Shan A. Kothari (he/him)

Contact Information

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Research Interests

Plant physiological ecology, remote sensing, community assembly

Professional Appointments

Université de Montréal, Montréal, QC 2021—present
Postdoctoral researcher, Institut de recherche en biologie végétale
Supervisor: Etienne Laliberté

Education

University of Minnesota—Twin Cities, Falcon Heights, MN 2014—2020
Ph.D., Plant Biology
Blinded by the Light: The Functional Ecology of Plant-Light Interactions
Committee: Jeannine Cavender-Bares (advisor), Daniel Stanton, Rebecca Montgomery, Yaniv Brandvain, Phil Townsend (UW-Madison)

Michigan State University, East Lansing, MI 2010—2014
B.S., Zoology, Spec. in Ecology, Evolution, and Organismal Biology
B.S., Anthropology
Minor, Mathematics
3.97/4.0 overall GPA, Honors College

Teaching Experience

Teaching Assistant Spring 2019
PMB 3005W: Plant Function Lab
University of Minnesota
David Marks

Volunteer Teaching Assistant Spring 2016
EEB 4068/5068: Plant Physiological Ecology
University of Minnesota
Jeannine Cavender-Bares

Publications

S. A. Kothari, R. Beauchamp-Rioux, E. Laliberté and J. Cavender-Bares. Reflectance spectroscopy allows rapid, accurate, and non-destructive estimates of functional traits from pressed leaves. *biorXiv* DOI: https://doi.org/10.1101/2021.04.21.440856 (invited, in review at *Methods in Ecology and Evolution*)

A. K. Schweiger, J. Cavender-Bares, **S. A. Kothari**, P. A. Townsend, M. D. Madritch, J. J. Grossman, H. Gholizadeh, R. Wang and J. A. Gamon. Coupling spectral and resource-use complementarity in experimental grassland and forest communities. *Proceedings of the Royal Society B* 288 (2021): 20211290.

P. L. Zarnetske*, J. Gurevitch*, J. Franklin, P. Groffman, C. Harrison, J. Hellmann, F. M. Hoffman, **S. A. Kothari**, A. Robock, S. Tilmes, D. Visioni, J. Wu, L. Xia and

C.-E. Yang. Potential ecological impacts of climate intervention by reflecting sunlight to cool Earth. *PNAS* 118 (2021): e1921854118. (*equal contributors)

S. A. Kothari, R. A. Montgomery and J. Cavender-Bares. Physiological responses to light explain facilitation and competition in a tree diversity experiment. *Journal of Ecology* 109 (2021): 2000-2018.

R. D. Briscoe Runquist*, A. Gorton*, J. B. Yoder*, N. J. Deacon, J. J. Grossman, **S. A. Kothari**, M. Lyons, S. Sheth, P. Tiffin and D. A. Moeller. Context dependence of local adaptation to abiotic and biotic environments: a quantitative and qualitative synthesis. *The American Naturalist* 195 (2020): 412-431. (*equal contributors)

C. Halpern, J. Antos, **S. A. Kothari**, and A. Olson. Past tree influence and prescribed fire exert strong controls on reassembly of mountain grasslands after tree removal. *Ecological Applications* 29 (2019): e01860.

J. Cavender-Bares, **S. A. Kothari** and W. Pearse. Evolutionary Ecology of Communities. *Oxford Bibliographies in Evolutionary Biology* (2018).

J. Cavender-Bares, **S. A. Kothari**, J. E. Meireles, A. Hipp, M. Kaproth and P. Manos. The role of diversification in the continental scale community assembly of the American oaks (*Quercus*). *American Journal of Botany* 105 (2018): 565-586.

R. Wang, J. A. Gamon, A. K. Schweiger, J. Cavender-Bares, P. A. Townsend, A. I. Zygielbaum and **S. A. Kothari**. Influence of species richness, evenness, and composition on spectral diversity: a simulation study. *Remote Sensing of Environment* 211 (2018): 218–228.

S. A. Kothari, J. Cavender-Bares, K. Bitan, A. Verhoeven, R. Wang, R. Montgomery and J. A. Gamon. Community-wide consequences of variation in photoprotective physiology among prairie plants. *Photosynthetica* 56 (2018): 455–467.

S. A. Kothari Characterization of a Family of Cubic Dynamical Systems. *Ball State Undergraduate Mathematics Exchange* (2011), 8(1): 25–36, 201.

Manuscripts in Preparation

A. K. Schweiger* and **S. A. Kothari***. Plant spectra as integrative measures of phenotypes. (invited submission to *Journal of Ecology*; *equal co-authors)

R. L. Bryant, C. R. See, **S. A. Kothari**, S. J. Curran, J. J. Grossman, C. Nash and G. C. Neumiller. Drivers of above and belowground carbon sequestration after six years of afforestation in a tree biodiversity experiment.

S. A. Kothari, R. Beauchamp-Rioux, F. Blanchard, A. Crofts, A. Girard, X. Guilbeault-Mayers, P. Hacker, M. J. Pardo Losada, S. Demers-Thibeault, A. Bruneau, N. Coops, M. Kalacska, M. Vellend and E. Laliberté. Predicting

leaf traits across functional groups using reflectance spectroscopy. (full manuscript available upon request)

S. A. Kothari, S. E. Hobbie and J. Cavender-Bares. Rapid estimates of leaf litter chemistry using reflectance spectroscopy. (full manuscript available upon request)

Major Presentations

S. A. Kothari, A. K. Schweiger and E. Laliberté. *A spectrum of spectra? Describing the major dimensions of plant hyperspectral variation* . Ecological Society of America. Inspire talk. August 2022. (invited, forthcoming)

S. A. Kothari and E. Laliberté. *Predicting leaf traits across functional groups using reflectance spectroscopy*. Quebec Centre for Biodiversity Science 2021. Long poster. December 2021.

S. A. Kothari, R. Beauchamp-Rioux, E. Laliberté and J. Cavender-Bares. *Reflectance spectroscopy allows rapid, accurate, and non-destructive estimates of functional traits from pressed leaves*. Botanical Society of America 2021. Talk. July 2021.

S. A. Kothari, R. Beauchamp-Rioux, E. Laliberté and J. Cavender-Bares. *Reflectance spectroscopy allows rapid, accurate, and non-destructive estimates of functional traits from pressed leaves*. ASCEND BII seminar. Talk. April 2021.

S. A. Kothari, S. E. Hobbie and J. Cavender-Bares. *Rapid estimates of leaf litter chemistry and decomposition using reflectance spectroscopy*. Ecological Society of America 2020. Talk. August 2020.

S. A. Kothari. *Plant Physiological Responses to Solar Geoengineering: Knowns and (Mostly) Unknowns*. UMN Ecosystem Consequences of Solar Geoengineering Symposium. Talk. November 2019.

S. A. Kothari, R. Montgomery and J. Cavender-Bares. *Throwing shade: Light-mediated facilitation and competition in a tree diversity experiment*. Ecological Society of America 2019. Talk. August 2019.

S. A. Kothari, R. Montgomery, S. E. Hobbie, P. Reich and J. Cavender-Bares. *The physiological underpinnings of facilitation in a tree diversity experiment*. Long-Term Ecological Research All-Scientists Meeting 2018. Poster. October 2018.

S. A. Kothari, R. Montgomery, S. E. Hobbie, P. Reich and J. Cavender-Bares. *The physiological underpinnings of facilitation in a tree diversity experiment*. Ecological Society of America 2018. Invited talk. August 2018.

S. A. Kothari, J. Cavender-Bares, K. Bitan, A. Verhoeven, R. Wang, R. Montgomery and J. Gamon. *Community-wide consequences of variation in photoprotective physiology among prairie plants*. Botanical Society of America 2018. Talk. July

2018.

S. A. Kothari (substitute for J. Cavender-Bares) *Linking remotely sensed spectral diversity to genetic, phylogenetic and functional diversity to predict ecosystem processes.* Ecological Society of America 2017. Ignite talk. August 2017.

S. A. Kothari, J. Cavender-Bares, A. K. Schweiger, P. A. Townsend, S. E. Hobbie and R. Montgomery. *Nitrogen uptake and crown-level allocation across an experimental tree diversity gradient.* Ecological Society of America 2017. Talk. August 2017.

S. A. Kothari, J. Cavender-Bares, A. Verhoeven, K. Bitan, R. Wang, R. Montgomery and J. Gamon. *Seasonal variation in xanthophyll cycle pigments among species with contrasting water use strategies.* Ecological Society of America 2016. Talk. August 2016.

S. A. Kothari, J. Cavender-Bares, A. Verhoeven, K. Bitan, R. Montgomery and J. Gamon. *Seasonal variation in xanthophyll cycle pigments among species with contrasting water use strategies.* Long-Term Ecological Research All-Scientists Meeting. Poster. August 2015.

Educational Presentations

S. A. Kothari. *Competition and Facilitation.* University of Minnesota–Duluth, Dr. Jessica Savage's Plant Physiology Class. Guest Lecture. February 2022.

S. A. Kothari. *Biodiversity and Ecosystem Function.* University of Minnesota, Dr. Jesus Pinto-Ledezma's Biodiversity Science Class. Guest Lecture. March 2020.

S. A. Kothari. *Spectral Properties of Leaves and Plants.* University of Minnesota, Dr. Jen Teshera-Levye's Plant Physiological Ecology Class. Guest Lecture. February 2020.

S. A. Kothari. *How Much Light Does a Plant Need?* Macalester College, Dr. Mary Heskel's Plant Ecophysiology Class. Guest Lecture. November 2019.

S. A. Kothari. *The Other Darwin.* University of Minnesota Darwin Day. Invited lecture. February 2018.

S. A. Kothari, C. Pearson, K. Mayfield, A. Zuchora and S. Smith. *Your Brain on Jane Austen.* Michigan State University Science Festival. Demonstration / Seminar. April 2014.

Symposia and Workshops Organized

Ecosystem Consequences of Solar Geoengineering, with Sumil Thakrar. University of Minnesota, 2019. Day-long symposium.

Interactions Between Leaf-Level and Canopy Physiology, with Z. Carter Berry. Ecological Society of America 2018. Organized Oral Session.

Spectral Detection of Plant Stress in a Changing Global Environment, with Jeannine Cavender-Bares. Ecological Society of America 2018. Symposium.

Workshops Attended

- RCN: Cross-Scale Processes Impacting Biodiversity. University of Florida, Gainesville, Florida. June 2019.
- RCN: Cross-Scale Processes Impacting Biodiversity. Cedar Creek Ecosystem Science Reserve, University of Minnesota, East Bethel, Minnesota. June 2018.
- PHYS-Fest. Konza Prairie, Kansas State University, Manhattan, Kansas. June 2016.
- Synthesizing Trait Evolution in Plants (sTEP). German Centre for Integrative Biodiversity Research (iDiv), Leipzig, Germany. May 2015.
- Open Tree of Life Hackathon. University of Michigan, Ann Arbor, Michigan. September 2014.

Awards and Funding

- UMN Hamm Award for Outstanding Plant Science Graduate Student 2020
- Fulbright/Swiss Government Excellence Scholarship (declined) 2019
- UMN Doctoral Dissertation Fellowship ($25,000) 2019
- UMN Plant Biological Sciences Travel Grants ($3760) 2015-9
- UMN International Thesis Research Travel Grant ($3300) 2019
- Alexander & Lydia Anderson Grant ($3000) 2019
- Travel Mini-Grant, NSF Cross-Scale Biodiversity RCN ($2000) 2019
- Cedar Creek Graduate Research Fellowships ($6000) 2016-8
- Carolyn Crosby Research Grant ($3000) 2016
- AAAS/Science Program for Excellence in Science 2016
- G. H. Lauff Tuition Scholarship, Kellogg Biological Station ($500) 2014
- National Science Foundation Graduate Research Fellowship ($138,000) 2014
- UMN College of Biological Sciences Excellence Fellowship ($45,000) 2014
- College of Arts and Letters Undergraduate Research Grant ($750) 2013
- Goldwater Scholarship Honorable Mention 2012
- MSU Professorial Assistantship ($4,000) 2010
- MSU Alumni Distinguished Scholarship (full ride) 2010

Mentoring

Britney Millman, Cedar Creek Intern 2018
Project title: Dimming the light: the effects of CO2 on photosynthetic light-use efficiency

Andrew Landsem, Cedar Creek Intern 2018
Project title: Raspberry abundance and soil salinity levels along road edges

Daav Sannerud and Ingrid Holstrom, Cedar Creek Interns 2018
Project title: Interaction between tree productivity and mycorrhizal communities in relation to varying levels of tree diversity

Jacob Becker and Valerie Gehn, Cedar Creek Interns 2017
Project title: Quantifying nitrogen's impact on C3 and C4 grass on the aniso- / isohydric continuum (co-mentored with Kaitlin Kimmel)

Emily Geary, Cedar Creek Intern 2016
Project title: Mapping migration corridors and land use of Northern Saw-whet owls in Minnesota

Ella Johnson, Cedar Creek Intern 2016-2017
Project title: Changes in the mean and variation of percentage light transmission in relation to relative abundance of needle-leaf and broad-leaf trees in forest ecosystems (co-mentored with Jake Grossman)

Service

- Advisory Board, *New Phytologist* (2021-2024)
- Representative, UMN College of Biological Sciences Graduate Student Board
- Representative, UMN Council of Graduate Students
- Representative, UMN College of Biological Sciences Diversity & Initiatives Committee
- Officer, Phytograds (UMN Plant Biology student association)
- Student Liaison, Physiological Ecology Section, Ecological Society of America
- Organizer, Jackson Middle School Eco-Extravaganza
- Reviewer for *Global Ecology and Biogeography* (5), *Biotropica* (2), *Oikos* (2), *Ecology and Evolution* (2), *New Phytologist* (1), *Ecology* (1), *Ecography* (1), *American Naturalist* (1), *Functional Ecology* (1), *AoB PLANTS* (1), *Northwest Science* (1)
- Market Science (2015-20) – led sessions on Plant Chemistry, Remote Sensing, the Biology of Sunscreen, and Counting Nature
- Judge at Minnesota State Science Fair (2015, 2017), Winchell Undergraduate Research Symposium (2015)
- Michigan Science Olympiad volunteer (2011, 2012, 2014)