

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

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

Academic Degrees:

Ph.D.	2008	Yale University
M.S.	2005	Yale University
B.A.	2003	Sarah Lawrence College

Professional Record:

2012 – present	Assistant Professor, Department of Ecology and Evolutionary Biology, and affiliation with the Department of Computational Medicine and Bioinformatics, Medical School, University of Michigan
2010 – 2011	iPlant Post-doctoral Researcher, Brown University
2008 – 2010	NESCent Post-doctoral Fellow, National Evolutionary Synthesis Center, Duke University

Summary of Evaluation:

Teaching – Professor Smith has been responsible for teaching the core course of Evolution (EEB 390) as well as Phylogenetic Methods and Theory (EEB 491) and the Biology Seminar (EEB 800). His approach to these courses is to incorporate active learning and students have responded with outstanding evaluations. Over the past six years, Professor Smith has mentored three graduate students, several undergraduate students, and seven post-doctoral researchers. Those who have completed their stays in Professor Smith’s lab have gone on to very successful positions. He has also increased the intellectual interaction among faculty, students, and post-docs in the department and beyond with his direction of informal discussion groups on phylogenetics, plant evolution, and macroevolution over five different years. Outside of Michigan, he co-taught an annual workshop in Computational Molecular Evolution sponsored by the Sanger Wellcome Trust Genome Center in Cambridge, England and Crete, Greece. He also developed a series of workshops for high school teachers enabling them to include topics on genomic research into their curricula. Professor Smith has excelled at all levels of teaching and has shown exceptional mentoring abilities that extend to the international level.

Research – Professor Smith’s unique research skills include expertise in computational phylogenetics and plant biodiversity, and represent a rare combination of talents that underlie his very successful research program. He makes significant contributions through his own analyses and generation of genomic data. His body of work highlights the discoveries and insights that can be made about patterns of molecular, geographic, and phenotypic evolution that were mostly intractable before the genomic revolution and development of novel analytical tools. His contributions to synthetic collaborative phylogenetic projects have propelled the phylogenetic community forward through his development of widely used analytical software. His work on the first-ever attempt to assemble “the” tree of life based on an analysis of over three million

species made a huge splash in terms of public attention, but it also revolutionized the evolutionary questions we can ask about genomes and phenotypes. The impact of the methodological frameworks that Professor Smith has developed extends far beyond his research program: his methodologies are applied by many researchers because he takes the time to produce well documented programs as a general service to the community. This practice spans his entire career, including what has become an extremely popular software program, *Lagrange*, that implements likelihood models for range evolution on phylogenetic trees, which has become widely cited in studies of historical biogeography. Evidence that Professor Smith's research is significant can be found in the top journals in which he publishes and the outstanding level of funding he has received from the National Science Foundation in support of his research.

Recent and Significant Publications:

- “Synthesis of phylogeny and taxonomy into a comprehensive tree of life,” with C. S. Hinchliff, *PNAS*, 2015, <https://doi.org/10.1073/pnas.1423041112>.
- “Analysis of phylogenomic datasets reveals conflict, concordance, and gene duplications with examples from animals and plants,” with Y. Yang, et al., *BMC Evolutionary Biology*, 2015, <https://doi.org/10.1186/s12862-015-0423-0>.
- “Dissecting molecular evolution in the highly diverse plant clade Caryophyllales using transcriptome sequencing,” with Y. Yang, et al., *Molecular Biology and Evolution*, 2015, <https://doi.org/10.1093/molbev/msv081>.
- “Orthology inference in nonmodel organisms using transcriptomes and low-coverage genomes: improving accuracy and matrix occupancy for phylogenomics,” with Y. Yang, *Molecular Biology and Evolution*, 31, 2014, pp. 3081-3092.

Service – Professor Smith's service to the department, college, and the external community has been outstanding. He has served on the departmental Executive, Undergraduate Affairs, and Nominations committees. He also served on the LSA Nominating, Library, Race and Ethnicity, and IT Faculty Advisory committees. Professor Smith regularly reviews manuscripts for both general science journals and specialty journals. He is currently an associate editor of *Systematic Biology*, a top journal in his field. He has been a guest editor for a special issue of *American Journal of Botany* on “Tree of Life” project. Professor Smith has reviewed grants for the National Science Foundation as an ad hoc reviewer and as a panelist. He provided a major service to his research community by writing and sharing seven computer programs used for various tasks in phylogenetics.

External Reviews:

Reviewer (A)

“Stephen has a knack for aggregating and analyzing enormous amounts of data to address important questions in biology. Furthermore, he is increasingly synthesizing entirely new data sets as he moves more squarely into the realm of comparative genomics.”

Reviewer (B)

“Stephen has helped to build the phylogenetics community not only through his megaphylogenetic collaborations, but, very concretely, through the development of widely used software for analyzing biogeography and divergence times, and (more recently) for synthesizing phylogenetic trees and taxonomies.”

Reviewer (C)

“If I were to compile a list of the most significant publications in the field, Dr. Smith’s work since he started at Michigan would be on it. In particular, *Synthesis of phylogeny and taxonomy into a comprehensive tree of life*, which he was co-first author on, set out many of the major challenges of constructing phylogenies at the largest scale and made important progress on some of them. It has been a provocative paper that is central to many important conversations about where to go next as a field. He has also tackled head-on one of the biggest challenges in genome-scale phylogenetics – the impact of heterogeneous molecular evolution processes and how to accommodate the intrinsic conflict they can create.”

Reviewer (D)

“...his work on empirical phylogenetics alone would merit promotion, but this interdisciplinary combination of areas is what sets him apart from many of his peers. His many software contributions to multiple areas of phylogenetics are widely recognized, and for good reason.”

Reviewer (E)

“Dr. Smith is a world-renowned leader in our field. His work is completely original and groundbreaking. I would put him among a very small group of intellectual leaders in the field of software development for phylogenetics. ... In my opinion, he is among the top 2 or 3 assistant professor-level evolutionary biologists in the whole world.”

Reviewer (F)

“Stephen Smith is an evolutionary biologist who develops innovative bioinformatics and computational tools, in particular in the field of phylogenetics, to describe and explain broad scale evolutionary patterns, such as variations in rates of molecular evolution across species groups. He applies his approaches primarily, but not only, to plant evolution. I know best [sic] Stephen Smith for his efforts to develop tools for constructing (very) large phylogenetic trees. In my frank opinion the candidate is one of the very best researchers in this area.”

Summary of Recommendation:

Professor Smith is a world-renowned scholar who has made significant contributions to the computational advances that are shaping the field of phylogenomics. The Executive Committee and the College of Literature, Science, and the Arts and I recommend that Assistant Professor Stephen A. Smith be promoted to the rank of associate 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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