Workshop on Molecular Evolution

Marine Biological Laboratory, Woods Hole, Massachusetts

26 May - 5 June, 2023

Daily Plan

Breakfast — Cafeteria 7-9

Optional: C++ with John 8-9

Lecture 9-12 with a coffee break

Lunch 12-14

Lecture/Tutorial 14-17

Dinner 17-19 (or coming swimming with me 17-18)

Tutorial 19-22

Social gathering 22-24

Daily Plan

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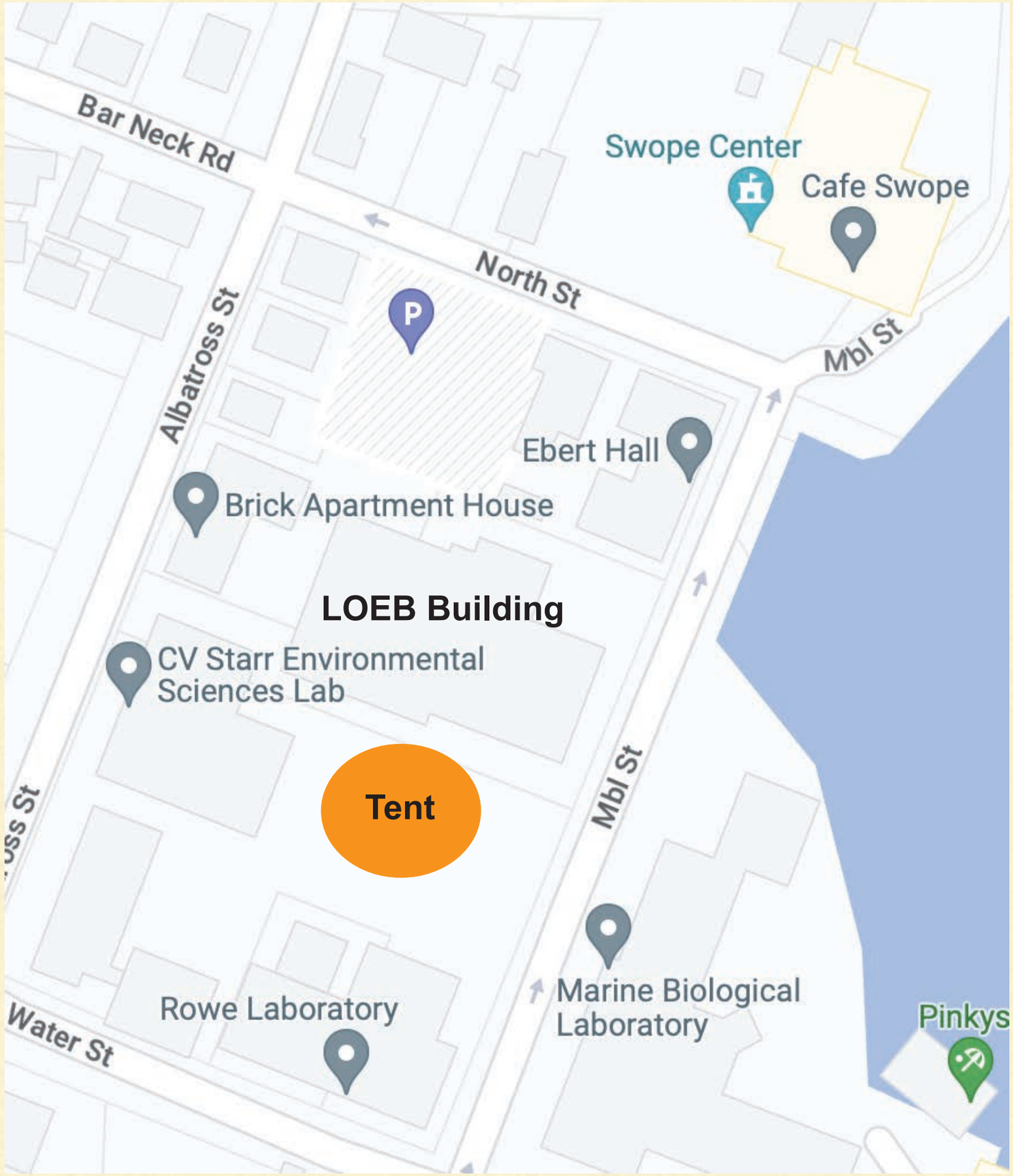
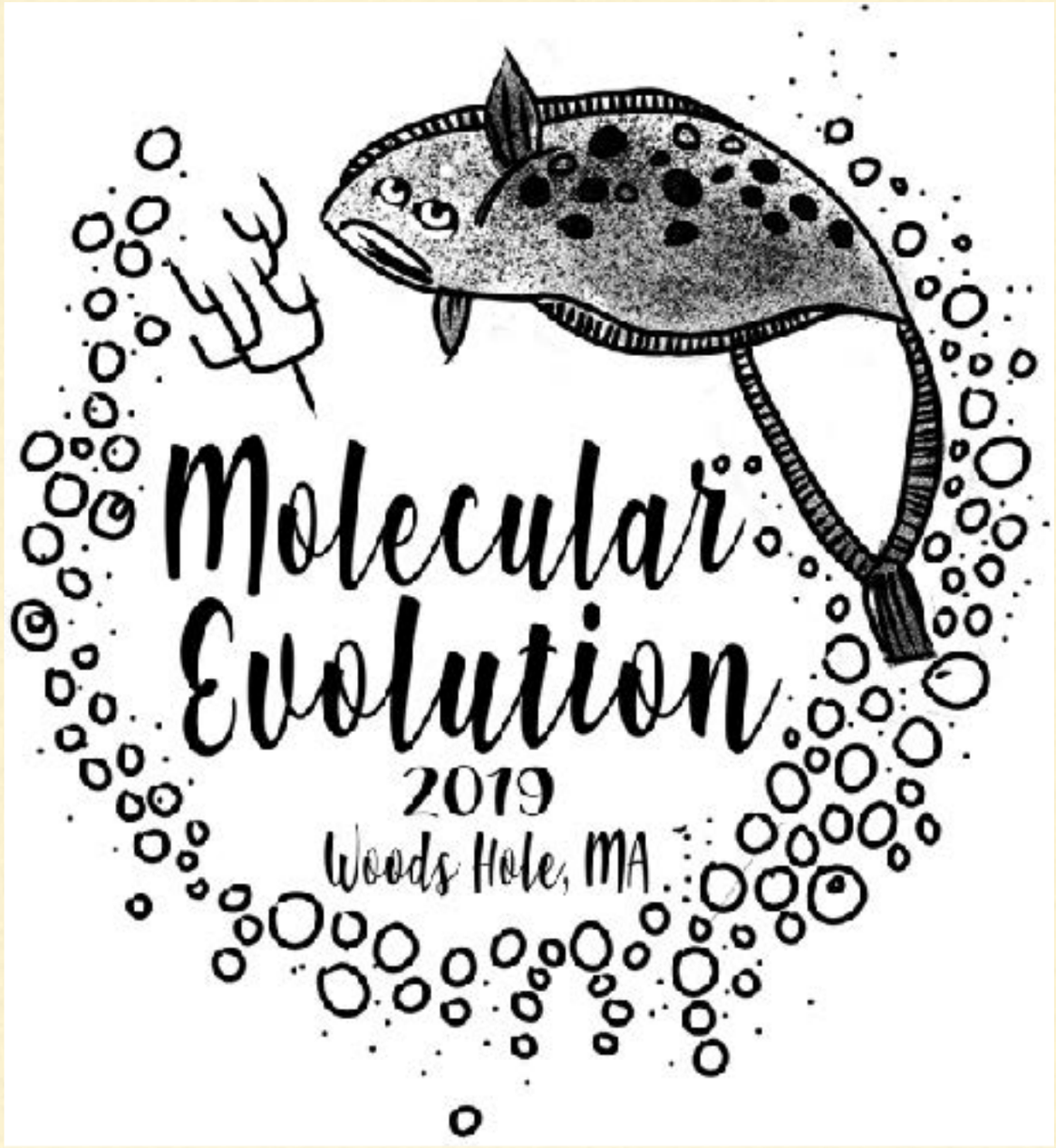

Bar Neck Rd
Swope Center
Cafe Swope
North St
Albatross St
Mbl St
Ebert Hall
Brick Apartment House
LOEB Building
CV Starr Environmental Sciences Lab
Tent
Mbl St
Marine Biological Laboratory
Rowe Laboratory
Water St
Pinkys

Group photo
Wednesday noon

Course T-shirt

Kate Taylor is the T-shirt leader

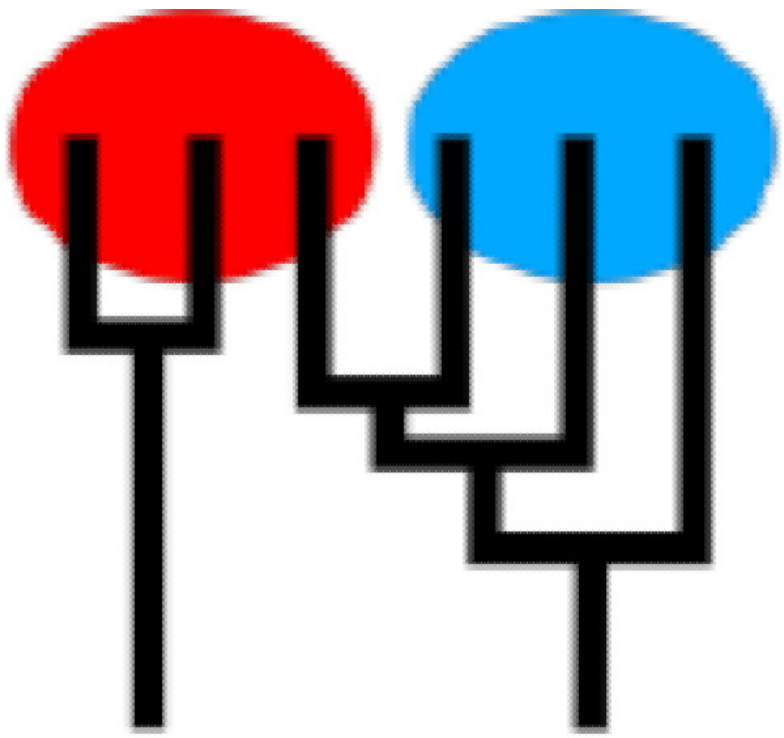
We will need designs by Tuesday 9am, take a look at the T-shirts on the course websites, very fine lines are usually a problem. There is guidance on Slack about details



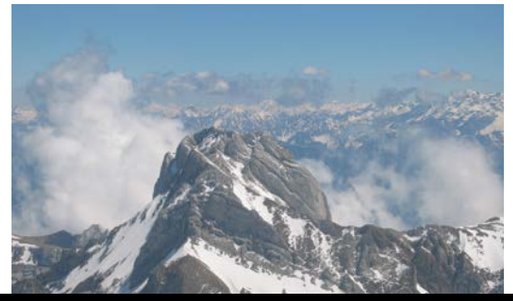
Peter Beerli

Florida State University

Call me: Peter
Pronouns: he/him



I develop probabilistic methods and software to infer population genetic models from DNA



email: beerli@fsu.edu
web: peterbeerli.com
github: pbeerli
twitter: @peterbeerli
instagram: @polliwoggles
@peterbeerli

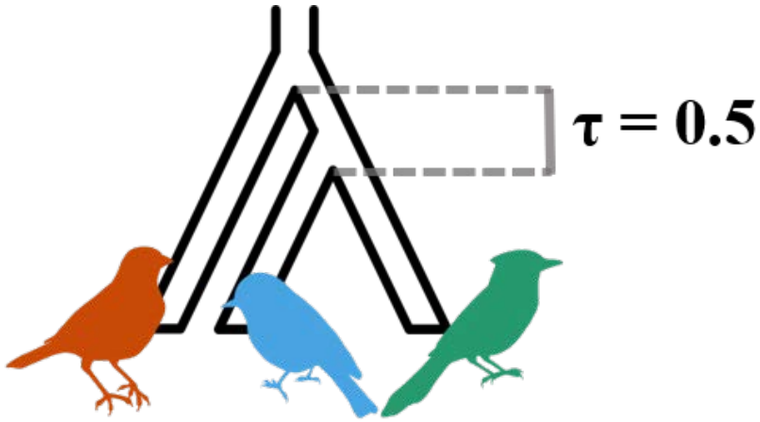
Laura Kubatko

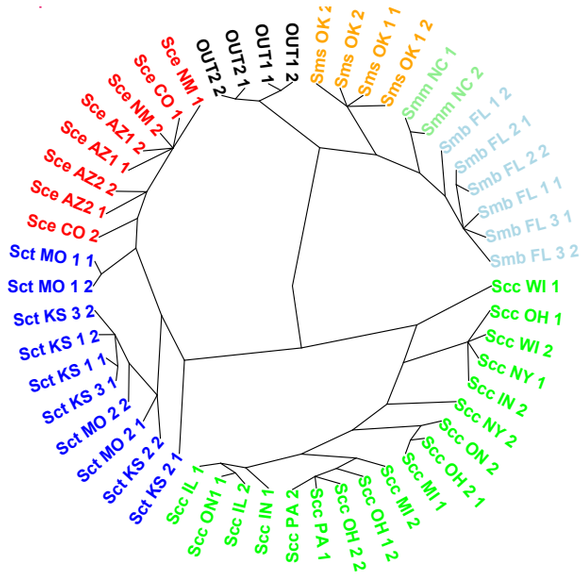
Professor, EEOB/Stats @ Ohio State

Call me: Laura

Pronouns: she/her/hers

Research interests: Species tree inference, coalescent theory, phylogenetic network estimation, phylogenomics





Road biking & touring

Backpacking & hiking

Skiing

Mountain biking

Parenting

kubatko.2@osu.edu

lkubatko

Laura_Kubatko

9858 8802 1990

Figures by: Sydney Decker

HI THERE!

I'M EMILY GRIFFITH.

(SHE/HER)

EMILYVGRIFFITH.COM

WHO I AM

A second-year Ph.D student studying dicrhomatism evolution in dabbling ducks

WHERE I'M AT

The Ornithology Department at the Academy of Natural Sciences of Drexel University

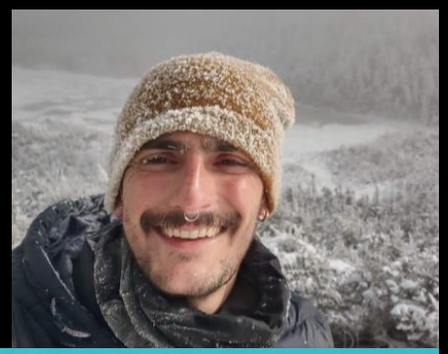
WHAT I LIKE

Museum sciences, trait evolution, sexual selection, graphic design, and board games/TTRPGs!

Alex Franzen (he/him/his)
PhD candidate
University of Oklahoma
ajfranzen@ou.edu @ellipsaria

Agustín Moreira-Saporiti

Postdoctoral researcher, Marine Biological Laboratory
amoreirasaporiti@mbl.edu



Research interests: Basically seagrass!

Functional trait ecology

Flower development in *Zostera marina*

Adaptive processes and ecophysiology

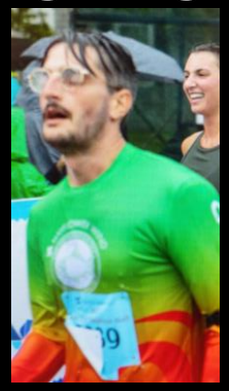
Hobbies

Baking

Worrying about the future

Swimming, snorkeling, free diving

Trying new sports and regretting it



Md Nafis Ul Alam

Call me: Michael (he/him)
PhD Student
Arizona Genomics Institute
School of Plant Sciences
The University of Arizona

- Genome Biology
- Population Genomics
- Statistical Genetics

I lurk in the demonic crawl space between theoretical genetics and applied genomics.

mdalam@arizona.edu
@MysticMonocyte
myrthandsorrow

Other interests:

Napping in strange places

Fitting in

Nature documentaries

Crying

Spirit animal: The Pallas' Cat

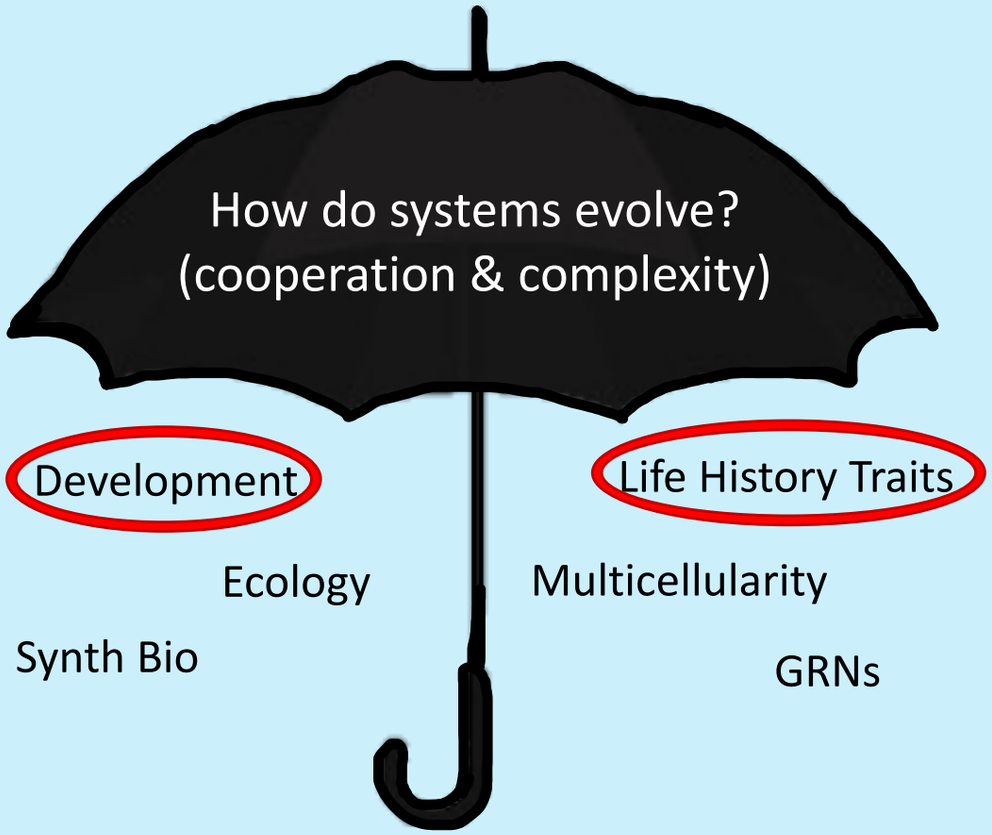
Research expertise:
(according to my mom)

- Dropping things
- Spilling things
- Breaking things
- Missing deadlines

Images: https://tinyurl.com/CreditsMOLE

Amanda Ivanoff (she/they)

SUNY Buffalo | amandaiv@buffalo.edu @anivanoff



Now I'm studying: how different mammals time parturition (birth at term)

Badminton

Improv

Gaming

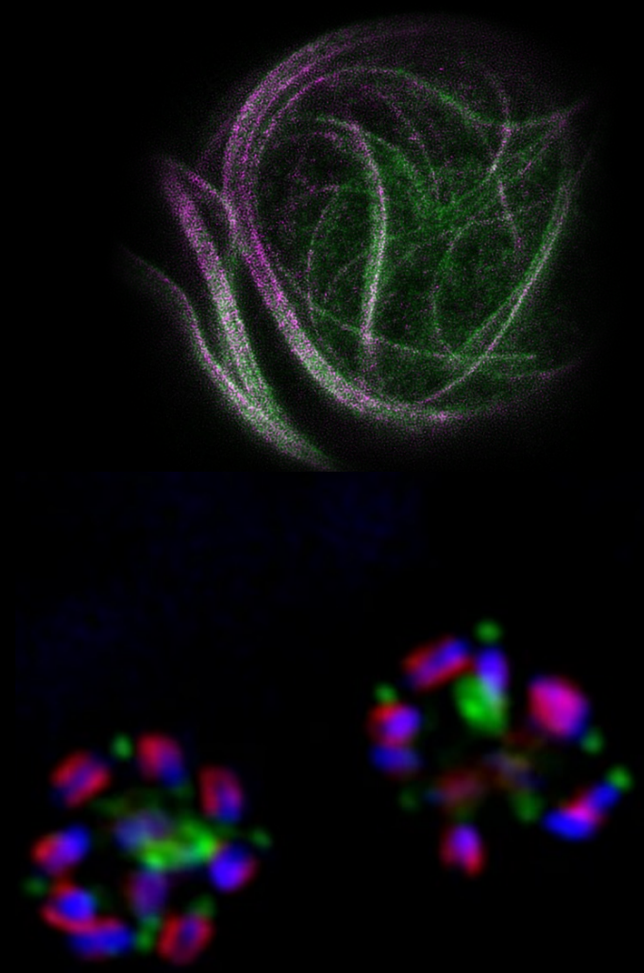
Aurelia Balestra

She/Her

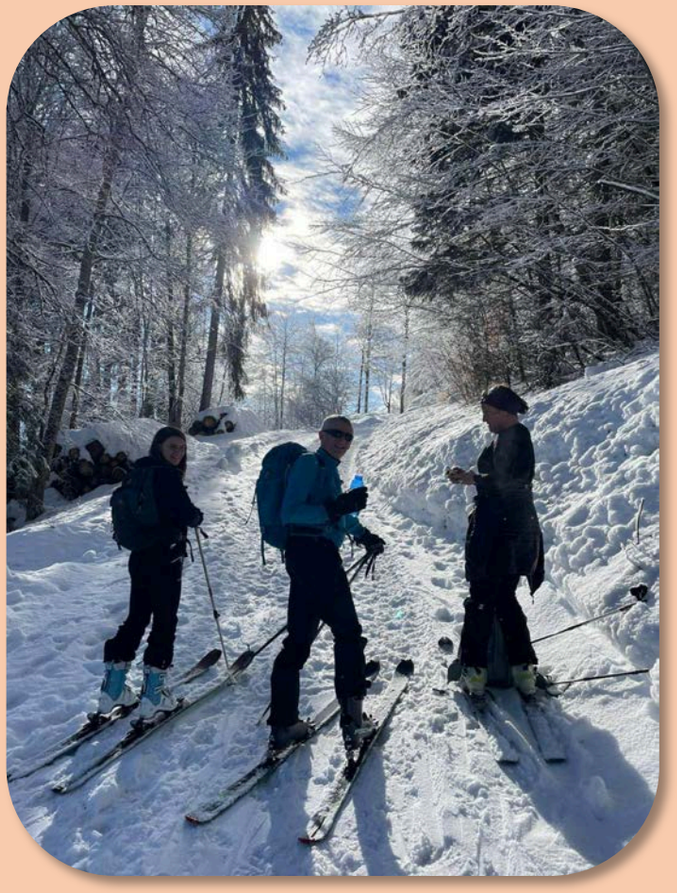
Postdoctorate fellow, 2nd year
University of Pennsylvania,
USA

Research interest:

Parasites
Evolution of sex/fertilization
Phylogenetics



Hobbies:
Climbing, hiking, skiing, biking



Avrami Aharonoff

he/him

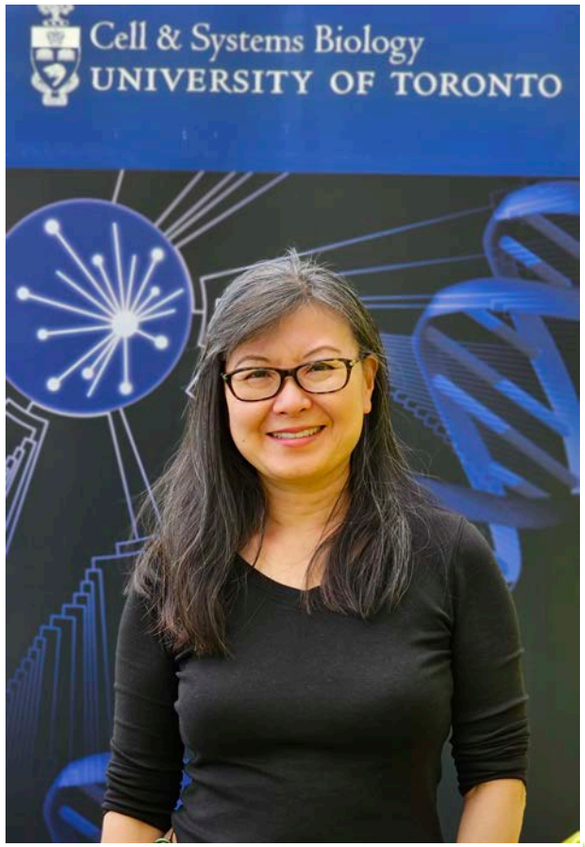
PhD candidate

New York University

Sex chromosomes | Genome evolution | Dosage compensation

Belinda Chang

(She/her)



Dept's of Ecology & Evolutionary Biology,
Cell & Systems Biology
University of Toronto
Molecular evolution of sensory systems
belinda.chang@utoronto.ca
https://chang.eeb.utoronto.ca/

Blair Christensen

PhD student
she/her, blair.christensen@uvm.edu

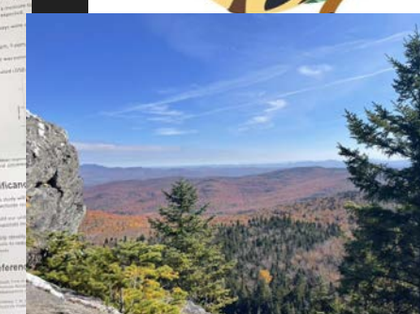
The UNIVERSITY of VERMONT

Insect Agroecology and Evolution Lab

Research Interests:

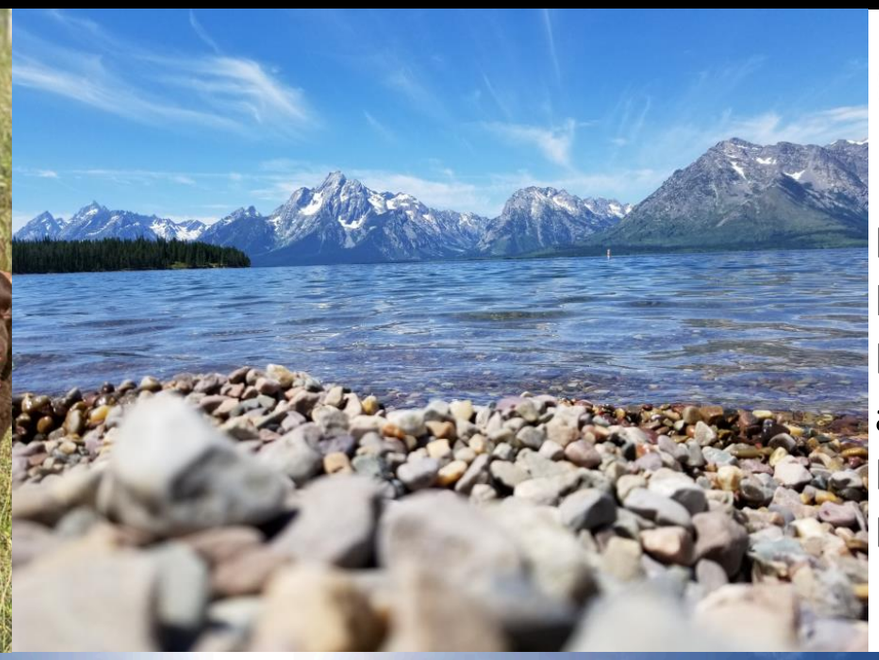
Bugs!

Insect Pest Evolution, Agroecosystems, Epigenetics, Transcriptomics



Non-Research Interests:

Hiking, Climbing, Drawing, Trivia



Cedric Kamaleson

Pronouns: He/Him
Institution: Georgia Tech
Research Interests: Single-cell learning, Mycoremediation, and Fungi Morphology
Personal Interests: My dogs, traveling, and nature
Email address: ckamaleson3@gatech.edu

Indiana University
Newton Lab

second year studying...

Microbial evolution,
Population genetics,
Symbiosis,
Horizontal gene transfer,
Mobile element ecology,

CHRIS ROBINSON

@shy_symbiont

David L. Swofford
(“Dave”, he/him)

Currently: Florida Museum of Natural History (U of F)

Previously:
- Smithsonian Institution NMNH (1992-2001)
- Florida State University (2001-2007)
- Duke University (2007-2018)

Research:
- Phylogenetic inference
- Phylogenomics
- Species tree estimation methodology
- Ancestral state reconstruction issues

davidswofford@ufl.edu

Software development

Live music

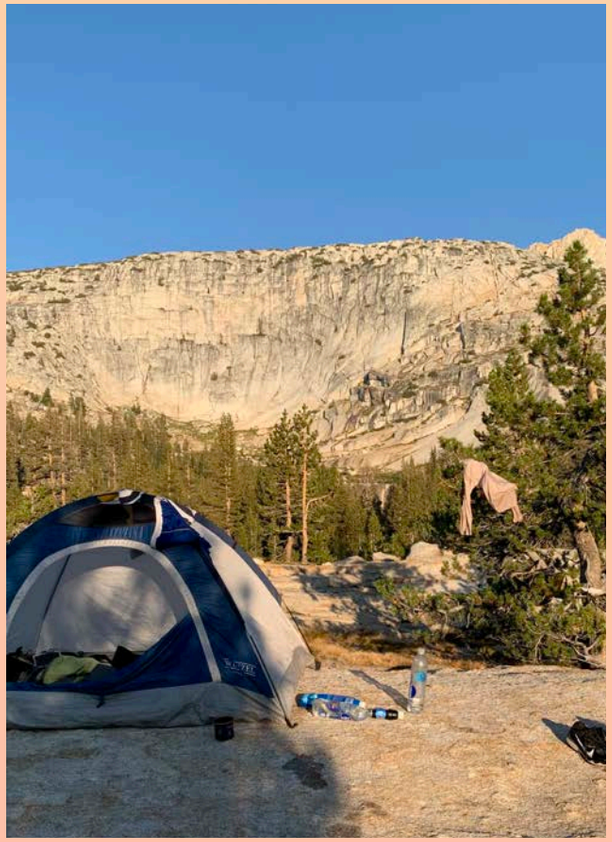
Camping/canoeing

Playing the blues

Daniel Sultanov he/him

PhD candidate
NYU | New York, NY
ds5639@nyu.edu

Molecular evolution of macromolecular machines
Genomics | Biochemistry | Bioengineering



Outside of lab find me mostly hiking or camping

Looking for postdoc starting Oct 2023! CV here

Elena Korte

Pronouns: She/Her
University of Connecticut (UConn)
Email: elena.korte@uconn.edu
Github: ehk2002

Research Interests: Statistical application of phylogenetic models and methods

Likes: Gardening, Star Trek, My Cat

Laura EME

Associate Professor

Paris-Saclay University

She/Her

Research:

Origin of eukaryotes

Microbial evolution

Horizontal gene transfer

Sampling for "new" microorganisms

Non-Research:

Roller-skating

Ice-skating

Wine and cheese

Boardgames

Diving

cats

@EME_LAURA

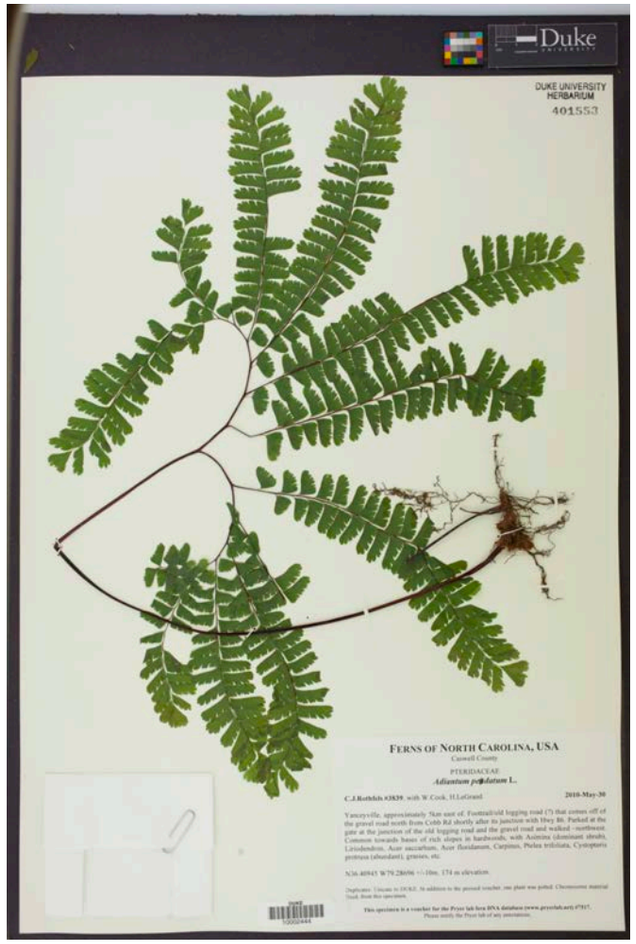
laura.eme@universite-paris-saclay.fr

Blake Fauskee (he/him)

Duke University
Email: bdf24@duke.edu
Twitter: @bfauskee

My Research

Leveraging phylogenetic methods to investigate the evolution of RNA editing in plant organellar genomes. Specific focus on ferns.



Other interests

Baseball, museums, cats, board games

Alexa Tyszka

(She/her)

Twitter: @AlexaTyszka email: atyszka2@uic.edu

Second year Ph.D. candidate at the Univ. of IL Chicago

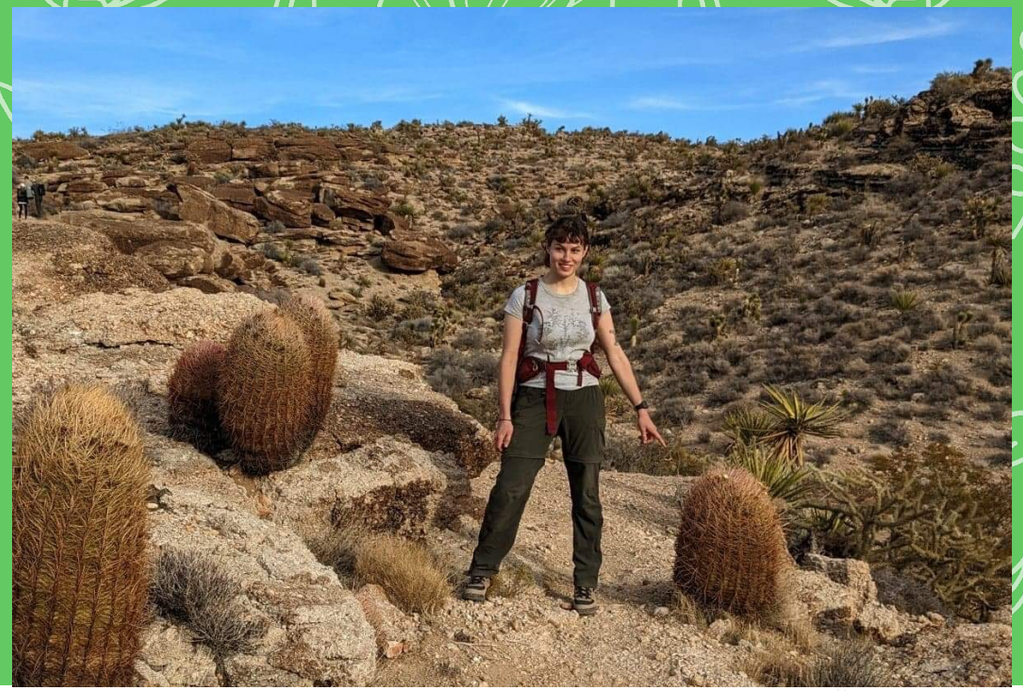
2021 NSF GRFP Awardee

Professional interests:

The multiple evolutions of carnivory in plants, RNA-seq, and phylotranscriptomics of non-model plants

Less professional interests:

Skate-style XC skiing, hiking, biking, gardening, board games



Śnieżka

Claudia Solís-Lemus

University of Wisconsin-Madison

Call me: Claudia
Pronouns: she/her

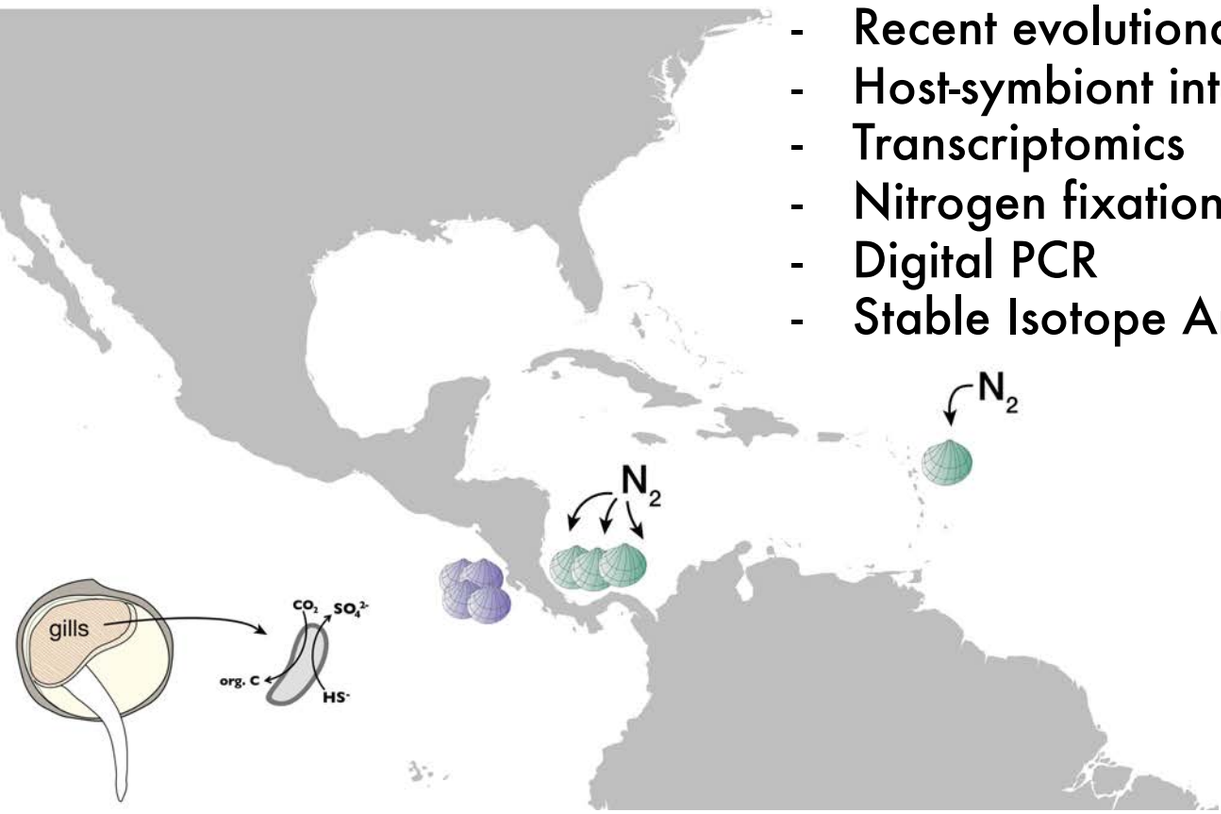
About my research:
Statistical methods to infer phylogenetic networks; microbial networks; open-source software

email: solislemus@wisc.edu
web: https://solislemuslab.github.io/
github: crsl4
mastodon: mstdn.social/@solislemuslab

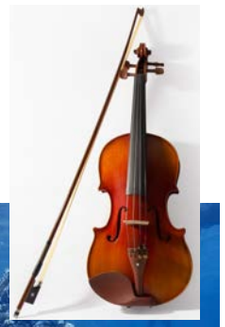
Non-science interests: Mystery novels, yoga, swimming, running, biking, climbing

Carlotta Kück (she/her)

PhD student @ Eco-Evolutionary Interactions
Max Planck Institute for Marine Microbiology
Bremen, Germany



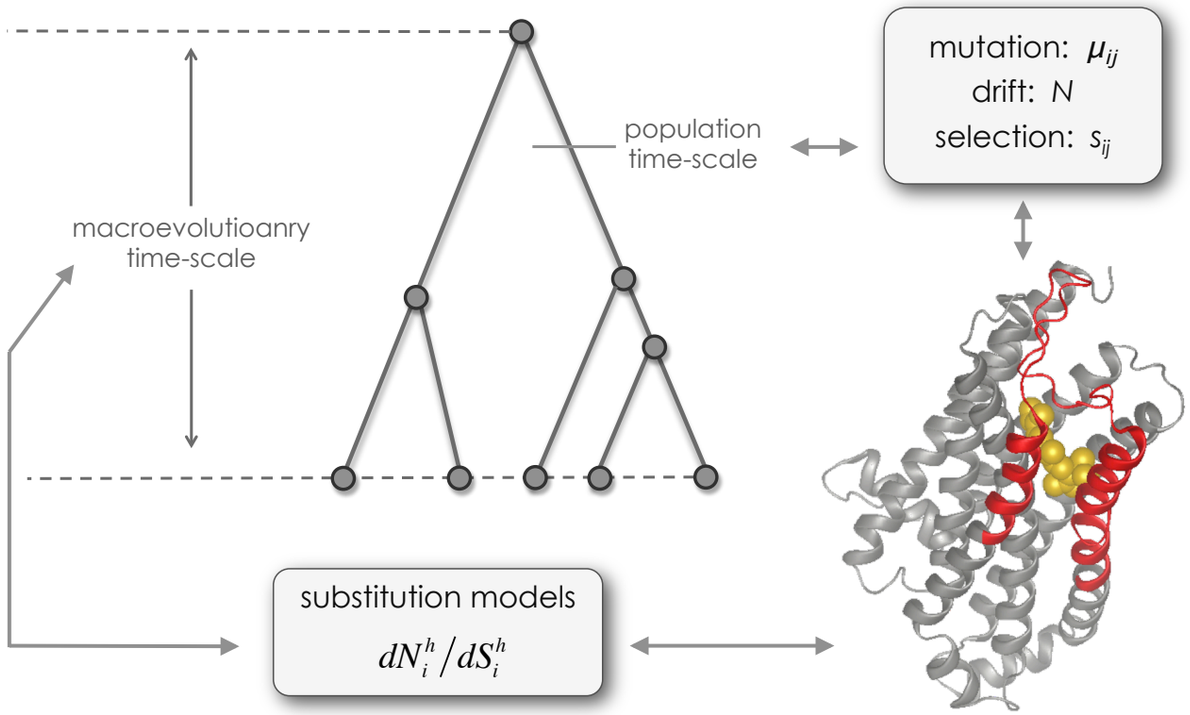
- Recent evolutionary changes
- Host-symbiont interactions
- Transcriptomics
- Nitrogen fixation
- Digital PCR
- Stable Isotope Analyses



ckueck@mpi-bremen.de ecoevoint CarlottaKueck GitHub ackueck https://www.ecoevoint.ch/

Adaptive Evolution of Complexity

Dalhousie University, Canada



Joseph P. Bielawski

Department of Biology
Department of Mathematic and Statistics
Institute of Comparative genomics
Dalhousie University, Halifax, Nova Scotia, Canada

call me: Joe
pronouns: he / him

e-mail: j.bielawski@dal.ca

www.bielawski.info
www.sciencescholars.info

Research :

- Functional complexity of genes & genomes
- Complex interactive functions at higher levels of biological organization (e.g., communities)
- Multi-level selection and adaptation
- Modelling adaptive evolution
- Microbiomes & Metagenomics

I am also part of "***The Evolutionary Gaia Project***": https://www.evolutionarygaia.org/

Jeremy M. Brown

Louisiana State University

Call me: Jeremy
Pronouns: he/him

About my research:

Bayesian phylogenetics; molecular evolution; heterotachy; model fit; variation in sets of trees; phylogenetic forensics; herpetology

email: jembrown@lsu.edu
web: phyleauxgenetics.org
github: jembrown
twitter: @jembrown

Non-science interests:

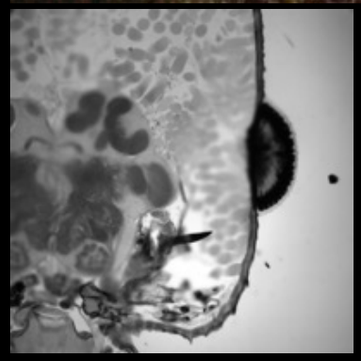
R. Keating Godfrey

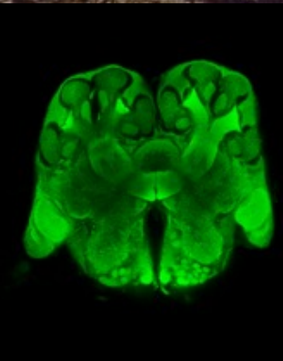
Postdoctoral Fellow
University of Florida

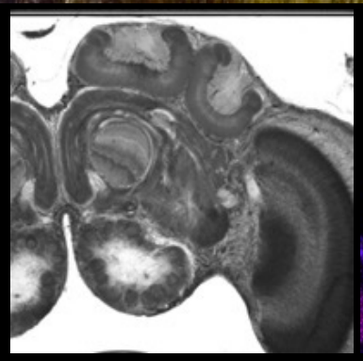
rkeating.godfrey@ufl.edu

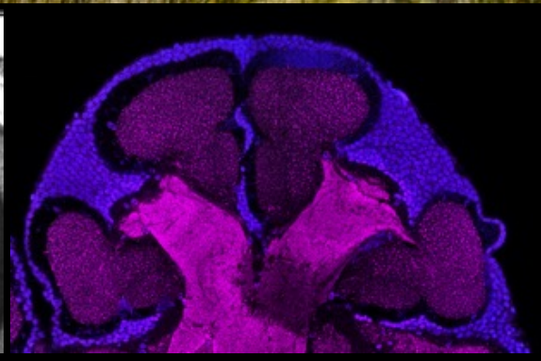
You can call me Keating (she/her)

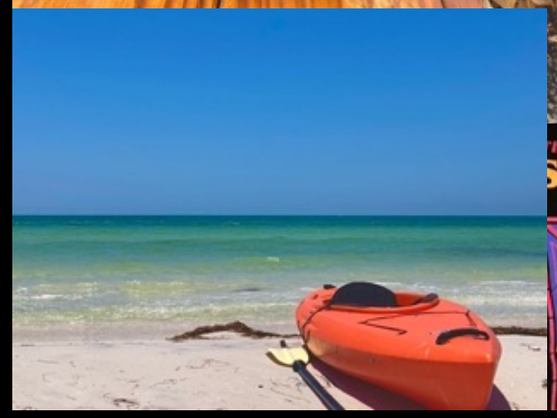
Research Interests
Sensory receptor evolution
Functional genomics
Neuroethology
Insect brains











Want to talk about applying model-based approaches to questions about species divergence?

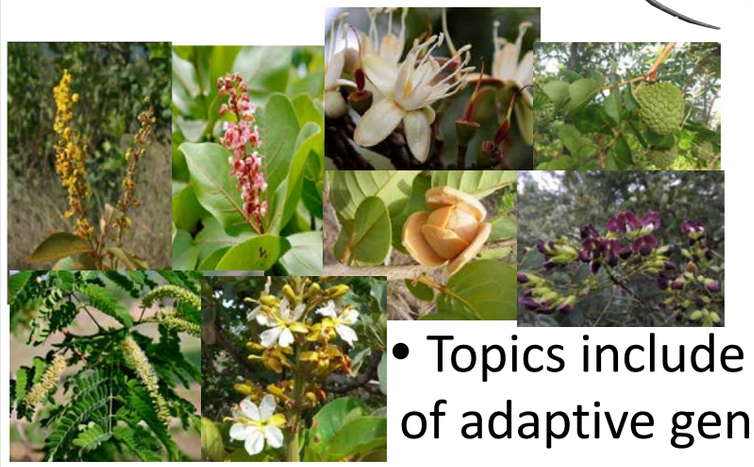
Let's get together!

L. Lacey Knowles; at MBL May 28– June 6
Reach out to knowlesl@umich.edu

- I work on a wide variety of taxa from around the world

(these are some organismal profiles from past publications)

- We apply coalescent models, ENMs, species tree inference, tests for selection, spatially explicit models informed by spatial and temporal landscape heterogeneity, ABC, hABC



- Topics include phylogeography, biogeography, diversification dynamics, sources of adaptive genetic variation, comparative phylogeography, species delimitation

Sungsik Kong

Please call me **Kevin**

(he/him/his)

Postdoctoral Researcher

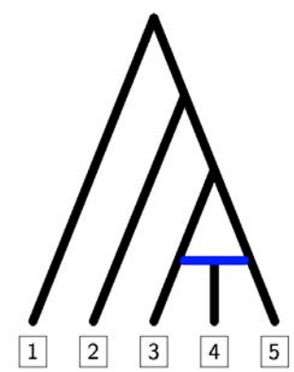
University of Wisconsin-Madison

About my research:

Phylogenetic methods & networks;

Hybridization;

Computational Biology



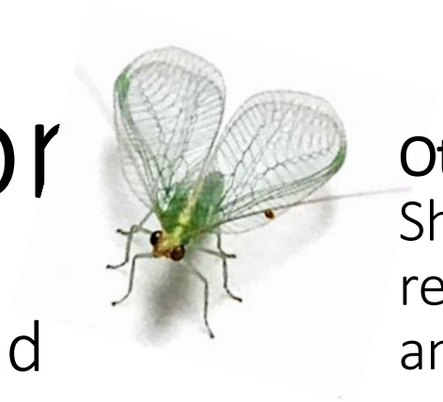
Other stuffs for fun:

sungsik.kong@gmail.com

sungsik-kong.github.io

Twitter: @ssik08

Kate Taylor



University of Maryland
She/her/hers

Research: Insect evolution and speciation. The genomic basis of complex traits. How evolutionary processes shape the genome.

Other interests: Cooking and baking, hiking in Shenandoah on the weekends, my cat named Zara, reading sci-fi and fantasy novels, strategy games, and keeping too many house plants.

Carly Lo

- She/her
- First-year PhD Student
- Texas A&M University at Galveston

Research Interests

- Jellyfish genomics
- Eye trait evolution
- Anthropogenic stressors on jellyfish reproduction

Other Interests!

- Piano
- Doting on my pet hamster
- Drawing
- Watching movies

I am Lydia (she/her)

Texas A&M University | lydia.morley@tamu.edu

Research Interests

Why do lineages diverge?

Why do lineages fuse?

How do we know that we know what we think we know?

Regular Interests

Cats

Cooking

Books

Exercise videos

Giulia Lin

eawag aquatic research

ETH zürich

First-year PhD student at ETH Zürich/Eawag

Research interest

- Maintenance of sex
- Origin of apomixis in *Potamopyrgus antipodarum* (New Zealand mudsnail)
- Polyploidy
- Gene flow in Bdelloid rotifers

What I like...

- Anything food related
- Cozy gaming
- Travelling

@SkeletonDancerx

@skeleton.dancer

giulia.lin@eawag.ch

Analisa Milkey (she/her)

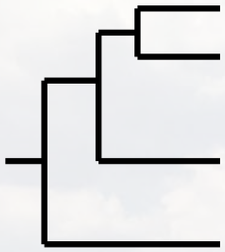
University of Connecticut
(2nd year PhD student)

Research interests:
Bayesian phylogenetic methods and modelling

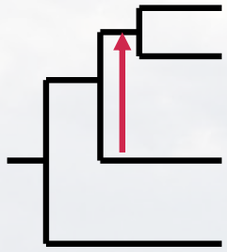
email: analisa.milkey@uconn.edu
website: amilkey1.github.io
github: amilkey1
twitter: @analisamilkey

Other interests: swimming, knitting, my pet rabbit

Research Interests



Phylogenetics and PCMs



Macroevolutionary impacts of introgression

Sexual Conflict

Mating System Evolution

Emma Lehmberg (she/her)
PhD candidate

Texas A&M University

eslehmberg@tamu.edu

@eslehmberg

Non-science interests

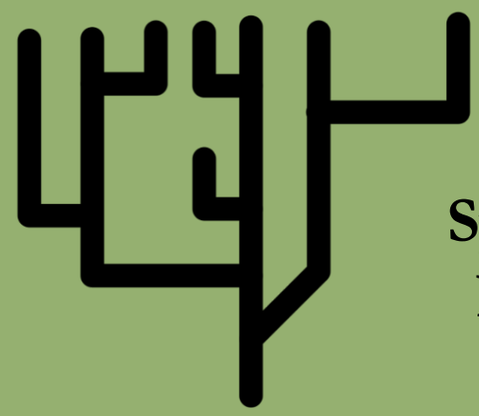
Knitting

Swimming

Gardening

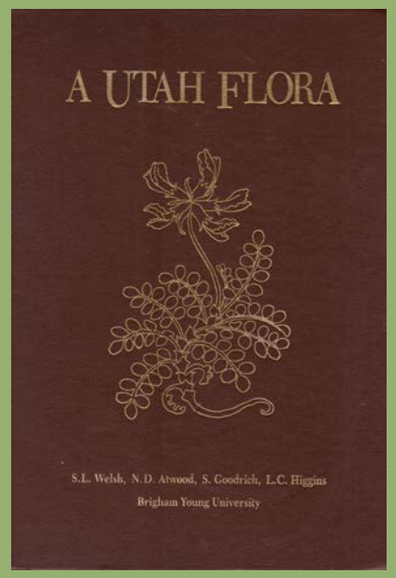
Canoe trips!

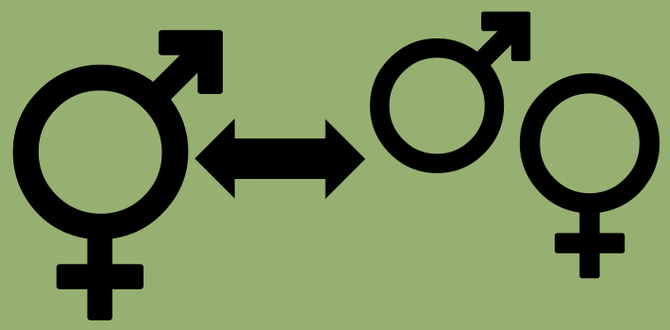
Bryophytes (Mosses ♥)



Systematics and Phylogenetics

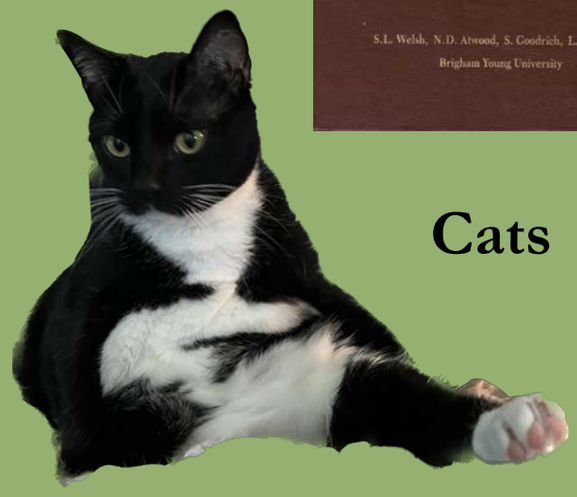
Botany





The Evolution of Sexual States

Katie Sanbonmatsu
she/her
Texas A&M University
katie.sanbonmatsu@tamu.edu



Cats

Crochet

Biogeography, Diversification, Colonization Processes

Gardening

Megan L. Smith

Postdoctoral Fellow, Indiana University
Incoming Assistant Professor, Mississippi State University

Call me: Megan
Pronouns: she/her

Research interests:
machine learning, phylogenetic inference, impacts of model misspecification, gene tree heterogeneity, gene duplication and loss, terrestrial gastropods

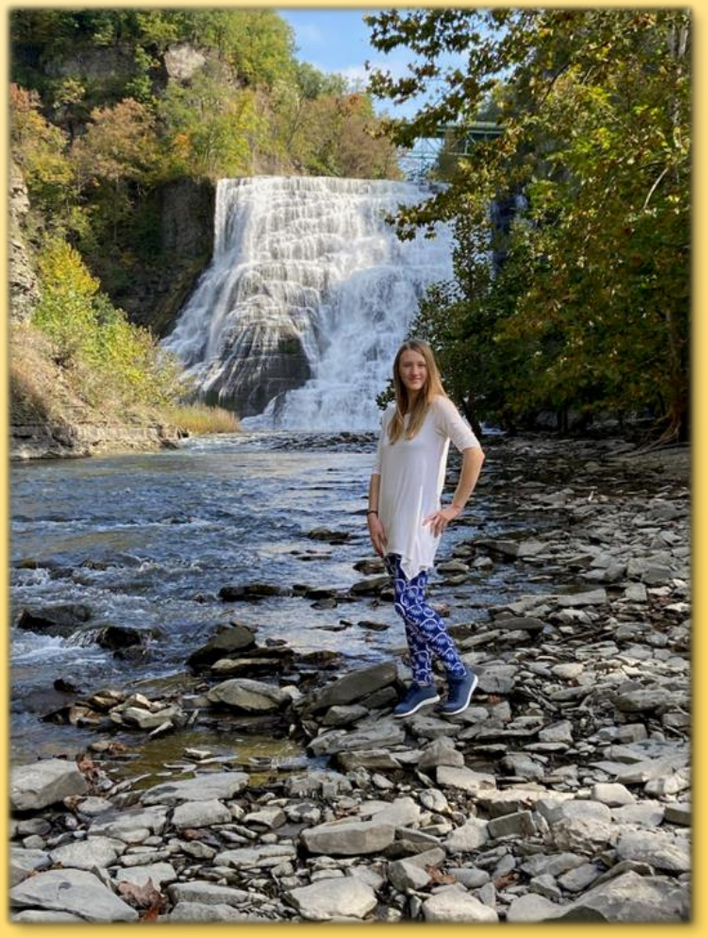
email: ms4438@msstate.edu
web: www.meganlsmith.org

Non-science interests:
hanging out with my dogs, hiking and exploring nature, reading, board games, baseball

Meg Branine
(she/her)

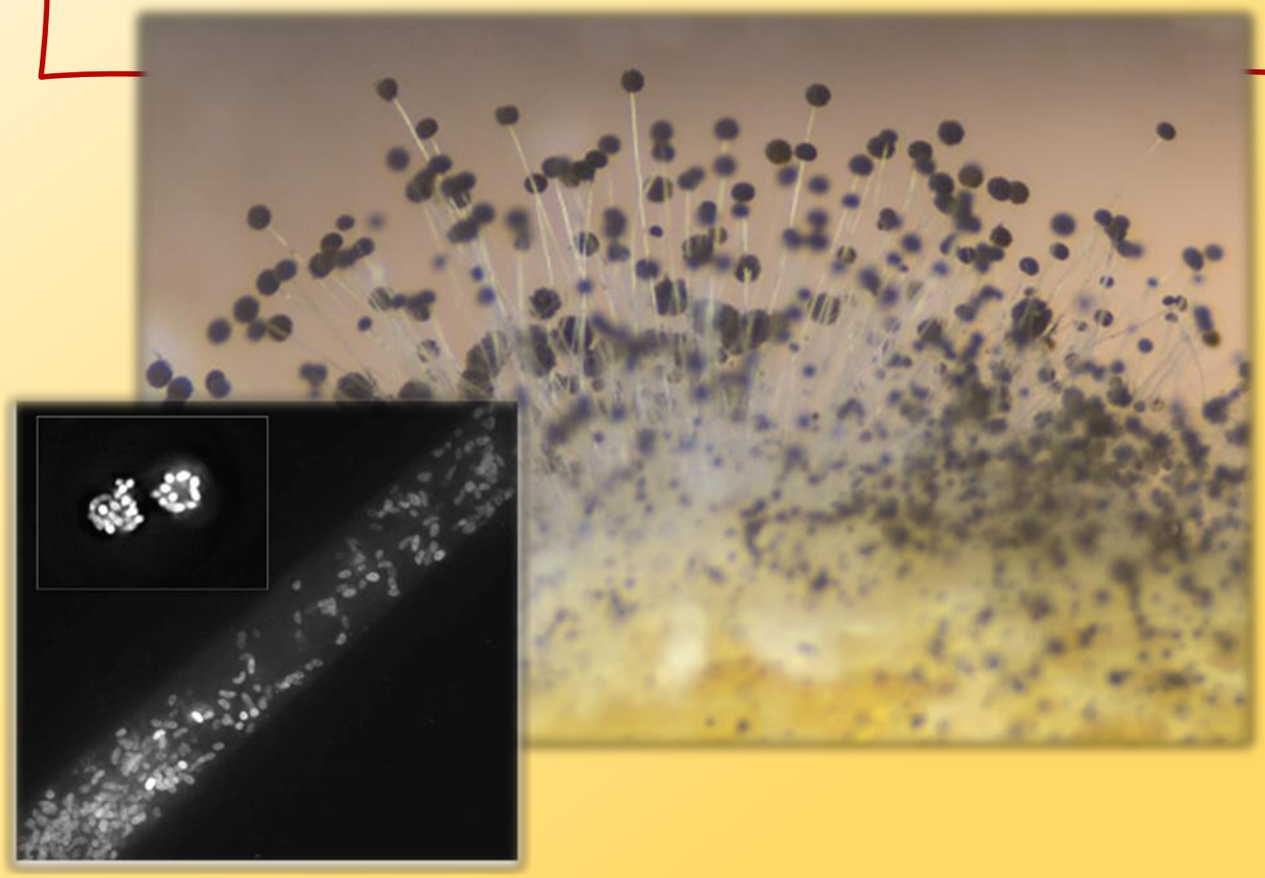
PhD Candidate in Microbiology at Cornell University

mb2689@cornell.edu



Research Interests:

- Coevolution of endosymbionts and their hosts; bacterial-fungal interactions
- Model system: *Rhizopus microsporus* and its bacterial endosymbiont *Mycetohabitans*



Other Interests (in no particular order):
Running, horse-back riding, reading, video games, animals in general (but especially cephalopods!)

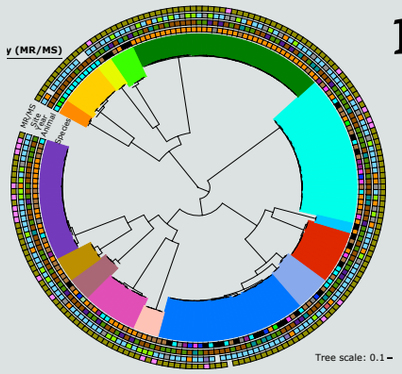
Odion O. Ikhimiukor

(He/Him/His)

oikhimiukor@albany.edu

Research interest:

Pathogen Genomics, Disease Epidemiology, Public Health



Postdoc
University at Albany, SUNY

Hobbies: movies, travel

MOLE 2023

John Huelsenbeck

Call me: “John”

Department of Integrative Biology
University of California, Berkeley

Research interests: Statistical phylogenetics, Bayesian estimation, molecular evolution, diversification models, insertion/deletion models.

Other interests: Woodworking, home renovation, antique guns.

Shelby Moshier

Pronouns: She/Her

Third year Ph.D. Candidate @ The Ohio State University

Research Interests:

Evolution & ecology of migratory behavior in bats – using comparative methods, machine learning, & GIS/biogeography models

Other Interests:

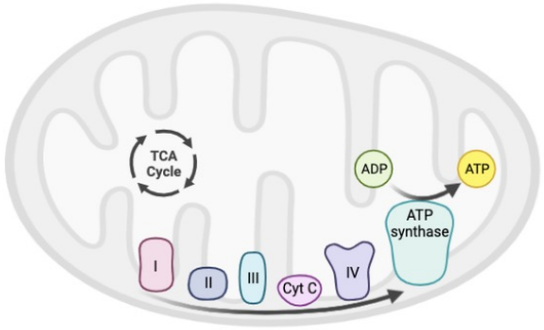
Enjoying nature & outdoor activities, photography, crocheting, my pets (Kali & crested geckos)

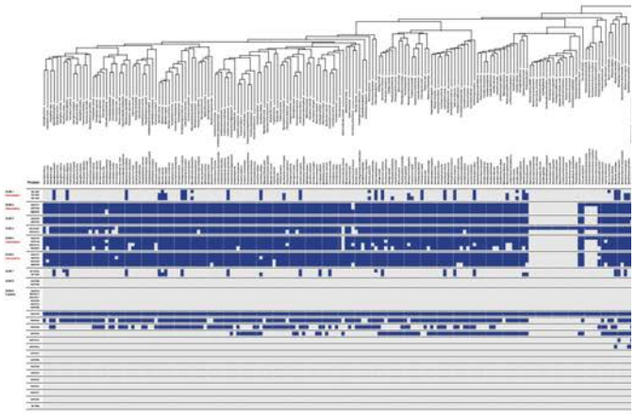
Contact me!
moshier.12@osu.edu

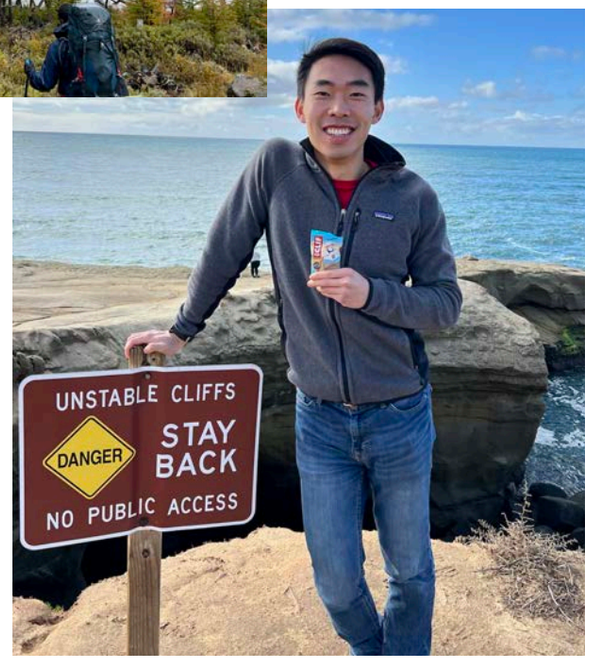
Michael Zhu Chen

Pronouns: he/him
MD-PhD student
Harvard Medical School, Vamsi Mootha and Jun Liu groups
michaelzhuchen@hms.harvard.edu
Twitter/IG @michaelzhuchen

Mitochondrial evolution







NAHUI MEDINA

She/hers. nmedinac@umn.edu

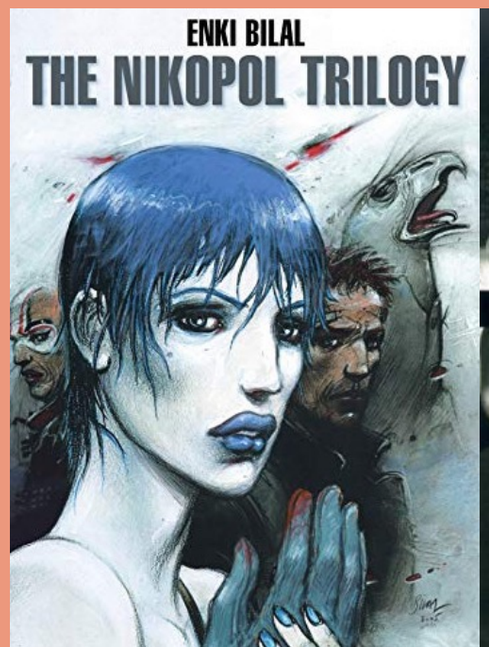
Evolution and adaptation processes in Archaea

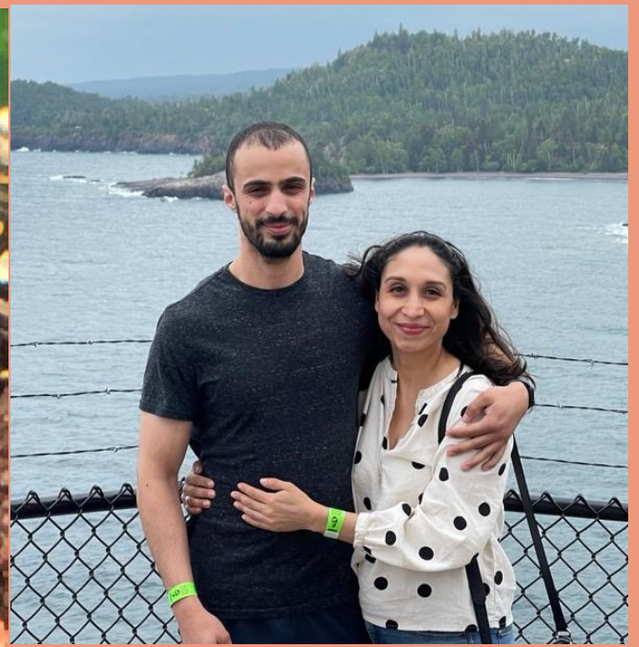
University of Minnesota Twin Cities
Ecology, Evolution & Behavior Department

ARCHAEA DOMAIN AS A MODEL FOR EOLUTIONARY STUDIES

-TRACING LIFE BACK TO AN ANCESTOR :SINGLE OR MULTIPLE LINEAGES?

- NO FOSSIL RECORDS – ‘From where we start?’





Olivia Morrison

(She/Her) olivia.morrison@emory.edu

3rd year PhD Candidate at Emory University

Research Interests:

- Centromere Drive
- Molecular/Cellular Evolution
- Speciation Genes

Other Interests:

- My dog →
- Gaming (cozy games, D&D)
- Textile Arts (crochet, weaving, felting)
- Gardening

Paul O. Lewis

University of Connecticut

Call me: **Paul**
Pronouns: **he/him/his**

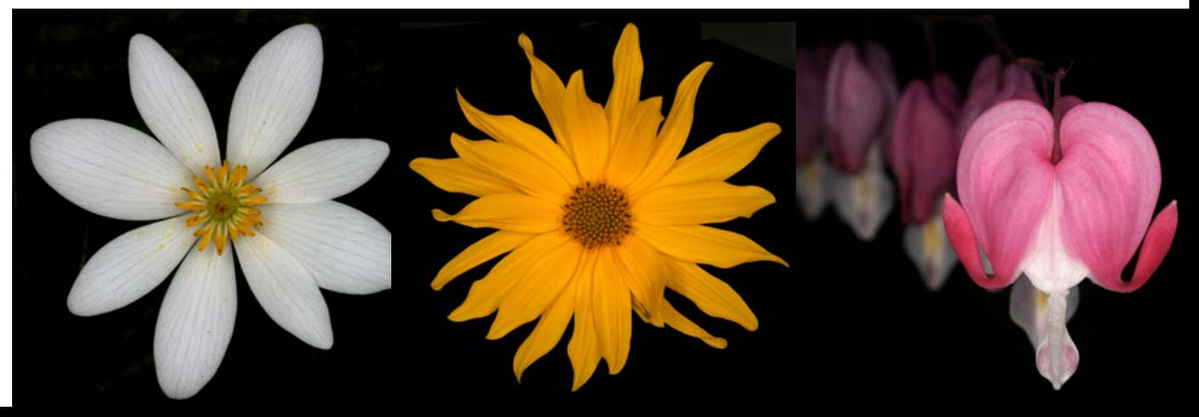
About my research:

Phylogenetic models and methods; marginal likelihood estimation; phylogenetic information; systematics of green plants

email: paul.lewis@uconn.edu
web: phylogeny.uconn.edu
github: plewis
twitter: @polewis

Non-science interests:

Naturally-leavened bread; hiking, kayaking, swimming, macro photography



Polina Len

she/her

- BSc in Biological Sciences

- Nanopore Sequencing
- Microbial Ecology
- Computational Methods
- Statistics

I love pop-sci books, climbing, snowboarding, and acrylic painting.

NAZARBAYEV UNIVERSITY
Astana, Kazakhstan

LinkedIn | Instagram | Email

RESEARCH

Charlotte Benedict

Third year Ph.D. candidate @ The Ohio State University
charlottebenedict3@gmail.com Pronouns: she/her

NON-RESEARCH

Travel, hiking, pottery, rock climbing, naps, puppy named Hobbes

Genomic adaptations
Evolution of symbioses
Marine invertebrates

Susanne Reier (she/her)

You can call me Susi

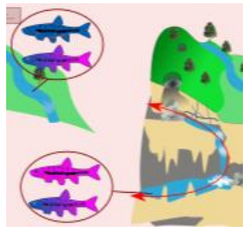
PhD Student @University of Vienna and Natural History Museum Vienna

susanne.reier@nhm-wien.ac.at

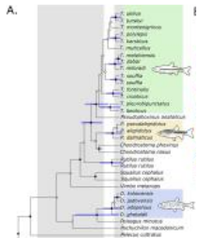
Research interests

Phylogeny

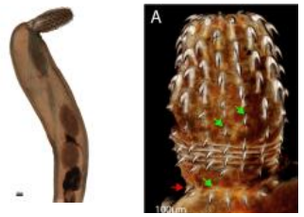
Phylogeography



Population genetics



Molecular timing



(Fish) parasitology

Study organism

Phoxinus lumaireul (Schinz, 1840)

Non-science interests

mountains

cats

Yoga

concerts

veggie food

Samyuktha Senthil

(she/her)

PhD candidate
Department of Integrative taxonomy of insects
Universität Hohenheim

Academic interests: Behaviour, ecology and evolution of social insects. I currently study the evolution of social parasitism in ants.

Non-academic interests: I love the woods, love to travel, cook, read, write, birdwatching and herping! Oh! And I love whales!

Jordan Satler

The Ohio State University

Call me: **Jordan (he/him/his)**

<u>Research interests:</u>
Community phylogeography, mutualisms, coevolution, species delimitation, phylogenomics

<u>Non-research interests:</u>
Exploring the outdoors, cultivating my niece's and nephew's interest in nature, photography, birding, eating frites with Samurai sauce in Bruges

satler.1@osu.edu | jordansatler.github.io

Avery Selberg

She/her

avery@temple.edu

Temple University
Twitter: @averyselberg

Adaptive evolution
Convergence
Method development

Running
Cats
Cooking new recipes

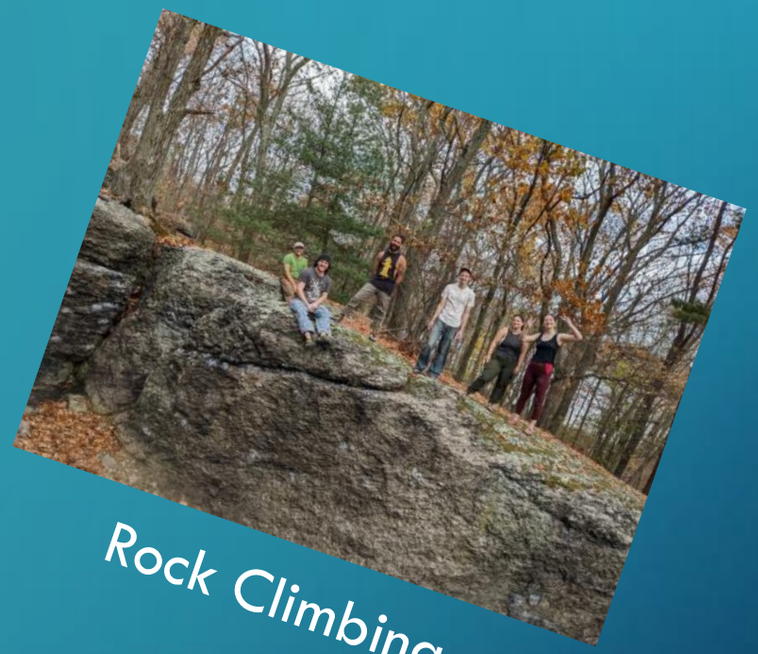
Datamonkey

Crístían Sharma

(You can call me Crís)

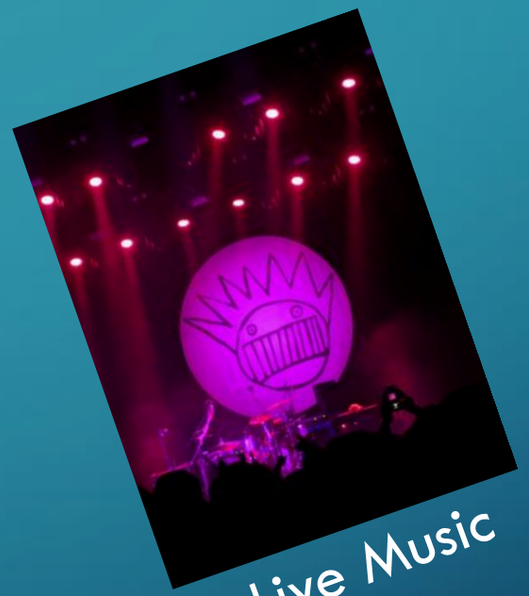
He/Him/His

Brandeis University
cristiansharma@brandeis.edu



Rock Climbing

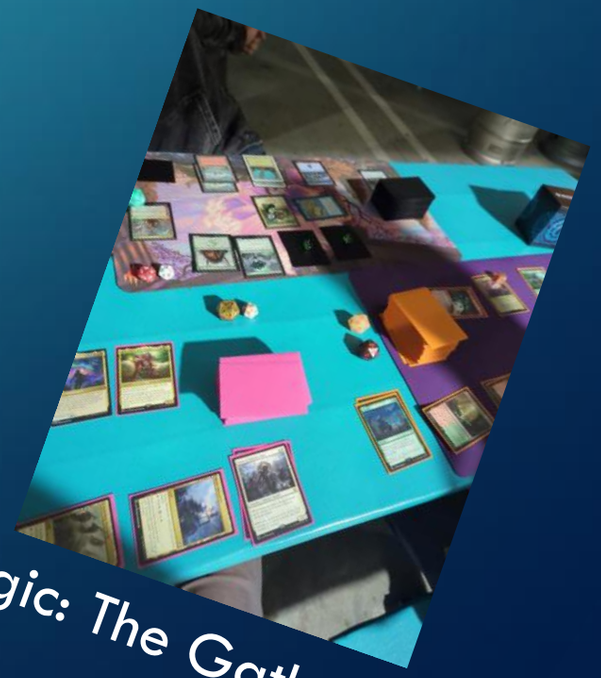
Which is the best codon model of evolution?
How do codon models compare to amino acid models?



Live Music

Pressure Adaptation in Deep Sea Fish Enzymes

Evolution of PET plastic specificity from cutinase-like ancestors



Magic: The Gathering

Roland BAMOU

(He/him)
Postdoctoral Visiting Fellow
Laboratory of Malaria and Vector Research
National Institute of Health

Research interest

- Vector ecology
- Mosquito control and Mosquito borne diseases surveillance
- Insect movement including high altitude migration and their impact in pathogens dispersal
- Zoonotic diseases vectored by arthropods

Field operation of collection of mosquito ~150m above ground in Mali

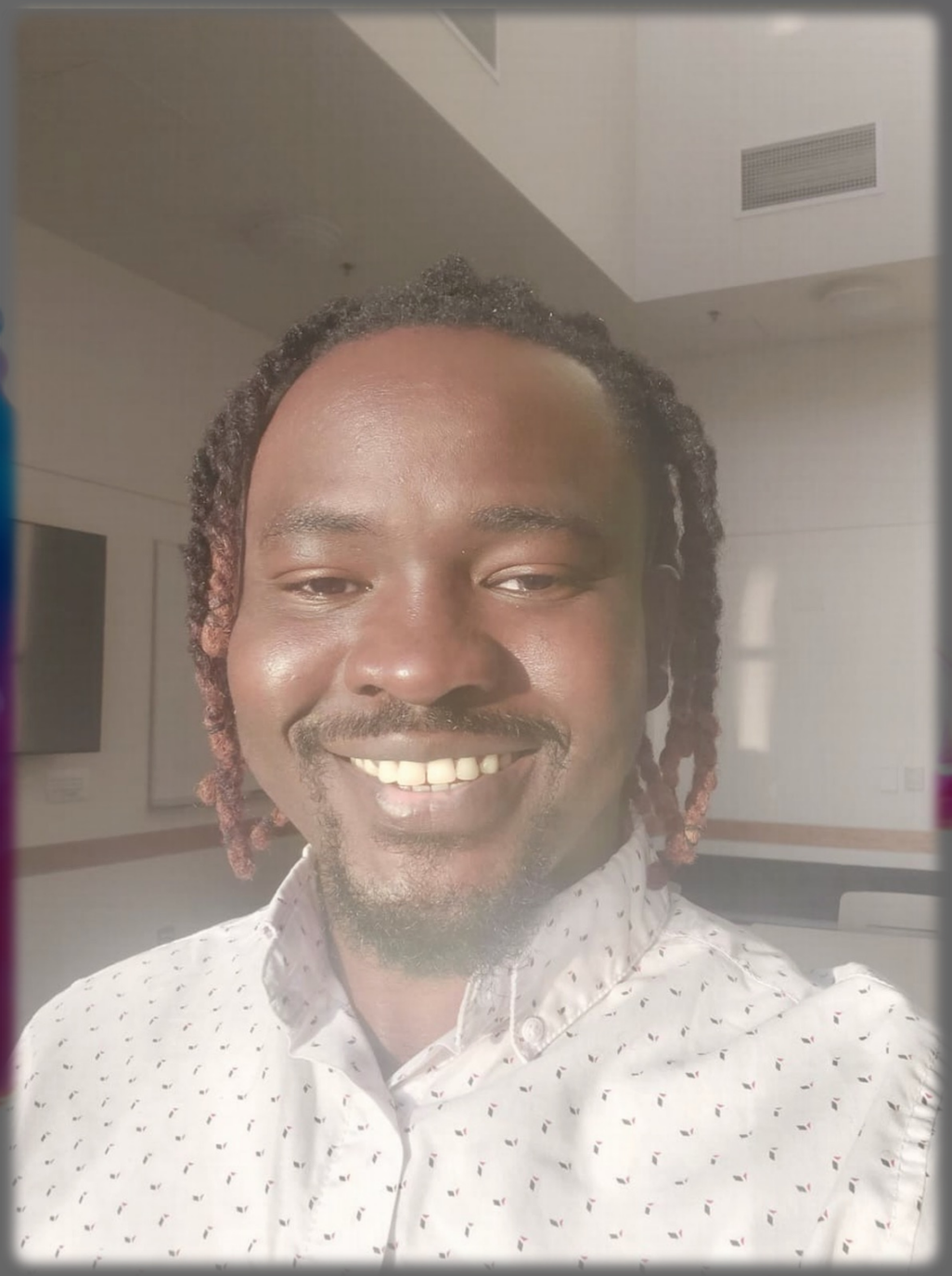
Email: roland.bamou@nih.gov
bamou2022@gmail.com

@RolandBamou

Roland Bamou

Adetunji “Teejay” Adesina

Postdoctoral Associate
University of Colorado Boulder
adetunji.adesina@colorado.edu



Research Interests:

Virus Epidemiology and Spillover

Virus Evolution

Phylogenetics

Other Interests:

Football, Psychology

I work on the evolutionary ecology of killer yeast, a phenomenon involving fungal competition driven by a multipartite viral endosymbiosis

Tommy J. Travers Cook

(he/him)

PhD Student @ ETH Zürich
Institute of Integrative Biology
thomas.traverscook@usys.ethz.ch

From London UK, residing in Zürich Switzerland

In my downtime, I like to hike, read, play chess, listen to live music and explore new places.

I am interested in coevolutionary interactions and the evolution, maintenance and breakdown of sociality and mutualism.

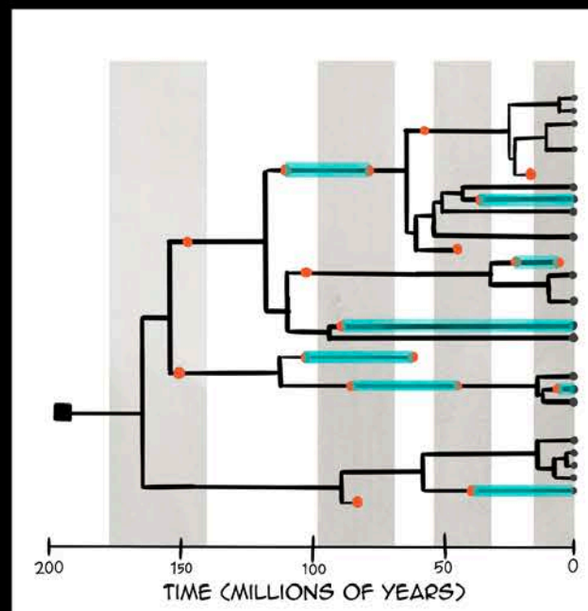
I look forward to getting to know you all!

TRACY HEATH

ASSOCIATE PROFESSOR
IOWA STATE UNIVERSITY
CALL ME: TRACY
PRONOUNS: SHE/HER

PHYLO@IASTATE.EDU
PHYLOWORKS.COM
@TRAYC7

STATISTICAL PHYLOGENETICS AND MACROEVOLUTION

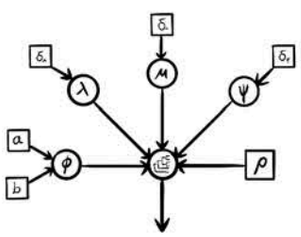


MY LAB DEVELOPS STATISTICAL MODELS FOR DESCRIBING PATTERNS OF EVOLUTION. WE APPLY THESE MODELS TO VARIOUS EMPIRICAL QUESTIONS ABOUT MACROEVOLUTION USING BAYESIAN INFERENCE.

OUR RESEARCH INTERESTS:

BIRTH-DEATH MODELS, PENGUINS, PALEOBIOLOGY, COPHYLOGENETIC METHODS, MUTUALISMS, FIGS & FIG WASPS, PHYLOGENETIC NETWORKS, & TRILOBITES

MEMBERS OF MY LAB AND I ARE PART OF THE CORE DEVELOPMENT TEAM FOR RevBayes.



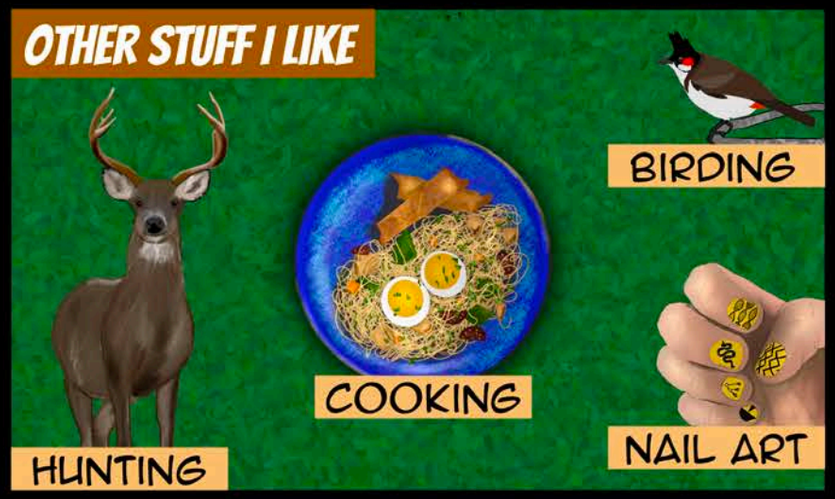
RevBayes IS A SOFTWARE PROGRAM FOR BAYESIAN PHYLOGENETIC INFERENCE.

I WILL BE TEACHING ABOUT BAYESIAN DIVERGENCE-TIME ESTIMATION IN RevBayes!

I AM ALSO THE PROFESSOR-IN-CHARGE OF THE GEORGE WASHINGTON CARVER PROGRAM AT IOWA STATE.

DIGITAL ART!

OTHER STUFF I LIKE



Ulises Rosas

- Pronouns: He/Him/His
- 2nd year PhD student at University of Oklahoma
- Email: urosas@ou.edu
- GitHub: Ulises-Rosas

Research interests:

- Mathematical Optimization
- Machine Learning
- Phylogenetics

Non-science interests:

- Cats
- Art
- Pop-sci books

Elizabeth Flesch

Postdoctoral Researcher
Montana State University

Research Interests:

Weddell seal population genomics

- **Detecting origins of immigrants**
- **Identifying past gene flow**
- **Historical demography**
- **Genetic basis of fitness**

Hobbies:

Rock climbing, hiking, skiing, taking care of pet guinea pig

Morgan Anderson NMFS Permit No. 26375

elizabeth.flesch@gmail.com

王
怡
安

Yee-Ann Wong *(she/they)*

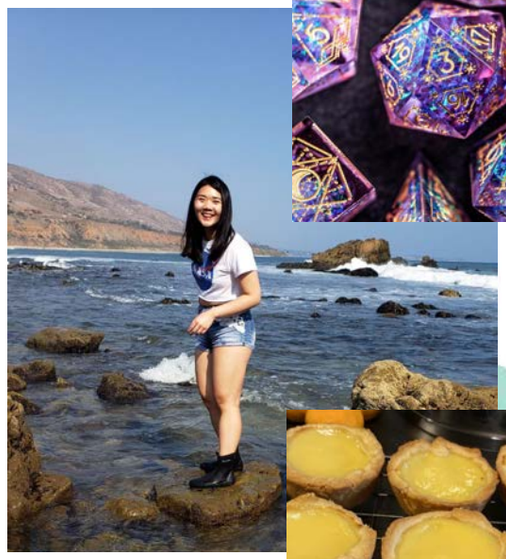
(Pronounce it like: Leeanne but *without the L sound!*
Or like the word 'Eon!')

Outdoor Hobbies:
Hiking, SCUBA Diving, Tidepooling

Indoor Hobbies:
Baking, TTRPGs, Art, Video Games

Research Interests: Ecology, Immunogenetics, Population Genomics, Conservation Biology

Currently Working on: Major Histocompatibility Complex (MHC) variation in *Taricha spp.* populations and characterization of immune response to emergent pathogens



PhD Student Quantitative Biology • University of Texas at Arlington

@_TheUnagi

yeeann.wong@gmail.com
yeeann.wong@uta.edu

I'm Yixuan Li 李一璇

Call me: Yi-xuan or Amber

Pronouns: she/her

- PhD candidate
- Hong Kong Baptist University
- liyi-xuan@life.hkbu.edu.hk

About my research:

- Phylogeny of marine bivalves and other invertebrates
- Population genetics of bivalves
- Marine biology

Other Interests: Photography, NS …

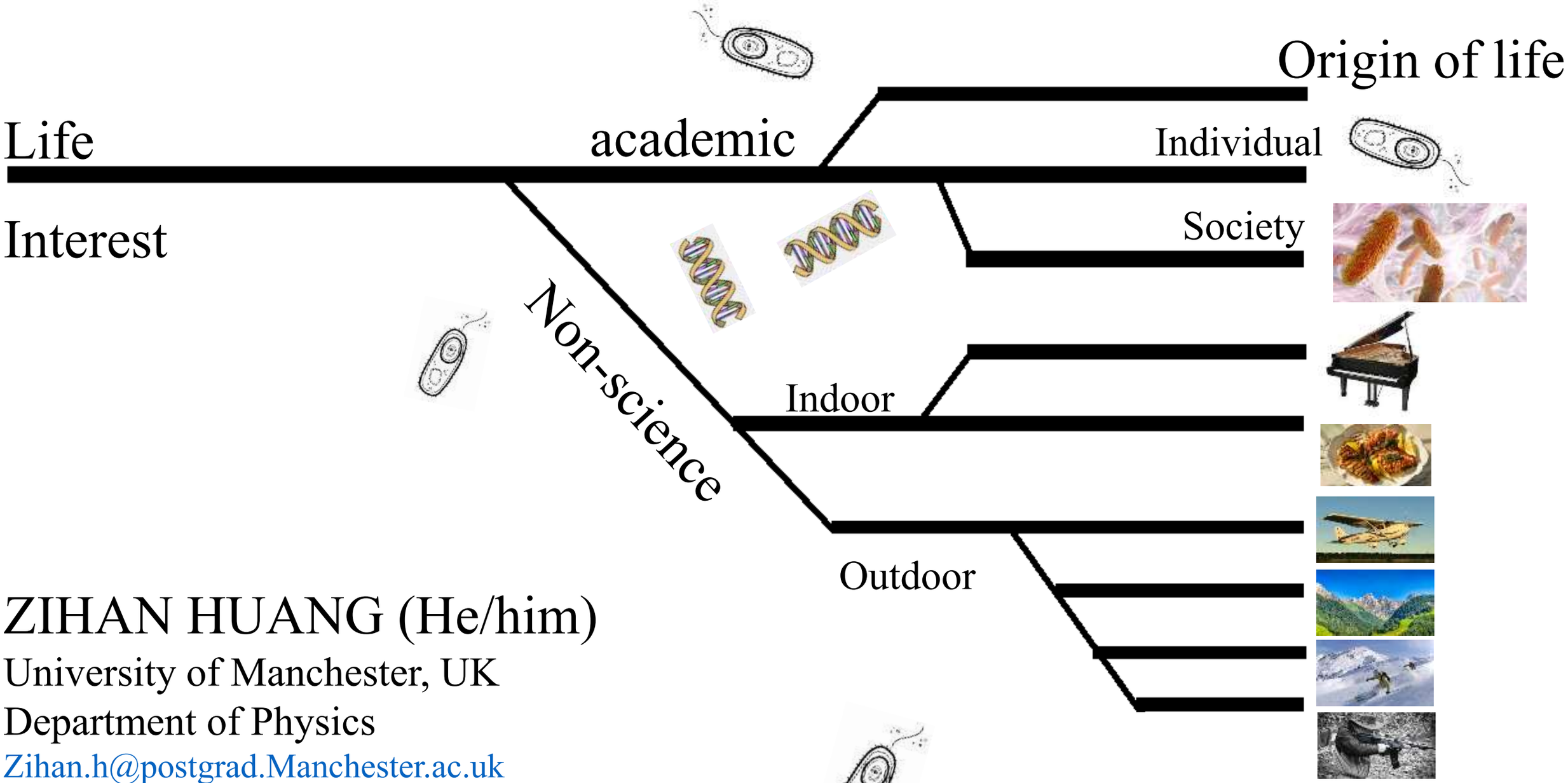
Anne Yoder (she, hers)

Duke University

Phylogenetics; genomics; speciation; conservation; all things Madagascar

Has been seen galloping about on horseback, dancing, lounging on the beach, and reading non-fiction (though not all at once)

anne.yoder@duke.edu



ZIHAN HUANG (He/him)
University of Manchester, UK
Department of Physics
Zihan.h@postgrad.Manchester.ac.uk

Yamamoto

Coffee break