deployable structures in architecture. In: B. Thibaut (ed.), *Proceedings of the 6th Plant Biomechanics International Conference*, Ecofog, Cayenne, French Guyana, pp. 389-397.
- 2007: **Poppinga S\*, Barthlott W, Koch K (2007)** Plants that trap animals: microscopic characteristics of anti-adhesive surfaces. 33rd Microscopy Conference of the Deutsche Gesellschaft für Elektronenmikroskopie e. V., Saarbrücken, 02.-07.09.2007. *Microscopy and Microanalysis* 13(3): 192-193. doi: 10.1017/S1431927607080968

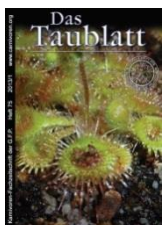
---

## Other publications (partly peer-reviewed)

- 2018: **Poppinga S\*, Speck T (2018)** Bark, the neglected tree postural motor system. *New Phytologist* (accepted).
- Poppinga S, Westermeier AS, Fleischmann A, Müller K, Speck T (2018)** Evolution of a sucker: Functional principles of traps in carnivorous bladderworts (*Utricularia*, Lentibulariaceae). *Atlas of Science* (<http://atlasofscience.org/evolution-of-a-sucker-functional-principles-of-traps-in-carnivorous-bladderworts-utricularia-lentibulariaceae/>).
- Poppinga S\*, Westermeier AS, Speck T, Fleischmann A (2018)** Differenze strutturali e funzionali nelle trappole delle utricolarie (Structural and functional diversity of bladderwort traps). *AIPC (Associazione Italiana Piante Carnivore) Magazine* 50(2): 4-17.



- Poppinga S\*, Alamsyah F, Bauer U, Fleischmann A, Horstmann M, Klink S, Kruppert S, Lin Q, Müller U, Northrop A, Plachno BJ, Prins A, Scharmann M, Sirová D, Skates L, Westermeier AS, Ellison AM\* (2018)** What's new in the world of carnivorous plants - Summary of two symposia held in July 2017. *Carnivorous Plant Newsletter* 47(1): 18-27.
- 2017: **Westermeier AS, Poppinga S, Körner A, Born L, Sachse R, Saffarian S, Knippers J, Bischoff M, Gresser GT, Speck T (2017)** Keine Gelenkbeschwerden – Wie Pflanzen sich bewegen und die Technik inspirieren. In: Knippers J, U. Schmid & Speck T (eds.), *Baubionik - Biologie beflügelt Architektur*. – Stuttgarter Beiträge zur Naturkunde, Serie C, Band 82, Stuttgart., pp. 30-39.
- Poppinga S, Nestle N, Reible B, Masselter T, Bruchmann B, Speck T (2017)** Fossile Zapfenschuppen bewegen sich noch nach Millionen von Jahren. *Naturwissenschaftliche Rundschau* 70(3), 139-140.
- 2016: **Poppinga S\*, Speck T (2016)** 3D-gedruckte, bewegliche Strukturen inspiriert von langsamen und schnellen Pflanzenbewegungen. In: A. B. Kesel, D. Zehren (eds.), *Bionik: Patente aus der Natur*. Tagungsbeiträge zum 8. Bionik-Kongress Hochschule Bremen, pp.12-18.
- Born L\*, Westermeier AS, Gresser GT, Poppinga S, Speck T (2016)** Catching inspiration from the carnivorous plant *Aldrovanda vesiculosa* – The biomimetic façade shading system “Flectofold”. In: A. B. Kesel, D. Zehren (eds.), *Bionik: Patente aus der Natur*. Tagungsbeiträge zum 8. Bionik-Kongress. Hochschule Bremen, pp. 137-143.
- Kampowski T\*, Eberhard L, Gallenmüller F, Poppinga S, Speck T (2016)** Medicinal leeches suck, don't they? – Investigating the functional morphology and general attachment performance of *Hirudo verbana* suction discs. In: A. B. Kesel, D. Zehren (eds.), *Bionik: Patente aus der Natur*. Tagungsbeiträge zum 8. Bionik-Kongress. Hochschule Bremen, pp. 193-200.
- Kampowski T\*, Mylo MD, Demandt S, Poppinga S, Speck T (2016)** The impact of water stress on morphological and biomechanical properties of desiccation-tolerant and desiccation-intolerant Gesneriaceae. In: A. B. Kesel, D. Zehren (eds.), *Bionik: Patente aus der Natur*. Tagungsbeiträge zum 8. Bionik-Kongress. Hochschule Bremen, pp.214-219.
- 2015: **Poppinga S (2015)** *Nepenthes gracilis*, die Kannenpflanze mit Sprungbrett. *Das Taublatt* 82: 104-111.
- Poppinga S\*, Speck T (2015)** New insights into the passive nastic motions of pine cone scales and false indusia in ferns. *Proceedings of the 8th Plant Biomechanics International Conference*, 30.11.-04.12.2015, Nagoya, Japan
- 2014: **Poppinga S\*, Speck T (2014)** Hygroscopic pine cone movement re-visited - Biomimetic actuators inspired by passive nastic plant movements. In: A. B. Kesel, D. Zehren (eds.), *Bionik: Patente aus der Natur*. Tagungsbeiträge zum 7. Bionik-Kongress Hochschule Bremen, pp. 256-260.
- 2013: **Poppinga S, Masselter T, Lienhard J, Schleicher S, Knippers J, Müller L, Milwich M, Speck T (2013)** Strelitzie inspiriert Architektur. *Naturwissenschaftliche Rundschau* 66(12): 649-651.
- Poppinga S, Metzger A, Speck O, Masselter T, Speck T\* (2013)** Schnappen, schleudern, saugen: Fallbewegungen fleischfressender Pflanzen. *Biologie in unserer Zeit* 43(6): 352-361 (invited article; with cover picture). doi: 10.1002/biuz.201310520
- Hartmeyer S\*, Hartmeyer I, Masselter T, Seidel R, Speck T, Poppinga S (2013)** Per Katapult in die Todesfalle: Der einzigartige Fangmechanismus von *Drosera glanduligera*. Deutsche Übersetzung des CPN-Artikels "Catapults into a deadly trap: The unique prey capture mechanism of *Drosera glanduligera*". *Das Taublatt* 75: 12-32 (with cover picture).
- Poppinga S, Hartmeyer S, Seidel R, Masselter T, Hartmeyer I, Speck T (2013)** Eine fleischfressende Pflanze mit Katapultfalle. *Naturwissenschaftliche Rundschau* 66(1): 37-38.
- 2012: **Poppinga S\*, Masselter T, Speck T (2012)** Fast plant movements. In: Moullia, B., Fournier, M. (eds.) *Proceedings of the 7th Plant Biomechanics International Conference*, Clermont-Ferrand, France, pp. 315-318.
- Masselter T\*, Poppinga S, Lienhard J, Schleicher S, Speck T (2012)** The flower of *Strelitzia reginae* as concept generator for the development of a technical deformation system for architectural purposes. In: B.



Mouliia, M. Fournier (eds.) *Proceedings of the 7th Plant Biomechanics International Conference*, Clermont-Ferrand, France, pp. 389-392.

**Poppinga S\***, Lienhard J, Schleicher S, Speck O, Knippers J, Speck T, Masselter T (2012) Paradiesvogelblume trifft Architektur - Bionische Innovation für gelenkfreie technische Anwendungen. *Praxis der Naturwissenschaften – Biologie* 5(61): 31-35.

**Lienhard J, Poppinga S, Schleicher S (2012)** Es geht auch ohne Gelenke. *architektur+technik* 4(12): 80-81.

2011: **Poppinga S, Weißkopf C, Masselter T, Speck T (2011)** Ultraschnelle Saugfallen beim fleischfressenden Wasserschlauch. *Naturwissenschaftliche Rundschau* 64(4): 205-206.

2010: **Poppinga S, Lienhard J, Schleicher S, Masselter T, Milwich M, Stegmaier T, Sartori J, Walter A, Schur H-F, Vogg K, Speck T, Knippers J (2010)** Architektur und Bionik - Wandelbarkeit ohne Gelenke. *ibr RKW Informationen Bau-Rationalisierung* 38(4): 24-25.

**Poppinga S\***, Lienhard J, Schleicher S, Masselter T, Knippers J, Speck T (2010) Gelenkfreie Klappen bei *Strelitzia reginae*. In: A. B. Kesel, D. Zehren (eds.), *Bionik: Patente aus der Natur*. Tagungsbeiträge zum 5. Bionik-Kongress Hochschule Bremen, pp. 320-326.

**Lienhard J\***, Schleicher S, Poppinga S, Walter A, Sartori J, Milwich M, Stegmaier T, Masselter T, Speck T, Knippers J (2010) Optimierung und Weiterentwicklung des Flectofin®. In: A. B. Kesel, D. Zehren (eds.), *Bionik: Patente aus der Natur*. Tagungsbeiträge zum 5. Bionik-Kongress Hochschule Bremen, pp. 36-45.

2009: **Poppinga S, Müller K, Omlor R (2009)** Darwin entdeckt tierische Eigenschaften an fleischfressenden Pflanzen. In: Schneckenburger, S., Omlor, R. (eds.), *Darwins Garten – Evolution entdecken*. Verband Botanische Gärten e. V., Berlin, pp. 42-43.

1997: **Poppinga S (1997)** *Drosophyllum lusitanicum* (L.) Link – Portugiesisches Taublatt. *Das Taublatt* 30(1): 4.

---

## Further conference contributions, posters and oral presentations

(\*\*T) keynote lecture, (\*T) invited talk, (T) regular talk, (ST) short talk accompanying poster presentation, (P) poster presentation, (A) abstract accompanying a talk. Presenter is underlined when several authors are listed.

2018: (T) (A) Poppinga S, Speck T (2018) Abstraction of slow and fast plant movement principles for the technical transfer into biomimetic structures. 9<sup>th</sup> Plant Biomechanics Conference, Montreal, Canada, 09.-14.08.2018.

(P) Thielen M, Poppinga S, Speck T (2018) 4D-printed material systems for sports and medicine inspired by the deformation of butterwort (*Pinguicula* sp.) leaves. 9<sup>th</sup> Plant Biomechanics Conference, Montreal, Canada, 09.-14.08.2018.

(P) Speck T, Eberhard L, Gallenmüller F, Poppinga S, Kampowski T (2018) Leech suction in air and under water: Secure attachment on plant leaves and other biological surfaces. 9<sup>th</sup> Plant Biomechanics Conference, Montreal, Canada, 09.-14.08.2018.

(A) Westermeier A, Sachse R, Poppinga S, Körner A, Born L, Bischoff M, Gresser GT, Knippers J, Speck T (2018) The fast snap-traps of the carnivorous aquatic waterwheel plant (*Aldrovanda vesiculosa*) – biomechanics, functional morphology, ecology, and biomimetic potential. 9<sup>th</sup> Plant Biomechanics Conference, Montreal, Canada, 09.-14.08.2018.

(A) Kampowski T, Mylo M, Demandt S, Poppinga S, Speck T (2018) Herbaceous shape memory material systems: Structural and biomechanical adaptations to desiccation in the resurrection plant *Ramonda myconi* (Gesneriaceae). 9<sup>th</sup> Plant Biomechanics Conference, Montreal, Canada, 09.-14.08.2018.

(\*T) Poppinga S, Speck T (2018) Suckers and snappers - New insights into the ultrafast traps of *Utricularia* and *Aldrovanda*. European Exchange and Exhibition, Bonn Botanic Gardens, 30.06.2018, Germany.

(\*T) (P) Poppinga S, Schenck P, Speck T, Correa D, Menges A, Nestle N, Bruchmann B (2018) Abstraction of slow and fast plant movement principles for the technical transfer into biomimetic structures. BASF-JONAS Family Days, Ludwigshafen, 20.-21.03.2018.

(T) Poppinga S, Gallenmüller F (2018) Bewegungen bei Pflanzen. Öffentlicher Vortrag, Veranstaltet vom Freundeskreis Botanischer Garten Freiburg, 19.01.2018.

2017: (\*T) Poppinga S, Speck T (2017) Functional morphology and biomechanics of the fast traps of *Aldrovanda vesiculosa* and *Utricularia* spp.. European Exchange and Exhibition, Hortus Botanicus Leiden, 13.08.2017, Netherlands.

(T) Poppinga S, Speck T (2017) How the Venus flytrap snaps revisited. SEB Annual Main Meeting, 03.-06.07.2017, Gothenburg, Sweden.

(P) Poppinga S, Correa D, Menges A, Nestle N, Bruchmann B, Speck T (2017) Pine cone seed scales as role models for adaptive flaps in architecture. SEB Annual Main Meeting, 03.-06.07.2017, Gothenburg, Sweden.

(\*T) (P) Poppinga S, Speck T (2015) Smart materials for sustainable architecture: Bio-inspired fiber-reinforced flap and scale structures for self-adaptive heat and humidity regulation. BASF-JONAS Family Days, Ludwigshafen, 12.-12.04.2017.

2016: (T) Poppinga S, Speck T (2016) 3D-gedruckte, bewegliche Strukturen inspiriert von langsamen und schnellen Pflanzenbewegungen. 8. Bionik-Kongress - Patente aus der Natur, Bremen, 21.-22.10.2016.

(P) Westermeier AS, Born L, Sachse R, Vögele P, Körner A, Bischoff M, Poppinga S, Knippers J, Gresser GT, Speck T (2016) Catching inspiration from the carnivorous plant *Aldrovanda vesiculosa* - Biological role model of the shading system "Flectofold". 8. Bionik-Kongress - Patente aus der Natur, Bremen, 21.-22.10.2016.

(P) Born L, Westermeier AS, Sachse R, Körner A, Bischoff M, Poppinga S, Knippers J, Speck T, Gresser GT (2016) Catching inspiration from the carnivorous plant *Aldrovanda vesiculosa* - Technical implementation of the shading system "Flectofold". 8. Bionik-Kongress - Patente aus der Natur, Bremen, 21.-22.10.2016.

(P) Kampowski T, Mylo MD, Demandt S, Poppinga S, Speck T (2016) The impact of water stress on morphological and biomechanical properties of desiccation-tolerant and desiccation-intolerant Gesneriaceae. 8. Bionik-Kongress - Patente aus der Natur, Bremen, 21.-22.10.2016.

(P) Kampowski T, Eberhard L, Gallenmüller F, Poppinga S, Speck T (2016) Medicinal leeches suck, don't they? Investigating the functional morphology and general attachment performance of *Hirudo verbana* suction discs. 8. Bionik-Kongress - Patente aus der Natur, Bremen, 21.-22.10.2016.

(P) Poppinga S, Speck T (2016) Pine cone seed scales as role models for adaptive flaps in architecture. Statusworkshop des Kompetenznetzes „Funktionelle Nanostrukturen“, 06.-07.10.2016, Bad Herrenalb.

(\*T) Poppinga S, Speck T (2016) How plants move, and how the motion principles can inspire new technologies. Skype talk with Studio One, Berkeley University (Prof. Simon Schleicher), 26.09.2016.

(\*T) Poppinga S (2016) New insights into the biomechanics and functional morphology of active carnivorous plant traps. International Carnivorous Plant Society Conference, Kew Gardens, London, UK (07.08.2016)

(\*T) Poppinga S (2016) Snappers, suckers & catapults: How motile carnivorous plants catch prey. Talk accompanying the science festival at Kew Gardens, London, UK (06.08.2016)

(P) Poppinga S, Speck T (2016) Pine cone seed scales as role models for adaptive flaps in architecture. SEB Annual Main Meeting, 04.-07.07.2016, Brighton, UK.

(P) Adamec L, Poppinga S (2016) Measurement of the critical negative pressure in traps of aquatic carnivorous *Utricularia* species. Plant Biology Europe EPSO/FESPB Congress, June 26-30, Prague, Czech Republic.

(A) Sachse R, Körner A, Poppinga S, Westermeier AS, Born L, Gresser GT, Speck T, Bischoff M, Knippers J (2016) Design process of a biomimetic facade element inspired by the carnivorous plant *Aldrovanda vesiculosa*. Proceedings of the ECCOMAS Congress 2016, VII European Congress on Computational Methods in Applied Sciences and Engineering, Crete, Greece, June 5-10.

- (\*T) (P) Poppinga S, Speck T (2015) Smart materials for sustainable architecture: Bio-inspired fiber-reinforced flap and scale structures for self-adaptive heat and humidity regulation. BASF-JONAS Family Days, Ludwigshafen, 12.-13.04.2016.
- 2015: (\*T) Poppinga S, Speck T (2015) New insights into the passive nastic motions of pine cone scales and false indusia in ferns. 8<sup>th</sup> Plant Biomechanics Conference, Nagoya, Japan (30.11-04.12.2015).
- (\*T) Poppinga S, Speck T (2015) Bewegung ohne Gelenke. 2. Bocholter Bionik-Workshop, 06.11.2015.
- (A) Kampowski T, Poppinga S, Speck T (2015) Self-adaptive stiffening in plants as role model for bio-inspired NIPUs. 24. FMF-Kolloquium, Schluchsee, 15.-16.10.2015.
- (P) Kampowski T, Mylo MD, Poppinga S, Speck T (2015) Adaptive mechanics and reinforcement in herbaceous plants. Statusworkshop des Kompetenznetzes 'Funktionelle Nanostrukturen' + 'BioMat-S' + 'Clean-Tech', Bad Herrenalb, 01.-02.10.2015.
- (T) Poppinga S, Speck T (2015) The passive nastic movements of pine cones and of false indusia in ferns. SEB Annual Main Meeting, Prague, Czech Republic, 30.06.-04.07.2014.
- (\*T) Poppinga S (2015) Wie fleischfressende Pflanzen ihre Beute fangen. Jahreshauptversammlung der GFP, Stuttgarter Wilhelma, 06.06.2015.
- (\*T) Poppinga S (2015) Smart materials for sustainable architecture: Bio-inspired fiber-reinforced flap and scale structures for self-adaptive heat and humidity regulation. BASF-JONAS Family Days, Ludwigshafen, 21.-22.04.2015.
- 2014: (ST) (P): Poppinga S, Horcas FA, Gallenmüller F, Speck T (2014) Hygroscopic pine cone movement revisited - Biomimetic actuators inspired by passive nastic plant movements. 7. Bionik-Kongress - Patente aus der Natur, Bremen, 24.-25.10.2014.
- (\*T) Poppinga S (2014) Flectofin. 7. Bionik-Kongress - Patente aus der Natur, Bremen, 24.-25.10.2014.
- (\*T) (A) Poppinga S (2014) Carnivorous plants traps and pine cone seed scales: Current investigations and promising future prospects for active and passive plant movement. SEB Annual Main Meeting, Manchester, UK, 01.-04.07.2014.
- (\*T) Poppinga S (2014) Saugen, Schnappen und Schleudern – Wie fleischfressende Pflanzen ihre Beute fangen. 100-Jahres-Feier des Botanischen Gartens Freiburg, 26.06.2014.
- (\*T) Poppinga S (2014) Saugen, Schnappen und Schleudern – Wie fleischfressende Pflanzen ihre Beute fangen. Sonderschau „Fleischfressende Pflanzen“ und Jahreshauptversammlung der GFP, Frankfurter Palmengarten, 21.06.2014.
- (\*T) Poppinga S (2014) Smart materials for sustainable architecture: Bio-inspired fiber-reinforced flap and scale structures for self-adaptive heat and humidity regulation. BASF-JONAS Family Days, Ludwigshafen, 06.-07.05.2014.
- 2013: (P) Speck T, Masselter T, Gallenmüller F, Bohn H, Poppinga S, Speck O (2013) Bionikforschung in der Plant Biomechanics Group Freiburg - Lehrstuhl für Botanik: Funktionelle Morphologie & Bionik und Botanischer Garten der Universität. 1. Internes Kolloquium FIT Kick-Off-Meeting, 18.10.2013.
- (\*T) Poppinga S, Speck T (2013) Pflanzenbewegungen als Vorbild für technische Anwendungen. Denkendorfer Symposium - Bionik und faserbasierte Werkstoffe, Institut für Textil- und Verfahrenstechnik (ITV) Denkendorf, 08.05.2013.
- (\*T) Poppinga S (2013) Saugen, Schnappen und Schleudern – Wie fleischfressende Pflanzen ihre Beute fangen. Jahresmitgliederversammlung Freundeskreis Botanischer Garten Freiburg, 08.01.2013.
- 2012: (\*T) Lienhard J, Schleicher S, Poppinga S, Masselter T, Müller L, Sartori J (2012) flectofin®. 6. 6. Bionik-Kongress - Patente aus der Natur, Bremen, 26.-27.10.2015.
- (ST) (P) Poppinga S, Masselter T, Speck T (2012) Fast plant movements. 7th Plant Biomechanics International Conference, Clermont-Ferrand, France, 20.-24.07.2012.



(P) Masselter T, Poppinga S, Lienhard J, Schleicher, Speck T (2012) The flower of *Strelitzia reginae* as concept generator for the development of a technical deformation system for architectural purposes. 7th Plant Biomechanics International Conference, Clermont-Ferrand, France, 20.-24.07.2012.

(A) Masselter T, Poppinga S, Lienhard J, Schleicher S, Knippers J, Speck T (2012) Innovative hingeless deformation systems inspired by the flower structure of *Strelitzia reginae*. SEB Annual Main Meeting 2012, Salzburg, Austria, 29.06.-02.07.2012.

(\*T) Poppinga S, Masselter T, Speck T (2012) Biomechanics and functional morphology of fast carnivorous plant traps. University of Würzburg, Department of Botany I - Molecular Plantphysiology and Biophysics, 04.06.2012.

(P) Poppinga S, Lienhard J, Schleicher S, Masselter T, Born L, Walter A, Sartori J, Milwich M, Stegmaier T, Speck T, Knippers J (2012) Flectofin® - Ein gelenkfreier Klappmechanismus. Hannovermesse, 23.-27.04.2012.

(\*T) Poppinga S, Masselter T, Speck T (2012) Von extrem langsam bis ultraschnell – Pflanzen in Bewegung. 103. Bundeskongress des Deutschen Vereins zur Förderung des mathematischen und naturwissenschaftlichen Unterrichts, Freiburg, 01.-05.04.2012.

(A) Schleicher S, Lienhard J, Poppinga S, Milwich M, Speck T, Knippers J (2012) The potential of novel design and fabrication processes for the transfer of plant kinematics into technical systems. EURO Bio-inspired Materials 2012, Potsdam, 20.-23.03.2012.

(\*T) Poppinga S (2012) Pflanzen, die den Spieß umdrehen - Die Vielfalt fleischfressender Pflanzen. Ringvorlesung "Lebensräume der Erde und Vielfalt der Organismen" der Fakultät für Biologie, Universität Freiburg, 25.01.2012.

(\*T) Poppinga S, Weißkopf C, Masselter T, Speck T (2012) Aquatische fleischfressende Pflanzen – Funktionelle Morphologie und Biomechanik der schnellen Fallen von *Utricularia* und *Aldrovanda*. Limnologische Station Iffeldorf, TU München, 20.01.2012.

2011: (A) (T) Poppinga S, Weißkopf C, Masselter T, Speck T (2011) Aquatische fleischfressende Pflanzen – Funktionelle Morphologie und Biomechanik der schnellen Fallen von *Utricularia* und *Aldrovanda*. 27. Jahrestagung der deutschen Gesellschaft für Limnologie e.V., Freising, 12.-16.09.2011.

(A) (T) Poppinga S, Weißkopf C, Vincent O, Quilliet C, Joyeux M, Marmottant P, Masselter T, Speck T (2011) Biomechanics and functional morphology of suction traps in aquatic carnivorous bladderworts (*Utricularia* spp.) as concept generator for biomimetic products. XVIII International Botanical Congress, Melbourne, Australia, 23.-30.07.2011.

(A) (T) Poppinga S, Masselter T, Weißkopf C, Vincent O, Marmottant P, Joyeux M, Quilliet C, Schleicher S, Lienhard J, Knippers J, Adamec L, Speck T (2011) Suckers and snappers – Functional trap morphology and biomechanics of fast underwater prey capture in aquatic carnivorous plants. SEB Annual Main Meeting, Glasgow, Scotland, 01.-04.07.2011.

(P) Lienhard J, Schleicher S, Poppinga S, Masselter T, Born L, Walter A, Sartori J, Milwich M, Stegmaier T, Speck T, Knippers J (2011) Biomimetic facade shading inspired by *Strelitzia reginae*. Techtexil Innovationspreissträger, Frankfurt, 23.05.2011.

(P) Lienhard J, Schleicher S, Poppinga S, Walter A, Sartori J, Milwich M, Stegmaier T, Masselter T, Speck T, Knippers J (2011) Wandelbarer Leichtbau in der Architektur - Biegsame Flächentragwerke auf der Grundlage bionischer Prinzipien. Hannovermesse, 04.-08.04.2011.

(P) Lienhard J, Schleicher S, Poppinga S, Walter A, Sartori J, Milwich M, Stegmaier T, Masselter T, Speck T, Knippers J (2011) Wandelbarer Leichtbau in der Architektur - Biegsame Flächentragwerke auf der Grundlage bionischer Prinzipien. 3. BIONA-Statusseminar, Berlin, 16.-17.03.2011.

2010: (P) Poppinga S, Lienhard J, Schleicher S, Masselter T, Knippers J, Speck T (2010) Gelenkfreie Klappen bei *Strelitzia reginae*. BAU 2011, München, 17.-19.01.2011.

(\*T) Poppinga S, Speck O, Speck T (2010) Bionik: Innovation zwischen Naturwissenschaft und Technik. Vortrag im Rahmen der Lehrerfortbildung für Naturwissenschaft & Technik, Fernstudienzentrum Universität Karlsruhe, 25.10.2010.

(A) (T) Lienhard J, Poppinga S (2010) Bio-inspirierte, wandelbare Konstruktionen für die Architektur. 5. Bionik-Kongress - Patente aus der Natur, Bremen, 22.-23.10.2010.

(P) Lienhard J, Schleicher S, Poppinga S, Masselter T, Speck T, Sartori J, Walter A, Milwich M, Stegmaier T, Knippers J (2010) Optimierung und Weiterentwicklung des Flectofin®. 5. Bionik Kongress, Patente aus der Natur', Bremen, 22.-23.10.2010.

(P) Poppinga S, Lienhard J, Schleicher S, Masselter T, Knippers J, Speck T (2010) Gelenkfreie Klappen bei *Strelitzia reginae*. 5. Bionik Kongress, Patente aus der Natur', Bremen, 22.-23.10.2010.

(P) Poppinga S, Masselter T, Lienhard J, Schleicher S, Knippers J, Speck T (2010) Biomimetics: Bio-inspired deployable structures in architecture. BRAGFOST, Brazilian-German Frontiers of Science and Technology Symposia, Bento Goncalves, Brazil (September 2010).

(A) (T) Poppinga S, Lienhard J, Schleicher S, Masselter T, Knippers J, Speck T (2010) Perching birds and twisted petals - Plant movements as concept generators for deployable technical systems. SEB Annual Main Meeting, Prague, Czech Republic, 30.06.-03.07.2010.

(A) (S) Poppinga S, Weißkopf C, Masselter T, Speck T, Vincent O, Joyeux M, Quilliet C, Marmottant P (2010) Functional morphology and biomechanics of the trap mechanism of bladderworts (*Utricularia* sp.). SEB Annual Main Meeting, Prague, Czech Republic, 30.06.-03.07.2010.

(\*T) Poppinga S (2010) Pflanzen, die den Spieß umdrehen - Die Vielfalt fleischfressender Pflanzen. Woche der Botanischen Gärten, Freiburg, 08.06.2010.

(P) Lienhard J, Poppinga S, Schleicher S, Masselter T, Speck T, Knippers J (2010) Wandelbarer Leichtbau in der Architektur - Biegsame Flächentragwerke auf der Grundlage bionischer Prinzipien. Hannovermesse, 19.-23.04.2010.

(A) Poppinga S, Masselter T, Lienhard J, Knippers J, Speck T (2010) Deployable technical structures on the basis of biomimetic principles. COST Strategic Workshop 'Principles and Development of Bio-Inspired Materials', Vienna, Austria, 13.-15.04.2010.

(P) Poppinga S, Masselter T, Lienhard J, Schleicher S, Knippers J, Speck T (2010) Flectofin - a hinge-less flap inspired by an elastic plant movement. COST Strategic Workshop 'Principles and Development of Bio-Inspired Materials', Vienna, Austria, 13.-15.04.2010.

(P) Lienhard J, Poppinga S, Schleicher S, Masselter T, Speck T, Knippers J (2010) Wandelbarer Leichtbau in der Architektur - Biegsame Flächentragwerke auf der Grundlage bionischer Prinzipien. 2. BIONA-Statusseminar, Berlin, 10.-11.03.2010.

2009: (\*T) Poppinga S, Speck O, Speck T (2009) Bionik: Innovation zwischen Naturwissenschaft und Technik. Vortrag im Rahmen der Lehrerfortbildung für Naturwissenschaft & Technik, Fernstudienzentrum Universität Karlsruhe, 16.10.2009.

2007: (P) Poppinga S, Barthlott W, Koch K (2007) Plants that trap animals: microscopic characteristics of anti-adhesive surfaces. 33rd Microscopy Conference of the Deutsche Gesellschaft für Elektronenmikroskopie e. V., Saarbrücken, 02.-07.09.2007.

---

## Published reports

2017 **Westermeier A, Poppinga S, Speck T (2017)** Das biomimetische Fassaden-Verschattungssystem Flectofold (The biomimetic façade shading device Flectofold). In: *Freiburger Zentrum für Interaktive Materialien und Bioinspirierte Technologien (FIT) Report 2017*, FIT, Freiburg, pp. 47-49.

2016: **Westermeier AS, Poppinga S, Speck T (2017)** Die fleischfressende Pflanze *Aldrovanda vesiculosa* als Ideengeber für die Entwicklung eines biomimetischen Fassaden-Verschattungssystems (The carnivorous plant *Aldrovanda vesiculosa* as concept generator for the development of a biomimetic façade shading sys-

tem). In: *Freiburger Zentrum für Interaktive Materialien und Bioinspirierte Technologien (FIT) Report 2016*, FIT, Freiburg, pp. 90-93.

**Schimpf V, Kampowski T, Reiter G, Poppinga S, Speck T, Mülhaupt R (2017)** Entwicklung isocyanatfreier Polyurethan-Materialien mit adaptiven und thermisch-responsiven Eigenschaften (Development of non-isocyanate polyurethane materials with adaptive and thermoresponsive features). In: *Freiburger Materialforschungszentrum (FMF) Report 2016*, FMF, Freiburg, pp. 24-27.

2015: **Westermeier AS, Hesse L, Poppinga S, Speck T (2016)** Kinematik planarer, gekrümmter und gewellter Pflanzenstrukturen als Konzeptgeneratoren für bewegliche Strukturen in der Architektur (Kinematics of planar, curved and corrugated plant surfaces as concept generators for deployable systems in architecture) – In: *Freiburger Zentrum für Interaktive Materialien und Bioinspirierte Technologien (FIT) Report 2015*, FIT, Freiburg, pp. 24-27.

**Schimpf V, Kampowski T, Reiter G, Poppinga S, Speck T, Mülhaupt R (2016)** Entwicklung neuartiger NIPU-Netzwerke mit adaptiven und thermisch-responsiven Eigenschaften (Development of novel NIPU networks with adaptive and thermoresponsive features). In: *Freiburger Materialforschungszentrum (FMF) Report 2015*, FMF, Freiburg, pp. 21-24.

2014: **Blattmann H, Schimpf V, Weyand S, Kampowski T, Schwaiger R, Kraft O, Reiter G, Speck T, Mülhaupt R (2015)** Entwicklung bioinspirierter isocyanatfreier Polyurethane auf Basis nachwachsender Rohstoffe (Development of bio-inspired non-isocyanate polyurethanes based on renewable resources). In: *Freiburger Materialforschungszentrum (FMF) Report 2014*, FMF, Freiburg, pp. 42-46.