

# ALECA M. BORSUK

Assistant Curator, New York Botanical Garden

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## EDUCATION

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<b>Ph.D.</b>	2024
Yale University, School of the Environment	New Haven, CT
<b>Master of Philosophy</b>	2022
Yale University, School of the Environment	New Haven, CT
<b>Master of Environmental Science</b>	2019
Yale University, School of the Environment	New Haven, CT
<b>B.S. Mechanical Engineering, Minor in Botany</b>	2017
University of Hawaii at Manoa, College of Engineering	Honolulu, HI

## PROFESSIONAL POSITIONS

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<b>Assistant Curator</b>	2024 - Present
New York Botanical Garden, Laboratory for Integrative Biodiversity Research	Bronx, NY
<b>Adjunct Instructor</b>	Fall 2020
Southern Connecticut State University, Department of Biology	New Haven, CT

## PUBLICATIONS

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### Peer-Reviewed Journal Articles

9. **Borsuk, A.M.**, Randall, J.M., Richburg, J., Montes, K.G., Edwards, E.J. and Brodersen, C.R., 2024. Palisade cell geometry in relation to leaf optical and photosynthetic properties in *Viburnum*. *Plant Physiology*, p.kiae659.
8. Fletcher, L.R., **Borsuk, A.M.**, Fanton, A.C., Johnson, K.M., Richburg, J., Zailaa, J. and Brodersen, C.R., 2024. Anatomical and physiological consequences of beech leaf disease in *Fagus grandifolia* L. *Forest Pathology*, 54(1), p.e12842.
7. Procko, C., Lee, T., **Borsuk, A.**, Bargmann, B., Dabi, T., Nery, J., Estelle, M., Baird, L., Brodersen, C., Ecker, J., Chory, J. Leaf cell-specific and single-cell transcriptional profiling reveals a role for the palisade layer in UV light protection. *The Plant Cell*, 34 (9), pp.3261-3279
6. **Borsuk, A.M.**, Roddy, A.B., Th eroux-Rancourt, G. and Brodersen, C.R., (2022). Structural organization of the spongy mesophyll. *New Phytologist*, 234(3), pp.946-960.
5. Momayyezi, M., **Borsuk, A.**, Brodersen, C., Gilbert, M., Theroux-Rancourt, G., McElrone, A. (2022). Desiccation of the leaf mesophyll and its implications for CO<sub>2</sub> diffusion and light processing. *Plant, Cell & Environment*, 45(5), pp.1362-1381.
4. Mankiewicz, P., **Borsuk, A.**, Ciardullo, C., H enaff, E. and Dyson, A., (2022). Developing Design Criteria for Active Green Wall Bioremediation Performance: Growth Media Selection Shapes Plant Physiology, Water and Air Flow Patterns. *Energy and Buildings*, p.111913
3. **Borsuk, A.**, and Brodersen, C. (2019). The spatial distribution of chlorophyll in leaves. *Plant Physiology*, 180(3), pp.1406-1417.
2. Saive, R., **Borsuk, A.**, Emmer, H., Bukowsky, C., Lloyd, J., Yalamanchili, S. and Atwater, H. (2016). Effectively transparent front contacts for optoelectronic devices. *Advanced Optical Materials*, 4(10), pp.1470-1474.

1. Abplanalp, M.J., **Borsuk, A.M.**, Jones, B.M. and Kaiser, R.I. (2015). On the formation and isomer specific detection of propenal (C<sub>2</sub>H<sub>3</sub>CHO) and cyclopropanone (c-C<sub>3</sub>H<sub>4</sub>O) in interstellar model ices—a combined FTIR and reflectron time-of-flight mass spectroscopic study. *The Astrophysical Journal*, 814(1), p.45.

### Conference Proceedings

3. Ureña, E.B., **Borsuk, A.**, Clark, H., Fosbury, R., Godinho, M.H., Hardy, M., Holt, A., Kolle, M., Kuttner, C., Lopez-Garcia, M. and McDougal, A. (2020). The role of composition: natural materials vs. synthetic composites: general discussion. *Faraday Discussions*, 223, pp.295-306.
2. Arwin, H., Barla, P., Blake, A.J., **Borsuk, A.**, Brien, M., Burg, S., Chang, Y., Freyer, P., Hardy, M., Holt, A. and Kallepalli, A. (2020). Optics and photonics in nature: general discussion. *Faraday Discussions*, 223, pp.107-124.
1. Saive, R., Bukowsky, C.R., Yalamanchili, S., Boccard, M., Saenz, T., **Borsuk, A.M.**, Holman, Z. and Atwater, H.A. (2016). Effectively transparent contacts (ETCs) for solar cells. *In Photovoltaic Specialists Conference (PVSC), IEEE 43rd* (pp. 3612-3615). IEEE.

## PRESENTATIONS

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### Invited Talks

The Landscape of the Leaf: Botanical Form & Function at the Microscale. Oak Spring Garden Foundation. 2021

### Contributed Talks

**Borsuk, A.**, E. Edwards, and C. Brodersen. Morphological variation in leaf photosynthetic cells and functional implications for leaf-light interaction. Early Career Researcher Living Light Virtual Conference. 2021

**Borsuk, A.**, A. Roddy, G. Thérroux-Rancourt, and C. Brodersen. Structural organization of the spongy mesophyll in laminar leaves with reticulate venation. Society of Integrative and Comparative Biology Virtual Conference. 2021

**Borsuk, A.**, A. Roddy, G. Thérroux-Rancourt, and C. Brodersen. Structural organization of the spongy mesophyll in laminar leaves with reticulate venation. Botanical Society of America Virtual Conference. 2020 *\*Maynard Moseley Award*

**Borsuk, A.** and C. Brodersen. The spatial distribution of chlorophyll in leaves. Yale School of the Environment Research Conference, New Haven CT. 2019 *\*Award for Best Oral Presentation by a Master's Student*

Saive, R., **Borsuk, A.**, Emmer, H., Bukowsky, C., Lloyd, J., Yalamanchili, S. and Atwater, H. Effectively transparent front contacts for solar cells. C3E Women in Clean Energy Symposium, Cambridge MA. 2015

### Posters

**Borsuk, A.**, A. Roddy, G. Thérroux-Rancourt, and C. Brodersen. Structural organization of the spongy mesophyll. Plant Biology Initiative Symposium, Boston MA. 2022

**Borsuk, A.** and C. Brodersen. The spatial distribution of chlorophyll in leaves. Gordon Research Conference: CO<sub>2</sub> Assimilation in Plants from Genome to Biome, Newry ME. 2019

**Borsuk, A.** and C. Brodersen. The spatial distribution of chlorophyll in leaves. Botanical Society of America, Rochester MN. 2018 *\*Physiological Section Student Poster Award*

**Borsuk, A.** and K. Kobayashi. Effects of LED lighting spatial configuration on spaceflight analog *Amaranthus tricolor*. American Society for Horticultural Science Annual Conference, Atlanta GA. 2016

**Borsuk, A.** and O. Semonin. Nickel oxide hole transport layer for methylammonium lead triiodide perovskite solar cells. Emory University STEM Research and Career Symposium, Atlanta GA. 2015

**Borsuk, A.** and O. Semonin. Nickel oxide hole transport layer for methylammonium lead triiodide perovskite solar cells. National Collegiate Research Conference, Cambridge, MA. 2015

**Borsuk, A.,** A. Turner, R. Kaiser. Experimental investigation of the formation routes of carbonyl-bearing molecules in the interstellar medium. KAUST International Undergraduate Poster Competition, Thuwal, Saudi Arabia. 2014

## PATENTS

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U.S. Provisional Patent  
Effectively Transparent Solar Cell Front Contacts.  
CIT File No. CIT-7176-P2; Filed 9/25/15

## FUNDING & AWARDS

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### Funded Grants

Yale Institute for Biospheric Studies Doctoral Pilot Grant, 2020  
Yale Institute for Biospheric Studies Small Grant, 2018  
Carpenter-Sperry Research Fund, 2018

### Awards

Maynard Moseley Award, *Botanical Society of America*, 2020  
Best Oral Presentation by a Master's Student, *YSE Research Conference*, 2019  
Physiological Section Student Poster Award, *Botanical Society of America*, 2018

### Fellowships & Scholarships

Plant Science Research Fellow, *Oak Spring Garden Foundation*, 2021  
Lewis B. Cullman Fellow, *The New York Botanical Garden*, 2019  
Merit Research Scholarship, *Yale School of the Environment*, 2017  
NSF Graduate Research Fellow, *National Science Foundation*, 2017  
Undergraduate Research Fellow, *NASA Hawaii Space Grant Consortium*, 2017  
Summer Undergraduate Research Fellow, *California Institute of Technology*, 2015  
Research Experience for Undergraduates, *Columbia University EFRC*, 2015  
Presidential Scholar, *University of Hawaii*, 2013

## TEACHING

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### Instructor

General Botany Lab, Southern Connecticut State University Fall 2020

### Teaching Assistant

Plant Ecophysiology, Yale University Fall 2020  
Trees: Environmental Biology and Global Significance (Lead), Yale University Spring 2019  
Trees: Environmental Biology and Global Significance, Yale University Spring 2018, 2021  
Algal Diversity and Evolution (Teaching Intern), University of Hawaii Spring 2017

### Guest Lecturer

Perspectives on becoming a doctoral student; ENV 550a, Yale University Spring 2019  
Plant structure from the inside out with X-ray imaging; PHYS 991, Yale University Spring 2019

## SERVICE

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### **Institutional Service**

Co-Treasurer & Information Officer; YSE Doctoral Student Government 2021-2022

### **Service to the Profession**

Interim Secretary; Division of Botany, Society of Integrative and Comparative Biology 2024-current

Co-Treasurer & Information Officer; YSE Doctoral Student Government 2021-2022

### *Ad-hoc reviewer*

The Botanical Review

### **Advising & Mentorship**

Kyra Montes, Yale College Undergraduate 2020-2022

Jenn Richburg, Yale College Undergraduate 2022

Mentor to Undergraduate, Women in Science at Yale 2020-2021

Mentor to Master's Student, Women in Science at Yale 2020-2021

### **Public Outreach**

Presenter, Yale Pathways to Science Flipped Science Fair, New Haven, CT 2020

Volunteer Judge, New Haven Science Fair, New Haven, CT 2018

Volunteer Chair, Expanding Your Horizons Hawaii, Honolulu, HI 2014-2017