

# Julia Van Etten

Rutgers, the State University of New Jersey  
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## EDUCATION

**Rutgers University, Graduate Program in Ecology and Evolution**—New Brunswick, NJ  
Ph.D. in Ecology and Evolution: 2018—2024 | GPA: 4.00  
Advisor: Prof. Debashish Bhattacharya

**University of Florida, Graduate Program in Microbiology and Cell Science**—Gainesville, FL  
Microbiology and Cell Science online M.S. program: 2017-2018 (degree unfinished) | GPA: 4.00

**University of Miami, Rosenstiel School of Marine and Atmospheric Science**—Coral Gables, FL  
B.S. in Marine and Atmospheric Science: 2012-2016 | GPA: 3.63 | Major GPA: 3.83  
Majors: Biology, Marine Science | Minors: Chemistry, Mathematics

## GRANTS + AWARDS (\$272,438 total)

- 2024** **New Phytologist Next Generations Scientists delegate** – \$100
- 2023** **Publisher’s Award for Excellence in Systematic Research** – \$500  
Oxford University Press and Society of Systematic Biologists
- 2023** **International Society of Endocytobiology travel grant** - \$1,000
- 2022** **Hilda Canter-Lund Award** – British Phycological Society microscopy competition - €250
- 2022** **Rutgers University and Louis Bevier Dissertation Completion Fellowship** - \$25,000  
Rutgers’ most distinguished dissertation award, only 15 given university-wide annually
- 2021** **People’s Choice Award** – *Microscopy Today* Micrograph Awards (Video) - \$500
- 2020** **Finalist & 3<sup>rd</sup> prize** – *Microscopy Today* Micrograph Awards (Video) - \$100
- 2020** **School of Graduate Studies Conference Travel Award** - \$1,000
- 2019** **Campus as Classroom Undergraduate Seed Fund** - \$1,188  
Grant money to utilize campus outdoor space for teaching (Protist/Microscopy lab)
- 2019** **Future Investigators in NASA Earth and Space Science and Technology** - \$135,000
- 2019** **Rutgers University Ecology & Evolution Small Grants Award** - \$1,000
- 2019** **Finalist** - *Microscopy Today* Micrograph Awards (Video)
- 2012** **University Scholarship** - \$96,000 (undergrad), **Miami Grant** - \$10,800 (undergrad)

## PUBLICATIONS (peer-reviewed)

1. **Van Etten J**, Stephens TG, Chille E, Lipzen A, Peterson D, Barry K, Grigoriev IV, Bhattacharya D. “Diverse fates of ancient horizontal gene transfers in extremophilic red algae”. (*under review*)
2. Benites LF, Stephens TG, **Van Etten J**, McDermott TR, Bhattacharya D. “Viruses associated with extreme red algal mats reveal signatures of ancient thermal adaptations”. *Communications Biology*, 2024 (*accepted*) - [biorxiv.org/content/10.1101/2023.11.15.567249v1](https://doi.org/10.1101/2023.11.15.567249v1).
3. **Van Etten J**, Stephens TG, Bhattacharya D. “A *k*-mer-based approach for phylogenetic classification of taxa in environmental genomic data.” *Systematic Biology*, 2023. DOI: [10.1093/sysbio/syad037](https://doi.org/10.1093/sysbio/syad037)
4. **Van Etten J**, Benites LF, Stephens TG, Yoon HS, Bhattacharya D. “*Algae obscura*: the potential for rare species as model systems”. *Journal of Phycology*, 2023. DOI: [10.1111/JPY.13321](https://doi.org/10.1111/JPY.13321)
5. Bhattacharya D, **Van Etten J**, Benites LF, Stephens TG. “Endosymbiotic ratchet accelerates divergence after organelle origin: The *Paulinella* model for plastid evolution”. *BioEssays*, 2022. DOI: [10.1002/bies.202200165](https://doi.org/10.1002/bies.202200165)

6. **Van Etten J**, Yoon HS, Cho CH, Bhattacharya D. “Extremophilic red algae as models for understanding adaptation to hostile environments and evolution of eukaryotic life on the early Earth”. *Seminars in Cell and Developmental Biology*, 2022. DOI: [10.1016/j.semcdb.2022.03.007](https://doi.org/10.1016/j.semcdb.2022.03.007)
7. **Van Etten J**, Keddis R, Lisa J, Rauschenbach I. “The Diverse World of Protists – An Ideal Community with which to Introduce Microscopy in the Microbiology Teaching Laboratory”. *Journal of Microbiology and Biology Education*, 2022. DOI: [10.1128/jmbe.00142-2](https://doi.org/10.1128/jmbe.00142-2)
8. **Van Etten J** & Bhattacharya D. “Horizontal Gene Transfer in Eukaryotes: Not If, But How Much?”. *Trends in Genetics*, 2020. (Featured article) DOI: [10.016/j.tig.2020.08.006](https://doi.org/10.016/j.tig.2020.08.006)
9. **Van Etten J**, Shumaker A, Mass T, Putnam H, Bhattacharya D. “Transcriptome analysis provides a blueprint of coral egg and sperm functions”. *PeerJ*, 2020. DOI: [10.7717/peerj.0739](https://doi.org/10.7717/peerj.0739)

### MANUSCRIPTS IN PREPARATION

1. **Van Etten J**, Stephens TG, Benites LF, Bhattacharya D. “Genetic transfer in action: Evidence of DNA transfer through an extremophilic microbial community”. (*in prep*)
2. **Van Etten J**, Yoon HS, Benites LF, Stephens TG, Bhattacharya D. “Description of a novel epiphytic photosynthetic *Paulinella* species found at a roadside North Carolina marsh.” (*in prep*)
3. Stephens TG, **Van Etten J**, Benites LF, McDermott TR, JGI Authors, ..., Bhattacharya D. “Community Dynamics at the Extremes”. (*in prep*)
4. Nandi S, Stephens TG, **Van Etten J**, Bhattacharya D. “Metagenomic analysis of heterotrophic *Paulinella* provides insights into the evolution of phototrophy.” (*in prep*)

### PUBLICATIONS (popular media)

1. “[Brave New Worlds in a Drop of Water](#)”. *Global Water Forum*, 2024.
2. “[Meet the Algae and Other Microbes in Your Neighborhood](#)”. *Atlas Obscura*, 2023.
3. “[Red Algal Extremophiles: Novel Genes and Paradigms](#)”. *Microscopy Today*, 2020.  
(I also contributed the [cover art](#) for the issue)

### TEACHING

1. **Instructor**— Fundamentals of Evolution Lab – 1-credit course (11:216:252)—Spring 2024
2. **Guest lectures**— “Horizontal gene transfer” and “K-mers in genomics” in the course Fundamentals of Microbial genomics – 3-credit course (11:215:604)—Spring 2024
3. **Grader**— Ecology, Evolution, and Natural resources – 1-credit course (11:216:104)—Fall 2023
4. **Grader**— Evolution of Sex and Gender in animals – 3-credit course (11:216:115)—Spring 2023, 2024
5. **TA Project - Designing your own course** – completed a semester-long pedagogical workshop and created a syllabus and teaching materials for the undergraduate/graduate course “Survey of Protists: Misfits or Misunderstood?”—Fall 2021
6. **Guest Lecture**— “Protists and Why They Matter”- Applied Microbiology Lab—Fall 2019
7. **Guest Lecture**— “Introduction to Microscopy with Protists”- General Microbio. Lab—Summer 2019
8. **Curriculum developer**— Intro, General, and Applied Microbiology Labs—Spring 2019  
Proposed, developed, and implemented protist/microscopy module across four microbiology courses
9. **Teaching Assistant**— General Microbiology Lab (11:680:390)—Fall 2018
10. **Evolution: A Course for Educators**—Certificate TD34U6CRJSSA (Coursera) – 2017
11. **Genetics and Society: A Course for Educators**—Certificate CLB8PVP3VZBG (Coursera) – 2017
12. **5+ years of private tutoring experience**—Middle school, high school, and college Math, Biology, and SAT prep – 2016-2021

### RESEARCH + FIELD EXPERIENCE

**Graduate Research at Rutgers University** - New Brunswick, NJ (August 2018—present)

Lab of Prof. Debashish Bhattacharya

- Worked on coral egg and sperm transcriptomics
- Maintained over 50 different algal cultures and conducted experiments to optimize growth conditions

- Planned, organized, and executed molecular work including DNA and RNA extractions and clean ups, Nanodrop, Qubit, and Bioanalyzer quantification methods, running gels, PCR, etc.
- Helped develop bioinformatic methods to analyze algal genomes, especially those utilizing *k*-mers
- Acted as the liaison between the lab and the JGI, helping organize a large CSP project with 7 co-PIs
- **Mentored** undergraduate and post-baccalaureate researchers: Catherine McTighe, Daniel Liu, Ashim Bhattacharya, Sruthi Yuvaraj, Ali Sadeghiadi, Timeeka James, and rotation student Sayoni Chatterjee

### **Fieldwork in plankton of North Carolina** – Outer Banks, NC (June 2022)

Bhattacharya Lab trip that I organized

- In May 2021 on a family vacation to the Outer Banks, I discovered two cells of putative photosynthetic *Paulinella* with my personal microscope; this is an amoeba of great importance to our lab
- I organized two trips back in 2022 to isolate, sequence, and culture this amoeba (*in progress*)
- Co-produced a documentary on how to find and isolate microbes from nature (*in progress*)

### **University of Miami Biology Department** - Coral Gables, FL (January 2014–June 2016)

Lab of Prof. Athula Wikramanayake

- Worked to characterize expression of the Dishevelled (Dsh) protein in the purple sea urchin (*S. purpuratus*) by identifying interacting proteins involved in the Wnt signaling/ $\beta$ -catenin pathway
- Functional studies of Axin, a protein implicated in embryonic axis establishment and negative regulation of  $\beta$ -catenin activity in the urchin
- **Mentored** high school student Orko Sarkar

### **Fieldwork in political ecology of coastal cultures** - Bonaire, Netherlands Antilles (March 2014)

Supervised by Prof. Sarah Meltzoff

- Designed an independent project focusing on island politics and the worsening tensions between different cultural populations on the island of Bonaire: native island population, Euro-Dutch immigrants, and native peoples who received government-subsidized education in the Netherlands and returned
- Conducted over 20 face-to-face interviews; culminated in analysis addressing tensions between communities

### **University of Miami/NIH Experimental Hatchery** - Virginia Key, FL (January 2013–December 2014)

Advised by Hatchery Manager Tom Capo

- Maintained various macroalgae cultures by managing large conical tanks and seawater pumps
- Conducted experiments involving *Agardhiella subulata* and its growth rate in media with various combinations of common oceanic trace metals (Fe, Cu, Co, Mo, Mg, Mn)

### POSTERS + TALKS

1. **Invited panel member** – [“Symbiosis in a Changing World: Lessons from Dying Corals”](#). The Field Museum, public event, September 2023
2. **Van Etten J.** “Diverse fates of ancient horizontal gene transfers in extremophilic red algae”. International Society of Endocytobiology, September 2023
3. **Van Etten J.** “Modeling DNA flow through an extremophilic microbial community”. Life and Space 2022 Conference-Polish Astrobiology Society, December 2022 (invited talk)
4. **Van Etten J.** “*k*-mer-based approaches for phylogenetic classification of taxa in environmental genomic data”. Rutgers Department of Ecology, Evolution, and Natural Resources, December 2022
5. **Van Etten J.** “Genetic transfer in action: The search for prokaryote HGT donors in the Cyanidiophyceae of Yellowstone”. Phycological Society of America-Joint Aquatic Sciences Meeting, May 2022 (invited talk)
6. **Van Etten J.** “Extreme solutions to extreme problems: adaptations of a eukaryotic phototroph genome to early Earth conditions”. American Geophysical Union-Astrobiology Science Conference, May 2022
7. **Van Etten J.** “Social Media as a Tool for Communicating Your Science”. American Fisheries Society-Rutgers and New Jersey chapter, invited talk/workshop, March 2022 (invited talk)
8. **Van Etten J.** “Horizontal Gene Transfer in Eukaryotes: Cyanidiophycean red algae as extremophilic models of an overlooked driver of evolution”. 12<sup>th</sup> International Phycological Congress, March 2021
9. **Van Etten J.** “Horizontal Gene Transfer in Eukaryotes: Not controversial anymore and adaptively important”. Rutgers Department of Ecology, Evolution, and Natural Resources, December 2020
10. **Van Etten J.** “Communicating Science on Social Media”. Rutgers Department of Ecology, Evolution, and Natural Resources, November 2019
11. **Van Etten J.** “Pondlife of New Jersey”. Rutgers Department of Biochemistry and Microbiology,

Rutgers Day Student Research Symposium, April 2019

12. Wu W, Wang L, Van Etten J, Sarkar O, Wikramanayake A. "Identification and functional characterization of Dishevelled-interacting proteins in the micromeres of sea urchin embryos." Society of Integrative and Comparative Biology Meeting, January 2015

## VOLUNTEERING

1. Graduate student panelist for Rutgers E&E department recruitment event (2021, 2022, 2023)
2. Ecology and Evolution first year peer mentor (2021-2022, 2022-2023)
3. Ecology and Evolution first year peer mentor program coordinator (2020-2022)
4. Marine Science Peer Counselor: UM Marine Science Department (2014, 2015)
5. Event Chair: Ocean Awareness Week (2014, 2015)
6. School Liaison: Ocean Kids Event-F.I.N.SEA Foundation, 501(c)(3) (2013-2014)

## SERVICE TO THE DEPARTMENT + PROFESSION

### **Have served as a referee for:**

1. Plants, People, Planet
2. BioEssays
3. BMC Genomics
4. Molecular Ecology Resources

### **Rutgers University Ecology and Evolution Graduate Student Association (EcoGSA)**

1. *Communications Chair: 2018-2019, 2019-2020*
2. *Post-quals representative: 2020-2021, 2021-2022*

### **Service to the Ecology and Evolution department—Rutgers University**

1. *Organizer of the 2023 Eminent Ecologist seminar, an annual special seminar with 3 days of events within and outside the department; Speaker: Dr. Lynn Rothschild (NASA Ames)*
2. *Co-chair of the DEI committee: 2022-present*
3. *Member of Departmental Code of Conduct Committee: 2021-present*
4. *Chair of Departmental Flow Chart Committee: 2021-present*
5. *Member of Diversity, Equity, and Inclusion (DEI) committee: 2020-present*

## PROFESSIONAL MEMBERSHIP

1. International Society of Endocytobiology –2023-present
2. Society of Systematic Biologists —2023-present
3. American Society of Naturalists —2022-present
4. International Phycological Society—2020-present
5. Phycological Society of America—2020-present
6. American Society for Microbiology—2018-present
7. New England Society for Microscopy—2017-present

## CERTIFICATIONS

- **SCUBA certified** (Open Water, Advanced Open Water, and Nitrox)

## OUTREACH

**Tiny Living Beings Podcast host – [Found on all podcast-hosting apps](#)**

**In Defense of Plants Podcast guest – [Ep. 329 A Closer Look at Algae](#)**

**Instagram: [@couch\\_microscopy](#) | Over 30,000 followers from >60 countries**

-Featured in the press: NBC News, PBS/NJTV, Rutgers Today, various Patch and TAPinto features, The Daily Targum, Microscopy & Analysis, AlgiKnit, Australian Academy of Science

-Couch Microscopy photos and video have been licensed for projects for Facebook HQ, the World Health Organization, used in music videos, and for other film projects

**Co-directed and produced the short film "[All We Are](#)" with filmmaker Marleine van der Werf**

Film screened at the Imagine Science Film Festival (NYC) and internationally at the 55<sup>th</sup> Academia Film Olomouc (Czech Republic), Zeitimpuls film festival (Austria), and InScience festival (Netherlands)

### **Developed and led “Communicating Science on Social Media” workshop**

Gave a one-hour talk followed by a fun interactive workshop to the Rutgers and Northeast American Fisheries Society student chapters

### TECHNICAL SKILLS

- ☞ Primer design, PCR, gel extraction and imaging, running an RNA gel
- ☞ Immunocytochemical antibody staining, western blot and imaging
- ☞ Probe design/synthesis and in situ hybridization
- ☞ Microscopy: Fluorescent, Brightfield, Darkfield, Phase Contrast
- ☞ Micro and macroalgae culture, amoeba culture, sea urchin and ctenophore culture/spawning
- ☞ RNA-sequencing experimental design, sampling, and analysis
- ☞ Metabolite experimental design and sample preparation
- ☞ Bioinformatics skills in Linux/Command Line, RStudio, and many other programs
- ☞ Experience with most phylogenetics programs
- ☞ *k*-mer-based alignment-free phylogenomics
- ☞ Mining horizontal gene transfers, especially in eukaryotes

### RELEVANT COURSEWORK

- Cellular and Molecular Biology
- Genetics
- Comparative Physiology
- Marine Biomedicine
- Marine Comparative Immunology
- Comparative Ecology
- Mathematical Biology
- Chemical Oceanography
- Physical Oceanography
- Fundamentals of Bioinformatics
- Advanced Bacterial Genetics
- Archaea and Biotechnology
- Comparative Microbial Genomics
- The Microbiome
- Eco and Evol of Climate Change
- Fundamentals of Genomics
- History of the Earth System
- Evo Journal Club (7 semesters)
- Botany Salon (6 semesters)

### REFERENCES

Prof. Debashish Bhattacharya  
PhD advisor  
Distinguished Professor, Rutgers University  
[dbhattac@rutgers.edu](mailto:dbhattac@rutgers.edu)

Prof. Lena Struwe  
Dissertation committee member  
Professor, Rutgers University  
[lana.struwe@rutgers.edu](mailto:lana.struwe@rutgers.edu)

Dr. Siobain Duffy  
Dissertation committee member  
Associate Professor and Chair, Rutgers University  
[duffy@sebs.rutgers.edu](mailto:duffy@sebs.rutgers.edu)

Dr. Lynn Rothschild  
Dissertation committee member  
Senior Research Scientist, NASA Ames Research Center  
[lynn.j.rothschild@nasa.gov](mailto:lynn.j.rothschild@nasa.gov)