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DEGREES:

A.A. (Biology) -- Mt. San Antonio Junior College, 1973
 B.S. (Biology) -- California State Polytechnic University, Pomona, 1975
 M.S. (Biology) -- California State Polytechnic University, Pomona, 1978. Thesis: "Mosses of the chaparral: the systematics and ecology of the class Musci in the San Dimas Experimental Forest, California."
 Ph.D. (Biology) -- Harvard University, 1984. Dissertation: "Systematic studies in the genus *Tortula* Hedw. (Musci: Pottiaceae)."

PROFESSIONAL EMPLOYMENT:

Ranger-Naturalist for the Los Angeles County Nature Center Unit (Parks and Recreation Department), weekends and summers, 1971-76
 Instructor for "The Biology of Mosses and Liverworts--An Introduction," co-sponsored by the Arnold Arboretum and the New England Wildflower Society, 1980
 Instructor for "Focus on Woody Plants: Growth Forms and Patterns," The Arnold Arboretum, 1981
 Teaching Fellow, Harvard University:
 "Diversity in the Plant Kingdom," 1979 (P.B. Tomlinson, C.E. Wood, Jr., N.G. Miller & D. Pfister)
 "Population Biology: Ecology," 1980 (W.H. Bossert)
 "The Taxonomy of Seed-bearing Plants," 1981 (C.E. Wood, Jr.)
 "The Darwinian Revolution," 1982 (J. Beatty & S.A. Roe)
 "Evolutionary Biology," 1983 (E.O. Wilson)
 Faculty member, Duke University:
 Assistant Professor of Botany, 1984-1990
 Associate Professor of Botany (with tenure), 1990-1993
 Adjunct Associate Professor of Botany, 1993-1996
 Faculty member, University of California, Berkeley:
 Director, University and Jepson Herbaria, 1993-
 Associate Professor (with tenure), Dept. of Integrative Biology, 1993-1996
 Professor, Dept. of Integrative Biology, 1996-
 Associate Director, California Biodiversity Center, 2001-2009
 Senior Fellow, Berkeley Institute for Data Science (BIDS), 2014-

AWARDS:

Graduation with Honors, California State Polytechnic University, Pomona, 1975.
 Graduate Scholarship, Harvard University, 1978-83.
 Fellow, California Academy of Sciences, 1995-
 Distinguished John Tanner Lectureship Award, M.L. Bean Life Sciences Museum, Brigham Young University, 2002.
 Distinguished Alumnus of the Year, College of Science, California State Polytechnic University, Pomona, 2003.

GRANTS (served as Principal Investigator except where noted):

- National Science Foundation (NSF) Doctoral Dissertation Research Grant, Harvard University, 1981-83.
- NSF Research Grant, "Biosystematic studies of the *Tortula ruralis* complex (Musci: Pottiaceae)," Duke University, 1985-89, \$91,000.
- NSF Research Grant, "Peristome development in mosses in relation to systematics and evolution," Duke University, 1985-89, \$154,000; with Co-Principal Investigators Lewis E. Anderson and Jonathan Shaw.
- North Carolina Board of Science and Technology Development Award, "A molecular approach to the phylogeny of bryophytes using chloroplast DNA," Duke University, 1989-90, \$16,889; with Co-Principal Investigator Rytas J. Vilgalys.
- Duke University Research Council, "Ecological and developmental studies on the dwarf male breeding system of the moss *Dicranum scoparium*," 1989-90, \$3,844.
- NSF Doctoral Dissertation Research Grant, for Juan Efrain De Luna, "Systematic Studies in the Hedwigiaceae Schimper (Musci)," Duke University, 1989-92, \$6,304.
- NSF Instrumentation Grant, "Study of Biological Structure," Duke University, 1990-93, \$240,595; one of six core faculty; Frederick Nijhout, Principal Investigator.
- NSF Research Grant, "A molecular approach to the phylogeny of bryophytes using chloroplast DNA," Duke University 1991-95, \$290,078; with Co-Principal Investigator Rytas J. Vilgalys.
- NSF Doctoral Dissertation Research Grant, for Steven K. Rice, "Ecology and Evolution of Aquatic Sphagna: Functional Morphology, Physiology, and Phylogeny," Duke University, 1992-94, \$10,638; with Co-Principal Investigator Norman L. Christensen.
- NSF Doctoral Dissertation Research Grant, for Kathleen M. Pryer, "Ontogeny and Phylogeny in the Aquatic Fern Family Marsileaceae," Duke University, 1993-95, \$9,500.
- NSF Collection Improvement Grant, "Compactorization of the University Herbarium and Jepson Herbarium, University of California at Berkeley," 1993-95, \$313,930.
- USDA Research Coordination Grant (DOE/NSF/USDA Panel on Collaborative Research in Plant Biology), "The Origins and Phylogeny of Green Plants: A Research Coordination Group," University of Tulsa, 1994-00, \$285,459; Co-Principal Investigator, with M. A. Buchheim and R. L. Chapman.
- National Geographic Society Grant, "Bryophytes of the Mojave Desert," Missouri Botanical Garden, 1995-98, \$11,940; Co-Investigator with Lloyd R. Stark and Alan T. Whittemore.
- NSF Research Grant, "PEET: Monographic research in the moss family Calymperaceae," University of California, Berkeley, 1997-2003, \$740,000. [Plus \$90,259 supplement for 2002-2004 to run the PEET IV meeting at Berkeley.]
- NSF Doctoral Dissertation Research Grant, for Patricia Sánchez-Baracaldo, "Phylogenetics of a neotropical fern genus *Jamesonia*, and its closest relatives," University of California, Berkeley, 1998-2000, \$10,000.
- NSF Collection Improvement Grant, "Curation of the Bryophyte Herbarium at the University of California at Berkeley," 2001-2003, \$180,000.
- NSF Research Coordination Network Grant, "Beyond 'Deep Green': Toward an Integration of Plant Phylogenetics and Plant Genomics," University of California, Berkeley, 2001-2006, \$496,434.
- NSF Research Grant, "ATOL: Collaborative Research: Deep Green Plant Phylogenetics: Novel Analytical Methods for Scaling from Genomics to Morphology," 2002-2007, \$683,000.
- NSF Research Grant, "ITR Collaborative Research: Building the Tree of Life -- A National Resource for Phyloinformatics and Computational Phylogenetics," 2003-2008, \$1,229,749, Co-Principal Investigator (Satish Rao, Principal Investigator).
- NSF Doctoral Dissertation Research Grant, for Anya Hinkle, "Patterns of Intraspecific Genetic Variation In *Cordyline fruticosa* and the Basis for Male Sterility with Implications for Archaeoethnobotany in Polynesia," University of California, Berkeley, 2004-2006, \$10,761.
- Department of Energy, Joint Genome Institute Community Sequencing Program, "PHYSCOME: The Moss *Physcomitrella* Genome Project," 2004-2005, approximately \$7,000,000 in sequencing capacity and informatics awarded; with Co-Principal Investigator Ralph S. Quatrano.

NSF Research Grant, "Assembling the Tree of Life: A Meeting for PIs and co-PIs," 2004-2005, \$159,162.

NSF Collection Improvement Grant, "Integrating the Cryptogamic Collections of LAM into UC at the University of California, Berkeley." 2006-2007, \$277,755.

NSF Doctoral Dissertation Research Grant, for Andrew Murdock, "Systematics and molecular evolution of marattioid ferns (Marattiaceae)," University of California, Berkeley, 2006-2008, \$8,385.

NSF Training Grant, "Track 2, GK-12: Exploring California Biodiversity." 2006-2012. \$2,100,883, Co-Principal Investigator (Rosemary Gillespie, Principle Investigator).

Andrew W. Mellon Foundation, "Latin American Type Specimens," 2007-2011, \$182,629

Gordon and Betty Moore Foundation, "All Taxa Biotic Inventory of Moorea," 2008-2011, \$129,870 (my lab's portion of a \$5.2M grant), Co-Principal Investigator (Neil Davies, Principle Investigator).

Academy of Finland, "Deep moss: phylogeny of the oldest moss lineages." 2009-2012, \$431,475, Co-Principal Investigator (Jaakko Hyvönen, Principal Investigator).

Council on Library and Information Resources, "Cataloging Hidden Archives of Western American Botany and Beyond," 2009-2013, \$253,794.

Andrew W. Mellon Foundation, "CollectionSpace 2.0," 2010-2011, \$360,000.

NSF Collection Improvement Grant, "Collaborative Proposal: Harnessing the power of herbaria to understand the changing flora of California: A biodiversity hotspot in peril," 2010-2016, \$681,973 (including \$23,838 supplemental funding in 2015 to add Baja California).

Canada-California Strategic Innovation Partnership (CCSIP) award, "Canadensys-UC Berkeley Biodiversity Databases Business Plan," 2011-2012, \$50,000.

NSF Doctoral Dissertation Research Grant, for Benjamin Carter, "Niche differentiation among cryptic moss species," 2011-2013, \$12,560.

NSF Collection Improvement Grant, "Digitizing Pacific Coast Seaweeds: Documenting the Past to Interpret the Future," 2011-2014, \$551,296.

NSF Advancing Digitization of Biological Collections Grant, "Digitization TCN Collaborative Research: North American Lichens and Bryophytes: Sensitive Indicators of Environmental Quality and Change," 2011-2016, \$264,476.

CSIRO, Australia, Distinguished Visiting Scientist Award, "Biogeography and evolution of Australia's bryophytes: Development of phylogenetic measures of diversity and endangerment," 2011, \$15,000.

Andrew W. Mellon Foundation, Sawyer Seminar Grant, "Speciesism in Biology, Culture, and Sociopolitics," 2012-2013, \$165,000.

NSF Advancing Digitization of Biological Collections Grant, "Digitization TCN Collaborative Research: The Macrofungi Collection Consortium: Unlocking a Biodiversity Resource for Understanding Biotic Interactions, Nutrient Cycling and Human Affairs." 2012-2017, \$353,176.

Andrew W. Mellon Foundation, "CollectionSpace 3.0," 2012-2013, \$235,542.

Andrew W. Mellon Foundation, "Central American Type Specimens," 2013-2015, \$150,000.

University of Canberra, Murray-Darling Basin Futures Visiting Fellowship, "Phylogenetic approaches to biodiversity and conservation of the MDB biota," 2013, \$7,740.

NSF Advancing Digitization of Biological Collections Grant, "Collaborative Research: Digitization TCN: The Macroalgal Herbarium Consortium: Accessing 150 Years of Specimen Data to Understand Changes in the Marine/Aquatic Environment." 2013-2017, \$315,518.

Packard Foundation Special Opportunities Fund, "California Seaweed eFlora: A Free, Online Resource for the 21st Century," 2013-2017, \$500,000.

Center for Latin American Studies, UC Berkeley, "UCB-U.Chile Working Group for Comparative Evolutionary Studies of New World Mediterranean-type Flora," 2013-2014, \$27,000.

NSF Research Grant, "Phylogenetic Diversity and Phylogenetic Endemism in the California Flora," 2014-2017, \$390,783.

UC MEXUS, "Baja California and its floristic connection to the California Floristic Province: data for climate models, floristic studies, and conservation efforts," 2014-2016, \$24,873

NSF Collection Improvement Grant, "CSBR: Natural History: Critical Access and Storage for the Mycological Collections at the University of California, Berkeley," 2015-2017, \$243,724.

NSF Advancing Digitization of Biological Collections Grant, "Digitization TCN: Collaborative: The Microfungi Collections Consortium: A Networked Approach to Digitizing Small Fungi with Large Impacts on the Function and Health of Ecosystems." 2015-2018, \$239,701.

Comisión Nacional de Investigación Científica y Tecnológica (CONICYT) of Chile, "Integrating molecular and spatial modeling approaches in new world Mediterranean flora: A multiscale study for understanding evolutionary relationships in Central Chile and California, two endemic-rich biodiversity hotspots." 2016-2019, 102,600,000 CLP (approximately US\$150,000). Co-Principal Investigator (Patricio Plissock, Principle Investigator).

France-Berkeley Fund, "Phylogenetic diversity, endemism, and conservation of Mediterranean Basin flora," 2016-2017, \$12,000.

Institute of Museum and Library Services, "The Silva Center for Phycological Documentation: Long-term Preservation of Classic and Current Resources for the Study of Algae Worldwide," 2016-2017, \$147,231.

University of New South Wales, Australia, Science Visiting Fellowship, "Spatial Phylogenetics," 2016, \$6,000.

NSF Research Grant, "Collaborative Research: Dimensions: Desiccation and Diversity in Dryland Mosses," 2017-2019, \$345,000.

Peder Sather Center for Advanced Study, "The Evolution And Conservation Of Biodiversity: Spatial Phylogenetic Analyses Of The Fennoscandian Flora," 2017-2018, \$24,215.

NSF Collection Improvement Grant, "CSBR: Natural History: Critical Access and Storage For a Unique Collection of Mistletoes at University of California, Berkeley," 2018-2020, \$154,686.00. Co-Principal Investigator (Carol Wilson, Principle Investigator).

NSF Advancing Digitization of Biological Collections Grant, "Digitization TCN: Collaborative Research: Capturing California's Flowers: using digital images to investigate phenological change in a biodiversity hotspot." 2018-2022, \$316,789.

RESEARCH INTERESTS:

My research interests can be grouped into two main areas: empirical studies of ecology, phylogeny, systematics, and development of mosses, and the theoretical basis of systematic and evolutionary biology. Empirical studies include: (1) the phylogenetic relationships of the major groups of bryophytes and other green plants, using morphological, developmental, and ultrastructural characters as well as chloroplast DNA sequence data; (2) the development of moss peristomes in relation to evolution of the group; and (3) biosystematic studies of the haplolepidous mosses, including the tropical family Calymperaceae and the diverse temperate genus *Tortula* (*Syntrichia*), which involve remote-sensing, transplant, and ecological studies in the field, DNA sequencing, comparative physiological measurements, and culture experiments in the lab, and morphological studies in the herbarium; (4) the reproductive biology of bryophytes, especially dryland mosses; and (5) the bryophyte flora of California and of Moorea (in the Society Islands of the South Pacific), and Australia. Theoretical studies include investigations of the nature of species, rank-free classification, methods for phylogenetic reconstruction (with an emphasis on cladistic analysis of molecular and genomic data), the relationship between development and evolution, phyloinformatics (comparative genomics, databasing, and visualization of phylogenetic trees), and biodiversity informatics (digitization and databasing of biological collections, and integration with taxonomic, ecological, geographic, and phylogenetic data).

BIBLIOGRAPHY:

Peer-Reviewed Articles in Professional Journals and Books (117 total):

1979. M.P. Harthill, D.M. Long and B.D. MISHLER. Preliminary list of southern California mosses. The Bryologist 82: 260-267.
1982. B.D. MISHLER and M.J. Donoghue. Species concepts: a case for pluralism. Systematic Zoology 31: 491-503.

- **[Reprinted 1992 in: Ereshefsky, M. (ed.) The Units of Evolution: Essays on the Nature of Species. MIT Press.]
- **[Reprinted 1994 in: Sober, E. (ed.) Conceptual Issues in Evolutionary Biology (second edition). MIT Press.]
1983. B.D. MISHLER and N.G. Miller. Distributional studies of Massachusetts bryophytes. Rhodora 85: 421-432.
1984. B.D. MISHLER and S.P. Churchill. A cladistic approach to the phylogeny of the "bryophytes". Brittonia 36: 406-424.
1985. B.D. MISHLER and S.P. Churchill. Cladistics and the land plants: a response to Robinson. Brittonia 37: 282-285.
- B.D. MISHLER. Biosystematic studies of the *Tortula ruralis* complex. I. Variation of taxonomic characters in culture. Journal of the Hattori Botanical Laboratory 58: 225-253.
- B.D. MISHLER. The morphological, developmental, and phylogenetic basis of species concepts in bryophytes. The Bryologist 88: 207-214.
- B.D. MISHLER and S.P. Churchill. Transition to a land flora: phylogenetic relationships of the green algae and bryophytes. Cladistics 1: 305-328.
- B.D. MISHLER. The phylogenetic relationships of *Tortula*: an SEM survey and a preliminary cladistic analysis. The Bryologist 88: 388-403.
1986. B.D. MISHLER. Ontogeny and phylogeny in *Tortula* (Musci: Pottiaceae). Systematic Botany 11: 189-208.
- B.D. MISHLER. A Hennigian approach to bryophyte phylogeny. Journal of Bryology 14: 71-81.
1987. B.D. MISHLER. Sociology of science and the future of Hennigian phylogenetic systematics. Cladistics 3: 55-60.
- B.D. MISHLER and S.P. Churchill. Transition to a land flora: a reply. Cladistics 3: 65-71.
- K. Bremer, C.J. Humphries, B.D. MISHLER, and S.P. Churchill. On cladistic relationships in green plants. Taxon 36: 339-349.
- B.D. MISHLER. Leaf development in *Tortula papillosissima* (Pottiaceae). Mem. New York Bot. Gard. 45: 48-54.
- J. Shaw, L.E. Anderson, and B.D. MISHLER. Peristome development in mosses in relation to systematics and evolution. I. *Diphyscium foliosum* (Buxbaumiaceae). Mem. New York Bot. Gard. 45: 55-70.
- B.D. MISHLER and R.N. Brandon. Individuality, pluralism, and the phylogenetic species concept. Biology and Philosophy 2: 397-414.
- **[Reprinted 1996 in: Brandon, R.N. Concepts and Methods in Evolutionary Biology. Cambridge University Press.]
- **[Reprinted 1998 in: Hull, D.L. and Ruse, M. (eds.) The Philosophy of Biology. Oxford University Press.]
1988. B.D. MISHLER. Relationships between ontogeny and phylogeny, with reference to bryophytes. In C. J. Humphries (ed.), Ontogeny and Systematics, pp. 117-136. Columbia University Press.
- B.D. MISHLER. Reproductive ecology of bryophytes. In J. Lovett Doust and L. Lovett Doust (eds.), Plant Reproductive Ecology, pp. 285-306. Oxford University Press.
- B.D. MISHLER, K. Bremer, C.J. Humphries, and S.P. Churchill. The use of nucleic acid sequence data in phylogenetic reconstruction. Taxon 37: 391-395.
- B.D. MISHLER and A.E. Newton. Influences of mature plants and desiccation on germination of spores and gametophytic fragments of *Tortula*. Journal of Bryology 15: 327-342.
1989. J. Shaw, L.E. Anderson, and B.D. MISHLER. Peristome development in mosses in relation to systematics and evolution. III. *Funaria hygrometrica*, *Bryum pseudocapillare*, and *B. bicolor*. Systematic Botany 14:24-36.
- B.D. MISHLER and R.N. Brandon. Sex and the individuality of species: a response to Ghiselin. Biology and Philosophy 4:77-79.

- J. Shaw, B.D. MISHLER, and L.E. Anderson. Peristome development in mosses in relation to systematics and evolution. IV. Haplolepidaceae: Ditrichaceae and Dicranaceae. The Bryologist 92: 314-325.
1990. B.D. MISHLER and A.F. Budd. Species and evolution in clonal organisms--introduction. Systematic Botany 15: 79-85.
- B.D. MISHLER. Reproductive biology and species distinctions in the moss genus *Tortula*, as represented in Mexico. Systematic Botany 15: 86-97.
- A.F. Budd and B.D. MISHLER. Species and evolution in clonal organisms--summary and discussion. Systematic Botany 15: 166-171.
1991. B.D. MISHLER and M.J. Oliver. Gametophytic phenology of *Tortula ruralis*, a desiccation-tolerant moss, in the Organ Mountains of southern New Mexico. The Bryologist 94: 143-153.
- B.D. MISHLER. Phylogenetic analogies in the conceptual development of science. PSA 1990, Volume Two, pp. 225-235. [Proceedings of the 1990 biennial meeting of the Philosophy of Science Association]
- B.D. MISHLER and E. De Luna. The use of ontogenetic data in phylogenetic analyses of mosses. Advances in Bryology 4: 121-167.
- L.E. Graham, C.F. Delwiche, and B.D. MISHLER. Phylogenetic connections between the "green algae" and the "bryophytes". Advances in Bryology 4: 213-244.
1992. V.A. Albert, B.D. MISHLER, and M.W. Chase. Character-state weighting for restriction site data in phylogenetic reconstruction, with an example from chloroplast DNA. In P. Soltis, D. Soltis, and J. Doyle (eds.), Molecular Systematics of Plants, pp. 369-403. Chapman and Hall.
- B.D. MISHLER, P.H. Thrall, J.S. Hopple, Jr., E. De Luna, and R.J. Vilgalys. A molecular approach to the phylogeny of bryophytes: cladistic analysis of chloroplast-encoded 16S and 23S ribosomal RNA genes. The Bryologist 95: 172-180.
- V.A. Albert and B.D. MISHLER. On the rationale and utility of weighting nucleotide sequence data. Cladistics 8: 73-83.
1993. M.J. Oliver, B.D. MISHLER, and J.E. Quisenberry. Comparative measures of desiccation-tolerance in the *Tortula ruralis* complex. I. Variation in damage control and repair. American Journal of Botany 80: 127-136.
- M.W. Chase, D.E. Soltis, R.G. Olmstead, D. Morgan, D.H. Les, B.D. MISHLER, M.R. Duvall, R.A. Price, H.G. Hills, Y. Qiu, K.A. Kron, J.H. Rettig, E. Conti, J.D. Palmer, J.R. Manhart, K.J. Sytsma, H.J. Michaels, W.J. Kress, K.G. Karol, W.D. Clark, M. Hedrén, B.S. Gaut, R.K. Jansen, K. Kim, C.F. Wimpee, J.F. Smith, G.R. Furnier, S.H. Strauss, Q. Xiang, G.M. Plunkett, P.S. Soltis, S.M. Swensen, S.E. Williams, P.A. Gadek, C.J. Quinn, L.E. Eguiarte, E. Golenberg, G.H. Learn, Jr., S.W. Graham, S.C.H. Barrett, S. Dayanandan, and V.A. Albert. Phylogenetics of seed plants: an analysis of nucleotide sequences from the plastid gene *rbcL*. Annals Missouri Botanical Garden 80: 528-580.
- V.A. Albert, M.W. Chase, and B.D. MISHLER. Character-state weighting for cladistic analysis of protein-coding DNA sequences. Annals Missouri Botanical Garden 80: 752-766.
1994. B.D. MISHLER. *Tortula*. In A.J. Sharp, H. Crum, and P. M. Eckel (eds.), The Moss Flora of Mexico. Mem. New York Bot. Gard. 69: 319-352. [a monographic treatment of 25 species]
- B.D. MISHLER. Cladistic analysis of molecular and morphological data. American Journal of Physical Anthropology 94: 143-156.
- B.D. MISHLER, L.A. Lewis, M.A. Buchheim, K.S. Renzaglia, D.J. Garbary, C.F. Delwiche, F.W. Zechman, T.S. Kantz, and R.L. Chapman. Phylogenetic relationships of the "green algae" and "bryophytes." Annals Missouri Botanical Garden 81: 451-483.
- V.A. Albert, A. Backlund, K. Bremer, M.W. Chase, J.R. Manhart, B.D. MISHLER, and K.C. Nixon. Functional constraints and *rbcL* evidence for land plant phylogeny. Annals Missouri Botanical Garden 81: 534-567.
- R.N. Brandon, J. Antonovics, R. Burian, S. Carson, G. Cooper, P.S. Davies, C. Horvath, B.D. MISHLER, R.C. Richardson, K. Smith, and P. Thrall. Discussion: Sober on Brandon on screening-off and the levels of selection. Philosophy of Science 61: 475-486.

- A.E. Newton and B.D. MISHLER. The evolutionary significance of asexual reproduction in mosses. Journal of the Hattori Botanical Laboratory 76: 127-145.
1995. B.D. MISHLER. Plant systematics and conservation: science and society. Madroño 42: 103-113. **[Reprinted in part, 2004 in: M. Brooks, S. Carothers, and T. LaBanca. The Ecology and Management of Rare Plants of Northwestern California. California Native Plant Society.]
1996. B.D. MISHLER, V. A. Albert, M. W. Chase, P. O. Karis, and K. Bremer. Character-state weighting for DNA restriction site data: asymmetry, ancestors, and the Asteraceae. Cladistics 12: 11-19.
- E. De Luna and B.D. MISHLER. El concepto de homología filogenética y la selección de caracteres taxonómicos. Boletín de la Sociedad Botánica de México 59: 131-146.
1997. L.A. Lewis, B.D. MISHLER, and R. Vilgalys. Phylogenetic relationships of the liverworts (Hepaticae), a basal embryophyte lineage, inferred from nucleotide sequence data of the chloroplast gene *rbcL*. Molecular Phylogenetics and Evolution 7: 377-393.
- B.D. MISHLER and E. De Luna. Sistemática filogenética y el concepto de especie. Boletín de la Sociedad Botánica de México 60: 45-57.
1998. L. R. Stark, B.D. MISHLER, and D.N. McLetchie. Sex expression and growth rates in natural populations of the desert soil crustal moss *Syntrichia caninervis*. Journal of Arid Environments 40: 401-416.
1999. B.D. MISHLER. Getting rid of species? In R. Wilson (ed.), Species: New Interdisciplinary Essays, pp.307-315. MIT Press.
- B. Goffinet, J. Shaw, L.E. Anderson, and B.D. MISHLER. Peristome development in mosses in relation to systematics and evolution. V. Diplolepideae: Orthotrichaceae. The Bryologist 102: 581-594.
- E. De Luna, A.E. Newton, A. Withey, D. Gonzalez, and B.D. MISHLER. The transition to pleurocarpy: a phylogenetic analysis of the main Diplolepideous lineages based on *rbcL* sequences and morphology. The Bryologist 102: 634-650.
2000. J. Shaw, L.E. Anderson, and B.D. MISHLER. Paedomorphic sporophyte development in *Bruchia flexuosa* (Bruchiaceae). The Bryologist 103: 147-155.
- M.A. Bowker, L. R. Stark, D.N. McLetchie, and B.D. MISHLER. Sex expression, skewed sex ratios, and microhabitat distribution in the dioecious desert moss *Syntrichia caninervis* (Pottiaceae). American Journal of Botany 87: 517-526.
- A.E. Newton, C.J. Cox, J.G. Duckett, J. Wheeler, B. Goffinet, T.A.J. Hedderson, and B.D. MISHLER. Evolution of the major moss lineages: phylogenetic analyses based on multiple gene sequences and morphology. The Bryologist 103: 187-211.
- C. La Farge, B.D. MISHLER, J. Wheeler, D. Wall, K. Johannes, S. Schaffer, and J. Shaw. Phylogenetic relationships within the haplolepideous mosses. The Bryologist 103: 257-276.
- B.D. MISHLER and E. Theriot. The phylogenetic species concept *sensu* Mishler and Theriot: monophyly, apomorphy, and phylogenetic species concepts. In Q.D. Wheeler & R. Meier (eds.), Species Concepts and Phylogenetic Theory: A Debate, pp. 44-54. Columbia U. Press.
- B.D. MISHLER and E. Theriot. A critique from the Mishler and Theriot phylogenetic species concept perspective: monophyly, apomorphy, and phylogenetic species concepts. In Q.D. Wheeler & R. Meier (eds.), Species Concepts and Phylogenetic Theory: A Debate, pp.119-132. Columbia University Press.
- B.D. MISHLER and E. Theriot. A defense of the phylogenetic species concept *sensu* Mishler and Theriot: monophyly, apomorphy, and phylogenetic species concepts. In Q.D. Wheeler & R. Meier (eds.), Species Concepts and Phylogenetic Theory: A Debate, pp.179-184. Columbia University Press.
- L. R. Stark, B.D. MISHLER, and D.N. McLetchie. The cost of realized sexual reproduction: assessing patterns of reproductive allocation and sporophyte abortion in a desert moss. American Journal of Botany 87: 1599-1608.
- M.J. Oliver, Z. Tuba, and B.D. MISHLER. The evolution of vegetative desiccation tolerance in land plants. Plant Ecology 151: 85-100.

- **[subject of a mini-review in Genome Biology **2000** 1(2): reviews 1010.1-1010.4
(<http://www.genomebiology.com/2000/1/2/reviews/1010/>)]
- B.D. MISHLER. Deep phylogenetic relationships among "plants" and their implications for classification. Taxon 49: 661-683.
- **[Reprinted **2001** in: Stuessy, T.F, Hörandl, E., and Mayer, V. (eds.). Plant Systematics: A Half-Century of Progress (1950-2000) and Future Challenges. International Association for Plant Taxonomy.]
- B.D. MISHLER. The need for integrated studies of the California flora. Madroño 47: 230-236.
- **[Reprinted **2004** in: M. Brooks, S. Carothers, and T. LaBanca. The Ecology and Management of Rare Plants of Northwestern California. California Native Plant Society.]
- 2001.** B.D. MISHLER. Biodiversity and the loss of lineages. In L. Maffi (ed.), On Biocultural Diversity: Linking Language, Knowledge, and the Environment, pp.71-81. Smithsonian Institution Press.
- L. R. Stark, D.N. McLetchie, and B.D. MISHLER. Sex expression and sex dimorphism in sporophytic populations of the desert moss *Syntrichia caninervis*. Plant Ecology 157: 181-194.
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[Note that it is my policy not to co-author papers resulting from my graduate student's dissertations, because I encourage them to work independently. Following are thesis/dissertation papers that I have supervised and provided funding for as major professor]

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1994. B.D. MISHLER. Phylogeny and its importance for practical botany and conservation. The Jepson Globe 5(3) : 1-3.
1995. B.D. MISHLER. New connections for the Jepson Herbarium. The Jepson Globe 6(1) : 1-4.
B.D. MISHLER, B.G. Baldwin, and S. D'Alcamo. The future of California floristics and systematics: research, education, conservation. Madroño 42: 93-95.
B.D. MISHLER. The Molecular Phylogenetics Laboratory. The Jepson Globe 6(3) : 1-3.
1996. B.D. MISHLER. Spring field trips of the Jepson Herbarium. The Jepson Globe 7(2) : 1-4.
1997. B.D. MISHLER. Current events at the Jepson Herbarium: Bacigalupi gift, PEET Grant, and the Jepson Flora Project. The Jepson Globe 8(1) : 1-7.
1998. B.D. MISHLER. An external review of University and Jepson Herbaria. The Jepson Globe 9(2): 1-3.
B.D. MISHLER, H. Mohamed, and B. Tan. PEET mossier in Southeast Asia: collaborative fieldwork in Malaysia and Singapore. Bryological Times 97: 1-2.
1999. J.H. Lipps, C. D'Antonio, K. Grove, C. Hickman, B.D. MISHLER, and Z. Wang. Geology and natural history of the Central Coast Ranges: Berkeley to Bodega Head, California. In Wagner, D.L. and Graham, S.A. (eds.), Geologic Field Trips in northern California: Centennial Meeting of the Cordilleran Section of the Geological Society of America, pp. 188-201. California Division of Mines and Geology Special Publication 119.
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B.D. MISHLER. Bryophyte and fern studies in the Bryolab at the University and Jepson Herbaria. The Jepson Globe 10(3): 1-5.
2000. B.D. MISHLER. The Jepson Herbarium 50th anniversary celebration and scientific symposium: discovery, communication, and conservation of plant biodiversity in California. The Jepson Globe 11(2): 1-6.
B.D. MISHLER, B. Ertter, B.G. Baldwin, and S. Marcos. The Jepson Herbarium 50th anniversary celebration and scientific symposium: discovery, communication, and conservation of plant biodiversity in California -- June 16-18, 2000. Madroño 47: 217-218.
2001. B.D. MISHLER. UC Merced and the Jepson Herbarium. The Jepson Globe 12(1): 1-4.
B.D. MISHLER. Book review: The biology of bryophytes. American Journal of Botany 88: 2129-2131.
B.D. MISHLER. Deep Gene. The Jepson Globe 12(3): 1-4.
B.D. MISHLER. Book review: The origin and early diversification of land plants: a cladistic study. Systematic Biology 50: 753-754.
2002. B.D. MISHLER. Publications from the Herbaria. The Jepson Globe 13(2): 1-7.
2003. B.D. MISHLER. New collaborations and electronic resources. The Jepson Globe 14(1): 1-7.
B.D. MISHLER. The biology of bryophytes, with special reference to water. Fremontia 31(3): 34-38.
2004. B.D. MISHLER and J. Shevock. "Mosses". In T.I. Storer, R.L. Usinger, and D. Lukas. Sierra Nevada Natural History, Revised Edition., pp. 50-51 & plates 39-42. University of California Press.
B.D. MISHLER. Graduate student research. The Jepson Globe 15(1): 1-6.

- B.D. MISHLER. A quantum leap in cryptogams! The herbarium of the Natural History Museum of Los Angeles County moves to UC Berkeley. The Jepson Globe 15(3): 1-2.
- B.D. MISHLER. The underlying nature of biodiversity and rarity under a phylogenetic worldview, in relation to conservation. In M. Brooks, S. Carothers, and T. LaBanca. The Ecology and Management of Rare Plants of Northwestern California, p.183. California Native Plant Society. [Introduction to reprinting of Mishler 1995 and 2000, as noted above]
- 2006.** B.D. MISHLER. Genomics and the modern herbarium. The Jepson Globe 16(3): 1-2.
- B.D. MISHLER, B.G. Baldwin, and R.B. Park. In memoriam: Lincoln Constance. University of California Academic Senate, In Memorium. (<http://www.universityofcalifornia.edu/senate/inmemoriam/lincolnconstance.htm>)
- 2007.** B.D. MISHLER. Bryophyte biology. The Jepson Globe 17(3): 1-3.
- B.D. MISHLER. Foreword. In A.E. Newton and R.S. Tangney (eds.), Pleurocarpous Mosses: Systematics and Evolution. CRC Press, Boca Raton.
- 2008.** B.D. MISHLER. Recent Herbaria retirees continue research efforts. The Jepson Globe 18(3): 1-7.
- B.D. MISHLER. Herbarium funding and universities. The Vasculum: Society of Herbarium Curators Newsletter 3(2): 8.
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- B.D. MISHLER. Teaching and research on Moorea (French Polynesia) at the Gump Research Station. The Jepson Globe 19(2): 1-3.
- 2009.** B.D. MISHLER. UC Merced and the Jepson Herbarium revisited. The Jepson Globe 20(1&2): 1.
- B.D. MISHLER. Preface. In M. Chen (ed.), Magnificent Chinese and American Redwoods. Science Press, Beijing.
- 2011.** B.D. MISHLER. Digitizing Pacific Coast seaweeds: documenting the past to interpret the future. The Jepson Globe 21(1): 1-10.
- B.D. MISHLER. Bryology at International Botanical Congress XVIII, 2011, Melbourne. Australasian Bryological Newsletter 59: 2-3.
- B.D. MISHLER. Bryology at International Botanical Congress XVIII, 2011, Melbourne, Australia. The Bryological Times 134: 3.
- B.D. MISHLER. Herbaria data go mainstream. The Jepson Globe 21(2&3): 1-4
- 2012.** B.D. MISHLER. New methods for biodiversity assessment: a sabbatical report. The Jepson Globe 22(1): 1-4.
- B.D. MISHLER, H.S. Miller, and A.D. Miller. Norton G. Miller (1942-2011). The Bryologist. 115: 449-453.
- 2013.** B.D. MISHLER. Introducing the California Moss eFlora. The Jepson Globe 23(1): 1-10.
- S. Markos and B.D. MISHLER. Dedication: Bruce G. Baldwin. Madroño, 60(4): 365-366.
- 2014.** B.D. MISHLER. Phylogenetic diversity and phylogenetic endemism in the California flora: a new NSF-funded initiative. The Jepson Globe 24(1): 1-6.
- B.D. MISHLER. In memoriam -- Roderick Park: a personalized remembrance. The Jepson Globe 24(1): 10.
- B.D. MISHLER. California plant phylogeny working group established. California Native Plant Society Bulletin 44(4): 1-6.
- 2015.** D.T. Harbaugh-Reynaud, B.D. MISHLER, J. Neal-Kababick, and P.N. Brown. The capabilities and limitations of DNA barcoding of botanical dietary supplements. [Scientific white paper commissioned by four trade associations—the American Herbal Products Association; the Consumer Healthcare Products Association; the Council for Responsible Nutrition; and the United Natural Products Alliance.] <https://wholefoodsmagazine.com/wp-content/uploads/2016/03/dnatesting.pdf>
- B.D. MISHLER. Sex and the single moss. The Jepson Globe 25(2): 1-8.
- 2016.** B.D. MISHLER. A new, comprehensive grant to study multiple dimensions of biodiversity in dryland mosses. The Jepson Globe 26(2): 1-7.
- 2017.** B.D. MISHLER. The XIX International Botanical Congress in Shenzhen, China. The Jepson Globe 27(2): 1-6.

2018. B.D. MISHLER. The changing funding landscape of the Herbaria. The Jepson Globe 28(1): 1-2.
 B.D. MISHLER. Taking digitization to a new level at the University and Jepson Herbaria. The Jepson Globe 28(2): 1-4.
2019. B.D. MISHLER. What is biodiversity? Friends of the Regional Parks Botanic Garden Newsletter. July, 2019. <https://mailchi.mp/nativeplants/july-2019-newsletter?e=18648df902>

Presented Papers and Symposia (most with published abstracts):

1977. A preliminary study on the effect of air pollution on the distribution of *Orthotrichum* in southern California. Annual meeting, American Bryological and Lichenological Society (ABLS). East Lansing, Michigan.
 Biosystematics as applied to mosses. Annual meeting, Southern California Academy of Sciences. Pomona, California.
1979. Flora of the San Gabriel Mountains, California: Bryophytes. Annual meeting, ABLS. Stillwater, Oklahoma. (With David M. Long.)
1981. Studies on *Tortula amphidiacea* (C. Muell.) Broth. and *T. fragilis* Tayl., two Appalachian mosses also found in Middle America. Annual meeting, ABLS. Highlands, North Carolina.
1982. Species concepts and phylogenetic systematics. Annual meeting, Willi Hennig Society. College Park, Maryland.
1983. Phylogenetic relationships and generic limits of *Tortula* (Musci: Pottiaceae): evidence from SEM studies of the peristome. Annual meeting, American Society of Plant Taxonomists (ASPT). Grand Forks, North Dakota.
 Development of the leaf of *Tortula obtusissima*: systematic and ecological implications. Annual meeting, ABLS. Grand Forks, North Dakota. (With Daniel C. Scheirer.)
 On the application of Hennigian cladistics to the phylogeny of the bryophytes. Annual meeting, ABLS. Grand Forks, North Dakota. (With Steven P. Churchill.)
1984. The morphological, developmental, and phylogenetic basis of species concepts in bryophytes. Annual meeting, ABLS. Fort Collins, Colorado. (An invited paper.)
 Transition to a land flora: phylogenetic relationships and classification of the "green algae" and the "bryophytes". Annual meeting, Willi Hennig Society. London, England. (With Steven P. Churchill -- an invited paper.)
1985. Relationships between ontogeny and phylogeny in the mosses. Third International Congress of Systematic and Evolutionary Biology. Brighton, England. (An invited paper.)
 A Hennigian approach to bryophyte phylogeny. Third International Congress of Systematic and Evolutionary Biology. Brighton, England. (An invited paper.)
 Sociology of science and the future of Hennigian phylogenetic systematics. Annual meeting, Willi Hennig Society. Miami, Florida. (An invited pre-dinner address.)
1986. Biosystematic studies of the *Tortula ruralis* complex. Annual meeting, ABLS. Amherst, Massachusetts.
 Gametophyte development in the Mniaceae (Musci) and its phylogenetic implications. Annual meeting, Willi Hennig Society. New York, NY. (With Steven P. Churchill.)
1987. Individuality, pluralism, and the phylogenetic species concept. Summer Conference on History, Philosophy, and Social Studies of Biology. Blacksburg, VA. (With R.N. Brandon.)
 The application of cladistics to species and to higher-level taxa of Bryophytes. XIV International Botanical Congress. Berlin, Germany. (An invited paper.)
 Germination of spores and gametophytic fragments of *Tortula* under a variety of experimental conditions. Annual meeting, ABLS. Columbus, Ohio. (With A.E. Newton)
1988. The role of cladistics in systematics and evolutionary theory. Annual meeting, Phycological Society of America. Asilomar, California. (An invited paper.)
 Evolution of desiccation-tolerance in the *Tortula ruralis* complex. I. Distribution, habitats, and water relationships. II. Physiological and biochemical mechanisms. Annual meeting, ABLS. Davis, California. (With M.J. Oliver.)

- El uso de informacion ontogenetica en la sistematica de las briofitas. I Simposio Latinamericano De Briologia. Bogota, Colombia. (With Efraín De Luna.)
- Phylogenetic relationships of Agaricales. Annual meeting, Willi Hennig Society. Stockholm, Sweden. (With Rytas Vilgalys and David Hibbett--an invited paper.)
- The nature of sexual and asexual species in the moss genus *Tortula*. Annual meeting, Society of Systematic Zoology. San Francisco, California. (An invited paper.)
- 1989.** Systematics, ecology, and biogeography of *Tortula* in Mexico. Tropical Bryology Conference, International Association of Bryologists. St. Louis, Missouri. (An invited paper.)
- Peristome development in mosses in relation to systematics and evolution. Annual meeting, ASPT. Toronto, Canada. (With J. Shaw and L.E. Anderson.)
- Phylogenetic relationships in the "charophyte" green algae. Annual meeting, Willi Hennig Society. Ithaca, New York. (An invited paper--with C. Delwiche and L.E. Graham.)
- 1990.** Problems and prospects for phylogenetic reconstruction of Angiosperm relationships from *rbcL* data. Annual meeting, ASPT. Richmond, Virginia. (An invited paper--with V. A. Albert and M. W. Chase.)
- Interspecific differences in the control and repair of desiccation-damage within the *Tortula ruralis* complex. Annual meeting, ABLs. Richmond, Virginia. (With M. J. Oliver.)
- The emperor's new clothes? A molecular approach to the phylogeny of bryophytes using chloroplast DNA. Annual meeting, ASPT. Richmond, Virginia. (With P. Thrall, J. S. Hopple, Jr., E. De Luna, and R. Vilgalys.)
- Integrating molecular and morphological data in phylogenetic reconstruction of the bryophytes. Annual meeting, ABLs. Wakulla Springs, Florida.
- Invited participant in a symposium entitled "Science as a Process". Biennial meeting, Philosophy of Science Association. Minneapolis, Minnesota.
- 1991.** Capsule developmental anatomy and the systematic position of the Hedwigiaceae (Musci). Annual meeting, ABLs. San Antonio, Texas. (With E. DeLuna.)
- Uses of developmental information in phylogenetic reconstruction. Annual meeting, Botanical Society of America. San Antonio, Texas. (An invited paper.)
- Maximum likelihood character-state weighting for parsimony analysis of nucleotide data: examples using characters from the plastid-encoded *rbcL* gene. Annual meeting, ASPT. San Antonio, Texas. (With V.A. Albert and M.W. Chase.)
- The relevance of *rbcL* sequence data to the phylogeny of bryophytes. Annual meeting, ASPT. San Antonio, Texas. (With C. Colacino and M.W. Chase.)
- Homology and the recognition of character states. Annual meeting, ASPT. San Antonio, Texas. (With E. DeLuna.)
- An overview of competing concepts of species and speciation. Annual meeting, Mycological Society of America. San Antonio, Texas. (An invited paper.)
- Phylogenetic classification in biology: A revolution in evolution. Biennial meeting, International Society for the History, Philosophy, and Social Studies of Biology (ISHPSSB). Evanston, Illinois.
- Cladistics, morphogenetic constraints, and species concepts in plants. Biennial meeting, ISHPSSB. Evanston, Illinois.
- The decay index as a measure of relative robustness within a cladogram. Annual meeting, Willi Hennig Society. Toronto, Canada. (With M.J. Donoghue and V.A. Albert.)
- Monophyly: divergence, reticulation, and species. Annual meeting, Willi Hennig Society. Toronto, Canada. (An invited paper.)
- Phylogenetic relationships within the bryophyta: a preliminary analysis based on *rbcL* data. 86th Congress of the Societa Botanica Italiana. Viterbo, Italy. (With C. Colacino and M.W. Chase.)
- 1992.** The cladistic analysis of molecular and morphological data. Annual meeting, American Association of Physical Anthropologists. Las Vegas, Nevada. (An invited paper.)
- Phylogenetic reconstruction in bryophytes using nucleotide sequence data from chloroplast DNA. Annual meeting, ABLs. Honolulu, Hawaii. (An invited paper.)

- The application of nucleotide sequence data from the *rbcL* gene to the phylogeny of bryophytes. Annual meeting, ASPT. Honolulu, Hawaii. (With L.A. Lewis, D. Gonzalez, and R. Vilgalys.)
- Phylogenetic relationships of the "green algae" and "bryophytes" to the tracheophytes. 39th Annual Systematics Symposium, Missouri Botanical Garden, St. Louis. (An invited paper--with L.A. Lewis, M.A. Buchheim, and R.L. Chapman.)
- 1993.** Towards a unified phylogenetic species concept. Annual meeting, ASPT. Ames, Iowa. (An invited paper.)
- Phylogenetic analysis of the liverworts (Bryophyta: Hepaticae) using morphological and molecular characters. Annual meeting, ASPT. Ames, Iowa. (With L.A. Lewis and R. Vilgalys.)
- Compartmentalization: local versus global parsimony. Annual meeting, Willi Hennig Society. Fullerton, California.
- Evolutionary roles of asexual reproduction in bryophytes. XV International Botanical Congress. Yokohama, Japan. (An invited paper--with A.E. Newton.)
- Molecular systematics of bryophytes. XV International Botanical Congress. Yokohama, Japan. (An invited paper.)
- Problems and prospects for the inference of land-plant relationships from *rbcL* sequence variation. XV International Botanical Congress. Yokohama, Japan. (An invited paper--with M.W. Chase, V.A. Albert, A. Backlund, K. Bremer, J.R. Manhart, and K.C. Nixon.)
- 1994.** Phylogeny and ontogeny: heterochrony, ecology, and reproductive biology of mosses. 10th Annual Southwestern Botanical Systematics Symposium, Rancho Santa Ana Botanic Garden. Claremont, California. (An invited paper.)
- The future of plant systematics, science, and society. Symposium: The Future of California Floristics and Systematics, Friends of the Jepson Herbarium. Berkeley, California. (An invited paper.)
- The future of bryology in North America. Annual meeting, ABLs. Knoxville, Tennessee. (An invited paper.)
- Speciation, adaptation, and evolution. 41st Annual Systematics Symposium, Missouri Botanical Garden, St. Louis. (An invited paper.)
- 1995.** Integrating molecular data into systematics. Annual meeting, ABLs. Jasper National Park, Canada. (An invited paper.)
- Introduction to bryophyte conservation issues. Center for Plant Conservation, California Plant Conservation Task Force Meeting. Berkeley, California. (With D.H. Norris.)
- A phylogenetic analysis of the subclass Mezgeriidae Bartholomew-Began (Jungermanniopsida). International Association of Bryologists meeting. Mexico City, Mexico. (With B. Crandall-Stotler and R.E. Stotler.)
- Principles of phylogenetic systematics: the species problem. XIII Congreso Mexicano de Botánica. Cuernavaca, Morelos, México. (An invited paper.)
- 1996.** Representing large clades in high-level phylogenetic analyses, with examples from the land plant radiation. Mardi Gras Symposium in Systematics and Evolutionary Biology, Louisiana State University, Baton Rouge. (An invited paper.)
- Preliminary results from ITS sequence data analysis in the genus *Syntrichia* (Musci: Potticeae). Annual meeting, ABLs. Seattle, Washington. (With C. Colacino.)
- Influence of mature plants on establishment, and the evolution and ecology of asexual reproduction in mosses. Annual meeting, ABLs. Seattle, Washington. (An invited paper -- with A. E. Newton.)
- Biodiversity and the loss of lineages. Conference on: Endangered Languages, Endangered Knowledge, Endangered Environments. Berkeley, California. (An invited paper.)
- 1997.** Molecular systematics of bryophytes. Biennial meeting, International Association of Bryologists. Beijing, China. (An invited paper.)
- Systematics Agenda 2000 -- Charting the Biosphere. Annual meeting, Biological Sciences Division, Special Libraries Association. Seattle, Washington, (An invited paper.)

- A molecular phylogeny of the bryophytes and their relationships to the tracheophytes based on chloroplast 16s and 23s ribosomal-coding genes. Annual meeting, ABLs. Montreal, Canada. (With J.M. Arrington, L.A. Lewis, R. J. Vilgalys and P.S. Manos.)
- Island bryogeography: a case study in the South Pacific. Annual meeting, ABLs. Montreal, Canada. (With D.P. Wall and Mohamed Bin Abdul Majidi.)
- Ecological and developmental studies on the dwarf male breeding system of the moss *Dicranum scoparium* in the North Carolina Piedmont. Annual meeting, ABLs. Montreal, Canada. (With K. Preston.)
- Phylogenetic relationships of extant liverworts based on morphological and molecular data. Annual meeting, ABLs. Montreal, Canada. (An invited paper -- with L.A. Lewis, B. Crandall-Stotler and R.E. Stotler.)
- Phylogenetic relationships within the Metzgeriidae (simple thalloid liverworts) as inferred from morphological characters. Annual meeting, ABLs. Montreal, Canada. (An invited paper -- with B. Crandall-Stotler and R.E. Stotler.)
- An overview of the phylogeny of the mosses inferred from cladistic analysis of morphology and the *rbcL* gene. Annual meeting, ABLs. Montreal, Canada. (An invited paper -- with D. Gonzalez, J.M. Arrington, L. A. Lewis, and R.J. Vilgalys.)
- Phylogeny of the haplolepidous mosses inferred from cladistic analysis of morphology and the *rbcL* gene. Annual meeting, ABLs. Montreal, Canada. (An invited paper -- with S. Schaffer.)
- Major features of the evolution of bryophytes. Annual meeting, ABLs. Montreal, Canada. (An invited paper.)
- 1998.** Compartmentalization in phylogeny reconstruction: philosophy and practice. DIMACS Symposium on Estimating Large Scale Phylogenies. Princeton, New Jersey. (An invited paper -- with P. Soltis and D. Soltis.)
- Preliminary analyses of the phylogenetic relationships of Calymperaceae using *rbcL* sequences. Annual meeting, ABLs. San Juan, Puerto Rico. (With J.A. Wheeler and D.P. Wall.)
- Preliminary inferences on the phylogeny of the pleuocarp diplolepidous-alternate mosses from *rbcL* sequences and morphology. Annual meeting, ABLs. San Juan, Puerto Rico. (With E. De Luna, D. Gonzales, A.E. Newton, and A. Withey.)
- Biodiversity: molecular phylogenetics and conservation. 8th Congress of the Federation of Asian and Oceanian Biochemists and Molecular Biologists. Kuala Lumpur, Malaysia. (An invited paper.)
- 1999.** Relationships among museum collections, phylogenetic systematics, and society. Spring Symposium on "Museums, Universities, and Biodiversity in the 21st Century." California Academy of Sciences and Stanford University. (An invited paper.)
- An overview of early embryophyte phylogeny: problems and prospects for a "total evidence" solution. Royal Society Discussion Meeting. London, England. (An invited paper.)
- Evolution of the major moss lineages. International Botanical Congress. St. Louis, Missouri. (An invited paper -- with A.E. Newton, C.J. Cox, J.G. Duckett, J. Wheeler, B. Goffinet, D. Vitt and T.A.J. Hedderston.)
- Phylogenetic relationships within the haplolepidous mosses. International Botanical Congress. St. Louis, Missouri. (An invited paper -- with J. Wheeler, D. Wall, K. Johannes, S. Schaffer, and J. Shaw.)
- Phylogeny of desiccation-tolerance in plants. International Botanical Congress. St. Louis, Missouri. (An invited paper -- with Z. Tuba and M.J. Oliver.)
- Deep Green: recent results on phylogenetic relationships of the green plants and their evolutionary significance. Keynote Symposium "Phylogeny of Life," International Botanical Congress. St. Louis, Missouri. (An invited paper.)
- Early land plant phylogeny, with special reference to bryophytes: problems and prospects for a "total evidence" solution. International Symposium on "Biodiversity and Evolutionary Biology," German Botanical Society. Jena, Germany. (An invited paper.)
- Phylogenetics, classification, and species concepts. Annual meeting, Willi Hennig Society. Göttingen, Germany. (An invited paper.)

- "Deep Green": recent advances in the phylogenetic relationships of green plants and their evolutionary significance. Annual meeting, Willi Hennig Society. Göttingen, Germany. (An invited paper.)
- 2000.** Deep Green: phylogeny of green plants, comparative genomics, and society. 2000 Genome Symposium, AAAS annual meeting. Washington, DC. (An invited paper.)
- Deep Green: lessons learned from collaborative research. Annual meeting, Association of Systematics Collections, Baltimore, Maryland. (An invited paper.)
- What is a species? Real world implications of species definitions. Annual meeting, AAAS: Pacific Division. Asland, Oregon. (An invited paper.)
- The need for integrated studies of the California flora. Symposium: discovery, communication, and conservation of plant biodiversity in California, Friends of the Jepson Herbarium. Berkeley, California. (An invited paper.)
- The dehydrin like Rehydrin Tr288: A trackable marker for the evolution of desiccation-tolerance? Annual meeting of the American Society of Plant Physiologists. San Diego, California. (A poster -- with M.J. Oliver, J. A. Wheeler, and J. Velten.)
- Spatial distribution of desert bryophyte populations. Annual meeting, ABLs and Botanical Society of America. Portland, Oregon. (A poster -- with M.L. Bonine, L.R. Stark, and D. N. McLetchie.)
- Congruence and convergence in the moss family Calymperaceae: phylogenetic analysis of two chloroplast genes (*rbcL* and *rps4*) and morphology. Annual meeting, ABLs and BSA. Portland, Oregon. (With J. A. Wheeler, D. P. Wall, and K. Johannes.)
- Deep Green: recent advances in plant phylogeny and their uses for comparative genomics. 12th International Genome Sequencing and Analysis Conference (organized by TIGR, The Institute for Genomic Research). Miami, Florida. (an invited plenary paper, which opened the meeting)
- 2001.** An overview of plant phylogeny and its role in comparative studies. Annual meeting, AAAS. San Francisco, California. (An invited paper.)
- Rank-free phylogenetic classification and the unification of biology. Smithsonian Botanical Symposium: Linnaean Taxonomy in the 21st Century. Washington, DC (An invited paper.)
- The uses of phylogenetics in ethnobiological research. Building Bridges with Traditional Knowledge Summit Meeting. Honolulu, Hawaii (with Anya Hinkle)
- Repair of desiccation induced damage: use of replacement histone genes to map the role of cellular repair in the evolution of desiccation tolerance. Annual meeting of the American Society of Plant Biologists. Providence, Rhode Island. (A poster -- with M.J. Oliver and J. Velten.)
- A bryophyte rehydrin trackable marker for the evolution of desiccation tolerance. Annual meeting, ABLs and BSA. Albuquerque, New Mexico (With M.J. Oliver, J.A. Wheeler, and J. Velten.)
- Desiccation-tolerant pteridophytes: a unique position in the evolution of desiccation tolerance in land plants. Annual meeting, American Fern Society and BSA. Albuquerque, New Mexico (An invited paper -- with M.J. Oliver.)
- A reappraisal of the resorption pores of hyalocysts in the Calymperaceae and their phylogenetic significance. Annual meeting, ASPT and BSA. Albuquerque, New Mexico (With K.L. Yip.)
- Biodiversity: how is it measured and what are its values? Forum on Polynesian Biodiversity and Ethnobotany. Richard B. Gump South Pacific Research Station, Moorea, French Polynesia (An invited paper.)
- 2002.** The NSF Deep Gene Research Coordination Network. Plant, Animal and Microbe Genomes X Conference. San Diego, California. (An invited paper.)
- The underlying nature of biodiversity and rarity under a phylogenetic worldview, in relation to conservation. Symposium on Ecology and Management of Rare Plants of Northwestern California. North Coast Chapter of the California Native Plant Society. Arcata, California (An invited paper.)

- Rank-free classification for foraminifera. Forams 2002: International Symposium on Foraminifera. Perth, Australia (With J. Lipps.)
- The MossCam Project: the world's first remote-sensing project on moss ecology. Annual meeting, ABLs. Storrs, Connecticut (with M.P. Hamilton.)
- Spatial segregation of the sexes in a desert moss. Annual meeting, ABLs. Storrs, Connecticut (with L. Stark and N. McLetchie.)
- Phylogeography of the moss Genus *Timmia* (Pottiaceae; Musci). Annual meeting, ASPT and BSA. Madison, Wisconsin (With D. Des Marais.)
- The advantages of rank-free classification for teaching and research. Annual meeting, Willi Hennig Society. Helsinki, Finland (An invited paper.)
- Progress in green plant phylogeny: cladistics and genomics in the most important branch of the tree of life. Annual meeting, Willi Hennig Society. Helsinki, Finland (An invited paper.)
- Deep Gene: redrawing the tree of life. Annual meeting, California Science Teachers Association. San Francisco, CA. (An invited paper.)
- 2003.** Toward resolution of the "fuzzy nodes" in green plant phylogeny. Plant, Animal and Microbe Genomes XI Conference. San Diego, California. (A poster -- with D. Mandoli, R. Olmstead, J. Boore, A. Smith, K. Renzaglia, P. Wolf, M. Donoghue, and C. O'Kelly.)
- Deep Gene and the Plant Genome Initiative. Plant, Animal and Microbe Genomes XI Conference. San Diego, California. (An invited paper.)
- Biodiversity isn't species: the tree of life, rank-free phylogenetic classification, and the future of bioinformatics. Annual meeting, AAAS: Pacific Division. San Francisco, California. (An invited paper.)
- Phylogenetically structured databases: the future of bioinformatics. Annual meeting, Society for the Study of Evolution. Chico, California. (With D. Ackerly, C. Webb, S. Askay, R. Moe, and S. Markos.)
- Phylogenetically structured databases: the future of bioinformatics. Annual meeting, ASPT and BSA. Mobile, Alabama. (With D. Ackerly, C. Webb, S. Askay, R. Moe, and S. Markos.)
- Getting to the bottom of land plants: genomic characters vs. DNA sequence data, and compartmentalization vs. global analyses. International symposium: Molecular Systematics of Bryophytes: Progress, Problems, and Perspectives. St. Louis, Missouri. (An invited paper.)
- Deep Gene: how phylogenetics can help genomics and vice versa. Moss 2003 - Annual International Conference for Moss Experimental Research. St. Louis, Missouri. (An invited keynote address.)
- A phylogenetic approach to understanding gene relevance to important traits in the evolution of land plants. Moss 2003 - Annual International Conference for Moss Experimental Research. St. Louis, Missouri. (With M.J. Oliver and J. Velten.)
- Phylogeny of the land plants, with special reference to bryophytes. Annual meeting, Australian Systematic Botany Society (National Herbarium of Victoria's 150th Anniversary Celebration Conference). Melbourne, Australia. (An invited keynote address.)
- 2004.** Deep Gene and plant genomics: what to expect from ontologies. Plant, Animal and Microbe Genomes XII Conference. San Diego, California. (An invited paper.)
- Toward resolution of the "fuzzy nodes" in green plant phylogeny: year 2 update. Plant, Animal and Microbe Genomes XII Conference. San Diego, California. (A poster -- with D. Mandoli, R. Olmstead, J. Boore, A. Smith, K. Renzaglia, P. Wolf, M. Donoghue, and C. O'Kelly.)
- Phylogenetic systematics: its tasks, current tools, and future. Primera Reunión Mexicana de Biología Filogenética. Xalapa, Veracruz, Mexico. (An invited keynote address.)
- Terminating species: a rank-free approach to terminal taxa. First International Phylogenetic Nomenclature Meeting. Paris, France. (With K. Fisher.)
- Monography and the PhyloCode: a practical example from the moss clade *Leucophanella*. First International Phylogenetic Nomenclature Meeting. Paris, France. (With K. Fisher.)
- The complete chloroplast genome sequence of the lycopod, *Huperzia lucidula* (Lycopodiaceae): implications for land plant phylogeny. Annual meeting, BSA. Snowbird, Utah. (A poster --

- with P. Wolf, K. Karol, D. Mandoli, J. Kuehl, K. Arumuganathan, M. Ellis, J. Roper, D. Kelch, R. Olmstead, and J. Boore.)
- Non-traditional approaches to resolving the green plant tree of life. Annual meeting, BSA. Snowbird, Utah. (With A. Driskell, D. Kelch, and M. Sanderson).
- Inferring phylogeny using genomic characters: a case study using land plant plastomes. Annual meeting, BSA. Snowbird, Utah. (With D. Kelch, A. Driskell, and P. Wolf).
- Phylogeny of the land plants: the role of morphology, DNA sequences, and comparative genomics. Second international symposium on molecular phylogeny of bryophytes. Göttingen, Germany. (An invited paper.)
- 2005.** The ecology and evolution of desiccation tolerance in mosses. Annual meeting, Society for Integrative and Comparative Biology. San Diego, California. (An invited paper.)
- Toward Resolution Of The Fuzzy Nodes In Green Plant Phylogeny. Plant, Animal and Microbe Genomes XIII Conference. San Diego, California. (With D. Mandoli, J. Boore, K. Everett, M.J. Donoghue, K. Karol, J. Kuehl, C. O'Kelly R. Olmstead, A. Smith, K. Renzaglia, and P. Wolf.)
- The Jepson Flora Project: an integrative approach to floristics. International Botanical Congress, Vienna, Austria (With B. Baldwin).
- Homology and character states in morphological and molecular data. International Botanical Congress, Vienna, Austria (With E. De Luna).
- Geometric spaces and quantitative methods for the similarity test of homology and character state identity. International Botanical Congress, Vienna, Austria (With E. De Luna).
- Inference of land plant phylogeny from genomic chloroplast data. International Botanical Congress, Vienna, Austria (With D. G. Kelch, K. G. Karol, and P. G. Wolf).
- Desiccation tolerance in bryophytes: the primitive strategy for land plants? International Botanical Congress, Vienna, Austria (With A. J. Wood and M. J. Oliver).
- The uses of phylogenetics in comparative genomics, with special reference to *Physcomitrella*. Moss 2005 - Annual International Conference for Moss Experimental Research. Brno, Czech Republic.
- Chloroplast genome sequence of the marattioid fern *Angiopteris*. Annual meeting, BSA. Austin, Texas (With J.M. Roper, S.K. Hansen, A.G. Murdock, J.V. Kuehl, J.L. Boore, K.G. Karol, D.F. Mandoli, R. Olmstead, and P.G. Wolf).
- Phylogeny of the land plants: analysis of a new comprehensive morphological matrix in relation to nucleotide sequence data and comparative organellar genomics. Annual meeting, BSA. Austin, Texas (With A.G. Murdock, A.R. Smith, K.S. Renzaglia, S. Schuette, C.J. O'Kelly, J.M. Roper, S.K. Hansen, and P.G. Wolf).
- The evolution and ecology of desiccation tolerance in mosses. Annual meeting, BSA. Austin, Texas. (An invited paper.)
- 2006.** Gene trees and “species” trees: problems for comparative genomics and classification. Moss 2006 - Annual International Conference for Moss Experimental Research. Berkeley, California.
- Complete chloroplast genome sequence of the moss *Tortula ruralis* and structural arrangement relative to other green plant chloroplast genomes. Annual meeting, BSA. Chico, California (With A.G. Murdock, M.J. Oliver, J.V. Kuehl, J.L. Boore, K.G. Karol, D.F. Mandoli, and K. Everett).
- Desiccation-tolerance: A case study of physiological trends in the evolution of land plants. Annual meeting, BSA. Chico, California (An invited paper -- with M.J. Oliver).
- Early events in green plant evolution: morphological character assessments and phylogenetic analysis. Annual meeting, BSA. Chico, California (With C.J. O'Kelly and A.G. Murdock).
- Evolutionary origin of the leptosporangiate ferns: sorting through conflicting evidence. Annual meeting, BSA. Chico, California (With A.G. Murdock, A.R. Smith, and K.S. Renzaglia).
- Phylogeny of land plants - information from comparative genomics. Annual meeting, BSA. Chico, California (An invited paper -- with D. Kelch).

- Reproductive Studies of the Moss *Calymperes graeffeanum* from Moorea, French Polynesia. Annual meeting, BSA. Chico, California (With T.D. d'Artenay).
- The Jepson Flora Project: An update and an introduction to the Ecological Flora of California. Annual meeting, BSA. Chico, California (With B.G. Baldwin and D.D. Ackerly).
- 2007.** Three centuries of paradigm changes in biological classification: is the end in sight? Annual meeting, BSA and ASPB. Chicago, Illinois (An invited paper).
- The uses of phylogenetics in comparative genomics, with special reference to the *Physcomitrella* genome project. World Conference of Bryology, 2007 (biennial meeting, International Association of Bryologists). Kuala Lumpur, Malaysia (An invited paper).
- The *Physcomitrella* genome project and its uses in bryology and beyond. Annual meeting, ABLS. Xalapa, Veracruz, Mexico.
- An exploration of the Phylocode using the moss clade Calymperaceae. Annual meeting, ABLS. Xalapa, Veracruz, Mexico. (With K.M. Fisher).
- 2008.** Species and DNA barcoding. "Edges & Boundaries of Biological Objects" conference, University of Utah (An invited paper).
- California and its endemics with an emphasis on bryophytes. Annual meeting, ABLS. Asilomar, Pacific Grove, California (An invited paper -- with D.H. Norris and J.R. Shevock).
- Synergisms between phylogenetics and genomics, with special reference to the *Physcomitrella* Genome Project. Annual meeting, ABLS. Asilomar, Pacific Grove, California (An invited paper).
- 2009.** Studies on the Moss Flora of Moorea, French Polynesia. Annual meeting, BSA. Snowbird, Utah. (With T.D. d'Artenay).
- The Moorea Biocode Project: bryophytes. Annual meeting, BSA. Snowbird, Utah (With E. Fok)
- The tortoise and the hare, moss-style. Annual meeting, BSA. Snowbird, Utah (With B. Carter)
- Modern phylogenetic approaches to biodiversity assessment, with examples from the Moorea Biocode Project and the Jepson Flora Project. Annual meeting, Willi Hennig Society. Singapore.
- 2010.** Factors influencing the biogeographic and ecological distribution of bryophytes in California: mosses are from Mars, vascular plants are from Venus. Northern California Botanists Symposium entitled "Botanical Treasures in Northern California—What's at Stake?" Chico, California (An invited paper -- with P. Wilson).
- Introducing CollectionSpace, a collection management system and foundation for research. Annual meeting, Society for Preservation of Natural History Collections, Ottawa, Canada (With C.R. Hoffman, A. Doran, R. Moe, and P. McGrath).
- The Jepson Flora Project and the Consortium of California Herbaria. Annual meeting, Society for Preservation of Natural History Collections, Ottawa, Canada (With B.G. Baldwin, R.L. Moe and S. Markos).
- 2011.** What are we trying to conserve? The role of phylogenetics in taxon recognition and prioritization for conservation. International Botanical Congress, Melbourne, Australia.
- Cryptic lineage diversity in California mosses – examples from *Syntrichia*. International Botanical Congress, Melbourne, Australia (With K.M. Fisher).
- 2012.** New methods of assessing biodiversity using molecular phylogenetics. Moss 2012, New York.
- Phylogenetic views of species: a status report. Annual meeting, Willi Hennig Society. Riverside, California.
- Integrative research using digitized specimens: examples from the Consortium of California Herbaria. Annual meeting, BSA. Columbus, Ohio (An invited paper -- with L. McDade).
- A new era for natural history collections: the impact of digitization and phylogenetics on analysis of biodiversity data. Australasian Systematic Botany Society Conference. Perth, Western Australia (An invited keynote address).
- Phylogenetic measures of biodiversity and endemism, with an example using Australian bryophytes. Australasian Systematic Botany Society Conference. Perth, Western Australia (With D.C. Cargill, N. Knerr, C.E. González-Orozco, A.H. Thornhill, S. Laffan, and J.T. Miller).

- Biodiversity research data cleaning and visualisation methods. Australasian Systematic Botany Society Conference. Perth, Western Australia (With N. Knerr, C.E. González-Orozco, A.H. Thornhill, S. Laffan, and J.T. Miller).
- Phylogenetic Niche Modelling (PhyNM): exploring evolutionary history of Australia in a new way. Australasian Systematic Botany Society Conference. Perth, Western Australia (With C.E. González-Orozco, N. Knerr, D.C. Cargill, and J.T. Miller).
- Phylogeny and endemism of *Acacia*. Australasian Systematic Botany Society Conference. Perth, Western Australia (With J.T. Miller, C.E. González-Orozco, A.H. Thornhill, N. Knerr, and S. Laffan).
- Eucalypts and Orchids: A phylogenetic and spatial analysis of two of Australia's largest plant groups. Australasian Systematic Botany Society Conference. Perth, Western Australia (With A.H. Thornhill, M.D. Crisp, L.A. Nelson, K.E. Lam, N. Knerr, C.E. González-Orozco, K. Kulheim, M.A. Clements, and J.T. Miller).
- 2013.** Integrative research using digitized specimens: examples from the Consortium of California Herbaria. Global Plants Initiative VI Annual Meeting. Panama City, Panama.
- A new era for natural history collections: the impact of digitization and phylogenetics on analysis of biodiversity data. Annual meeting, BSA. New Orleans, Louisiana (An invited paper).
- Continental scale patterns and predictors of fern diversity. Annual meeting, BSA. New Orleans, Louisiana (With N.S. Nagalingum, N. Knerr, S. Laffan, A. Thornhill, C.E. González-Orozco, and J.T. Miller).
- Liverwort Flora of Mo'orea, French Polynesia: Progress and Future. Annual meeting, BSA. New Orleans, Louisiana (With E. Kraichak, B. Carter, and S. Nosratinia).
- Phylogenetic diversity and endemism in Australian conifers. Annual meeting, BSA. New Orleans, Louisiana (With A. Lee, N.S. Nagalingum, S. Nosratinia, N. Knerr, and J.T. Miller).
- Phylogenetic diversity and endemism of the Australian flora. Annual meeting, BSA. New Orleans, Louisiana (With J.T. Miller).
- Systematics and ecology of *Rhabdodontium buftonii*, a paleoendemic Tasmanian moss newly placed in the Ptychomniaceae. Annual meeting, BSA. New Orleans, Louisiana (With P. Dalton, N. Bell, S. Nosratinia, and J.T. Miller).
- 2014.** The evolution of desiccation tolerance. New Frontiers in Anhydrobiosis. Pornichet, France (An invited plenary lecture).
- The evolution and ecology of rheophytic mosses. Annual meeting, BSA. Boise, Idaho (An invited talk, with J. Shevock).
- Taxonomy and DNA Methods. USP Workshop on DNA Methods for Quality Control of Botanical Products. Washington, D.C.
- 2015.** Phylogenetic diversity and phylogenetic endemism in the California flora. California Native Plant Society (CNPS) Conservation Conference. San Jose, California (With B.G. Baldwin and D.D. Ackerly).
- California Moss eFlora. CNPS Conservation Conference. San Jose, California (With P. Wilson, N. Mendez, and A.E. Sims).
- Mobilizing community efforts to improve our knowledge of the systematics and evolution of California plants. CNPS Conservation Conference. San Jose, California.
- Spatial phylogenetics: methods for exploring phylogenetic diversity and phylogenetic endemism on the landscape, with examples from *Acacia*. Annual meeting, BSA. Edmonton, Alberta (An invited talk, with A.H. Thornhill, N. Knerr, C.E. González-Orozco, S. Laffan, and J.T. Miller).
- Patterns of diversity and endemism at different phylogenetic scales using examples from the Australian flora. Annual meeting, BSA. Edmonton, Alberta (An invited talk, with A.H. Thornhill, N. Knerr, C.E. González-Orozco, and J.T. Miller).
- Using herbarium data for niche modeling to study phylogenetic diversity and endemism of Florida plants. Annual meeting, BSA. Edmonton, Alberta (An invited talk, with C. Germain-Aubrey, J. Allen, K.M. Neubig, S. Laffan, R. Guralnick, T. Lamy, L. Majure, D. Soltis, J.-M. Ponciano, R. Abbott, and P. Soltis).

- New phylogenetic approaches to biodiversity assessment and conservation. 41st Annual Southern California Botanists Symposium. Claremont, California.
- 2016.** Locating centres of palaeo and neo endemism by varying the randomisation and spatial scale. VIII Southern Connection Congress 2016 (With S. Laffan, J.T. Miller, N. Knerr, C.E. González-Orozco, and A.H. Thornhill).
- Spatial phylogenetics: determining patterns of diversity and endemism at different scales using examples from the Australian flora. VIII Southern Connection Congress 2016 (With A.H. Thornhill, J.T. Miller, N. Knerr, C.E. González-Orozco, S. Laffan, C. Costion, and D. Crayn).
- Phylogenetic diversity and endemism in the vascular flora of Chile. VIII Southern Connection Congress 2016 (With R. Urbina-Cassanova, W. Freyman, A.H. Thornhill, and R. Scherson).
- Hotspots of species richness and endemism in the California flora. Annual meeting, BSA. Savannah, Georgia (with B.G. Baldwin, A.H. Thornhill, W.A. Freyman, and D.D. Ackerly).
- Patterns of beta-diversity in the California vascular flora, comparing species-based and phylogenetic turnover measures. Annual meeting, BSA. Savannah, Georgia (with A.H. Thornhill, M.M. Kling, W.A. Freyman, D.D. Ackerly, and B.G. Baldwin).
- Hotspots of phylogenetic richness and endemism in the California flora. Annual meeting, BSA. Savannah, Georgia (An invited talk, with A.H. Thornhill, B.G. Baldwin, W.A. Freyman, S. Nosratinia, N. Morueta-Holme, M.M. Kling, T. Madsen, and D.D. Ackerly).
- Using museum specimens to refine species distribution models: The Florida Plant Diversity Project. Annual meeting, BSA. Savannah, Georgia (with C. Germain-Aubrey, J. Allen, R. Guralnick, S. Laffan, K. Neubig, K. Maximillian, D. Soltis, L. Majure, and P. Soltis).
- The Consortium of California Herbaria: Integrating curation, information, and research. Annual meeting, BSA. Savannah, Georgia (An invited talk).
- Spatial phylogenetics —combining molecular phylogenetics with collection-based spatial data to interpret evolutionary and ecological history, as well as better inform conservation decisions. Annual meeting of the GDR Théorie et Modélisation de la Biodiversité. Grenoble, France. (with A.H. Thornhill).
- 2017.** Richness and endemism in the California flora measured using both species-based and phylogenetic approaches. XIV MEDECOS and XIII AEET Meeting. University of Seville, Spain (with D.D. Ackerly, B.G. Baldwin, A.H. Thornhill and W. Freyman).
- Spatial phylogenetic of the native vascular flora of Chile. XIV MEDECOS and XIII AEET Meeting. University of Seville, Spain (with R. Scherson, A.H. Thornhill, W. Freyman, P. Pliscoff, B.G. Baldwin, and D.D. Ackerly).
- Discordance is telling us something about "species." Conference on "Species in the Age of Discordance." University of Utah (An invited talk).
https://philosophy.utah.edu/conferences_workshops/species.php
- Funding staff and infrastructure for sustaining biodiversity informatics and data curation. Directors' Summit on Digital Data. Denver, Colorado (An invited talk).
- Spatial phylogenetics of the North American flora. International Botanical Congress, Shenzhen, China (An invited talk, with B.G. Baldwin, W.A. Freyman, and A.H. Thornhill).
- Spatial phylogenetics of the native California flora. International Botanical Congress, Shenzhen, China (An invited talk, with A.H. Thornhill, B.G. Baldwin, W.A. Freyman, S. Nosratinia, M.M. Kling, N. Morueta-Holme, T. Madsen, and D.D. Ackerly).
- A new spatial phylogenetic method for distinguishing neo-endemism, paleo-endemism, and meso-endemism: range-weighted branch length difference (RWiBaLD). International Botanical Congress, Shenzhen, China (An invited talk, with N.Knerr, J.T. Miller, and S.W. Laffan).
- 2018.** Using specimen data with new quantitative approaches to study spatial patterns of richness and endemism in California's vascular flora. CNPS Conservation Conference, Los Angeles, California (With B.G. Baldwin, A.H. Thornhill, W.A. Freyman, D.D. Ackerly, M.M. Kling, N. Morueta-Holme, T. Madsen, and S. Nosratinia).

- Future priorities for conserving the evolutionary diversity of the California flora. Second Annual Digital Data in Biodiversity Research Conference. Berkeley, California (With M. Kling, B. Baldwin, D. Ackerly, and A. Thornhill).
- Spatial phylogenetics of the native California flora: integrating ecology, evolution, and conservation. Second Annual Digital Data in Biodiversity Research Conference. Berkeley, California (With M. Kling, B. Baldwin, D. Ackerly, and A. Thornhill).
- Conserving the evolutionary diversity of the California flora. North American Congress for Conservation Biology (NACCB). Toronto, Ontario, Canada (With M. Kling, D. Ackerly, and B. Baldwin).
- Priorities for conserving the endemic phylodiversity of the California flora. Annual meeting, BSA. Rochester, Minnesota (With M. Kling, A. Thornhill, B. Baldwin, and D. Ackerly).
- Systematics of *Syntrichia*: new morphological character analysis. Annual meeting, BSA. Nederland, Colorado (With J. Jauregui-Lazo, and J.C. Brinda).
- A new gap analysis of the California flora incorporating phylogenetic information: evolutionary diversification, divergence, and survival as conservation targets. California Native Plant Society Conservation Symposium. Lee Vining, California.
- 2019.** Biodiversity assessment and conservation without species. Northern California Botanists symposium on "Research and Conservation of Northern California's Vegetation Communities." Chico, California.
- New phylogenetic methods for detecting, understanding, and conserving centers of endemism. 2019 State of Biodiversity Symposium. San Diego, California.
- The logic of the data matrix in phylogenetic analysis. Annual meeting, Willi Hennig Society. Berkeley, California.

INVITED SEMINARS:

- 1984** Harvard University; Duke University
- 1985** University of North Carolina at Chapel Hill; Ohio State University
- 1986** University of North Carolina at Chapel Hill
- 1987** New Mexico State University; North Carolina State University
- 1988** Virginia Polytechnic Institute and State University; Cornell University
- 1989** National Endowment for the Humanities Summer Seminar in Philosophy of Biology, Virginia Polytechnic Institute and State University
- 1990** Rancho Santa Ana Botanic Garden; Louisiana State University; University of Cincinnati; Miami University of Ohio; University of Wisconsin, Madison; Field Museum of Natural History, Chicago
- 1991** Academy of Natural Sciences, Philadelphia
- 1992** University of Puerto Rico; University of North Carolina at Chapel Hill; University of California, Riverside; University of Arizona, Tucson; Rancho Santa Ana Botanic Garden; University of Georgia, Athens; University of California, Berkeley
- 1993** Rancho Santa Ana Botanic Garden; Suez Canal University, Ismailya, Egypt; Ain Shams University, Cairo, Egypt; University of Northern Colorado; California Botanical Society; San Francisco State University
- 1994** Bay Area Biosystematists, UC Berkeley, California; National Museum of Natural History (The Smithsonian); East Bay Chapter, California Native Plant Society; University of Toronto; Southern Illinois University at Carbondale; Arizona State University; Los Angeles County Museum of Natural History
- 1995** Yerba Buena Chapter, California Native Plant Society; California State University, Chico; Mt. Lassen Chapter, California Native Plant Society; San Diego State University; California

- Academy of Sciences; Università di Napoli, Italy; Sonoma State University; Instituto de Ecología, Xalapa, Veracruz, México
- 1996** Berkeley Natural History Museums public lecture series; Bay Area Biosystematists, UC Berkeley, California; Ohio State University (*Rudolph Memorial Lecture*)
- 1997** Marin Chapter, California Native Plant Society; Bay Area Biosystematists, Sonoma State University; University of California, Davis; San Francisco State University; Harvard University; Harvard Forest
- 1998** San Diego State University; University of Nevada, Las Vegas; Washington State University; Bay Area Biosystematists, University of California, Davis; Field Museum of Natural History, Chicago; University of Queensland, Australia; University of Canterbury, New Zealand; University of Otago, New Zealand; Centre for Plant Biodiversity Research, Canberra, Australia; Coopers and Cladistics Discussion Group, Australia National University and CSIRO; Rancho Santa Ana Botanic Garden; Universiti Malaysia, Sabah; National University of Singapore; Universiti Malaya, Kuala Lumpur
- 1999** University of Missouri, St. Louis; University of Kansas, Lawrence; British Museum of Natural History, London; University of California, Riverside; Georg-August-Universität, Göttingen, Germany; Bay Area Biosystematists, University of California, Davis; University of Michigan, Ann Arbor
- 2000** University of California, Riverside; California State Polytechnic University, Pomona; Harvard University; Bay Area Biosystematists, Stanford University; University of Maryland, College Park; United States Department of Agriculture, Beltsville, MD; Bay Area Biosystematists, University of California, Davis
- 2001** Santa Margarita Ecological Reserve, Temecula CA; DOE Joint Genome Institute, Walnut Creek, CA; Salk Institute, La Jolla, CA
- 2002** Max-Planck-Institute for Plant Breeding Research, Cologne, Germany; Georg-August-Universität, Göttingen, Germany; Brigham Young University (*John Tanner Lectureship*); Utah State University; University of California, Riverside; Duke University; University of Tehran, Iran
- 2003** University of Texas, Austin; Southern Illinois University at Carbondale; Melbourne Systematic Forum, Australia; CSIRO Entomology, Canberra, Australia; Centre for Plant Biodiversity Research, Canberra, Australia
- 2004** Berkeley Natural History Museums Biodiversity Informatics Seminar, University of California, Berkeley; California State University, Fresno; San Jose State University; Universidad Veracruzana, Xalapa, Veracruz, Mexico (simulcast to all campuses in the system over Internet2)
- 2006** Michigan State University; Google, Mt. View, CA
- 2007** University of Arizona
- 2008** University of Missouri, Columbia; University of California, Merced; Moss Landing Marine Laboratory, CA
- 2009** Singapore Institute of Biology and Science Centre, Singapore
- 2010** Field Museum of Natural History; Cornell University; Arizona State University
- 2011** Sonoma State University; University of California, Merced; American Museum of Natural History; Coopers and Cladistics Discussion Group, Australia National University and CSIRO; Centre for Plant Biodiversity Research, Canberra, Australia; Royal Botanic Garden Sydney, Australia; Australian Museum, Sydney, Australia; University of Tasmania, Australia; Woolongong University, Australia; Western Australian Herbarium, Perth, Australia
- 2012** New York Botanical Garden
- 2013** University of Canberra, Australia; Humboldt State University; University of California, Santa Barbara
- 2014** University of Arizona, Tucson; Oklahoma State University; Universidad de Chile, Santiago, Chile
- 2015** North Carolina State University (*B.W. Wells Lecture*); Duke University; California State University, Northridge; Santa Barbara Botanical Garden; Rancho Santa Ana Botanic Garden
- 2016** East Bay Chapter, California Native Plant Society; Université Paris-Sud; Herbar National de Paris; University of New South Wales, Sydney, Australia
- 2017** Royal Botanical Garden of Madrid, Spain

2018 Milo Baker Chapter, California Native Plant Society; Norwegian University of Science and Technology (NTNU), Trondheim, Norway; Royal Botanic Garden, Edinburgh, Scotland; ESRI, Redlands, California; University of Colorado, Boulder
2019 Yerba Buena Chapter, California Native Plant Society

FIELD EXPERIENCE:

1975-1978. Extensive fieldwork in southern California
1979, Summer. Missouri, Arkansas, Oklahoma
1980, Summer. Canada: from Ontario to British Columbia; Washington state
1981, Summer. Southern California, Arizona, New Mexico, western Texas
1981, Winter. Mexico: from Colima in the west to Veracruz in the east; Zacatecas in the north to Oaxaca in the south; especially in the alpine regions of the Central Volcanic Axis
1979-1984. Extensive fieldwork in New England and New York; especially Massachusetts
1983, Summer. Michigan, Wisconsin, Minnesota, North Dakota
1984, Summer. Colorado, Utah, southern California
1985, Summer. Southern England; New Mexico, Arizona, southern California
1986-1992 North Carolina
1992. Puerto Rico; Hawaii
1993, Spring. Egypt
1993- Extensive fieldwork in California and western North America
1994- French Polynesia, especially Moorea
1995, Summer. Southern Italy, Greece; western Canada
1995, Fall. Mexico: Sierra Madre Oriental
1998, Summer. Australia: east coast from Queensland to Victoria; New Zealand
1998, Fall. Southeast Asia: Malaysia (peninsula and Borneo), Singapore
1999, Spring. Mexico: Veracruz and Oaxaca
2002, Fall Iran
2003, Fall Southeastern Australia
2007, Summer Indonesia (western Java); Mexico (Veracruz)
2014, Fall Central Chile
2015, Summer Canadian Rockies
2011, 2012, 2016 Australia: the southeast from Blue Mountains NSW to Victoria; Tasmania; the southwest from Perth to Albany; the northeast around Cairns; the center around Alice Springs; New Zealand
2018, Spring Norway; Scotland
2019, Spring Southern Africa

PROFESSIONAL SERVICE:

Board of Trustees, Highlands Biological Foundation, Inc. 1991-1993
External Reviewer, Botany Department, Royal Ontario Museum, Toronto, 1994
External Peer Reviewer, search for Professorship and Head of Department of Cryptogamic Botany, Swedish Museum of Natural History, 1994
External Reviewer, Department of Biology, San Diego State University, 1998
Program Committee, Bay Area Biosystematists, 1994-1998; 1999-2001; 2005-2011
Program Committee, XVI International Botanical Congress, 1996-1999
External reviewer, Cheadle Center for Biodiversity and Ecological Restoration (CCBER), UC Santa Barbara, 2008.
External reviewer, Plant Resource Center (PRC), University of Texas at Austin, 2016.

Bryophyte Chapter of the California Native Plant Society: co-founder and initial steering committee member, 2015; Field Trip Director 2016; President-Elect 2018-2020.

<http://bryophyte.cnps.org/index.php>

Co-wrote and one of 27 Founding Signatories to "A Charter to Secure the Future of California's Native Biodiversity," used by the Governor of California to create an executive order (<https://www.gov.ca.gov/wp-content/uploads/2018/09/9.7.18-Biodiversity-EO-B-54-18.pdf>) and working plan called "California Biodiversity Initiative A Roadmap for Protecting the State's Natural Heritage" (<http://opr.ca.gov/docs/20180907-CaliforniaBiodiversityActionPlan.pdf>).

Activities in professional organizations:

American Bryological and Lichenological Society:

Nomination Committee, 1992

Member-at-Large, Executive Committee, 1991-1993

President-Elect (meeting organizer), 1995-1997

President, 1997-1999

Financial Advisor Committee, 2004-2016 (Chair, 2009-2016)

American Society of Plant Taxonomists:

Editorial Committee, *Systematic Botany*, 1989-1992

Student Endowment Committee, 2001-

American Society of Naturalists:

Associate Editor, *The American Naturalist*, 1990-94

Botanical Society of America:

Member, Liaison with National Biological Survey Committee, 1993-1996

Member, Educational Forum Planning Committee, 2002

Member, Strategic Planning Committee, 2008

California Botanical Society:

Council Member, 1993-1995

Green Plant Phylogeny Research Coordination Group ("Deep Green"):

Chair, Executive Committee, 1999-2000

International Association for Plant Taxonomy:

Editorial Board, *Taxon*, 2000-

Society of Systematic Biologists:

Nomination Committee, 1990

Associate Editor, *Systematic Biology*, 1992-95

"Systematics Agenda 2000":

Invited participant, organizational meeting, 1991

Member, Steering Committee, 1991-1994

Co-chair, Standing Committee on "Speciation and Evolutionary Analysis" (with E.O. Wiley), 1991-1994

Willi Hennig Society:

Council Member, 2016-2018

Workshops, forays, meetings, and symposia:

Co-organized and led the first, third, and fifth annual Blomquist Bryological Foray, 1985, 1987, and 1989 [a continuing series of meetings for Southeastern bryologists].

Co-organizer (with D. Showers) of the American Bryological and Lichenological Foray for 1988, Mendocino County, California.

Invited participant in "Workshop on Biological Collections Resources for the 1990's," sponsored by the Association of Systematics Collections and the National Science Foundation, 1988, Washington, D.C.

Co-organizer (with R.K. Jansen), moderator, and participant in a symposium entitled "Phylogenetic Analysis of Molecular Data - Theory and Application" for the 1988 American Institute of Biological Sciences (AIBS) meeting. Davis, California.

Organizer, moderator, and participant in a symposium entitled "Cladistics and Species Concepts" for the 1988 Willi Hennig Society meeting. Stockholm, Sweden.

Co-organizer (with A.F. Budd), moderator, and participant in a symposium entitled "Species and Evolution in Clonal Organisms" for the 1988 American Society of Zoologists meeting. San Francisco, California.

Co-organizer (with E. DeLuna) of a workshop on "Numerical Methods for Phylogenetic Analysis" for the 1990 American Bryological and Lichenological Society (ABLS) meeting. Wakulla Springs, Florida.

Co-organizer (with T. McLellan), moderator, and participant in a symposium entitled "Development and Evolution in Plants" for the 1991 AIBS meeting. San Antonio, Texas.

Panel member in conference on "Educating for Science" held at Duke University, 1991.

Organizer of a symposium on "Systematics and Evolution of Mosses," with associated field trip, held at Duke University, 1992.

Organizer of a symposium on "The Fields of Bryology and Lichenology: Current Status and Future Opportunities" for the 1994 AIBS meeting. Knoxville, Tennessee.

Organizer, moderator, and participant in a workshop entitled "Current Status of the Phylogeny of the 'Charophyte' Green Algae and the Embryophytes," held at the University of California, Berkeley, 1995.

Co-organizer (with M.J. Oliver) of a symposium on "The Application of Modern Molecular Tools to Classic Bryological and Lichenological Questions" for the 1995 ABLS meeting. Jasper, Alberta.

Co-organized and led the first, second, third, sixth, seventh, eighth, and ninth annual SO BE FREE forays, 1996- [a continuing series of meetings for western bryologists, with an emphasis on training amateurs; see: <http://ucjeps.berkeley.edu/bryolab/trips/sobefree.php>].

Invited participant in a workshop entitled "Green Plant Phylogeny Research Coordination Group - Data Analysis," held at Louisiana State University, Baton Rouge, 1996.

Organizer, moderator, and participant in a workshop of the "Green Plant Phylogeny Research Coordination Group" held at the University of Washington, Seattle, 1996.

Co-organizer (with B. Crandall-Stotler and E. DeLuna) of a symposium on "Phylogeny Within the Major Bryophyte Clades" for the 1997 AIBS meeting. Montreal, Canada.

Organizer, moderator, and participant in a workshop of the "Green Plant Phylogeny Research Coordination Group" held at the Montreal Botanical Garden, Québec, 1997.

Organizer, moderator, and participant in a workshop of the "Green Plant Phylogeny Research Coordination Group" held at Princeton University, 1998.

Co-organizer (with E. DeLuna), moderator, and participant in a workshop of the "Green Plant Phylogeny Research Coordination Group" held at Xalapa, Veracruz, Mexico, 1999.

Invited participant in a workshop of the "Green Plant Phylogeny Research Coordination Group" entitled "Angiosperm Phylogeny" held at Washington State University, Pullman, 1999.

Invited participant in the third workshop on the concept of a national Biodiversity Observatory Network ("BON3"), sponsored by the National Science Foundation, 1999, California Academy of Sciences (and served on writing committee for report at: <http://www.nsf.gov/bio/neon/BON3.pdf>)

Invited speaker for "TED X" (the 10th Technology, Entertainment, and Design Conference, organized by Richard Saul Wurman), 2000, Monterey, California.

Invited participant in a workshop of the "Green Plant Phylogeny Research Coordination Group" entitled "The Computational Challenges of Green Plant Phylogeny" held at University of Maryland, College Park, 2000.

Participant in a workshop entitled "California Central Valley Vernal Pools: Planning for the UC Merced Lake Yosemite Site," held at the University of California, Davis, 2000.

Organizer, moderator, and participant in a workshop entitled "Exploring Biodiversity Above and Below the Species Level: Populations to Communities to the Tree of Life," held at the University of California, Berkeley, 2000.

Invited participant in a workshop entitled "Which Critters," sponsored by the U.S. Department of Energy to consider scientific directions for its future activities in genomic studies, 2000, Pacifica, California.

Invited participant in a workshop entitled "Phylogenetics and Phyloinformatics to Assemble the Tree of Life" sponsored by the National Science Foundation to consider a major new research effort, New Haven, Connecticut, 2000.

Invited participant in a workshop entitled "Tree of Life/Phyloinformatics" sponsored by the "Deep Gene" NSF Research Coordination Network and the San Diego Supercomputer Center, 2001.

Organizer, moderator, and participant in a symposium entitled "Deep Green: Phylogeny, Evolution, and Genomics of the Green Plants" for the 2001 AAAS Annual Meeting, San Francisco, California.

Organizer, moderator, and participant in the inaugural workshop of the "Deep Gene" NSF Research Coordination Network, held in Sonoma, California, 2001.

Invited participant in a panel discussion entitled "President's Forum: Federal funding for Botanical Research" at the annual meeting, BSA. Albuquerque, New Mexico, 2001.

Organizer, moderator, and participant in a workshop of the "Deep Gene" NSF Research Coordination Network, held at the annual meeting, BSA. Albuquerque, New Mexico, 2001.

Organizer and participant in the fourth conference of the NSF PEET Program, entitled "Expanding PEET to the World and to the Tree of Life," held at Berkeley, California, 2002 (<http://ucjeps.herb.berkeley.edu/bryolab/PEETIV/>).

Invited participant in a workshop entitled "Managing Genomic Resources" sponsored by the National Science Foundation to consider bioinformatics and curation of physical resources generated by the Plant Genome Program. Asilomar, California, 2002.

Invited participant in a workshop entitled "Linnaean Nomenclature in the 21st Century" hosted by the Hunt Institute for Botanical Documentation, Carnegie Mellon University. Pittsburgh, Pennsylvania, 2002.

Invited participant in a workshop entitled "Second International Workshop on Phylogenetic Nomenclature" hosted by the Peabody Museum of Natural History, Yale University. New Haven, Connecticut, 2002.

Organizer and participant in a panel discussion entitled "Starting a green movement: integrating botanical systems in high school state standards" held at the annual meeting, BSA. Madison, Wisconsin, 2002.

Participant in a panel discussion entitled "Training non-academic, professional botanists: the California experience" held at the annual meeting, BSA. Madison, Wisconsin, 2002.

Organizer and leader of a workshop for teachers entitled "Getting to the Roots of Plant Evolution: Genomics and the reconstruction of the Tree of Life" held at the annual meeting, BSA. Madison, Wisconsin, 2002.

Organizer, moderator, and participant in a workshop of the "Deep Gene" NSF Research Coordination Network, held at the annual meeting, BSA. Madison, Wisconsin, 2002.

Organizer and participant in a public symposium entitled "Understanding the Tree of Life" hosted by the Berkeley Natural History Museums. Berkeley, California, 2003.

Invited participant in a workshop entitled "Research Coordination Networks in Biological Sciences, Principle Investigator Meeting" hosted by the National Science Foundation, Washington, DC, 2003.

Organizer and participant in a panel discussion entitled "Providing data for new research initiatives" held at the annual meeting of the National Science Collections Alliance. Berkeley, California, 2003.

Organizer and participant in a panel discussion entitled "Teaching the 'tree of life' for plants" held at the annual meeting, BSA. Mobile, Alabama, 2003.

Organizer and leader of a workshop for teachers entitled "Getting to the Roots of Plant Evolution: Genomics and the reconstruction of the Tree of Life" held at the annual meeting, BSA. Mobile, Alabama, 2003.

Organizer, moderator, and participant in a workshop of the "Deep Gene" NSF Research Coordination Network, held at the annual meeting, BSA. Mobile, Alabama, 2003.

Organizer and leader of a workshop entitled "Attaining synergy between systematics and genomics." held at Moss 2003, the Annual International Conference for Moss Experimental Research. St. Louis, Missouri.

Invited participant in a "Workshop to Produce a Decadal Vision for Taxonomy and Natural History Collections" sponsored by the National Science Foundation. Florida Museum of Natural History, Gainesville, FL, 2003.

Invited participant in a roundtable discussion on "Species concepts: past present, and future" held at the Primera Reunión Mexicana de Biología Filogenética. Xalapa, Veracruz, Mexico, 2004.

Co-organizer (with M. Allen) and participant in a workshop entitled "Biodiversity and Ecosystem Functioning" (designed to help define the pending National Ecological Observatory Network program) held at the Hastings Reservation, Carmel Valley, California, 2004.

Organizer and participant in a panel discussion entitled "Building the Tree of Life" held at the annual meeting, BSA. Snowbird, Utah, 2004.

Organizer and leader of a workshop for teachers entitled "Building the Tree of Life" held at the annual meeting, BSA. Snowbird, Utah, 2004.

Co-organizer (with P. Wolf) of a symposium on "Resolving the green branch of life: Current progress and future challenges" held at the annual meeting, BSA. Snowbird, Utah, 2004.

Organizer and leader of a workshop for teachers entitled "Building the Tree of Life" held at the annual meeting, California Science Teachers Association. San Jose, CA, 2004.

Organizer of a meeting entitled "Assembling the Tree of Life - PI Meeting" Washington, DC., 2004.

Invited participant in a workshop entitled "Research Coordination Networks in Biological Sciences, PI Meeting" hosted by the National Science Foundation, Washington, DC, 2005.

Co-organizer (with M.J. Oliver and P. Alpert) of a symposium on "Desiccation Tolerance in Bryophytes and Lichens" held at the annual meeting, BSA. Austin, Texas, 2005.

Invited participant in a workshop entitled "NSF Workshop for a Plant Cyberinfrastructure Center" Washington, DC, 2005.

Organizer of a meeting entitled "Moss 2006 - Annual International Conference for Moss Experimental Research." Berkeley, California.

Co-organizer (with K.W. Hilu) of a symposium on "Land Plant Evolution: Phylogenetics and Beyond" held at the annual meeting, BSA. Chico, California, 2006.

Leader of a workshop for teachers entitled "Understanding plants through tree-thinking: integrating phylogenetics and genomics" held at the annual meeting, California Science Teachers Association. San Francisco, California, 2006.

Invited participant (along with K. Padien) in a public dialog entitled "Is Biodiversity Important, and is it Radically Changing?" at Wonderfest, the Bay Area Festival of Science. Stanford University, California, 2006.

Leader of a session on rank-free classification and its implications held at the annual Bodega Phylogenetics Workshop, Bodega Bay, California, 2007.

Leader of a workshop for 4th through 8th grade teachers entitled "Biodiversity and the Tree of Life" as part of the Summer Institute of the Partnership for Oakland Science Inquiry Teaching (Project POSIT). Berkeley, California, 2007.

Invited participant in a workshop entitled "pPOD Community Meeting" held at NESCENT, Durham, North Carolina, 2007.

Leader of a session on rank-free classification and species concepts held at the annual Bodega Phylogenetics Workshop, Bodega Bay, California, 2008.

Leader of a session entitled "Phylocode discussion" held at the annual meeting, ABLs. Asilomar, Pacific Grove, California, 2008.

Invited participant in a workshop entitled "Virtual herbaria: regional progress in organizing, fundraising, and delivering content" held at the annual meeting, BSA. Vancouver, British Columbia, 2008.

Leader of a session entitled "Finalizing the PhyloCode: a discussion" held at the annual meeting, BSA. Vancouver, British Columbia, 2008.

Invited participant in a workshop of the iPlant Tree of Life working group, Phoenix, 2009.

Invited participant in a working group meeting for the United States Virtual Herbarium, St. Louis, 2010.

Invited participant in the "Phylogenetic Trees Workshop," held at Stanford University, California, 2010.

Invited participant in the first annual summit meeting of the Phenotype Ontology RCN held at NESCENT, Durham, North Carolina, 2011.

Invited participant in a meeting of the TraiNet RCN held at Columbia University, New York, 2011.

Invited participant in a working group meeting of the Phenotype Ontology RCN held at Google, Boulder, Colorado, 2011.

Organizer of a symposium on "Fine-scale phylogenetics and biogeography in mosses" held at the XVIII International Botanical Congress, Melbourne, Australia, 2011.

Invited participant in the iDigBio Summit Meeting held at the University of Florida, Gainesville, 2012.

Co-organizer (with J. Shaw) of a symposium on "The evolution and ecology of aquatic bryophytes" held at the annual meeting, BSA. Boise, Idaho, 2014.

Organizer of two workshops on "Understanding Taxon Ranges in Space and Time " held at the University of California, Berkeley, 2014.

Co-organizer (with B.G. Baldwin and D.D. Ackerly) of a workshop entitled "Phylogeny and Biodiversity: Integrating systematic, geographic, and phylogenetic information for ecology and conservation" held at Universidad de Chile, Santiago, Chile, 2014.

Organizer of public outreach workshop of the California Plant Phylogeny Working Group held at the California Native Plant Society Conservation Conference, San Jose, CA, 2015.

Organizer of a public field training workshop in plant phylogeny, collecting techniques, and data needs, held at McLaughlin Natural Reserve near Lower Lake, CA, 2015.

Co-organizer (with P.R. Kellar) of a symposium on "Phylogenetic approaches to understanding biodiversity and endemism" held at the annual meeting, BSA. Edmonton, Alberta, 2015.

Organizer of a public training workshop in plant phylogeny, collecting techniques, and data needs, held in association with the Southern California Botanists Symposium, Claremont, CA, 2015.

Co-organizer (with R. Scherson and D. Faith) of a symposium on "Phylogeny-based biodiversity assessments for conservation: perspectives from the Southern Hemisphere" held at VIII Southern Connection Congress, Punta Arenas, Chile, 2016.

Invited participant in an iDigBio workshop on phenology held at the University of California, Berkeley, 2016.

Organizer and participant in a workshop entitled "Mediterranean Spatial Phylogenetics Workshop" held at Laboratoire d'Ecologie Alpine, Université Grenoble, Grenoble, France, 2016.

Organizer and participant in a workshop entitled "Mediterranean Spatial Phylogenetics Workshop" held at the University of Seville, Spain, 2017.

Invited participant in a conference on "Species in the Age of Discordance" held at University of Utah, 2017

Invited participant in an iDigBio conference entitled "Directors' Summit on Digital Data" held in Denver, Colorado, 2017.

Co-organizer (with J.M. Miller and Z. Chen) of a symposium on "Spatial phylogenetics as applied to floras around the world " held at the XIX International Botanical Congress, Shenzhen, China, 2017.

Co-organizer (with M. Martin) of a symposium and workshop on "Spatial Phylogenetics" held at Norwegian University of Science and Technology (NTNU), Trondheim, Norway, 2018.

Organizing committee for the "Second Annual Digital Data in Biodiversity Research Conference" held in Berkeley, California, 2018.

Lead organizer for the "XXXVIII Annual Meeting of the Willi Hennig Society" held in Berkeley, California, 2019.

UNIVERSITY SERVICE:

Duke University:

Directed the Graduate Training Program in Plant Systematics, 1992-1993; wrote major part of proposal funded by the Andrew W. Mellon Foundation (\$600,000) for graduate student and postdoctoral fellowships, research and travel funds, and facilities; initiated cooperative training program with the Department of Botany at the Smithsonian Institution.

Director of Undergraduate Studies for Biology, 1992-1993

Curator, Bryophyte Herbarium, 1984-1993; expanded the exchange program with other herbaria, which along with extensive collecting done by faculty and students, resulted in an addition of 38,000 specimens (an increase of 23% in the collection).

Undergraduate Faculty Council of Arts and Sciences:

Alternate representative 1985-1986; Regular representative, 1986-1989

Arts and Sciences Council, 1991-1993

Academic Council, Alternate member, 1986-87; 1990-91; Regular member, 1992-93

Angier B. Duke Scholarship Interviewer, 1986, 1988-91

Winston Churchill Scholarship Committee, 1987-1993

Search Committee for Head, Biology/Forestry Branch Library, 1990-91

Interdepartmental Committee on the Future of the Biological Sciences Building, 1991

Seminar Leader, Biology, Duke/Durham Fellows Program, 1990-1993

Master of Arts in Teaching Program Advisory Committee, 1990-1993

Center for Science Education Advisory Committee, 1992-1993

Teaching Responsibilities:

Served on 38 graduate student committees at Duke, and 6 graduate student committees at the University of North Carolina, Chapel Hill.

Major professor for the following graduate students at Duke University:

Allen Risk--ecological studies of *Sphagnum* in the southeastern coastal plain (Masters degree completed, 1988; currently Professor, Morehead State University, Kentucky)

Owen Schwartz (jointly with Dr. R. White)--developmental anatomy of the *Funaria*-type peristome (Ph.D. degree completed, 1989; currently Head, Biological Imaging Facility, National Institute of Allergy and Infectious Diseases, Bethesda, Maryland)

Zack Murrell--systematics of *Cornus* (Ph.D. degree completed, 1992; recipient of NSF Environmental Biology Postdoctoral Fellowship; currently Professor and Curator of the Herbarium, Dept. of Biology, Appalachian State University, North Carolina)

Efraín De Luna--systematic and developmental studies of the Hedwigiaceae (Ph.D. degree completed, 1992; co-recipient of 1990 A.J. Sharp Award for best student paper at the ABLs national meeting; co-recipient of 2000 Sullivant Award presented by the ABLs for best paper of the previous volume of The Bryologist; currently a permanent member of the research staff (Investigador Titular B) at the Instituto de Ecología, Xalapa, Veracruz, Mexico)

Angela Newton--systematic and ecological studies of *Pirella* (Pterobryaceae) (Ph.D. degree completed, 1993; co-recipient of 2000 Sullivant Award presented by the ABLs for best paper of the previous volume of The Bryologist; currently Research Bryologist, Department of Botany, Natural History Museum, London)

Steven Rice (jointly with Dr. N. Christensen)--ecology of *Sphagnum* in relation to phylogeny (Ph.D. completed, 1994; recipient of 1992 Botanical Society of America, Ecological Section Award for the best contributed paper at its national meeting; honorable mention for the 1994 A.J. Sharp Award for best student paper at the ABLs national meeting; co-recipient of 2012 Sullivant Award presented by the ABLs for best paper of the previous volume of The Bryologist; currently Professor, Union College, NY)

Kathleen Pryer--ontogeny and phylogeny in the aquatic fern family Marsileaceae (Ph.D. completed, 1995; recipient of 1994 Lawrence Memorial Award; President of American Fern Society 2012; President of American Society of Plant Taxonomists 2012; currently Professor, Duke University)

Alison Withey--systematics of the tropical moss family Spiridentaceae (Ph.D. completed, 1996; recipient of 1994 A.J. Sharp Award for best student paper at the ABLs national meeting; became Assistant Director, San Diego Supercomputer Center, University of California, San Diego)

Selected Undergraduate Research Assistant:

Katherine A. Preston--reproductive biology of bryophytes (recipient of 1997 A.J. Sharp Award for best student paper at the ABLs national meeting; completed a Ph.D. program at Indiana University; currently at Stanford University as Lecturer and Associate Director of the Program in Human Biology)

Postdoctoral Research Associate:

Louise Lewis--molecular phylogenetics of bryophytes (academic years 1991-94; currently Professor, University of Connecticut, Storrs)

Courses Taught at Duke:

Bio 49. The Darwinian Revolution
Bot/Zoo 237. Systematic Biology
Bot/Zoo 287. Macroevolution
Bio 120. Principles of Evolution
Bot 306. Plant Systematics Seminar

Bio 142. Plant Systematics
Bot 321. Systematics Discussion Group
Bot 140/240. Plant Diversity
Bot 210. Bryology
LS 270.14. The Darwinian Revolution

University of California, Berkeley:

Management Committee, Valley Life Sciences Building, 1993-

Faculty Advisory Committee, Essig Museum of Entomology, 1993-

Faculty Advisory Committee, Richard P. Gump South Pacific Biological Research Station (Moorea), 1995-

Faculty Advisory Committee, UC Botanical Garden, 1996-

Personnel and Promotion Committee, Dept. of Integrative Biology, 1994-95

Executive Committee, Dept. of Integrative Biology, 1995-

Academic Program Committee, Dept. of Integrative Biology, 1995-

Chair, Editorial Board, University of California Publications in Botany, 1994-

Chair, Berkeley Natural History Museums, 1996-1998; 2001-2002

Member, Search Committee for Arthropod Systematist faculty (Schlinger Chair) Dept. of Environmental Science, Policy and Management. 1997-1998 (a successful search, resulting in the appointment of Dr. Rosemary Gillespie)

Chair, Search Committee for Plant Population Biologist faculty / UC Botanical Garden Director, Dept. of Integrative Biology 1997-1998 (a successful search, resulting in the appointment of Dr. Ellen Simms)

Member, Search Committee for Plant Biologist faculty, Dept. of Plant and Microbial Biology. 2001-2002 (a successful search, resulting in the appointment of Dr. Mary Wildermuth)

Chair, Search Committee for Plant Form/Function faculty, Dept. of Integrative Biology 2003-2004 (a successful search, resulting in the appointment of Dr. David Ackerly)

Member, Editorial Committee, University of California Press, 2000-2005; Vice Chair 2003-2004; Chair 2004-2005 (took leading role in new efforts of the EdCom to more actively support and advise the Press, and in expanding science publishing)

Head Graduate Advisor, Dept. of Integrative Biology, 2007-2019 (led a revision of IB's graduate program requirements)

Chair, Search Committee for Plant Evolutionary Biologist faculty / curator, Dept. of Integrative Biology and University & Jepson Herbaria 2013-2014 (a successful search, resulting in the appointment of Dr. Carl Rothfels)

Member, Search Committee for Whole Plant Biologist faculty, Dept. of Plant and Microbial Biology. 2014-2015 (a successful search, resulting in the appointment of Dr. Ben Blackman)

Member, Search Committee for University of California Botanical Garden Director, Vice Chancellor for Research Office. 2015 (a successful search, resulting in the appointment of Eric Siegel)

Teaching Responsibilities:

I have served on more than 50 graduate student committees at Berkeley.

Major professor for the following graduate students at UC Berkeley:

Anastasia Thanukos -- phylogenetic analysis of host use and diet breadth in phytophagous insects (Masters degree completed, 2000; went on to receive Ph.D. in Science and Mathematics Education at UC Berkeley; currently staff member (writing, editing, and outreach) at the University of California Museum of Paleontology)

Patricia Sánchez-Baracaldo--systematics of the neotropical fern genus *Jamesonia* (Ph.D. completed, 2000; recipient of 2000 Edgar T. Wherry Award for best paper in the Pteridological Section at the Botanical Society of America annual meetings; currently a Royal Society Dorothy Hodgkin Research Fellow and Principal Investigator at Bristol University in England)

Terry O'Brien--reproductive biology of the moss genus *Aulacomnium* (Ph.D. completed, 2001; currently Associate Professor, Rowan University)

Dennis Wall--systematics and evolution of the moss genus *Mitthyridium* (Ph.D. completed, 2001; recipient of the 2001 A.J. Sharp Award for best student paper at the ABLs national meeting; recipient of an NSF Bioinformatics Postdoctoral Fellowship; currently Associate Professor, Stanford University)

Carrine Blank--phylogeny and evolution of bacteria (Ph.D. completed, 2002; currently Research Assistant Professor of Molecular Geomicrobiology, University of Montana)

John McMurray--systematics of the moss genus *Thelia* (Ph.D. completed, 2004; currently Professor and Program Director of Bioinformatics, Oklahoma City Community College)

Kirsten Fisher--systematics and evolution of the moss family Calymperaceae (Ph.D. completed, 2004; awarded Postdoctoral Fellowship, National Evolutionary Synthesis Center; currently Associate Professor, California State University, Los Angeles)

Anya Hinkle (jointly with Dr. T. Carlson)--systematics and ethnobotany of tropical angiosperms, *Cordyline* in particular (Ph.D. completed, 2005; currently Associate Director, Highlands Biological Station)

Eric Harris (jointly with Dr. T. Carlson)--systematics and ethnobotany of the moss genus *Plagiomnium* (Ph.D. completed, 2006; first runner-up for the 2007 A.J. Sharp Award for best student paper at the ABLs national meeting; recipient of 2009 Sullivant Award presented by the ABLs for best paper of the previous volume of *The Bryologist*; Postdoctoral Fellow, Harvard University; currently Agricultural Sustainability Manager, SCSglobal Services)

Andy Murdock (jointly with Dr. T. Carlson) -- systematics and evolution of ferns (Ph.D. completed, 2007; served as Postdoctoral Fellow, British Museum of Natural History; currently Communications Strategist for Research, University of California Office of the President)

Anna Larsen (jointly with Dr. T. Carlson)--systematics and ethnobotany of tropical Pacific angiosperms, *Aleurites* in particular (Ph.D. completed, 2007; was Coordinator of Public Programs, Jepson Herbarium, UC Berkeley, currently Senior Botanist, AECOM)

Ruth Kirkpatrick (jointly with Dr. B. Baldwin)--systematics and evolution of the fern genus *Pellaea* (Ph.D. completed, 2008; currently Instructor, Spokane Falls Community College)

Mary Jessica Knoll -- phytoremediation and bioaccumulation of heavy metals in relation to phylogeny in the fern family Pteridaceae (Masters degree completed, 2007; currently a high school science teacher in the Bay Area)

- Benjamin Carter -- systematics and ecology of mosses, *Scleropodium* in particular (PhD completed 2012; was postdoctoral fellow at Duke University; currently Assistant Professor and Director Sharsmith Herbarium, San Jose State University)
- Ekaphan Kraichak -- ecology of epiphyllous bryophytes (PhD completed 2012; was postdoctoral fellow at the Field Museum of Natural History; currently Assistant Professor, Kasetart University, Bangkok, Thailand)
- Susan Tremblay -- systematics and ecology of liverworts (Ph.D. completed, 2016; currently Lecturer, UC Berkeley)
- Rebecca Welch (jointly with Dr. E. Simms) -- coevolution of hornworts and their endosymbiotic bluegreen bacteria
- Thomas Madsen -- systematics and ecology of mosses
- Caleb Caswell-Levy -- ecology of epiphytic mosses
- Javier Jauregui Lazo -- ecology and systematics of Chilean mosses
- Jenna Baughman -- ecology and functional genomics of desert mosses
- Ixchel González -- ecology and spatial phylogenetics of Mexican liverworts

Major professor for the following graduate students at other universities:

- Mostafa Mansi--ecological studies of the moss vegetation of Egypt (Joint Ph.D. Supervisor, with Dr. M.A. Helmy, Ph.D. awarded 1998, Suez Canal University, Ismailia, Egypt); currently assistant professor, University of Nizwa, Oman.
- Nisao Ogata--systematics and ethnobotany of *Theobroma* (Malvaceae) (Joint Ph.D. Supervisor, with Dr. Arturo Gómez-Pompa, Ph.D. awarded 2002, University of California, Riverside); currently an investigator, Centro de Investigaciones Tropicales (CITRO), Universidad Veracruzana, Mexico.
- Carmine Colacino--biosystematic studies of *Tortula* in the southwestern U.S., Andes, and the Mediterranean region (Joint Ph.D. Supervisor, with Dr. C. Parks), University of North Carolina, Chapel Hill.

Selected Undergraduate Research Assistants:

- David Des Marais--phylogeography of mosses (received PhD at Duke University, currently professor, MIT)
- Randy Clayton--molecular evolution of the *rbcL* gene (currently PhD student at the Centers for Disease Control and Prevention in Atlanta)
- Danica Harbaugh Reynaud--reproductive biology of the Calymperaceae (recipient of the 2001 Integrative Biology Departmental Citation; recipient of the 2006 George Cooley Award for best talk at the ASPT annual meeting; received PhD at UC Berkeley; founder and currently Global Director of Scientific Innovation, NSF AuthenTechnologies; <https://www.authentechnologies.com>)
- Rosalyn Sayaman--functional morphology of mosses (undergraduate honors thesis 2003; currently PhD student at Cal Tech)
- Nicole Baltrushes--ethnobotany of ferns of Moorea (undergraduate honors thesis 2006; currently in Medical School at the University of Chicago)
- Tamrya d'Artenay--reproductive biology of the Calymperaceae; mosses of Moorea (received PhD at Southern Illinois University; currently Assistant Professor, Morningside College, Sioux City, IA)
- Joel Nitta--phylogeography of the filmy ferns of Moorea (undergraduate honors thesis 2007; recipient of the 2007 Integrative Biology Departmental Citation; currently PhD student at Harvard University)

Postdoctoral Research Associates:

- Steven Jessup--biogeography and diversification of moss and angiosperm lineages (academic years 1994-95 and 1995-96; currently Associate Professor and Director of the Herbarium, Southern Oregon University)
- John Wheeler--systematics of the moss family Calymperaceae (February, 1998 - August, 2000; currently Assistant Professor, University of Wisconsin, River Falls)

- Kwok Leung (Joseph) Yip--systematics of the moss family Calymperaceae (October 2000 - September 2001; currently Keeper of the Hong Kong Herbarium, Agriculture, Fisheries and Conservation Department, Hong Kong)
- Pengcheng Rao--systematics of the moss family Calymperaceae (July 2002 - December 2002; currently a postdoctoral researcher at the University of Oklahoma)
- Neil Bell -- relationships of the deepest nodes in the moss phylogeny (2009-2012; currently a Research Scientist at the Royal Botanic Garden Edinburgh)
- Brian Swartz -- species concepts and "speciesism" in science and society (2011-2014)
- Andrew Thornhill -- Spatial phylogenetics methods, and empirical studies of Australia, California, Chile, and South Africa (2014-2017)

Visiting Scientists Hosted:

- Barbara Crandall-Stotler and Raymond Stotler (USA) -- cladistics of simple thalloid liverworts, the Metzgeriidae (March, 1994; October, 2000)
- Steffen Schaffer (Germany) -- phylogeny of the haplolepideous mosses (September, 1994 - August, 1995)
- Jaakko Hyvönen (Finland) -- molecular systematics of the moss family Polytrichaceae (March - April, 1995)
- Haji Mohamed (Malaysia) -- biogeography and phylogeny of the moss genus *Mitthyridium* (April - December, 1996)
- Raymond Tangney (New Zealand) -- molecular and morphological phylogenetics of the moss family Lembophyllaceae (April - May, 1998)
- Catherine Lafarge-England (Canada) -- phylogeny of the haplolepideous mosses (February, 1999)
- Satoshi Imura (Japan) -- molecular systematics of the moss family Bryaceae (March - April, 1999)
- Anne Streiff (Switzerland) -- molecular systematics of of the moss genus *Grimmia* (January - March, 2000)
- Thomas Janssen (France) -- comparative protein structure in relation to systematics (July - September, 2001)
- Marcus Lehnert (Germany) -- systematics and phylogeny of Neotropical ferns (September, 2006 - June, 2007)
- Ariyo Olusesan Ayodele (Nigeria) -- systematics and ethnobotany of Nigerian mosses (March - August, 2011)
- Ertuğrul Yüzbaşıoğlu (Turkey) -- molecular phylogenetics of plants, with emphasis on Lamiaceae (February - May, 2012)
- Yuan Fang (China) -- genomics of bryophytes (February 2012 - May 2013)
- Xueqin Shi (China) -- spatial phylogenetics of Chinese bryophytes (December 2017 - November 2018)
- Shuo Shi (China) -- systematics of Bryales (May 2019 - May 2020)

Informal Science Education:

- Supported informal teaching about California bryophyte systematics and ecology, through popular articles, teaching workshops, and founding an annual series of 4-day spring forays (called SO BE FREE), for students, teachers, professional botanists, and amateurs. 1994-
<https://bryophyte.cnps.org/index.php/so-be-free>
- Frequent workshops for the general public on bryophytes, molecular systematics, and species, as part of the Jepson Herbarium Weekend Workshop series, 1995-
- Workshops for teachers on the Tree of Life, held at California Science Teachers Association annual meetings in 2002, 2004, and 2006 and the Botanical Society of America's annual Educator's Forum, 2002, 2003, 2004.

Outreach Coordinator for the large CIPRES NSF ITR grant (www.phylo.org); supervise development of the outreach part of the website, organize and teach workshops for teachers. 2002-2009

Participated as speaker and discussion session leader for two of UC Museum of Paleontology's annual "Think Evolution" summer institutes (Mostly for high school biology teachers with some community college and middle school teachers included):

"What, if anything, are species?" 2012

"Biodiversity without species" 2018

Faculty lecturer for Cal Alumni Association in their Cal Discoveries Travel program; educational outreach to UC Berkeley Alumni via ecotours (giving nature walks and evening lectures). Trips led:

"Costa Rica's Natural Heritage," 2015

"Exploring Australia and New Zealand," 2016

"Machu Picchu to the Galapagos" (Peru and Ecuador), 2016

"Scottish Isles and Norwegian Fjords" 2018

"The Pride of South Africa, Botswana, Namibia, and Zimbabwe" 2019

Formal courses taught at UC Berkeley:

IB 24 The Darwinian Revolution [Freshman Seminar]

IB 98/198 Integrative Medicine [faculty sponsor for DeCal student-initiated course]

IB 100B Principles of Biodiversity

IB 101 Diversity of Plants and Fungi

IB 105 Natural History Museums and Biodiversity Science

IB 158 Biology and Geomorphology of Tropical Islands

IB 165 Molecular Evolution

IB 200 Principles of Phylogenetics