

# M. Andrew Jansen, Ph.D.

## Curriculum Vitæ

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### Personal Information

**Address** Beltsville Agricultural Research Center, Bldg. 012, Room 1-8  
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**Phone** (301) 504-6649  
**E-mail** [andrew.jansen@usda.gov](mailto:andrew.jansen@usda.gov)  
**Website** [Electron & Confocal Microscopy Unit](#)  
**GitHub** [github.com/entojansen](https://github.com/entojansen)

### Current Employment

#### 2022 - Present

**Employer** United States Department of Agriculture  
Agricultural Research Service (Northeast Area)  
**Position** Research Entomologist – Systematic Entomology Laboratory  
Director – Electron and Confocal Microscopy Unit

### Research Interests

Insect evolution and biomechanics; nanoindentation of insect cuticle; structural adaptation and morphological optimization; mechanical behavior of biomaterials; biomimetic design of robotic systems and materials.

### Education

**2020 - 2022** Postdoctoral Fellowship, University of Bonn. Advisor: Dr. Alexander Blanke  
ERC Starting Grant (Recipient: Alexander Blanke, Grant agreement ID: 754290) “**MECH-EVO-INSECT**”  
**2014 - 2019** Ph.D., Arizona State University, Evolutionary Biology. Advisor: Dr. Nico Franz  
“Evolutionary Biomechanics of the Rostrum of *Curculio* Linnaeus, 1758 (Coleoptera: Curculionidae)”  
**2012 - 2014** M.Sc., Arizona State University, Biology.  
“A Phylogenetic Revision of *Minyomeres* Horn, 1876 and *Piscatopus* Sleeper, 1960 (Curculionidae: Entiminae: Tanymecini: Tanymecina)”  
**2007 - 2011** B.S., University of Florida, Entomology and Nematology.

### Peer Reviewed Publications

Franco Meléndez, K.P., Schuster, L., Donahey, M.C., Kairalla, E., **Jansen, M.A.**, Reisch, C., & A.R. Rivers. 2023. MicroMPN: Software and methods for high-throughput screening of microbe suppression in mixed populations. *In USDA-ARS internal review*.

Vieira, P., Kantor, M.R., **Jansen, M.A.**, Handoo, Z.A., & J.D. Eisenback. 2023. Cellular insights of beech leaf disease reveal abnormal ectopic cell division of symptomatic interveinal leaf areas. *PLOS ONE*. *In review*.

Inaba, J., Kim, B.M., Zhao, Y., **Jansen, M.A.**, W. Wei. 2023. The Endoplasmic Reticulum Is a Key Battleground between Phytoplasma Aggression and Host Plant Defense. *Cells*. 12(16): 2110

Dougherty, L., Borejsza-Wysocka, E., Miaule, A., Wang, P., Zheng, D., **Jansen, M.A.**, Brown, S., Pineros, M., Dardick, C., & K. Xu. 2023. A single amino acid substitution in MdLAZY1A dominantly impairs shoot gravitropism in *Malus*. *Plant Physiology*. [kiad373](#)

- Jansen, M.A.**, Niverty, S., Chawla, N., & N.M. Franz. 2021. Reducing the risk of rostral bending failure in *Curculio* Linnaeus, 1758. *Acta Biomaterialia*. **126**: p. 350-371.
- Jansen, M.A.**, Williams, J., Chawla, N., & N.M. Franz. 2019. Avoidance of catastrophic structural failure as an evolutionary constraint: Biomechanics of the acorn weevil rostrum. *Advanced Materials*. **31**(41): 1903526.
- Jansen, M.A.** & N.M. Franz. 2018. Descriptions of four new species of *Minyomeres* Horn, 1876 (Coleoptera: Curculionidae), with notes on their distribution and phylogeny. *PeerJ*. **6**: e5633.
- Jansen, M.A.**, Luck, K., Campbell, J., Amor, H.B., & D. Aukes. 2017. Bio-inspired robot design considering load-bearing and kinematic ontogeny of Chelonioidea sea turtles. In *Biomimetic and Biohybrid Systems*. p. 216-229
- Luck, K., **Jansen, M.A.**, Campbell, J., Aukes, D., & H.B. Amor. 2017. From the lab to the desert: fast prototyping and learning of robot locomotion. *Proceedings of Robotics: Science and Systems*. **13**: p. 75-83.
- Jansen, M.A.**, Singh, S.S., Chawla, N., & N.M. Franz. 2016. A multilayer micromechanical model of the cuticle of *Curculio longinasus* Chittenden, 1927 (Coleoptera: Curculionidae). *Journal of Structural Biology*. **195**: p. 139-158.
- Singh, S.S., **Jansen, M.A.**, Franz, N.M., & N. Chawla. 2016. Microstructure and nanoindentation of the rostrum of *Curculio longinasus* Chittenden, 1927 (Coleoptera: Curculionidae). *Materials Characterization*. **118**: p. 206-211.
- Jansen, M.A.** & S.E. Halbert. 2016. Key to Florida Alydidae (Hemiptera: Heteroptera) and selected exotic pest species. *Insecta Mundi*. **0476**: p. 1-14.
- Jansen, M.A.** & N.M. Franz. 2015. Phylogenetic revision of *Minyomeres* Horn, 1876 sec. Jansen & Franz, 2015 (Coleoptera, Curculionidae) using taxonomic concept annotations and alignments. *ZooKeys*. **528**: p. 1-133.

## Featured Media

- Shimonoya, R. 2020. “The strongest bug, uncrushed by a car, reveals its secret of robustness”. *Nikkei, Technology Column*. Electronic version of the Japanese Business Daily. **28 November**.
- Clement, M. 2019. “Weevil genius: Insect inspires stronger, more flexible materials”. *ASU Now*. **10 October**.

## Manuscripts in Preparation

- Jansen, M.A.** Two new species of *Minyomeres* Horn, 1876 (Coleoptera: Curculionidae). *In Prep*.
- Jansen, M.A.** & A. Blanke. Classification of unidirectional plies in the cuticle of Polyneoptera. *In Prep*.

## Protocols

- Franco Meléndez, K.P., Schuster, L., Donahey, M.C., Kairalla, E., **Jansen, M.A.**, Reisch, C., & A.R. Rivers. 2023. MicroMPN: Software and methods for high-throughput screening of microbe suppression in mixed populations. In *USDA-ARS internal review*. protocol published via [protocols.io](https://protocols.io)
- Franco Meléndez, K.P., Schuster, L., Donahey, M.C., Kairalla, E., **Jansen, M.A.**, Reisch, C., & A.R. Rivers. 2023. Most Probable Number Fluorescence Microplate Assay V.1. protocol published via [protocols.io](https://protocols.io)

## Conference Presentations

- Jansen, M.A.** 2023. “Insect cuticle is for entomologists, not engineers”. *Monthly Meeting (March) of the Entomological Society of Washington*, Washington, DC.
- Jansen, M.A.**, Luktuke, A., Chawla, N., Labonte, D., & A. Blanke. 2022. “Characterization of insect cuticle: challenges and insights”. *Annual Meeting of the Society for Experimental Biology*, Montpellier, FR.

- Jansen, M.A.,** Luktuke, A., Chawla, N., Labonte, D., & A. Blanke. 2022. "Evidence of functionally graded cuticle in Polyneopteran head capsules". 26<sup>th</sup> *International Congress of Entomology*, Helsinki, FI.
- Jansen, M.A.,** Luktuke, A., Chawla, N., Labonte, D., & A. Blanke. 2022. "Evidence of functionally graded cuticle in Polyneopteran head capsules". 5<sup>th</sup> *International Congress of Invertebrate Morphology*, Vienna, AT.
- Jansen, M.A.,** & N.M. Franz. 2018. "Comparative bending mechanics and morphology of the snout in *Curculio* Linnaeus 1756". *Annual Meeting of the Entomological Society of America*, Vancouver, BC.
- Jansen, M.A.,** Chawla, N., & N.M. Franz. 2017. "Fracture mechanics and evolution of resilient cuticle in the rostrum of *Curculio* Linnaeus, 1758". *Annual Meeting of the Entomological Society of America*, Denver, CO.
- Jansen, M.A.** & N.M. Franz. 2017. "Evolutionary mechanics of the rostrum in *Curculio* Linnaeus, 1758". *Annual Meeting of the Willi Hennig Society*, St. Petersburg, FL.
- Jansen, M.A.,** Luck, K., Campbell, J., Amor, H.B., & D. Aukes. 2017. "Bio-inspired robot design considering load-bearing and kinematic ontogeny of Chelonioid sea turtles". *Living Machines*, Stanford, CA.
- Luck, K., **Jansen, M.A.,** Campbell, J., Aukes, D., & H.B. Amor. 2017. "From the lab to the desert: fast prototyping and learning of robot locomotion". *Robotics: Science and Systems*, Cambridge, MA.
- Jansen, M.A.** & N.M. Franz. 2016. "Why the long face? Insights into the mechanical behavior of the rostrum in the genus *Curculio* Linnaeus, 1758". *International Congress of Entomology*, Orlando, FL.
- Jansen, M.A.,** Singh, S.S., Chawla, N., & N.M. Franz. 2015. "Mechanical Behavior of the Rostrum of *Curculio* Linnaeus, 1758 (Coleoptera: Curculionidae)". *Annual Meeting of the Entomological Society of America*, Minneapolis, MN.
- Jansen, M.A.** & N.M. Franz. 2014. "A phylogenetic revision of *Minyomeres* Horn, 1876, and *Piscatopus* Sleeper, 1960 (Coleoptera: Curculionidae: Entiminae: Tanymecini)". *Annual Meeting of the Entomological Society of America Pacific Branch*, Tucson, AZ.
- Jansen, M.A.** & N.M. Franz. 2013. "A phylogenetic revision of *Minyomeres* Horn, 1876, and *Piscatopus* Sleeper, 1960 (Coleoptera: Curculionidae: Entiminae: Tanymecini)". *Annual Meeting of the Entomological Society of America*, Austin, TX.
- Jansen, M.A.** & N.M. Franz. 2013. "A phylogenetic revision of *Minyomeres* Horn, 1876, and *Piscatopus* Sleeper, 1960 (Coleoptera: Curculionidae)". 12th Biennial Conference of Science and Management on the Colorado Plateau, Flagstaff, AZ.

## Awards and Fellowships

- 2019** \$12,000.00 - ASU School of Life Sciences Completion Fellowship
- 2018** Awarded honorary 1-year membership - AAAS/Science Excellence in Science Program
- 2018** \$400.00 - ASU School of Life Sciences Fall Travel Award
- 2018** \$500.00 - ASU Q2 Graduate College Travel Award
- 2018** \$12,250.00 - ASU Biomimicry Center Fellowship (Corporate sponsorship by Google, Inc.)
- 2017** \$500.00 - The Willi Hennig Society Student Travel Award
- 2017** \$400.00 - ASU School of Life Sciences Fall Travel Award
- 2017** \$195.00 - ASU Q2 Graduate College Travel Award
- 2017** \$6,000.00 - ASU Evolutionary Biology Doctoral Program Summer Fellowship
- 2016** \$400.00 - ASU School of Life Sciences Fall Travel Award

## Products Developed

### C-Turtle

**Website** <https://sites.google.com/view/c-turtle/>

**Design** Version 1.0 Cut-files

## Patent Applications

Aukes, D., Amor, H.B., Luck, K., **Jansen, M.A.**, & J. Campbell, *inventors*; Arizona State University, Skysong Innovations, *assignee*. 2018. United States non-provisional patent application for systems and methods for rapid-prototyped robotic devices. *US Patent Application No. 16/215,910*. Filed 11 December 2018.

Aukes, D., Amor, H.B., Luck, K., **Jansen, M.A.**, & J. Campbell, *inventors*; Arizona State University, Skysong Innovations, *assignee*. 2017. United States provisional patent application for systems and methods for rapid-prototyped robotic devices. *US Patent Application No. 62/597,276*. Filed 11 December 2017.

## Featured Media

Adams, D. 2017. "An army of these odd-looking robotic 'turtles' might help rid the world of landmines". *Digital Trends*. [26 May](#).

Ander, J. 2017. "Landmine-clearing Pi-powered C-Turtle". *Raspberry Pi Official Blog*. [26 July](#).

Coledevey, D. 2017. "These flat-pack turtlebots will crawl across minefields for safety's sake". *Tech Crunch*. [25 May](#).

Crookes, D. 2017. "C-TURTLE". *The MagPi Magazine*: Issue 63 [1 November](#).

DeLisle, J.J. 2017. "Raspberry-Pi-powered turtle robot learns to navigate new terrains on its own - From planetary exploration to swarm robotic landmine sensing, C-Turtle's possibilities are endless". *Electronic Products*. [11 August](#).

Fagan, K. 2017. "The landmine-detecting robot 'turtle'". *BBC News*. [22 July](#).

Horsey, J. 2017. "Raspberry Pi used to create C-Turtle, landmine clearing robot". *Geeky Gadgets*. [27 July](#).

Kety, S. 2017. "'C-Turtle', the 3D printed robot whose movements are similar to a sea turtle". *3D Adept News*. [16 August](#).

Koslow, T. 2017. "Out of the shell - C-Turtle: the paper turtle robot that can detect landmines". *All3DP*. [20 August](#).

Lavars, N. 2017. "Turtle-bot teaches itself to waddle through the desert". *New Atlas*. [26 May](#).

Ludacer, R. 2017. "Researchers are using robotic sea turtles to find land mines". *Tech Insider*. [10 June](#).

Ray, A. 2017. "A new turtle explorer - This \$70 robot that mimics a sea-turtle may eventually reach Mars". *Quartz*. [15 August](#).

Massaouden, L. 2017. "C-Turtle, le robot tortue en carton qui doit un jour explorer Mars". *Mashable avec France 24*. [25 August](#).

Mathews, L. 2017. "Robotic Turtles With Raspberry Pi Brains Are Sniffing Out Land Mines". *Geek.com*. [27 July](#).

Sabin, D. 2017. "This crawling C-Turtle robot could hunt for landmines". *Inverse*. [26 May](#).

Reynolds, M. 2017. "Robotic turtles can be used to detect landmines in the desert". *New Scientist Magazine*: Issue 3127. [24 May](#).

Sant, J.V. 2017. "ASU Robotics turns to nature for inspiration". KPHO Broadcasting Corporation: *3TV/CBS5*. [5 June](#).

Scott, C. 2017. "Partially 3D printed C-Turtle robots crawl and adapt in the desert". *3Dprint.com*. [17 August](#).

Seckel, S. 2017. "Technology comes from collaboration between computer science, mechanical engineering and biology". *ASU Now*. [25 May](#).

Seckel, S. 2017. "ASU-designed C-Turtle robot teaches itself to get around". *ASU Now*. [25 May](#).

Wehner, M. 2017. "These robotic turtles could save your life". *New York Post*. [25 May](#).

Unknown - 'Hackster Staff'. 2017. "Nature-inspired C-Turtle robot waddles the desert with ease". *Hackster*. [26 May](#).

Unknown - 'Gadget Junkie'. 2017. "C-Turtle: cardboard turtle robot with Raspberry Pi". *gadgetify*. [27 July](#).

Unknown - 'Robot Man'. 2017. "C-Turtle cardboard robot turtle learns to navigate different terrains". *Robotic Gizmos*. [27 July](#).

## *Design and Prototyping Services*

### **Western Entomological Supply (Co-founder)**

[github.com/western-entomological](https://github.com/western-entomological)

**2017 - 2019** Design and production of insect mounting points for entomological collections (Universal Laser Cutter VLS 6.6o)

**2017 - 2019** Design and production of curation equipment for insect specimens (MakerBot Replicator 2x)

**2018** Production of cassette cartridge spacer and brackets prototypes for TechShot (MakerBot Replicator 2x)

## *Programming Languages and Software*

### **Languages**

Most proficient with Python, R, and  $\text{\LaTeX}$

Intermediate experience with Bash, MATLAB

Dabbled in Abaqus Script, HTML, XML, Java, BASIC, Visual Basic, JavaScript, Git

Currently training in C++17/20

### **Software**

Most proficient with Solidworks, Abaqus/CAE, PrusaSlicer, Adobe Illustrator

Intermediate experience with COMSOL, GitHub Desktop, GraphPad Prism

Dabbled in ImageJ, Amira, Adobe Photoshop

## *Society Memberships*

**2013 - 2019** Entomological Society of America, Pacific Branch

**2013 - 2019** Coleopterists Society

## *Academic Service*

### **Manuscript Reviewer**

Acta Biomaterialia

The Coleopterists Bulletin

Coleopterists Society Monographs (Patricia Vaurie Series)

The Pan-Pacific Entomologist

Zootaxa

### **Book Chapter Reviews**

“Weevils (Coleoptera: Dryophthoridæ, Brachyceridæ, Erirhinidæ, Curculionidæ) of the Prairie Ecozone in Canada”. Robert S. Anderson, Patrice Bouchard, & Hume Douglas. In Volume 4 of *Arthropods of Canadian Grasslands*.

### **Community Outreach**

**2023** ECMU - Microscopy Open House

**2013 - 2018** ASU - SoLS Night of the Open Door

**2013 - 2016** ASU - IAFSE Engineering Open House

**2014 - 2015** ASU - SoLS Graduate Partners in Science Education

## **Insect Identification and Collection Services**

**2019** Greater Good, Madrean Discovery Expedition - Sierra Chivato, SO, México  
**2017 - 2018** US Department of Agriculture - Tempe, AZ, USA  
**2017** Greater Good, Madrean Discovery Expedition - Cajón Bonito, SO, México  
**2014** Madrean Discovery Expedition - Patagonia, AZ, USA  
**2013** Madrean Discovery Expedition - Sierra la Púrica, SO, México  
**2013** US National Park Service, BioBlitz - Joshua Tree National Park, CA, USA  
**2012** Madrean Discovery Expedition - Sierra Aconchi, SO, México

## *Teaching Appointments*

<b>Course</b>	<b>Subject</b>	<b>Semester</b>	<b>Position</b>
BIO 201	Human Anatomy and Physiology	Fall - 2019	Instructor
BIO 386	Entomology	Fall - 2018	Instructor
BIO 201	Human Anatomy and Physiology	Spring - 2017	Teaching Assistant
BIO 281	Biology (1 <sup>st</sup> Semester for Majors)	Fall - 2016	Teaching Assistant
BIO 182	Biology (2 <sup>nd</sup> Semester)	Summer - 2016	Teaching Assistant
BIO 181	Biology (1 <sup>st</sup> Semester)	Spring - 2016	Teaching Assistant
BIO 282	Biology (2 <sup>nd</sup> Semester for Majors)	Spring 2014	Teaching Assistant
BIO 386	Entomology	Fall - 2013, 2014, 2015	Teaching Assistant

## *Field and Museum Work*

### **Field Work**

<b>United States</b>	AZ, CA, CO, DC, FL, GA, ID, MD, NM, NV, PR, SC, TX, UT, VA (2010 - 2023)
<b>Germany</b>	NRW (2020 - 2022)
<b>Mexico</b>	SO (2012, 2013, 2017, 2019)
<b>Guatemala</b>	AV, BV, CM, CQ, ES, GU, HU, IZ, JA, PR, QC, QZ, SA, SO, SR, SU, TO, ZA (2014)

### **Collections Visited**

**ASUT** USA, Arizona, Tempe, Arizona State University, Hasbrouck Insect Collection  
**BYUC** USA, Utah, Provo, Brigham Young University, Monte L. Bean Life Science Museum  
**CASC** USA, California, San Francisco, California Academy of Sciences  
**CSCA** USA, California, Sacramento, California State Collection of Arthropods  
**CSDS** USA, California, Baker, Desert Studies Center  
**CSUC** USA, Colorado, Fort Collins, Colorado State University  
**CWOB** USA, Arizona, Green Valley, Charles W. O'Brien Collection  
**EMEC** USA, California, Berkeley, University of California, Essig Museum of Entomology  
**FSCA** USA, Florida, Gainesville, Division of Plant Industry, Florida State Collection of Arthropods  
**FSMC** USA, Florida, Gainesville, University of Florida, Florida Museum of Natural History  
**LBOB** USA, Arizona, Green Valley, Lois B. O'Brien Collection  
**MGCL** USA, Florida, Gainesville, University of Florida, McGuire Center for Lepidoptera and Biodiversity  
**NAUF** USA, Arizona, Flagstaff, Northern Arizona University  
**NMNH** USA, Washington, D.C., Smithsonian Institute, National Museum of Natural History  
**NMSU** USA, New Mexico, Las Cruces, New Mexico State University, Museum of Southwestern Biology  
**NVDA** USA, Nevada, Reno, Nevada State Department of Agriculture  
**RLAC** USA, California, El Dorado Hills, Rolf L. Aalbu Collection  
**SMFD** Germany, Hessen, Frankfurt-am-Main, Forschungsinstitut und Naturmuseum Senckenberg  
**SWRS** USA, Arizona, Portal, Southwestern Research Station  
**TAMU** USA, Texas, College Station, Texas Agricultural and Mechanical University



**TTUZ** USA, Texas, Lubbock, Texas Tech University  
**UAIC** USA, Arizona, Tucson, University of Arizona  
**UCDC** USA, California, Davis, University of California, R.M. Bohart Museum of Entomology  
**UCRC** USA, California, Riverside, University of California, Entomology Research Museum  
**UNMC** USA, New Mexico, Albuquerque, University of New Mexico  
**UMNH** USA, Utah, Salt Lake City, University of Utah, Utah Museum of Natural History  
**UVGC** Guatemala, Guatemala City, Universidad del Valle de Guatemala, Colección de Artrópodos  
**ZMHB** Germany, Berlin, Museum für Naturkunde der Humboldt Universität zu Berlin

## *Employment History*

**2021** Postdoctoral Researcher - University of Bonn  
**2020** Postdoctoral Researcher - University of Cologne  
**2019** Adjunct Instructor - Mesa Community College  
**2019** Research Consultant - The Biomimicry Center, Arizona State University  
**2012** Museum Technician - Florida State Collection of Arthropods & McGuire Center for Lepidoptera  
**2011** Research Technician - Honeybee Research and Extension Laboratory, University of Florida  
**2011** Research Assistant - Division of Insect Behavior, USDA-ARS, Gainesville, FL  
**2009 - 2011** Senior Counsellor - Center for Precollegiate Education and Training, University of Florida

## *Professional References*

**Michael Gates, Ph.D.**, [michael.gates@usda.gov](mailto:michael.gates@usda.gov)

*Research Leader*

Systematic Entomology Laboratory

Agricultural Research Service

United States Department of Agriculture

Beltsville, MD 20705, USA

**Alexander Blanke, Ph.D.**, [blanke@uni-bonn.de](mailto:blanke@uni-bonn.de)

*Postdoctoral Advisor*

AG Evolutionary Morphology

Institute for Evolutionary Biology and Zooecology

University of Bonn

Bonn 53121, DE

**Nico Franz, Ph.D.**, [nico.franz@asu.edu](mailto:nico.franz@asu.edu)

*Doctoral Advisor*

Biodiversity Knowledge Integration Center

Natural History Collections

Arizona State University

Tempe, AZ 85282, USA

**Additional references available upon request.**

