

Curriculum Vitae

July, 2018

Dr. Joseph H. (Joe) Williams
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Current position

Professor and Director of Graduate Studies (2015-present), Department of Ecology and Evolutionary Biology, University of Tennessee, Knoxville, TN (UTK)

Previous appointments

Associate Professor (2009-2015), Department of Ecology and Evolutionary Biology, UTK
Assistant Professor (2005-2009), Department of Ecology and Evolutionary Biology, UTK
Assistant Professor (2003-2005), Department of Botany, UTK
Research Associate (2000-2003), Department of Ecology and Evolutionary Biology, University of Colorado, Boulder, CO

Education

Ph.D., Genetics (2000), University of Georgia, "Evolution of a broad diploid-polyploid birch (*Betula*) hybrid zone."
M.S., Biology (1994), New Mexico State University, "The effect of pollen quality on reproductive success between two sympatric oak species."
A.B., Fine Arts (1981), Stanford University.

Grants and Awards

External

National Science Foundation – 2011-2015. "The evolution of development of flowering plant reproductive cycles." **\$421,956.**
National Science Foundation Dissertation Improvement Grant (Mackenzie Taylor) – 2009-2010. "Evolution of development of the progamic phase in Nymphaeales." **\$10,974.**
National Science Foundation – 2007-2010. "The early evolution of mate recognition in angiosperms: *Austrobaileya scandens*." **\$222,000.**
National Science Foundation – 2007. REU summer support for two undergraduates. **\$6000.**
NSF/USDA/DOE. 1994 – 2000. Mechanisms of Plant Evolution Graduate Fellowship (University of Georgia). **(5 ½ years of tuition plus \$5000/yr research funds)**
Sigma Xi Grant-In-Aid of Research. 1993. "Mechanisms of Reproductive Isolation in Two Hybridizing Species of Oaks." **\$589.**

Commission on Higher Education Graduate Student Research Project Award (New Mexico).
1993. "Reproductive Isolation in Two Sympatric Oak Species." **\$250.**

Internal

Tennessee Plant Research Center Exploratory Grant for Collaborative Research award. 2013.
"Myosins and the Evolution of Pollen Tube Growth." Co-PI with Andreas Nebenführ
(BCMB). **\$5,000.**

UT Arts and Sciences Instructional award – FY 2010 - For upgrading new Hesler plant sciences
classroom - **\$29,212.**

Haines-Morris Endowment Award – 2007 – "Seminar series on Emerging Infectious Diseases."
(with Mike Gilchrist, Gary McCracken, Lou Gross) - **\$6000.**

University of Tennessee Instructional Award – 2005. Camera system for light microscope in
teaching lab. **\$8000.**

New Mexico State University Biology department - Summer Research Award for Excellence in
Graduate Studies. 1993. "Mechanisms of Reproductive Isolation in Two Hybridizing
Species of Oaks." **\$1,800.**

New Mexico State University Biology Graduate Research Assistance Grant. 1993. **\$500.**

Publications

Reese, JB and **JH Williams**. *Submitted*. How do changes in genome size affect the
macroevolution of pollen tube growth rate, a haploid performance trait? *New Phytologist*

Williams, JH, and C Brown. 2018. Pollen has higher water content when dispersed in a
tricellular state than in a bicellular state. *Acta Botanica Brasilica* *In press*.

Bucksch, A, ...many others, **JH Williams**, and DH Chitwood. 2017. Morphological plant
modeling: unleashing geometric and topological potential within the plant sciences.
Frontiers in Plant Science 8:900. Doi: <https://doi.org/10.3389/fpls.2017.00900>

Wallace, S and **JH Williams**. 2017. Evolutionary origins of pectin methylesterase genes
associated with novel aspects of angiosperm pollen tube walls. *Biochemical and
Biophysical Research Communications* 487: 509-516.
<http://dx.doi.org/10.1016/j.bbrc.2017.04.027>

Williams, JH, and S. J. Mazer. 2016. Pollen - tiny and ephemeral but not forgotten: New ideas
on their ecology and evolution. *American Journal of Botany* 103: 365-374.

Williams, JH, JA Edwards and AJ Ramsey. 2016. Economy, efficiency and the evolution of
pollen tube growth rates. *American Journal of Botany* 103: 471-483.
In Special issue, *Ecology and Evolution of Pollen Performance* (co-organizer).

Williams, JH, Taylor, ML and BC O'Meara. 2014. Repeated evolution of tricellular (and
bicellular) pollen. *American Journal of Botany* 101(4): 559-571.

Braaten, CC, PB Matheny, DL Viess, MG Wood, **JH Williams**, NL Bougher. 2013. Two new
species of *Inocybe* from Australia and North America that include novel secotioid forms.
Botany 92: 9-22.

Williams, JH. 2012. Pollen tube growth rates and the diversification of flowering plant
reproductive cycles. *International Journal of Plant Sciences* 173:649-661.

Williams, JH. 2012. The evolution of pollen germination timing in flowering plants:
Austrobaileya scandens (Austrobaileyaceae). *AoB Plants* DOI: 10.1093/aobpla/pls010.
Editor's choice

- Taylor, ML and **JH Williams**. 2012. Pollen tube development in two species of *Trithuria* (Hydatellaceae) with contrasting breeding systems. *Sexual Plant Reproduction* 25:83-96.
- Abercrombie, JM, O'Meara, BC Moffatt, AR and **JH Williams**. 2011. Developmental evolution of flowering plant pollen tube cell walls: callose synthase (*CalS*) gene expression patterns. *EvoDevo* 2:14. *Highly accessed*
- Taylor, ML, Macfarlane, TD and **JH Williams**. 2010. Reproductive ecology of the basal angiosperm, *Trithuria submersa* (Hydatellaceae). *Annals of Botany* 106: 909-920.
- Williams, JH**, RT McNeilage, MT Lettre and ML Taylor. 2010. Pollen tube growth and the pollen tube pathway of *Nymphaea odorata* (Nymphaeaceae). *Botanical Journal of the Linnean Society* 162: 581-593.
- Taylor, MLT and **JH Williams**. 2009. Consequences of shifts in pollination syndrome for post-pollination biology in an ancient aquatic family. *International Journal of Plant Sciences* 170: 584-598.
- JP Bryant, TP Clausen, RK Swihart, SM Landhäusser, MT Stevens, CDB Hawkins, S Carrière, AP Kirilenko, AM Veitch, RA Popko, DT Cleland, **JH Williams**, W Jakubas, MR Carlson, K Lehmkhul Bodony, M Cebrian, TF Paragi, PM Picone, JE Moore, EC Packee, T Malone. 2009. Fire drives transcontinental variation in tree birch defense against browsing by snowshoe hares. *American Naturalist* 174: 13-23.
- Williams, JH**. 2009. *Amborella trichopoda* (Amborellaceae) and the evolutionary developmental origins of the angiosperm progamic phase. *American Journal of Botany* 96: 144-165.
- Thien, LB, Bernhardt, P, Devall, MS, Chen, Z-D, Luo, Y-B, Fan, J-H, Yuan, L-C, and **JH Williams**. 2009. The pollination biology of basal angiosperms (ANITA grade). *American Journal of Botany* 96: 166-182.
- Williams, JH**. 2008. Novelties of the flowering plant pollen tube underlie diversification of a key life history stage. *Proceedings of the National Academy of Sciences, USA* 105: 11259-11263. *Discovery magazine Top 100 Science story (2008)*
- Arias, T and **JH Williams**. 2008. Embryology of *Manekia naranjoana* (Piperaceae) and the origin of tetrasporic, sixteen-nucleate female gametophytes in Piperales. *American Journal of Botany* 95(3): 272-285.
- Friedman, WE, Madrid, E and **JH Williams**. 2008. Origin of the fittest and survival of the fittest: relating female gametophyte development to endosperm genetics. *International Journal of Plant Sciences* 169(1): 79-92.
- Williams, JH** and K Kennard. 2006. Microsatellite markers for the basal angiosperm *Austrobaileya scandens*. *Molecular Ecology Notes* 6(1): 201-203.
- Friedman, WE and **JH Williams**. 2004. Developmental evolution of the sexual process in ancient flowering plant lineages. *Plant Cell* 16: S1-S15.
- Williams, JH** and WE Friedman. 2004. The four-celled female gametophyte of *Illicium* (Illiciaceae; Austrobaileyales): Implications for understanding the origin and early evolution of monocots, eudicots and eumagnoliids. *American Journal of Botany* 91(3): 332-351.
- Friedman, WE, WN Gallup and **JH Williams**. 2003. Female gametophyte development in *Kadsura*: implications for Schisandraceae, Austrobaileyales, and the early evolution of flowering plants. *International Journal of Plant Sciences* 164(5): S293-S305.

- Friedman, WE and **JH Williams**. 2003. Modularity of the angiosperm female gametophyte and its bearing on the early evolution of endosperm in flowering plants. *Evolution* 57(2): 216-230.
- Williams, JH** and WE Friedman. 2002. Identification of diploid endosperm in an early angiosperm lineage. *Nature* 415: 522–526 (Cover story).
- Williams, JH**, WJ Boecklen and DJ Howard. 2001. Reproductive processes in two oak (*Quercus*) contact zones with different levels of hybridization. *Heredity* 87(6): 680-690.
- Williams, JH, Jr.** and ML Arnold. 2001. Sources of genetic structure in the woody perennial, *Betula occidentalis*. *International Journal of Plant Sciences* 162(5): 1097-1109.
- Godt, MJW, JL Hamrick, MA Edwards-Burke and **JH Williams**. 2001. Comparisons of genetic diversity in white spruce (*Picea glauca*) and jack pine (*Pinus banksiana*) seed orchards with natural populations. *Canadian Journal of Forest Research* 31(6): 943-949.
- Williams, JH, Jr.**, WE Friedman and ML Arnold. 1999. Developmental selection within the angiosperm style: using gamete DNA content to visualize interspecific pollen competition. *Proceedings of the National Academy of Sciences, USA* 96(16): 9201-9206.
- Arnold, ML, MR Bulger, JM Burke, AL Hempel and **JH Williams**. 1999. Natural hybridization - how low can you go (and still be important)? *Ecology* 80(2): 371-381.
- Howard, DJ, RW Preszler, **JH Williams**, S Fenchel and WJ Boecklen. 1997. How discrete are oak species? Insights from a hybrid zone between *Quercus grisea* and *Q. gambelii*. *Evolution* 51(3): 747-755.

Other publications

- Williams, JH**. 2010. *Book review*: Embryology of Flowering Plants: Terminology and Concepts, Volume 3: Reproductive Systems, edited by TB Batyгина. *Quarterly Review of Biology* 85: 510.
- Karasawa, MMG, Oliveira, GCX, **Williams, JH**, and Veasey, EA. 2009. Evolução das plantas com ênfase na forma de reprodução. In: *Diversidade Reprodutiva de Plantas - uma Perspectiva Evolutiva e Bases Genéticas*, edited by M. Karasawa. Editora Sociedade Brasileira de Genética, Riberão Preto, Brasil.
- Mellor, CJ with **JH Williams**. 2007. Translation of Schnarf, K. 1929. "Fertilization," pages 262-279. In Schnarf, K., *Embryologie der Angiospermen*. Handbuch der Pflanzenanatomie/ Band 10.2. Gebrüder Borntraeger, Berlin.
Available from: <http://www.bio.utk.edu/williams/>
- Williams, JH**. 2004. *Book review*: Plant Reproduction. *Annual Plant Reviews, Volume 6*, edited by S. D. O'Neill and J. A. Roberts. *Quarterly Review of Biology* 79: 208.

Contributions to textbooks

- Photo of pollen tube growth in style and ovary, in Raven et al. (2010, 2013). *Biology*, 9th and 10th editions. McGraw-Hill, NY.
- Photo of *Austrobaileya* flower, in Raven, PH, Evert, RF and SE Eichorn. 2012. *Biology of Plants*, 8th edition. WH Freeman, NY.

Editorial Boards

- American Journal of Botany* (2012 -) Associate editor

Plant Reproduction (2014 -) Associate editor
AoB Plants (2015 -) Associate editor
Nature Scientific Reports (2011-2014) Associate editor, Plant Biology section
Acta Botanica Brasilica (2013 -) Editorial committee (advisory)

Elected Positions

Botanical Society of America – Treasurer (2013-2016)
Botanical Society of America – Program director, Developmental & Structural section (2012-15)
Linnean Society of London – Fellow

Professional review experience

Average of 18 per year (past 3 years)

American Journal of Botany, Annales Botanici Fennici, Annals of Applied Biology, Annals of Botany, Annals of Botany Plants; Aquatic Botany, Botany, Biological Conservation, BMC Plant Biology, Botanical Journal of the Linnean Society, Forest Ecology and Management, Functional Ecology, International Journal of Plant Sciences, Journal of Biogeography, Journal of Heredity, Journal of the American Society of Horticultural Science, Marine Biology, Molecular Ecology, Nature Scientific Reports, New Forests, New Phytologist, Perspectives in Plant Ecology and Evolution, Philosophical Transactions of the Royal Society B, Plant Reproduction, Plants, Proceedings of the National Academy of Sciences USA, Proceedings of the Royal Society B, Protoplasma; ScienceAsia, Sexual Plant Reproduction, Turkish Journal of Botany, Western North American Naturalist, NSF proposals (Developmental Systems Cluster, Plant Genome Research Program, Evolutionary Genetics, Population and Evolutionary Processes), and various book chapters.

Invited seminars and symposia

University of Toronto, Department of Ecology and Evolutionary Biology. 2017. “Pollination to fertilization in the first angiosperms: a focal stage of evolutionary developmental innovation.” Toronto, Canada.

Arnold Arboretum, Harvard University. 2015. “Pines, orchids and oaks – some thoughts on slow fertilization syndromes.” Boston, MA

Brown University, Department of Ecology and Evolutionary Biology. 2015. “Pollen performance from a deep historical perspective.” Providence, RI

Symposium: The Evolution of Pollen Performance. 2014. “Pollen performance from a deep historical perspective.” Botanical Society of America meetings, Boise, ID. (Organizer)

23rd International Congress on Sexual Plant Reproduction. 2014. Repeated evolution of tricellular (and bicellular) pollen. Porto, Portugal.

University of Georgia, Department of Genetics. 2014. The macroevolution of pollen performance. Athens, GA.

Arnold Arboretum, Harvard University. 2012. “Intersecting ontogenies: the evolutionary developmental origins of the pollination to fertilization process of flowering plants.” Boston, MA

University of California, Davis. 2012. “Intersecting ontogenies: the evolutionary developmental origins of the pollination to fertilization process of flowering plants.” *First Esau Symposium: Integrating Structure and Function in Plants*. Davis, CA

University of Auckland, School of Biological Sciences. 2011. "How flowering plants got their rapid reproductive cycles and why it matters." Auckland, New Zealand.

18th International Botanical Congress. 2011. "Novel and ancient aspects of flowering plant pollen tubes and their pathways." Melbourne, Australia.

University of Florida, Department of Biology. 2010. "Consequences of pollen tube growth innovations for early angiosperm evolution." Gainesville, FL

10th Latin American Botanical Congress. 2010. "Consequences of pollen tube growth innovations for early angiosperm evolution." La Serena, Chile.

NSF-RCN steering committee meeting ("microMorph"). 2010. "Pathways and limitations in evolution of development of flowering plant reproductive cycles."

Universidade Estadual de Campinas, Instituto de Biologia. 2009. "Pollen tube innovations and the origin of angiosperms." Campinas, Brasil.

University of Zurich, Institute for Systematic Botany. 2009. "Pollination to fertilization in angiosperms: a focal period of ancient and modern flowering plant innovation." Zurich, Switzerland.

Université de Neuchâtel. 2009. "Pollination to fertilization in angiosperms: a focal period of ancient and modern flowering plant innovation." Neuchâtel, Switzerland.

Tennessee State University, Department of Biology. 2009. "The origin of the flowering plant reproductive syndrome and some of its evolutionary consequences." Nashville, TN.

Duke University, Department of Biology. 2009. "Pollination to fertilization in angiosperms: a focal period of ancient and modern flowering plant innovation." Durham, NC

Frontiers in Sexual Plant Reproduction III meeting. 2008. "Flowering plant pollen tube growth patterns and their relationship to carpel closure in ancient angiosperms." Tuscon, AZ.

XXth International Congress on Sexual Plant Reproduction. 2008. "Before pollen-style interactions: the origin and early evolution of the angiosperm fertilization process." Brasilia, Brasil. [Pollen-style interaction session]

XXth International Congress on Sexual Plant Reproduction. 2008. "'Endosperm genetics and the developmental evolution of female gametophyte body plans." Brasilia, Brasil. [Female gametophyte development session]

58th Congresso Nacional Botanica. 2007. "An evolutionary and developmental perspective on the flowering plant reproductive syndrome." Sao Paolo, Brasil.

Universidade Federal de Uberlândia, Instituto de Biologia. 2007. "Developmental evolution of the fertilization process among early lineages of flowering plants." Uberlândia, Brasil.

Appalachian State University, Department of Biology. 2007. "Developmental evolution of the fertilization process among early flowering plants." Boone, NC

NSF Research Experience for Undergraduates program: Conservation Biology in the Southeastern U.S. Mississippi State University. 2005. "Hybridization, evolution and conservation." Starkeville, MS.

Frontiers in Sexual Plant Reproduction II, SUNY, Albany. 2004. "The evolution of post-pollination reproductive barriers in flowering plants." Albany, NY.

NSF Research Experience for Undergraduates program: Conservation Biology in the Southeastern U.S. Mississippi State University. 2004. "Conservation and natural hybridization." Starkeville, MS.

Mississippi State University, Department of Biology. 2004. "Evolutionary dynamics of a continental species complex: western North American birches (*Betula*)." Starkeville, MS.

- University of Montana, Division of Biological Sciences. 2002. “Surviving the Pleistocene – polyploidy, introgression and mate recognition in a birch (*Betula*) hybrid zone.” Missoula, MT.
- University of Tennessee, Knoxville, Department of Botany. 2002. “The origin and early evolution of flowering plant reproductive biology.” Knoxville, TN.
- University of Minnesota, Department of Biology. 2002. “Pattern and process in a diploid-polyploid birch (*Betula*) hybrid zone.” Duluth, MN.
- Colorado State University, Department of Biology. 2000. “The nature of the species boundary in birches.” Fort Collins, CO.

In-house seminars

- University of Tennessee, Plant Research Center Colloquium. 2013. “How efficient are pollen tubes at getting sperm to the egg? Comparative biology of pollen performance.” Knoxville, TN.
- University of Tennessee, Plant Research Center Colloquium. 2010. “Pollination to fertilization in angiosperms: a focal period of modern flowering plant innovation.” Knoxville, TN.
- University of Tennessee, Department of Ecology and Evolution. 2008. “Innovations that begot innovations: how flowering plants got their unique reproductive syndrome.” Knoxville.
- University of Tennessee, Department of Plant Sciences. 2004. “The origin and evolution of the flowering plant reproductive syndrome.” Knoxville, TN.
- University of Tennessee, Department of Ecology and Evolution. 2003. “The origin and early evolution of the flowering plant reproductive syndrome.” Knoxville, TN.
- University of Tennessee, Department of Botany. 2003. “Evolutionary dynamics of diploid-polyploid genetic interactions: a case study of the Rocky Mountain birch (*Betula*) hybrid zone.” Knoxville, TN.
- University of Colorado, Department of EPO Biology. 2000. “The nature of the species boundary in birches.” Boulder, CO.
- University of Georgia, Department of Genetics retreat. 1999. “Causes and consequences of interspecific pollen competition in a diploid-polyploid plant hybrid zone.” Helen, GA.

Invited public lectures

- Tennessee Valley Unitarian Universalist church. 2011. “The evolutionary history of flowers.” Knoxville, TN.
- Rationalists of East Tennessee. 2010. “The evolutionary history of flowers.” Pellissippi College, Knoxville, TN.
- Seniors for Creative Learning (sponsored by University of Tennessee’s Department of Professional and Personal Development and the John T. O’Connor Senior Center). 2008. “The evolutionary history of flowers.” Knoxville, TN. (Faculty Speakers Bureau).
- Oak Ridge Institute for Continued Learning (Roane State Community College). 2007. “The evolutionary history of flowers.” Oak Ridge, TN. (Faculty Speakers Bureau).

Interviews/articles

- Alapo, L. 2016. UT’s Williams co-edits Journal exploring latest research on pollen performance. *Tennessee Today* April 8, 2016.
- Hund, R. 2016. Small but not forgotten: New ideas on pollen’s ecology and evolution. *EurekAlert* April 4, 2016.

- Hund, R. 2014. Which came first, bi- or tricellular pollen? New research updates a classic debate. **EurekAlert** May 2, 2014. http://www.eurekalert.org/pub_releases/2014-05/ajob-wcf050214.php
- Mayfield, J. 2009. Flora in Excelsis. **Quest (Research magazine of University of Tennessee)** 1(2): 8-11.
- Bosveld, J. 2009. Speedy sperm explains flower power (Top 100 science stories of 2008, number 87). **Discover magazine**. January issue, page 69.
- Smith, W. 2009. Darwin would be proud. **Bearden/Cedar Bluff Shopper-News Now**. January 19, 2009, page A-5.
- Carlson, E. 2009. Professor's research receives honor. **The Daily Beacon** (University of Tennessee) 1/9/09.
- Williams, R. D. 2008. Discover magazine honors UT professor. **Knoxville News Sentinel**. 12/26/08.
- Minas Gerais TV Rede Integração**. 2008. Espécie rara de árvore de 125 milhões de anos é encontrada no Cerrado. Interview in Portuguese from local TV in Uberlandia, Brasil. <http://megaminas.globo.com/noticia.php?noticia=2168>
- Mayfield, J. 2008. Professor's Work Named Top 100 Science Story by Discover Magazine. **University of Tennessee media relations**. 12/15/08
- Mayfield, J. 2008. UT Knoxville Professor Finds Unexpected Key to Flowering Plants' Diversity. **University of Tennessee media relations**. 12/15/08

Contributed Papers (speaker)

- Botanical Society of America 2017. "Ancient angiosperm pollen biology: conflicts between pollinator rewards, dispersal biology and germination timing?" Fort Worth, TX
- Botanical Society of America 2015. "Economy, efficiency and the evolution of pollen tube growth rates." Edmunton, Alberta, Canada
- Pollen Development meeting (NSF Research Coordination Network). 2014. "Repeated evolution of tricellular (and bicellular) pollen." Charlotte, NC.
- Botanical Society of America 2014. "Repeated evolution of tricellular (and bicellular) pollen." Boise, ID.
- Botanical Society of America 2013. "A comparative metric for studying the efficiency of pollen tube growth." New Orleans, LA.
- Botanical Society of America 2012. "The evolution of pollen germination timing in angiosperms." Columbus, OH.
- Botanical Society of America 2010. "Are there forms of pre-zygotic self-recognition in *Austrobaileya scandens* (Austrobaileyaceae)?" Providence, RI.
- Botanical Society of America 2008. "Origin of the angiosperm pollen tube growth pattern and its consequences." Vancouver, Canada.
- Botanical Society of America 2007. "Developmental evolution of the progamic phase: *Amborella trichopoda* (Amborellaceae)." Chicago, IL.
- Society for the Study of Evolution 2007. *Amborella*, *Austrobaileya* and the water lilies – basal angiosperms and the devo-evo of pollen-carpel interactions. Christchurch, NZ.
- Australasian Evolution Society 2007. "Developmental evolution of the pollination to fertilization life history stage among basal angiosperms." Sydney, Australia.
- Association of Southeastern Biologists. 2006. "Evolution of the progamic phase in flowering plants." Gatlinburg, TN.

- Society for the Study of Evolution 2005. "The geography of evolutionary interactions between wildfire, North American paper birches and Arctic hares." (Co-authors, JP Bryant, T Clausen, J Cook, S Landhausser, S Carrier.) (Delivered by Terry Chapin in my absence). Fairbanks, AK.
- Society for the Study of Evolution. 2004. "Bi-directional introgression in a diploid-polyploid birch (*Betula*) hybrid zone." Fort Collins, CO.
- Botanical Society of America. 2004. Modularity and the evolution of the female gametophyte in ancient angiosperms (Co-author, WE Friedman, speaking). Snowbird, UT.
- Botanical Society of America. 2003. "Female gametophyte development in *Illicium* (Austrobaileyales) and the evolution of endosperm ploidy and genetic constitution in early angiosperms." Mobile, AL.
- Botanical Society of America. 2003. Female gametophyte development in *Kadsura*: Implications for Schisandraceae, Austrobaileyales, and the early evolution of flowering plants. (Co-authors, WN Gallup, and WE Friedman, speaking). Mobile, AL.
- Botanical Society of America. 2001. "Double fertilization and diploid endosperm in basal angiosperms?" Albuquerque, NM.
- Guild of Rocky Mountain Population Biologists. 2000. "Interspecific pollen competition in a natural diploid-polyploid birch (*Betula*) hybrid zone." Gothic, CO.
- Botanical Society of America. 2000. "Interspecific pollen competition in a diploid-polyploid hybrid zone in birch (*Betula*)." Portland, OR.
- Society for the Study of Evolution. 1999. "Gamete competition and reproductive isolation in *Betula*: using DNA content to identify competing gametes in mixed pollinations." Madison, WI.
- Murray J. Littlejohn Symposium: Insights from studies of geographical variation and hybridization. 1999. "Conspecific fertilization precedence in a diploid-polyploid hybrid zone in birch (*Betula*)." Columbia, MO.
- Society for the Study of Evolution. 1997. "An ancient polyploid hybrid zone in birch (*Betula*)." Boulder, CO.
- Society for the Study of Evolution. 1995. "Reproductive isolation in two oak hybrid zones." Montreal, Quebec.
- Southwestern Association of Biologists. 1993. "Reproductive isolation in two sympatric oaks: *Quercus gambelii* Nutt. and *Quercus grisea* Liebm." Portal, Arizona.

Student contributed presentations (posters)

- Brown, C. D. and J. H. Williams. 2017. Is three always better than two? Pollen has higher water content when dispersed in a tricellular state than in a bicellular state. Office of Research annual Undergraduate Research Fair, Hodges library, UTK.
- Reese, J and JH Williams. 2017. The effects genome size and polyploidy on pollen tube growth rate evolution. Botanical Society of America meetings, Fort Worth, TX
- Ramsey, AJ, Edwards, JE and JH Williams. 2014. Comparative economics of pollen tube growth in two water lily species. (Poster) Botanical Society of America meetings, Boise, ID.
- Taylor, ML and JH Williams. 2010. Comparative pollen tube growth patterns in *Trithuria* species (Hydatellaceae). Botanical Society of America meetings, Providence, RI.
- Buckley, NE and JH Williams. 2010. Breeding System Biology of the Florida Native Plant: *Illicium parviflorum*. (Poster) Botanical Society of America meetings, Providence, RI.

- Taylor, ML and JH Williams. 2009. Pollination to fertilization biology of *Trithuria* (Hydatellaceae). Botanical Society of America meetings, Snowbird, UT.
- McNeilage, R., Taylor, ML and JH Williams. 2009 "Fertilization timing and pollen tube growth in *Nymphaea* (Nymphaeales)." Botanical Society of America meetings, Snowbird, UT.
- Valente, MJ and JH Williams. 2008. Clonality and genetic diversity revealed by AFLPs in *Schisandra glabra* (Schisandraceae), a rare basal angiosperm. Botanical Society of America meetings, Vancouver, Canada
- Arias-Garzón, T and JH Williams. 2008. Systematics 2008 Conference: Piperales: an integrative multidisciplinary approach session. "Embryology of *Manekia naranjoana* (Piperaceae) and its implications for the origin of the sixteen nucleate female gametophyte in Piperales." (Invited) Gottingen, Germany
- Valente, MJ and JH Williams. 2008. Genetic Variation, Diversity, and Phylogeography of the Southeastern US - Mexico Cloudforest Disjunct Vine *Schisandra glabra* (Brickell) Rheder (Schisandraceae). American Association of Geography meeting, Boston, MA. **Winner: Best Ph.D. student presentation.**
- Taylor, ML and JH Williams. 2007. Fertilization timing and the pollen tube pathway in Cabombaceae (Nymphaeales). Botanical Society of America meetings, Chicago, IL. **Winner: Katherine Esau prize for best student presentation on plant development.**
- Arias-Garzón, T and JH Williams. 2007. Embryology of *Manekia naranjoana* (Piperaceae) and its implications for the origin of the sixteen-nucleate female gametophyte in Piperales. Botanical Society of America meetings, Chicago, IL.
- Taylor, ML and JH Williams. 2007. Fertilization timing and the pollen tube pathway in *Brasenia* and *Cabomba* (Cabombaceae, Nymphaeales). Association of Southeastern Biologists meeting, Columbia, SC.
- Valente, M and JH Williams. 2007. Clonality and patterns of genetic diversity revealed by AFLPs in *Schisandra glabra* (Brickell) Rheder (Schisandraceae), a threatened woody vine. Association of Southeastern Biologists meeting, Columbia, SC.
- Valente, M and JH Williams. 2007. Genetic diversity of *Schisandra glabra* revealed by AFLPs: implications for basal angiosperm population genetics. Southeastern Population Ecology and Evolutionary Genetics (SEEPAGE) Conference, Tremont, TN.

Co-authored invited seminars and symposia

- 18th International Botanical Congress. 2011. "Reproductive ecology of three species of *Trithuria* (Hydatellaceae)." Melbourne, Australia.
- Frontiers in Sexual Plant Reproduction II, SUNY, Albany. 2004. "Modularity and the evolution of the female gametophyte in ancient angiosperms." (Co-author, W. E. Friedman). Albany, NY.
- Symposium at Botanical Society of America meeting - Seed Plant Gametophytes: Still the Forgotten Generation? 2004. "Modularity and the evolution of the female gametophyte in ancient angiosperms." (Co-author, W. E. Friedman). Snowbird, Utah.
- Conference on Gametophytes, Evolution, Development and Function. 2003. Modularity and the evolution of the flowering plant female gametophyte. (Co-author, W. E. Friedman). Ascona, Switzerland.

Symposium on Flowers: Diversity, Development and Evolution. 2002. Early evolution of the flowering plant reproductive syndrome. (Co-author, W. E. Friedman). Institute of Systematic Botany, Zurich, Switzerland.

Symposium on Plant Reproduction: From Evolutionary and Physiological Analyses to Molecular and Cellular Studies. 2002. Endosperm development and genetics in basal angiosperms: connecting the ontogenies of female gametophytes with endosperm evolution. (Co-author, W. E. Friedman). Pennsylvania State University, PA.

Professional Societies

Botanical Society of America

International Association of Sexual Plant Reproduction Research

Linnean Society of London (elected Fellow)

Organization for Tropical Studies

Sigma Xi

Society for the Study of Evolution

Post-doctoral Associates

Simon Wallace (Ph.D. University of Sheffield, UK, 2013). (2013-2014). *Simon went on to another postdoc at Florida State University and is now at Iowa State U* (2016-present).

Jason Abercrombie (Ph.D. University of Tennessee, 2007). (2009-2010). *Jason is now teaching High School science at Webb School, Knoxville* (2012-present).

Sabbatical visitors

Paulo Oliveira (faculty at U. of Uberlandia, Brasil). 2015-2016

Renatta Oliveira (faculty at U. of Uberlandia, Brasil) 2015-2016

Graduate students

Harmony Yomai (B.S. Chaminade U. of Honolulu, 2015). 2015- .

John Reese (B.S. Moravian College, 2011). 2013- .

Nicholas Buckley (B. S. Dalhousie University, 2003). **M.S. 2012.** “Mating System Biology of the Florida Native Plant: *Illicium parviflorum*.” *Nick is currently a lecturer at Lincoln Memorial and Pellissippi State Colleges in Knoxville.*

Mackenzie Taylor (B. S. Truman State University, 2005). **Ph.D. 2011.** “Developmental Evolution of the Progamic Phase in Nymphaeales.” *Started as an Assistant Professor at Creighton University in Fall, 2011.*

Mathew Valente (B.S. Auburn University, 2004). **M.S. 2007.** “Clonality and Genetic Diversity revealed by AFLPs in *Schisandra glabra* (Brickell) Rieder (Schisandraceae), a rare basal angiosperm.” *Entered Ph.D. program in Geography, University of Tennessee, in 2007.*

Tatiana Arias (B.S. Universidad de Atioquia, Colombia, 2002). **M.S. 2007.** “Embryology of *Manekia naranjoana* (Piperaceae) and the origin of tetrasporic, sixteen-nucleate female gametophytes in Piperales.” *Then Ph.D. at University Missouri-Columbia (2012).*

Undergraduate research mentoring

Chandler Brown (Summer 2016- present) – OR undergraduate research award, summer 2017.

Stephen Dorris (Spring 2017) – BS (EEB 2017) -

Marissa Rankin (Summer, 2014-2015) – BS (EEB 2015). NSF-supported tech in my lab. *Got job at NY Botanical Garden.*

Jacob Edwards (Spring, summer 2013) – BS (EEB 2013). NSF-supported tech in my lab. *Started Grad program at Colorado State University, Fall, 2015.*

Adam Ramsey (Spring, summer 2013) – BS (EEB 2013). *Office of Research Undergraduate research summer award (\$2,000) and NSF-supported tech in my lab. Entered PhD program in Biology at University of Tennessee, Memphis in Fall 2014.*

Christine Bratten (2011) resulted in publication as first author; went on to do MS in EEB (2014).

Andrew Moffatt (Summer 2009 - 2013) – BS 2012. *Lab technician (2012-13). Started PhD program at Florida State University, Fall 2013.*

Matthew Lettre (Summer 2009 - spring 2011) – BS 2011. *Entered Masters in Public Health program, U. Memphis 2012.*

Ralph McNeilage (Summer/fall 2008) BS 2009 – *Entered PhD program in Biochemistry and Molecular Biology, UC Davis, Fall 2009.*

Michael (Chris) James (Spring 2009-2010) – *Entered Ph.D. program, Natural Products Science at U. Mississippi, Fall 2011.*

Aaron Floden (Spring/Summer 2009) – *Entered EEB PhD program, UTK, 2011.*

David Fowler (Spring 2009) – *withdrew*

Anna Becker (Summer/fall 2007) – *Went on to get MS in EEB at UTK (2012).*

Andrew Herget (Summer, Fall 2007) – *Supported by NSF REU award. Sadly, Andrew passed away in 2010.*

Cyndi Rosini (Spring, Summer, Fall 2006 and 2007, supported by NSF REU award) – *Applying to graduate school in Washington state (2008).*

Galen Yakalis (Spring 2006). *Transferred to Botany at University of Texas.*

Michael Wilkerson (Spring 2004) (B. S. Biology, 2004) - *Went on to Medical School.*

Paid laboratory assistants (all undergrad or graduated during period)

Marissa Rankin (Summer, 2014 - 2016) – current EEB student. *Currently part-time tech in my lab.*

Jacob Edwards (Summer 2013 - present) – BS EEB 2013. *Currently working in my lab (2014).*

Adam Ramsey (Fall 2013 – summer 2014) – BS EEB 2013. *Part-time lab technician. Will enter graduate program in Biology at University of Tennessee, Memphis in Fall 2014.*

Andrew Moffatt (Summer 2011 - 2013). BS EEB 2012. *Lab technician in my lab (2012-13).*

Matt Lettre – Summer 2009 to spring 2011. *Entered Masters in Public Health program, U. Memphis 2012.*

Matt Heard – Summer/Fall/Spring 2005/2006. *Ph.D. at Brown University, 2011.*

Kim Kennard – Fall/Spring 2004/2005. *Went on to earn M.S. in EEB at UTK (2008). Now teaching elementary school in Knoxville.*

Tatiana Arias – Summer/Fall 2004. *Went on to earn M.S. in EEB (2007), then PhD at U. of Missouri-Columbia (2012). Now in Academia in Colombia.*

Shinara Taylor (Fall/Spring 2003/2004). *Went on to work at UTK Entomology.*

Teaching

Courses

- 2018, Spring: EEB 414 – Plant Anatomy (3-4 credits).
2017, Fall: BIOL 240 - Introductory Genetics (4 credits).
2017, Spring: EEB 490/607 – Evolution of Plant Reproduction seminar (1-2 credits).
2016, Fall: EEB 424 - Plant Diversity and Evolution (3-4 credits).
2016, Spring: EEB 414 – Plant Anatomy (3-4 credits).
2015, Spring: BIOL 240 - Introductory Genetics (4 credits).
2014, Fall: EEB 424 - Plant Diversity and Evolution (3-4 credits).
2014, Spring: EEB 414 – Plant Anatomy and Development (3 credits)
2013, Spring: EEB 414 – Plant Anatomy (3-4 credits).
2012, Fall: EEB 424 - Plant Diversity and Evolution (3-4 credits).
2011, Spring: BIOL 240 - Introductory Genetics (4 credits).
2010, Fall: EEB 410 – Plant Diversity and Evolution (3-4 credits).
2010, Spring: EEB 414 – Plant Anatomy and Development (3 credits).
2009, Spring: EEB 611 – Evolution of Development of Plants (2 credits).
2009, Spring: BIOL 240 – Introductory Genetics (4 credits).
2008, Fall: EEB 410 - Evolutionary Plant Morphology (with DK Smith) (4 credits).
2008, Spring: EEB 414 – Plant Anatomy and Development (3 credits).
2007, Spring: BIOL 240 – Introductory Genetics (4 credits).
2006, Fall: EEB 410 – Evolutionary Plant Morphology (with DK Smith) (4 credits).
2005, Fall: EEB 410 – Evolutionary Plant Morphology (with DK Smith) (4 credits).
2005, Spring: EEB 575 – Population Genetics (3 credits).
2004, Fall: Botany 310 – Evolutionary Plant Morphology (with DK Smith) (4 credits).

Seminars and workshops

- 2017, Spring: EEB 490/493/607 – Evolution of Plant Reproduction (1 credit).
2015, Fall: EEB 607 – Evolution of Plant Reproduction (1 credit).
2013, EEB 490/590: *Evolution of Plant Reproduction* (1 credit)
2009, Summer (Universidade Estadual de Campinas, Brasil) – “*Evolution of Development of Plant Reproduction*,” a one-week (40 hour) intensive graduate student workshop (Enrollment, 38).
2008, 2009, 2010, 2012, 2014, 2015 Fall: EEB 607 – “*Evolution of Development*” – two-week module in EEB Graduate Core course in Evolution.
2008, Fall: EEB 607 – “*Speciation in Birds*” (with D. Hulsey) (1 credit).
2006, Fall and Spring: EEB 503 – Departmental seminar series (1 credit).
2006, Spring: EEB 607 – Seminar, “*Developmental Evolution*” (with J Fordyce) (1 credit).
2005, Fall: EEB 607 – Seminar, “*Molecular Markers*” (1 credit).
2004, Spring: Botany 544 – Seminar, “*Plant Speciation*” (1 credit).

Service

Department

- 2015-present – Chair, Graduate Affairs committee (Director of Graduate Studies)
2011-present – EEB Graduate affairs committee

2005-present – EEB representative, Organization for Tropical Studies
2005-present – EEB library representative

2015 – EEB Faculty search committee, Herbarium director (2nd round; substitute)
2015 – Faculty liaison to Graduate student committee for choosing seminar speakers
2014 – EEB Faculty search committee, Herbarium director (1st round)
2010 – EEB Community ecologist search committee
2010 – Host, Darwin Day speaker (WE Friedman, University of Colorado).
2008 – Committee on EEB graduate curriculum
2008 – EEB Ecosystem ecologist search committee
2006-2011 – EEB Graduate admissions committee
2006 – EEB Evolutionary biologist search committee
2006 – EEB Departmental planning committee
2005-2006 – EEB Greenhouse committee, collections committee
2005 – Reviewer, EEB graduate student summer research awards

University

2009-present – Tennessee Plant Research Center, Founding Board member

2014 – Reviewer of Hunsicker seed grant proposals for BCMB department
2014 – Judge, 2014 Undergraduate summer research awards (UTK office of research)
2010 – Judge, 2010 Sigma Xi Student Competition (UTK, 3/23/10)
2006-2010 – Editorial Board, Newfound Press (University of Tennessee)
2006 – Core Biology teaching evaluation committee
2005-2006 - Advisory Board for University Libraries new digital imprint, Newfound Press
2005 – Reviewer, Hollaender Fellowship Award (Graduate School)
2004 – Life of the Mind program for entering Freshmen.

Profession

2015-present – Associate editor, *AoB Plants*
2014-present – Chair (2017-19) Pelton Award committee, *Botanical Society of America* (for sustained and creative contributions in experimental plant morphology)
2014-present – Associate editor, *Plant Reproduction*
2012-present – Associate editor, *American Journal of Botany*
2013-present – Advisory committee, *Acta Botanica Brasilica*
2010-present – Official liaison (steering committee member) to two NSF-RCNs, “Integrative Pollen Biology” and “microMORPH – microEvolution of Plant Development.”

2015-2017 – Chair of special publishing committee for *Botanical Society of America* (to explore alternative options for publishing *American Journal of Botany* and then to pursue a contract with Wiley publishing, which was signed in July, 2017).
2013-2016 – Treasurer (executive committee), *Botanical Society of America*
2013, 2015 – Webster Award committee, *Botanical Society of America* (Best paper in development and/or structure in *American Journal of Botany* in the preceding two years)

- 2012-2015 – Program director for Developmental and Structural section, Botanical Society of America annual meetings.
- 2011-2015 – Editorial board (Plant Sciences section), *Scientific Reports*
- 2008-2010 – Esau Award committee (Chair, 2010). Botanical Society of America annual meetings (for best student plant development paper and poster).
- 2006 – Program Director, Association of Southeastern Biologists meetings, Gatlinburg, TN (141 posters, 281 presentations, and publication of 422 abstracts in *Southeastern Biology*).
- 2005-2012 – Reviewed an average of 9 proposals/manuscripts per year.
- 2004, 2005 – Participant, NSF-funded Research Experience for Undergraduates program at Mississippi State University.

Community

- 2018 – Visit of seventh grade class to UTK genetics and plant anatomy labs (Clayton-Bradley Academy)
- 2011 – Presentation to Tennessee Valley Unitarian Universalist church. Knoxville, TN. (Faculty Speakers Bureau).
- 2010 – Presentation to Rationalists of East Tennessee. Pellissippi College, Knoxville, TN. (Faculty Speakers Bureau).
- 2008 – Teacher Excellence workshop for east Tennessee high school teachers. Topic: Inbreeding
- 2008 – Seniors for Creative Learning (sponsored by University of Tennessee's Department of Professional and Personal Development and the John T. O'Connor Senior Center). Knoxville, TN. (Faculty Speakers Bureau).
- 2007 – Oak Ridge Institute for Continued Learning (Roane State Community College). 2007. Oak Ridge, TN. (Faculty Speakers Bureau).
- 2005, 2007 – Presentation and trip leader, Spring Wildflower Pilgrimage, Smoky Mountain NP