

PROMOTION RECOMMENDATION
The University of Michigan
College of Literature, Science, and the Arts

Elizabeth A. Tibbetts, associate professor ecology and evolutionary biology, with tenure, College of Literature, Science, and the Arts, is recommended for promotion to professor of ecology and evolutionary biology, with tenure, College of Literature, Science, and the Arts.

Academic Degrees:

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| Ph.D. | 1992 | Cornell University |
| B.Sc. | 1998 | University of Michigan |

Professional Record:

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| 2012 – present | Associate Professor, Department of Ecology and Evolutionary Biology, University of Michigan |
| 2005 – 2012 | Assistant Professor, Department of Ecology and Evolutionary Biology, University of Michigan |
| 2003 – 2005 | Post-doctoral Fellow, Arizona Research Labs, University of Arizona |

Summary of Evaluation:

Teaching – Professor Tibbetts has proven to be a remarkably effective teacher at both the undergraduate and graduate levels. She teaches “Introduction to Animal Behavior,” “Behavioral Ecology,” and a graduate biology seminar course. By employing active teaching methodologies that encourage discussion and bringing empirical examples into the classroom, Professor Tibbetts engages her students and generates enthusiasm in them for biology in general and animal behavior specifically. She is a superb mentor of both undergraduate and graduate students. Besides directly supervising 41 undergraduate students, and 45 that have worked in her laboratory under the supervision of her graduate students, Professor Tibbetts has served as advisor for five Ph.D. students (two have graduated) and two Masters students (who have graduated). Her graduate students have received numerous awards, including National Science Foundation Dissertation Improvement Grants and national society research awards, and they have successfully transitioned into instructional and research careers in biology. Twelve of the undergraduate students who worked in her laboratory are currently attending graduate school in biology. These students consistently comment on the dynamic environment that Professor Tibbetts creates in her laboratory and how helpful she has been as a mentor.

Research – Professor Tibbetts’ research centers on fundamental questions regarding animal communication, with outstanding contributions to several areas of research, including signal evolution, behavioral endocrinology, and cognitive science. Such breadth is exceedingly rare in animal behavior and it is a testament to her strengths in designing experiments, but also to her talents in developing a system for probing different dimensions of animal behavior. Professor Tibbetts has established an experimentally tractable system for studying signals of fighting ability in wasps (*Polistes dominulus* and *Polistes fuscatus*). Using an array of techniques, she has developed a deep understanding of communication in *Polistes* wasps. The combined expertise in these areas has clearly contributed to her groundbreaking work, and there are very few researchers that link these areas on such a high level of scholarship without losing sight of

the bigger questions in biology. As such, Professor Tibbetts is one of the stars in her field of study as she pushes boundaries in pursuit of answers to classic questions about the evolution of conventional signals and social behavior.

Recent and Significant Publications:

- “Socially selected ornaments influence hormone titers of signalers and receivers,” with K. Crocker and Z. Y. Huang, *Proceedings of the National Academy of Sciences*, 2016, p. 02707.
- “Socially selected ornaments and fitness: Signals of fighting ability in paper wasps are positively associated with survival, reproductive success, and rank,” with T. Forrest, et al., *Evolution*, 69(11), 2015, pp. 2917-2926.
- “Advertised quality and resource value affect aggression and social vigilance in paper wasp contests,” with A. Injaian, *Animal Behaviour*, 102, 2015, pp. 259-266.
- “The challenge hypothesis across taxa: Social modulation of hormone titres in vertebrates and insects,” with K. C. Crocker, *Animal Behaviour*, 92, 2014, pp. 281-290.

Service – Professor Tibbetts has continued to provide the service and leadership within her department and university, and nationally and internationally that she established early in her career at Michigan. Since her last promotion, she has served on several important departmental and university committees, including chairing two faculty searches and several graduate student committees. Externally, Professor Tibbetts has served in an editorial role for two of the leading journals in her field, reviewed manuscripts for several science journals, and served on review panels for the National Science Foundation and other U.S. and international funding agencies.

External Reviewers:

Reviewer (A)

“She combines a deep understanding of natural history with her rigorous approach to signaling function. Her studies on a wide range of wasp species have resulted in fascinating discoveries about the evolution of communication systems.”

Reviewer (B)

“She has an absolutely unique approach to combining social insect behaviour research with neuroscience, physiology and an evolutionary perspective. It is clearly because of the combined expertise in all of these areas that she has managed to publish such ground-breaking work. There are very few scholars who link these areas on such a high level.”

Reviewer (C)

“Elizabeth made milestone discoveries concerning visual recognition and signaling in insects, and her theoretical considerations on the function, plasticity and evolution of signals are of general interest to anyone who works in the field of communication biology. She has now published more than 60 papers, almost all in the best journals of the field.”

Reviewer (D)

“Dr. Tibbetts has published, quite literally, textbook examples of communication of individual identity in animal behavior. She very cleverly observed that wasps have individual facial patterns, and from this she has developed a highly regarded research career.”

Reviewer (E)

“In terms of her contributions to our field...Tibbetts has recently advanced and supported two key ideas that I think are transformative. First is the idea that understanding sensory adaptation for signal detection needs to be part of any complete analysis of the evolution of a signaling system. ... The second critical idea Dr. Tibbetts has advanced recently...is the notion that there can be a dynamic and reciprocal interaction between behavior, physiology, and ornamentation, which changes the equation for our understanding of how reliable (or ‘honest’) signaling can evolve and be maintained by social selection. This is not an entirely novel idea, but... Dr. Tibbetts’ explanation for how this can work and the empirical data she brings to bear to support the idea are by far the clearest to date.”

Reviewer (F)

“Altogether, Dr. Tibbetts’ work provides the strongest case that social costs stabilize a signal’s reliability that I know of for any signaling system. As the social cost idea is a major hypothesis with respect to signal reliability, this conclusion is a strong endorsement of the work’s importance.”

Reviewer (G)

“Overall, Dr. Tibbetts is a highly productive, well funded scientist doing some of the most exciting, frontline research in her field in the world. She is widely viewed as one of the top stars in her field. ... I give her candidacy my very, very strong support.”

Summary of Recommendation:

Professor Tibbetts is a world-renowned scholar who has made significant contributions to the study of communication systems and social behavior. She is also an excellent teacher and mentor, and an engaged and valued citizen. The Executive Committee and the College of Literature, Science, and the Arts and I recommend that Associate Professor Elizabeth A. Tibbetts be promoted to the rank of professor of ecology and evolutionary biology, with tenure, College of Literature, Science, and the Arts.



Andrew D. Martin, Dean
Professor of Political Science and Statistics
College of Literature, Science, and the Arts

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