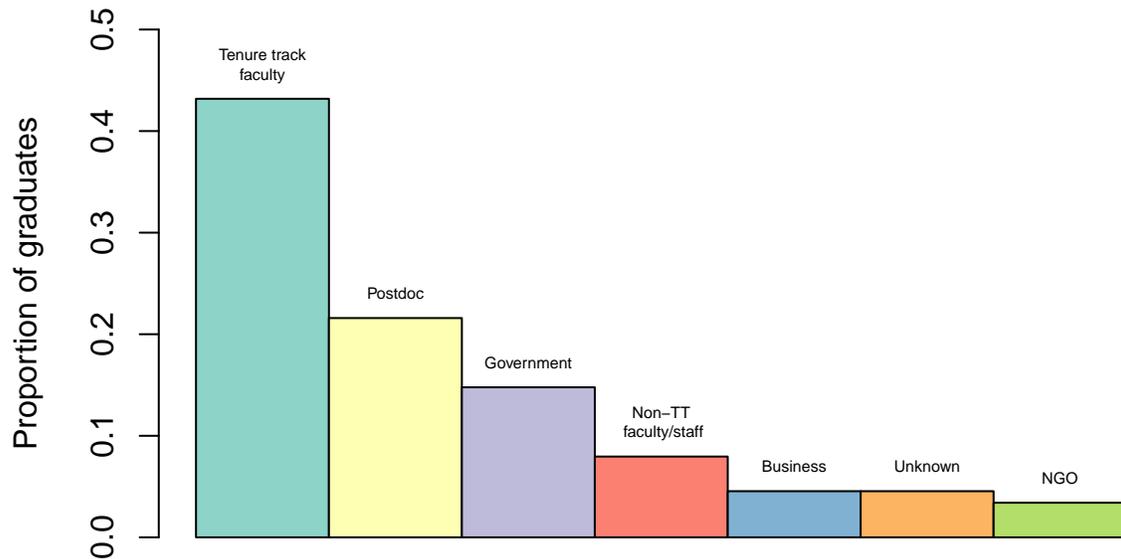


# Join the Department of Ecology and Evolutionary Biology at the U. of Tennessee, Knoxville, to earn your Masters or PhD degree

## Program Highlights

- Growing department: **3 new tenure track faculty** starting Aug. 2016, 2+ new faculty in 2017.
- Our students have published **over 80 papers** in 2015-2016: *Science*, *Ecology*, *Systematic Biology*, *Proceedings of the Royal Society B*, *American Naturalist*, *Biological Invasions*, *Journal of College Science Teaching*, and many more.

## All PhD Graduates 2000–2015



- **Resources to support student research**, in addition to external funding (i.e., internal funds, DNA sequencing facility, computer clusters, field station, boats).
- Available training in **teaching best practices**, including a certificate in college teaching and training consistent with AAAS national recommendations.
- Active initiatives to **improve diversity** in science (i.e., Program for Excellence & Equity in Research, EEB Women in Science).
- Grad students receive **health insurance** and a tuition waiver, but are still responsible for fees.
- 64% of students supported by TAing, 36% by fellowships, research, or training grants.
- One in twelve students has received **NSF Graduate Research Fellowship** funding.
- Last year students received over **\$421K in external funds** (in addition to internal research funds).
- Extensive outreach and service opportunities: students do invasive species removal, run taxonomic forays with the broader public, help organize Darwin Day Tennessee, mentor undergraduate and high school researchers, and much more.
- Students commonly develop their research projects in close partnership with NGOs, state and federal agencies and for profit companies to ensure their research has real-world impact.
  
- Nearby **locations for research**: Great Smoky Mountains N.P. (home to 17,000 documented species, including 1500 angiosperm, 200 bird, 66 mammal, and 67 fish species); numerous cave systems; campus greenhouses; experimental plots; and much more.
- Vibrant community: 86 miles of greenways and trails in Knoxville, many festivals and parades, museums, live music, and more.

- Active departmental graduate student organization (GREBE) to **represent and help graduate students**.

**Potential students should contact advisors before applying:** we only accept students into a lab (no rotations). For more information, go to <http://eeb.bio.utk.edu/graduate-studies/application-information/>. Application **deadline Jan. 1, 2017**.

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## Faculty seeking students and sample questions

This list is not exhaustive – indeed, far from it. There are other faculty members who will be recruiting students in the Department. Also, the listed faculty members may recruit students who have different interests to those listed. But we prepared this list just to illustrate to prospective students some of the diversity of topics on which we envision recruiting, spanning conservation, macroevolution, global change ecology, molecular genetics, biology education and systematics, among many other topics.

Paul Armsworth (<http://web.utk.edu/~parmswor>)

- How can large-scale efforts to conserve biodiversity or ecosystem services, which are led by governments or international nonprofits, most effectively complement bottom-up conservation efforts led by local communities?
- Conservation organizations often have a hierarchical management structure – how effectively do hierarchies allocate resources to support conservation of biodiversity and ecosystem services?

Joe Bailey (<http://web.utk.edu/~jbaile29/Default.html>)

- How will species range dynamics drive genetic divergence? How do feedbacks reinforce patterns of genetic divergence on the landscape?
- Does contemporary evolution along the gradients of global change alter ecosystem function?

Jessica Budke (<http://jmbudke.github.io>)

- What morphological and transcriptomic changes do plant species undergo transitioning from terrestrial to aquatic habitats? How do we resolve relationships between morphologically austere taxa?
- What are the functional roles of maternal structures for offspring survival, development, and fitness?

Nina Fefferman (<http://eeb.bio.utk.edu/people/nina-fefferman/>)

- How do different types of selective pressures on individuals shape the evolution of animal social systems?
- What role (if any) does infectious disease play in conservation management planning for endangered populations?

Jim Fordyce (<http://web.utk.edu/~jfordyce>)

- How does among population variation in plant phenotype affect population structuring of herbivores?
- What role does host breadth play in range size and diversification rate of herbivorous insects?

Sergey Gavrilets (<http://www.tiem.utk.edu/~gavrila>)

- How can we understand better theoretically the origins of new species and the links between micro-evolutionary processes and macro-evolutionary patterns?
- How did human social complexity evolve and what are the implications of our evolutionary past for our social behavior?

Mike Gilchrist (<http://eeb.bio.utk.edu/peopletwo/michael-gilchrist>)

- How do assembly costs and translation errors shape selection on codon usage and how do they play themselves out in the face of biased mutation and genetic drift?
- Some pathogens replicate intracellularly within hosts and move between host cells through budding or bursting. How does the rate of intracellular replication affect the rates of immune response clearance by the host? How, in turn, does this lead to changes in the survival of the host and transmission of the pathogen between hosts?

Lou Gross (<http://www.tiem.utk.edu/~gross/>)

- How are biological processes integrated across scales and levels of biological resolution from within organism level to those operating at population/community/landscape levels?
- How do we effectively utilize mathematical and computational methods for spatial control – what to do, where to do it, when to do it, and how to assess the resulting solutions – for problems in epidemiology, invasive species management and conservation biology?

Karen Hughes (<http://eeb.bio.utk.edu/peopletwo/karen-hughes/>)

- The diversity of fungal species is vastly underestimated. This is a function of cryptic species hidden within a single “common” species, incorrect assumptions about fungal species distributions and inadequate sampling. For common saprobic mushroom species, what proportion harbor cryptic species and what environmental or genetic factors determine cryptic speciation patterns?
- Hybridization is not widely recognized as an evolutionary process in fungi. When hybridization occurs, what is the outcome? Does hybridization result in hybrid swarms or is the hybrid an evolutionary dead end?

Susan Kalisz (<http://kaliszlab.weebly.com/>)

- How do invaders and antagonistic interactions alter soil fungal communities, the function of key plant mutualisms and shape the demography and life history evolution of native community members?
- What role does the ecological context, specifically selection driven by the absence of mates and pollinators, play in the evolution of selfing and genomic changes within and between species? Is selfing an evolutionary dead end or a reversible mating system?

Charlie Kwit (<http://www.charleskwit.com>)

- What are the effects (actual and predicted) and ramifications of land-use and climate change, management, and disturbance on biodiversity in natural, managed, and agricultural settings?
- What important roles do animals play in the seed dispersal process in animal-mediated seed dispersal systems?

Brandon Matheny (<http://www.bio.utk.edu/matheny/Site/Home.html>)

- How can we recognize species of mushroom-forming fungi? Why are there so many species of fungi? How are they related to each other, and what factors have promoted their diversification?

- What are general biogeographical patterns in fungi? What processes are responsible for patterns we observe?

Gary McCracken (email: gmccrack@utk.edu)

- How do highly mobile predators (bats) track ephemeral and patchy resources (insects) in three dimensional space?
- Why are some host species associated with a greater diversity of viral pathogens than are other host species?

Susan Riechert (email: sriecher@utk.edu)

- What is the importance of behavior in adapting animal populations to different and changing environments?
- What factors limit local adaptation to environmental context and why do weaker strategies persist?

Ed Schilling (<http://www.bio.utk.edu/schilling>)

- What is the parentage of the presumed allopolyploid lettuces (*Lactuca*) in North America, how many species are present, when did they arrive from Eurasia, what has been the consequence of polyploidy for their biology and evolution.

Beth Schussler (<http://www.bio.utk.edu/SchusslerLab>)

- How can biology programs enhance graduate student instruction of introductory biology courses?
- How do instructor active learning practices relate to student perception of their effectiveness in large introductory biology classes?

Jen Schweitzer (<http://jenschweitzer.com>)

- Under what varied circumstances do soils and soil microbial communities determine plant traits and act as selective agents?
- What is the role of plant-pollinator interactions on soil processes?

Kimberly Sheldon (<http://www.biogeographyresearch.org/>)

- What are the processes generating spatial patterns of biodiversity? What are the roles of biotic and abiotic factors in determining species' range limits?
- How do population-level variation in physiology and climatic variation affect predictions of the impacts of climate change?

Dan Simberloff (<http://eeb.bio.utk.edu/peopletwo/daniel-simberloff>)

- What are the direct and indirect effects of particular plant invasions? A direct effect might be shading, for example, or allelopathy, while an indirect effect might be changing the nutrient cycle (e.g., for instance, by being a nitrogen fixer) or the fire regime.
- What are the non-target impacts of particular insects introduced for biological control?

Randy Small (<http://web.utk.edu/~rsmall>)

- What is the role of polyploidy in governing the success (in terms of species richness) of plant lineages? Why are some polyploid lineages highly diverse, while others are not?
- What can contemporary patterns of genetic variation within and among populations tell us about species boundaries and the process of speciation?

Joe Williams (<http://eeb.bio.utk.edu/people/two/joseph-williams-jr>)

- What are the causes/consequences of diversification of reproductive traits in plants?
- How does a particular reproductive trait, or set of traits, in a clade of plants develop and how does it contribute to diversification of the clade?