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TERESA J. FEO

Curriculum vitae

Yale University
Dept. of Ecology and Evolutionary Biology
Peabody Natural History Museum

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Education

present — Ph.D Yale University
Dept. Ecology and Evolutionary Biology, Advisor: Richard Prum
expected graduation May 2015

2007 — B.A. University of California, Berkeley
Dept. Integrative Biology, Advisor: Kevin Padian

Peer-reviewed Publications

8. **Feo, T.J.**, J.M. Musser, J. Berv, and C.J. Clark. (2015). Divergence in morphology, calls, song, mechanical sounds and genetics supports species status for the Inaguan hummingbird (Trochilidae: *Calliphlox "evelynae" lyrura*). *The Auk,* 132:248-264. DOI: 10.1642/AUK-14-108.1
7. **Feo, T**. J. and R. O Prum. (2014). Theoretical morphology and development of flight feather vane asymmetry with experimental tests in parrots. *Journal of Experimental Zoology. Part B, Molecular and Developmental Evolution*, 322:240–255. doi:10.1002/jez.b.22573
6. Clark, C. J., **T. J. Feo**, and W. von Drogen. (2013). Sounds and courtship displays of Peruvian Sheartail, Chilean Woodstar, Oasis Hummingbird, and a Peruvian Sheartail × Chilean Woodstar. *The Condor*, 115:558-575
5. Clark, C. J., **T. J. Feo**, and K. B Brian. (2012). Courtship Displays and Sonations of a Hybrid Male Broad-Tailed × Black-Chinned Hummingbird. *The Condor*, 114:329-340
4. Clark, C. J., **T. J. Feo,** and I. Escalante. (2011). Courtship displays and natural history of the Scintillant (*Selasphorus scintilla*) and Volcano (*S. flammula*) hummingbirds. *Wilson Journal of Ornithology*, 123:218-228
3. **Feo, T. J.** and C. J. Clark. (2010). The displays and sonations of the Black-chinned Hummingbird (Trochilidae: *Archilochus alexandri*)**.** *The Auk* 127: 787-796
2. Clark, C.J. and **T.J Feo.** (2010). Why do *Calypte* hummingbirds "sing" with both their tails and their syrinx? An apparent example of sexual sensory bias. *Am. Nat.*175:27-37
1. Clark, C.J. and **T.J. Feo.** (2008). The Anna's Hummingbird chirps with its tail: a new mechanism of sonation in birds. *Proceedings of the Royal Society, Part B*, 275:955-962.

Awards and Honors

2007 — Phi Beta Kappa

Grants and Fellowships

2014 EEB Chair's Graduate Student Fund
2011 EEB Chair's Graduate Student Fund
2010 National Science Foundation Graduate Research Fellow

Invited Talks

2015 Hartford Bird Club, Hartford, CT
2014 New Haven Bird Club, New Haven, CT

Conference Presentations

13. Feo, T.J., D.J. Field, and R.O. Prum. (2015). Comparison of barb geometry in modern and Mesozoic asymmetrical flight feathers reveals a transitional morphology during the evolution of avian flight. *Oral Presentation.* Society of Integrative and Comparative Biology, 3-7 Jan, West Palm Beach, Florida
12. Feo, T.J., D.J. Field, and R.O. Prum. (2014). The morphological evolution of asymmetrical flight feathers. *Oral Presentation.* 26th International Ornithological Congress, 18-24 August, Tokyo, Japan.
11. Feo, T.J. and R.O. Prum. (2014). Using models of feather shape development to explore how development structures diversity. *Oral Presentation.* Avian Model Systems, 5-8 Mar, Cold Spring Harbor, New York
10. Feo, T.J. and R.O. Prum. (2014). Not all asymmetric feathers are created equal: a survey of flight feathers reveals several asymmetric strategies. *Oral Presentation*. Society of Integrative and Comparative Biology, 3-7 Jan, Austin, Texas
9. Feo, T.J. and R.O. Prum. (2013). The theoretical morphology and development of vane asymmetry in flight feathers. *Oral Presentation.* American Ornithologists' Union, 14-17 Aug, Chicago, Illinois
8. Feo, T.J. (2013). The developmental basis of flight feather asymmetry. *Oral Presentation*. Yale Dept. Ecology and Evolution Graduate Student Research Symposium. May 3, New Haven, Connecticut.
7. Feo, T.J. and R.O. Prum. (2013). Uncovering the morphological and developmental basis of vane asymmetry in flight feathers. *Poster Presentation.* Society for Integrative and Comparative Biology, Jan 3-7, San Francisco, California
6. Feo, T.J. (2012). Theoretic morphology of vane asymmetry in flight feathers. *Oral Presentation*. Yale Dept. Ecology and Evolution Graduate Student Research Symposium. Apr 27, New Haven, Connecticut.
5. Feo, T.J. and R.O. Prum. (2012). A revised model of feather shape development. *Poster presentation*. Society for Integrative and Comparative Biology, Jan 3-7, Charleston, South Carolina.
4. Feo, T.J., C.J. Clark, and R.O. Prum. (2010). Exploring the diversity of sonations in neo-tropical "Bee" Hummingbirds. *Poster presentation*. International Ornithological Congress, Aug 22-28, Campos do Jordão, São Paulo, Brazil
3. Feo, T.J. (2008). The Black-chinned Hummingbird sings with the tip of his tail; a second mode of feather flutter. *Oral presentation.* Animal Acoustics, Aug 12-15, Corvalis, Oregon

2. Feo, T.J. (2008). The Black-chinned Hummingbird sings with the tip of his tail; a second mode of feather flutter. *Oral presentation.* American Ornithological Union, Aug 4-8, Portland, Oregon
1. Feo, T.J. (2008). Could the Hadrosaurs Sing? A re-evaluation with new evidence. *Oral presentation.* Society for Integrative and Comparative Biology, Jan 2-6, San Antonio, Texas

Curatorial and Field Work Experience

2009-2014 Specimen preparation, Yale Peabody Museum, Yale University, CT

2011-2012 Specimen preparation, Museum of Wildlife and Fish Biology, UC Davis, CA

2006-2011 Field research on the courtship displays of hummingbirds
- USA (CA, CT, TX), The Bahamas, Costa Rica, Columbia, Chile

2008-2009 Lab Assistant, Museum of Vertebrate Zoology, UC Berkeley, CA
- Lead curator of 5th largest audio collection in USA

2007-2009 Field Volunteer, Museum of Vertebrate Zoology, UC Berkeley, CA
- Field collecting, surveys, specimen preparation in CA

2006-2009 Specimen preparation, Museum of Vertebrate Zoology, UC Berkeley, CA

2008 Field Technician, Museum of Vertebrate Zoology, UC Berkeley, CA
- Conducted point count transects of birds in southern Sierras

2007-2008 Biological Technician, Condor Country Consulting, Martinez, CA
- Construction monitoring, wildlife surveys, preparation of technical reports

Teaching Experience

The Evolution of Beauty (2014), TA
Ornithology (2011, 2013), TA
Ornithology Lab (2011, 2013), TA
Evolution Ecology and Behavior (2010), TA

Professional Service

2013 Lead organizer for the *2013 joint Division of Vertebrate Morphology, Division of Comparative Biomechanics, Northeast Regional Meeting of the Society for Integrative and Comparative Biology* meeting, 26 Oct, New Haven, CT
- The meeting was attended by 95 researchers from 17 institutions across the northeast, presenting 45 talks.

2012-2013 Organizer for the *Yale Dept. Ecology and Evolution Graduate Student Research Symposium*. New Haven CT.

Peer Reviewer:
Journal of Experimental Zoology. Part B, Molecular and Developmental Evolution
Journal of Morphology

Media Coverage

2010 PBS *Nature* "Hummingbirds: Magic in the Air"

2008 Science; BBC News; National Geographic News; New Scientist; Quirks and Quarks (CBC radio); Discovery News; LiveScience; DDP; London Daily Telegraph; COSMOS Magazine; ABC Channel 7 News; San Francisco Chronicle; Current Biology; Australian Broadcasting Corporation; New York Times; The Daily Californian; Discovery Channel; Nature; Popular Science; Birding Magazine; KNOW magazine; GEO magazine; Audubon Magazine; Berkeley Science Review; California Magazine; (Berkeley Press Release)

Public Outreach

2013-2014 Mentor of undergraduate research projects

2011-2014 Member of Evolution Outreach Group, http://evolutionoutreach.org/

2009-2014 Tour guide for research collections, Yale Peabody Museum

2010 Yale Peabody Museum EVOLUTIONS After School Program volunteer

Professional Memberships

American Ornithologists' Union

Wilson Ornithological Society

Society for Integrative and Comparative Biology

Research Interests

My research relies heavily on natural history collections to investigate key aspects of avian biology, evolution, and natural history. I am particularly interested in the evolution and development of feather diversity. Feathers display an unparalleled level of diversity in form and function that is important for many major aspects of avian biology including flight and courtship. Moreover, feathers have become a popular study system in the field of evo-devo for investigating the role of development in structuring phenotypic diversity.

My own research has focused on two different aspects of feather diversity: the evo-devo of asymmetrical flight feathers across the evolutionary history of birds, and the role of sound-producing feathers in the courtship displays of hummingbirds. My research on flight feathers is the product of my dissertation research under the direction of Dr. Richard Prum at Yale University. Relying on a combination of theoretical modeling and empirical investigations, I have identified fundamental aerodynamic adaptations of asymmetrical flight feathers in both modern birds and feathered dinosaurs and have identified transitional flight feather morphology during their evolutionary history. This research has refined our understanding of the origin and incremental evolution of avian flight.

My research on hummingbirds is the product of an ongoing collaboration with Dr. Chris Clark at UC Riverside. Relying on extensive fieldwork in 5 countries, I have documented the use of uniquely shaped feathers to produce sounds in the courtship displays of hummingbirds. This research has expanded our understanding of a unique from of acoustic signaling. In both of these projects I have advanced our understanding of the evolution and development of feather diversity and avian biology with 3 first authored papers and 5 second authored papers.