ALECA M. BORSUK

Assistant Curator, New York Botanical Garden
2900 Southern Blvd, Bronx, NY 10458
aborsuk@nybg.org ⋄ alecaborsuk.com ⋄ ORCID iD: 0000-0002-1696-9647

EDUCATION

Ph.D. 2024
Yale University, School of the Environment New Haven, CT

Master of Philosophy 2022
Yale University, School of the Environment New Haven, CT

Master of Environmental Science 2019
Yale University, School of the Environment New Haven, CT

B.S. Mechanical Engineering, Minor in Botany 2017
University of Hawaii at Manoa, College of Engineering Honolulu, HI

PROFESSIONAL POSITIONS

Assistant Curator 2024 - Present
New York Botanical Garden, Laboratory for Integrative Biodiversity Research Bronx, NY

Adjunct Instructor Fall 2020
Southern Connecticut State University, Department of Biology New Haven, CT

PUBLICATIONS

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., Théroux-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_2 diffusion and light processing. *Plant, Cell & Environment*, 45(5), pp.1362-1381.

4. Mankiewicz, P., **Borsuk, A.**, Ciardullo, C., Hénaff, 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_2H_3CHO) and cyclopropanone (c-C_3H_4O) 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

Invited Talks

The Landscape of the Leaf: Cellular Architectures for Enhanced Carbon Assimilation. CUNY Undergraduate Research Seminar. 2025

Illuminating Photosynthesis: The Optical Properties of Lobed Palisade Cells. New York University Plant Labs Seminar. 2025

The Landscape of the Leaf: Cellular Architectures for Enhanced Carbon Assimilation. Columbia University E3B Seminar. 2025

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. Théroux-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. Théroux-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. Théroux-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_2 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

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

FUNDING & AWARDS

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

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 & PROFESSIONAL ACTIVITIES

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

Editorial Postitions
Associate Editor, The Botanical Review — 2025-current

Advising & Mentorship
Elis Moore, NYBG Science Intern (Barnard College) — 2025
Julie Bichler, NYBG Science Intern (Barnard College) — 2025
Reem Salha, NYBG Science Intern (Frank Sinatra High School for the Arts) — 2025
Grace Angert, NYBG Science Intern (Fordham University) — 2025
K.G. 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