

Annual Meeting
American Society of Naturalists
Society of Systematic Biologists
Society for the Study of Evolution

CODON USAGE

AA

June 14 - 18, 1997
Boulder, Colorado



**Joint Meeting of ASN, SSB and SSE
Shuttle Bus Schedule**

Saturday, June 14

5:00 pm - 10:00pm Kittredge - Williams Village

Sunday, June 15

7:30 - 9:30am Williams Village, Holiday Inn - UMC
5:00 - 6:30pm UMC - Williams Village, Holiday Inn, Kittredge
7:00 - 8:30pm Williams Village, Holiday Inn, Kittredge - Macky
9:30 - 11:15pm Macky - Williams Village, Holiday Inn, Kittredge

Monday, June 16

7:30 - 9:30am Williams Village, Holiday Inn - UMC
4:30 - 7:00pm UMC - Holiday Inn - Williams Village
7:15 - 8:15pm Williams Village - Macky, Kittredge, Holiday Inn
8:45 - 9:30pm Macky - Williams Village, Kittredge, Holiday Inn

Tuesday, June 17

7:30 - 9:30am Williams Village, Holiday Inn - UMC
5:00 - 7:00pm UMC - Holiday Inn - Williams Village
7:15 - 8:15pm Williams Village, Holiday Inn, Kittredge - Macky
8:45 - 9:30pm Macky - Williams Village, Kittredge, Holiday Inn

Wednesday, June 18

7:30 - 9:30am Williams Village, Holiday Inn - UMC
11:00 - 12:30pm UMC - Holiday Inn, Kittredge, Williams Village

Please note: Participants living at the Broker Inn may walk across the street to Williams Village to board the shuttle bus

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June 14 - 18, 1997
Boulder, Colorado

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Meeting Host: Jeff Mitton
Program Organization: Brian Kreiser

Front Cover: An ancient limber pine, *Pinus flexilis*, near Trail Ridge Road, Rocky Mountain National Park

Back Cover: Common killifish, *Fundulus heteroclitus*, swimming over a bed of blue mussels, *Mytilus edulis*
Drawing by Jan Logan

Of special interest: Linhart, Y.B. 1997. The teaching of evolution - we need to do better. *BioScience* 47: 385-391.

Summary Schedule of Events

6/14 (Sat)	2:00-9:30PM	Proutfest - Symposium and Dinner at the Mountain Research Station
	1:00-9:00	Registration at Williams Village
	1:00-3:00	ASN/SSB/SSE Coordinating Council Meeting (Williams Village 103)
	3:00-5:00	ASN, SSB, SSE Council Meetings (Williams Village 101, 103 and 100)
	7:00-10:00	Welcome reception, Williams Village
6/15 (Sun)	8:30-12:00	SSB Symposium - "Large Data Sets"
	8:30-12:00	Concurrent Paper Sessions
	12:00-1:30	Lunch
		SSE Business Meeting (12:30-1:30)
		NSF Information Session: Program updates, the review process, and questions and answers
	1:30-5:00	ASN Vice President's Symposium - "Adaptive Hypotheses"
	1:30-5:00	Concurrent Paper Sessions
	4:30-5:30	SSE Presidential Address: R. Lande
	4:30-6:30	Poster Session #1
	8:00-9:00	Address by Professor E.O. Wilson
	9:00-11:00	Social for E.O. Wilson
6/16 (Mon)	8:00-12:00	SSE Symposium - "Mutations"
	8:30-12:00	Concurrent Paper Sessions
	12:00-1:30	Lunch
		ASN Business Meeting (12:30-1:30)
		NIH Grants Workshop
	1:30-5:00	SSB Symposium "Developmental Patterns"
	1:30-5:15	Concurrent Paper Sessions
	4:30-6:30	Poster Session #2
	6:00-7:45	Barbecue
	8:00-9:00	ASN Presidential Address: G. Vermeij
6/17 (Tues)	8:30-11:30	ASN Young Investigators Symposium
	8:30-12:00	Concurrent Paper Sessions
	12:00-1:30	Lunch
		SSB Business Meeting (12:30-1:30)
		NSF Population Biology: Open Discussion - The role of model organisms in research in population biology
	1:30-5:00	SSE Symposium - "Self-Recognition Systems"
	1:30-5:15	Concurrent Paper Sessions
	4:30-6:30	Poster Session #3
	5:30-6:30	ASN/SSB/SSE Coordinating Council Meeting
	6:00-7:45	Banquet
8:00-9:00	SSB Presidential Address: J. Savage	
6/18 (Wed)	8:00-12:00	Concurrent Paper Sessions

Notice to Speakers and Poster Presenters

Speakers:

Please check the schedule to reconfirm the session and time of your talk. There may have been some minor changes in the presentation number and time of your talk since the preliminary program was posted on the website. The 15 minutes that you are allotted includes both the presentation and question periods. To keep the session on schedule please do not exceed this time limit. The chair of the session will signal you at 12 minutes and then physically remove you from the podium at 15 minutes.

Poster Presenters:

Each poster has been assigned a number corresponding to a reserved space. You are allowed 4 ft. by 4 ft. for your poster. Please do not encroach upon the space of other presenters. There are three separate posters sessions (Sunday, Monday and Tuesday afternoons). Posters may be put up from 2:00-4:00 on the day in which you are presenting. For the Sunday and Monday sessions, posters must be removed by 2:00 the next day. Posters in the Tuesday session must be removed at the end of the session. All posters sessions will be located in UMC East Ballroom.

Exhibitors - Book Publishers

There will be a book publisher's display in the UMC West Ballroom. We hope that all participants will stop by during the course of the meeting to see the books from these fine publishers.

Oxford University Press

Blackwell Science Inc.

Academic Press

Harvard University Press

Princeton University Press

Sinauer Associates, Inc.

The University of Chicago Press

University Press of Colorado

Saturday, 14th June

- 1:00-9:00 **Registration at Williams Village**
- 2:00-9:30 **Proutfest - Symposium and Dinner at the Mountain Research Station**
- 1:00-3:00 **ASN/SSB/SSE Coordination Council Meeting - Williams Village Darley Commons 103**
- 3:00-5:00 **ASN Council Meeting - Williams Village Darley Commons 101
SSB Council Meeting - Williams Village Darley Commons 103
SSE Council Meeting - Williams Village Darley Commons 100**
- 7:00-10:00 **Welcome Reception - Williams Village**

Sunday, 15th June

UMC Center Ballroom

- 8:30-12:00 Symposium 1 - Phylogenetic Analyses of Large Data Sets
Organizers: Pamela Soltis and Douglas Soltis
- 8:30 1 Efficiency of Phylogenetic Methods with Large Data Sets
*D.M. Hillis
- 9:00 2 Tree Comparison Metrics for the Evaluation of Large Data Sets
*D. Penny, M. Hendy
- 9:30 3 Inference and Reliability of Large Phylogenies Under the Minimum Evolution Criterion
*S. Kumar
- 10:00-10:30 Break
- 10:30 4 Advantages of Parsimony Jackknifing
*J.S. Farris, V. Albert
- 11:00 5 The Construction of Maximally Informative Phylogenetic Supertrees
*M.J. Sanderson, C. Henze
- 11:30 6 Using Ancestral States as Terminal Taxa: An Empirical Approach
*P.S. Soltis, D.E. Soltis

JILA Auditorium

- 8:30-10:00 Session 1 - Adaptation and Plasticity
Chair: Sally Aitken
- 8:30 7 Phenotypic Plasticity and Drought Sensitivity in Douglas-Fir (*Pseudotsuga Menziesii*)
*S.N. Aitken, B.J. Yoder, K.L. Kavanagh, B.L. Gartner
- 8:45 8 Causes and Consequences of Variation in Germination for a Winter Annual: Evidence for Adaptation to Desert Environments?
*M.J. Clauss, D.L. Venable
- 9:00 9 Ecophysiology of Water Relations in *Arabis Fecunda*, a Rare Plant
*J. Mckay, J. Richards, T. Mitchell-Olds, A. Sala
- 9:15 10 Sources of Genotype X Environment Interaction for Fitness in *Plantago Lanceolata*
*S.A. Dudley, J. Schmitt
- 9:30 11 Parental Effects in *Plantago Lanceolata*. III. The Measurement of Temperature Effects in the Field
*E.P. Lacey, D. Herr
- 9:45 12 Salt Tolerance in *Plantago Coronopus*: Responses to Artificial Selection in Constant and Heterogeneous Environments
*M. Smekens, P. Van Tienderen

Fine Arts N141

8:30-10:00
Session 2 - Life Histories and Development
Chair: Christian Klingenberg

- 8:30 13 The Costs and Benefits of Fusion (Chimera Formation) in the Marine Bryozoan *Fenestrulina* Sp.
*S.F. Craig
- 8:45 14 Quantifying Fluctuating Asymmetry with Geometric Morphometrics
*C.P. Klingenberg
- 9:00 15 Morphogenesis of the Gastropod Radulae: Character States in Transformation
*D.R. Lindberg, R.P. Guralnick
- 9:15 16 The Evolution Life History and Population Stability in Laboratory Populations of *Drosophila*
A. Joshi, *L. Mueller
- 9:30 17 Snail Trematode Interactions: Tests of Gigantism, Fecundity Compensation and Juvenile Susceptibility in the Freshwater Snail *Potamopyrgus antipodarum*
*A. Krist, C. Lively
- 9:45 18 Spontaneous Mutation Accumulation in *Caenorhabditis elegans*
*L.L. Vassilieva, M. Lynch

Chemistry 140

8:30-10:00
Session 3 - Hybridization And Sexual Isolation
Chair: Jeffrey McKinnon

- 8:30 19 A Test of Parallel Speciation Using Japanese and British Columbia Populations of the Threespine Stickleback
*J.S. McKinnon, D. Schluter, S. Mori
- 8:45 20 Male Preference for Hybrid Phenotypes in a Gynogenetic Complex of Poeciliid Fishes
*L. Dries
- 9:00 21 Hybridization and Introgression Between Two Species of *Orconectes* Crayfishes in Northern Wisconsin, and It's Implications for Species Invasions
*W.L. Perry, J.L. Feder, D.M. Lodge
- 9:15 22 Asymmetric F1 Parentage in a Newt Hybrid Zone
*G.P. Wallis, J.W. Arntzen
- 9:30 23 An Incipient Speciation Event in the *Drosophila willistoni* Group
*V.R. DeFilippis, F.J. Ayala
- 9:45 24 Reproductive Isolation Between Sympatric Populations of Pea Aphids on Two Hosts: Fitness of Hybrids
*S. Via

Chemistry 142

8:30-10:00

Session 4 - Behavior
Chair: Thomas Getty

- 8:30 25 End-Products of Behaviour vs. Behavioural Characters: Which Gives a More Reliable Phylogeny for Blackflies (Diptera: Simuliidae)?
*A. Stuart, F. Hunter
- 8:45 26 Variation in Increased Male Mortality Due to Mating with Males of Different Strains of *Drosophila melanogaster*
R. Smith, *N.A. Johnson
- 9:00 27 Evolution of Recognition Behavior and Morphological Stasis in the Botryllid Ascidians
*C.S. Cohen
- 9:15 28 Sex Allocation Patterns in Haplodiploid, Gall-Forming Thrips (Insecta: Thysanoptera)
*B. Kranz, B. Crespi, M. Schwarz, L. Mound
- 9:30 29 Handicap Signaling: When Fecundity and Viability Do Not Add Up
*T. Getty
- 9:45 30 Phenotypic Engineering of a Pheromone Reveals a Multi-Component Badge of Status
*P.J. Moore, K.F. Haynes, A.J. Moore

Ramaley C250

8:30-10:00

Session 5 - Population Genetics
Chair: Tracie Jenkins

- 8:30 31 Phylogeography of a Relict Species: The Iowa Pleistocene Snail (*Discus macclintocki*)
*T. Ross
- 8:45 32 Mitochondrial DNA Genetic Patterns in the Subterranean Termite (Isoptera: Rhinotermitidae)
*T.M. Jenkins, B.T. Forschler
- 9:00 33 Genetic Variation in Populations of the Fathead Minnow (*Pimephales promelas*) and the Plains Killifish (*Fundulus zebrinus*) from an Intermittent Stream
*B.R. Kreiser, J.B. Mitton, J. Woodling
- 9:15 34 Genetic Differentiation among Pygmy Whitefish (*Prosopium coulteri*) Populations, with Varying Life History Traits, Using RAPD and Mitochondrial Gene Sequence Analysis
*L. Rankin, D.M. Blouw, D.D. Heath
- 9:30 35 Mitochondrial DNA Variation in the Blue Crab (*Callinectes sapidus* Rathbun): Are the Highly Diverse Haplotypes Geographically Structured?
*A.L. McMillen-Jackson, T.M. Bert
- 9:45 36

		<u>UMC 235</u>
8:30-10:00		Session 6 - Quantitative Genetics Chair: Adam Chippindale
8:30	37	Age-Specific Properties of Spontaneous Mutations Affecting Mortality in <i>Drosophila melanogaster</i> *S.D. Pletcher, J.W. Curtsinger
8:45	38	Mapping of Genetic Factors Causing Genotype-By-Environment Interaction for Fitness in <i>Drosophila melanogaster</i> *J.D. Fry, S. Nuzhdin, E. Pasyukova, T.F.C. Mackay
9:00	39	Measuring Heritable Variation in Net Fitness: A New Technique Using Cytogenetic Cloning of <i>Drosophila</i> *A. Chippindale, B. Rice
9:15	40	The Evolution of Threshold Traits: A Quantitative Genetic Analysis of the Physiological and Life History Correlates of Wing Dimorphism *D. Roff, G. Stirling, D. Fairbairn
9:30	41	Partitioning a Fitness Tradeoff: Genetic and Physiological Components *G. Stirling, D. Roff
9:45	42	

		<u>Old Main Chapel</u>
8:30-10:00		Session 7 - Plant Mating/Breeding Systems Chair: Phil Gibson
8:30	43	Experimental Test of Differential Seed Fitness in a Gynodioecious Species: Negative Pleiotropy vs. Gametophytic Selection *L. Delph
8:45	44	Sex Allocation in Monomorphic and Dimorphic Populations of a Gynodioecious Plant, <i>Lobelia siphilitica</i> *D. Dudle
9:00	45	Evolution of Gynodioecy in a Tropical Tree: Influence of Mating System and Floral Development *P. Gibson, P. Diggle
9:15	46	Gender Specialization in Andromonoecious <i>Solanum carolinense</i> : Results from Field and Quantitative Genetic Studies *E. Elle
9:30	47	Factors Influencing Sex Expression in <i>Wurmbea dioica</i> (Colchicaceae): Implications for the Evolution of Dioecy *A. Case, S.C.H. Barrett
9:45	48	Mating System Evolution in <i>Linanthus</i> (Polemoniaceae): Phylogenetic Evidence from ITS Sequence Data *C. Goodwillie
<hr/>		
10:00-10:30		Break

JLA Auditorium

10:30-12:00 Session 8 - Adaptation and Plasticity
Chair: Susan Mopper

- 10:30 49 Is Adaptive Radiation Sex Specific? A Case Study in *Anolis* Lizards
*M. Butler
- 10:45 50 Phylogenetic and Ecological Aspects of Cooperative Breeding in the Bee-Eaters (Aves: Meropidae)
*B. Burt
- 11:00 51 Genetic Structure and Local Adaptation in a Dispersive Leafmining Insect
*S. Mopper, K. Landau
- 11:15 52 Genetic Basis of an Adaptive Radiation: Warning Color in Two *Heliconius* Species
*W.O. McMillan, C.D. Jiggins
- 11:30 53 Genetics of Adaptation: The Genetics of *Drosophila sechellia*'s Resistance to a Naturally Occurring Toxin
*C. Jones, H.A. Orr
- 11:45 54 Variation and Possible Evolution of Dominance of an Insecticide Resistance Gene
*D. Bourguet, F. Didier, R. Michel

Fine Arts N141

10:30-12:00 Session 9 - Life Histories and Development
Chair: David Baum

- 10:30 55 Demographic Consequences of Variation in Life Histories of a Long-Lived Perennial Monocarpic Gentian, *Frasera speciosa*
*D.W. Inouye
- 10:45 56 Inclusive Fitness Theory and the Evolutionary Origin of Endosperm
*W. Friedman
- 11:00 57 The Molecular Genetic Basis for the Evolution of Solitary Flowers in Brassicaceae
*D. Baum, G. Shu, W. Amaral, E. Freeman
- 11:15 58 Evolution of Response to Light Signals in Wild Populations of *Arabidopsis thaliana*
*H. Callahan, M. Pigliucci
- 11:30 59 Ontogeny and Phylogeny of Marsileaceous Ferns: Evidence for Heterochrony
*K. Pryer

11:45 60

Chemistry 140

10:30-12:00 Session 10 - Geographic Variation and Hybrid Zones
Chair: Jon Bridle

- 10:30 61 A Mosaic Hybrid Zone Between Species of the *Biguttulus* Group of Chorthippus Grasshoppers in Northern Spain
*J. Bridle, R. Butlin
- 10:45 62 The Role of Host-Plant Choice in the Local Adaptation of Divergent Pea Aphid Populations in Sympatry
*M. Caillaud, S. Via
- 11:00 63 Fine Scale Structure of a Field Cricket Mosaic Hybrid Zone
*C. Ross
- 11:15 64 Role of *Wolbachia* Infections in Two Hybrid Zones
*R. Giordano, J.J. Jackson, H.M. Robertson
- 11:30 65 Evidence of Hybridization Among Black Oaks of Eastern North America Based on Molecular Markers and Quantitative Morphometrics
*M.A. Thomas, B.A. McPheron, J.C. Schultz
- 11:45 66 An Ancient Polyploid Hybrid Zone in Birch (*Betula*).
*J.H. Williams, Jr, M.L. Arnold

Chemistry 142

10:30-12:00 Session 11 - Ecological Genetics
Chair: Joe Pollard

- 10:30 67 Intra-population Sex Ratio Variation in the Salt Grass *Distichlis spicata*.
*S. Eppley, M.L. Stanton, R.K. Grosberg
- 10:45 68 Relative Fitness of Polyploid Cytotypes of Big Bluestem *Andropogon gerar* (Poaceae)
*K. Keeler
- 11:00 69 Fitness Consequences of Transplantation in *Lotus scoparius*: Preliminary Test of the Outbreeding Depression Hypothesis
*A. Montalvo
- 11:15 70 Natural Selection on a Leaf Shape Polymorphism in the Ivyleaf Morning Glory (*Ipomoea hederacea*)
*K. Bright
- 11:30 71 Ecological Genetics of Heavy Metal Hyperaccumulation in *Thlaspi caerulescens*
*J. Pollard, K. Dandridge, E. Jhee
- 11:45 72

Ramaley C250

10:30-12:00 Session 12 - Population Genetics
Chair: Janice Bossart

- 10:30 73 Genetic Structure in a Coastal Dune Spider (*Geolycosa pikei*) on Long Island, New York Barrier Islands: A Test of the Linear Stepping-Stone Model
*A.M. Boulton, M.G. Ramirez, C.P. Blair

- 10:45 74 Comparative Population Genetics of Endemic Sonoran Desert *Drosophila*
*C. Breitmeyer
- 11:00 75 Minimal Genetic Variation in Coastal Dune Wolf Spiders
*M.G. Ramirez, A.M. Boulton, J.M. Lenes, W.J. Farr, K.K. Lay
- 11:15 76 How Reliable Are Indirect Estimates of Gene Flow?
*J.L. Bossart, D.P. Prowell
- 11:30 77 Evolution in Fragmented Populations: Testing an Extinction/Recolonization Metapopulation
Genetics Model Using Visible Genetic Markers
*A.M. McMillan

UMC 235

10:30-12:00 Session 13 - Quantitative Genetics
Chair: Thomas Meagher

- 10:30 79 Retrospective Selection Gradient Analysis of Sexual Dimorphism in *Silene latifolia*
*T.R. Meagher
- 10:45 80 Phylogenetic Patterns of Floral Evolution in *Silene* sect. *Elisanthe*
D.E. Costich, *T.R. Meagher
- 11:00 81 Evolution of Insect Resistance in *Arabidopsis thaliana*
*B. Barker, T. Mitchell-Olds, M. Tobler
- 11:15 82 Responses to Selection on Male and Female Investment in *Spergularia marina*
(Caryophyllaceae): The Second Generation
*S.J. Mazer, V.A. Delesalle, P. Neal
- 11:30 83 Diminishing>Returns Epistasis in an *Escherichia coli* DNA Repair Mutant
J. Blanchard, M. Lynch*
- 11:45 84 Genetic Integration of Maternal and Offspring Characters
*J.B. Wolf, E.D. Brodie III

Old Main Chapel

10:30-12:00 Session 14 - Plant/Animal Interactions
Chair: Yan Linhart

- 10:30 85 Fitness Benefits of Induced Responses to Herbivory in a Wild Mustard
*A.A. Agrawal
- 10:45 86 Effects of Deer Mouse Granivory on the Population Dynamics of Bush Lupine: Is Seedlings
Recruitment Limited By Safe Sites or Seeds?
J.L. Maron, *E.L. Simms
- 11:00 87 The Dimensions of Plant Resistance to Herbivory: Looking Beyond Phytochemistry
*A.E. Weis
- 11:15 88 Evolutionary Consequences of Differential Host Utilization By Two Parasites of Ponderosa
Pine
*Y.B. Linhart, M.A. Snyder

- 11:30 89 Selection on Flower Color Polymorphism From Foliage-Feeding Herbivores?
*S.Y. Strauss, A. Emerson
- 11:45 90 Genetic Variability for Tolerance to Defoliation in *Datura stramonium*
*J.E. Fornoni, J. Núñez-Farfán

12:00-1:30 - Lunch

- SSE Business Meeting (12:30-1:30) - UMC 157

- UMC Forum

NSF Information Session: Program updates, the review process, and questions and answers

L. Lyons, M. Courtney (Population Biology) & C. O'Kelly (Systematic Biology)

UMC Center Ballroom
1:30-5:00 Symposium 2 - Testing Adaptive Hypotheses Through Genetic and Physiological Manipulation
Organizer: Johanna Schmitt

1:30 91 Manipulative Approaches to the Study of Adaptive Plasticity
*J. Schmitt

2:00 92 Phenotypic Engineering: Using Hormones to Explore Adaptation
*E. Ketterson, V. Nolan

2:30 93 Experimental Manipulations of Reproductive Allocation and Life History Adaptation
*B. Sinervo

3:00-3:30 Break

3:30 94 Transgenes in the Analysis of Stress Tolerance and Life Histories
*M. Tatar

4:00 95 Evolutionary Physiology of Heat Shock Proteins and the Stress Response in *Drosophila*: How Directed Mutagenesis and Natural Variation Can Contribute to Understanding Adaptation
*M. Feder

4:30 96 Exploring the Evolution of Plant Defenses with Transgenes
*J. Bergelson, C. Purrington

JILA Auditorium
1:30-3:00 Session 15 - Coevolution
Chair: William Rice

1:30 97 Correlation Between Virulence and Vertical Transmission in a Plant Pathogen and It's Consequences on the Evolution of Pathogen's Virulence.
*P.X. Kover, K. Clay

1:45 98 A Model of Endosymbiotic Mutualism with Horizontal Transmission: Host Strategies to Minimize Symbiont Cheating
*T. Wilcox

- 2:00 99 The Intraspecific Red Queen as a Catalyst in Evolution
*W.R. Rice
- 2:15 100 Red Queen Meets Santa Rosalia: Evolution of Specialization Driven by Arms-Races
*T.J. Kawecki
- 2:30 101 The Evolution of Specialization in the Seed Beetle Genus *Stator*
(Coleoptera: Chrysomelidae: Bruchinae)
*G. Morse, B. Farrell, C.D. Johnson
- 2:45 102 Host-Plant Use Drives Polymorphism in *Heliconius* Butterflies
*D.D. Kapan

Old Main Chapel

- 1:30-3:00 Session 16 - Sexual Selection
Chair: Robert Warner
- 1:30 103 Antagonistic Seduction - A New Hypothesis for the Evolution of Ornaments
*B. Holland
- 1:45 104 Variation Among Taxa in a Pre-Existing Bias
*A.L. Basolo
- 2:00 105 Courtship as an Indicator of Safety Rather Than Male Quality
*R.R. Warner
- 2:15 106 Polyandry as a Hedge Against Genetic Incompatibility
*J.A. Zeh, D.W. Zeh
- 2:30 107 Sexual Selection, Nearly Neutral Theory and the Rate of Molecular Evolution
*P. Wimberger, R. Reis
- 2:45 108 Empty Nuptial Gifts in an Empidid Fly, *Empis snoddyi*: Bigger Isn't Always Better
*J.A. Sadowski, A.J. Moore, E.D. Brodie III

UMC 235

- 1:30-3:00 Session 17 - Molecular Evolution
Chair: Scott Edwards
- 1:30 109 Test of Convergent and Parallel Evolution at the Amino Acid Sequence Level
*J. Zhang, S. Kumar
- 1:45 110 Something Odd Has Happened in a *Mus* Histone H2a Pseudogene
*R.W. Debry
- 2:00 111 Cloning and Evolution of Mhc Class II Genes from North American Songbirds
*S.V. Edwards, J. Gasper
- 2:15 112 Selective Regimes Affecting Replacement Substitutions in *D. melanogaster* and *E. coli* Are Revealed Through Quantifying the Bioenergetic Costs of Amino Acid Synthesis
*C.L. Craig, R.S. Weber

- 2:30 113 Evolution of Abalone Sperm Fertilization Proteins and Characterization of the Egg Receptor
*W.J. Swanson, V.D. Vacquier
- 2:45 114 Contrasting Patterns of Molecular Evolution Among Invertebrate Sperm-Egg Recognition Loci
*E.C. Metz, V.D. Vacquier

1:30-3:00 Ramaley C250
Session 18 - Population Genetics
Chair: Matthew Hare

- 1:30 115 Using Introns to Measure Intraspecific Genetic Structure: Distinguishing Loci, Alleles, and Polymerase Errors
*S.C. France, S.R. Palumbi
- 1:45 116 Multilocus Approaches to Individual and Population Origins
*N. Davies, F.X. Villablanca, G.K. Roderick
- 2:00 117 Use of Multiple Analyses (Phylogeny, Nucleotide Diversity, and Patterns of Sequence Variation) to Determine Effects of Historical Processes on Current Patterns of MtDNA Variation
*C.A. Tibbets
- 2:15 118 Moving Beyond MtDNA: Finding and Utilizing Numt (Nuclear DNA of Mitochondrial Origin) for the Construction of Intraspecific Gene Trees.
*M. Hare, S. Palumbi
- 2:30 119 Inferring Ancient Human Demographic History from Nuclear Microsatellite Haplotype Data
*S.A. Tishkoff, A.G. Clark
- 2:45 120 Using Coalescent Theory to Infer Historical Demography in the Phytophagous Beetle *Ophraella*
*L.L. Knowles, D.J. Futuyma

1:30-3:00 Chemistry 140
Session 19 - Molecular Systematics
Chair: Mark Springer

- 1:30 121 Molecular Phylogeny of the Marmots (Rodentia: Sciuridae) and Its Significance for Holarctic and Amphiberingian Biogeography.
*S. Steppan, M. Hakhverdyan, E. Lyapunova, M. Braun
- 1:45 122 Phylogeny of the Extant Malagasy Lemuriformes Based on 16S Sequence Data and a Review of the Current Evidence
*K.F. Stanger-Hall, C. Cunningham
- 2:00 123 Molecular Evidence for a Diverse Clade of Endemic African Mammals
*M. Springer, M. Stanhope, W. De Jong
- 2:15 124 The Artiodactyl Radiations
*J. Gatesy

- 2:30 125 Mountain Sheep Evolution: Molecular and Morphological Perspectives
*R.R. Ramey II
- 2:45 126 Evidence From Two Mitochondrial Genes for the Relationships Within Perissodactyla
*J.E. Norman, M.V. Ashley

Chemistry 142

1:30-3:00 Session 20 - Phylogenetic Methodology
Chair: Brian Crother

- 1:30 127 Sensitivity of Phylogeny Estimation to Incomplete Taxonomic Sampling
*S. Poe
- 1:45 128 Parsimony, Step Matrices, and the Interpretation of Homoplasy
*R. Ree, M. Donoghue
- 2:00 129 The Behavior of the PTP Test
*B.I. Crother, J.B. Slowinski
- 2:15 130 Is It Better to Add Characters or Taxa to a Difficult Phylogenetic Problem? A Simulation Study
*A. Graybeal
- 2:30 131 Bias Introduced into Majority Rule Consensus by Labile Taxa: Its Cause, Description, and Consequences for Bootstrap Analysis
C.D. Sumrall, C. Brochu, *J.W. Merck Jr.
- 2:45 132 Tree Shape Bias, Character Weighting, and the Impact of Noise on Phylogenetic Analysis.
*N. Caithness

Fine Arts N141

1:30-3:00 Session 21 - Plant Mating/Breeding Systems
Chair: Judy Stone

- 1:30 133 Differential Siring Success of PGI Genotypes in *Clarkia unguiculata*
*S.E. Travers
- 1:45 134 Does Genetic Load Constrain the Origin of New S-Alleles in *Solanum carolinense*?
*J.L. Stone, M.K. Uyenoyama
- 2:00 135 Phenotypic and Genetic Components of Floral Display in *Eichhornia paniculata*
(Pontederiaceae)
*A.C. Worley, S.C.H. Barrett
- 2:15 136 Diploid-Tetraploid Mating and the Evolution of Polyploidy in *Epilobium angustifolium*
(Onagraceae)
*B.C. Husband
- 2:30 137 Models for Packaging and Provisioning in Plant Reproduction
*D.L. Venable
- 2:45 138 The Effects of Pollen Transport Characteristics on the Evolution of Pollen Size
*L.D. Harder

3:00-3:30		Break
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		<u>JILA Auditorium</u>
3:30-5:00		Session 22 - Evolutionary Theory Chair: Sally Otto
3:30	139	QTL and Epistasis: The Quantitative Genetics of Metapopulations *C. Goodnight
3:45	140	The Origin of Order and Organization in Evolution: The Role of the Persistibility Selection Force *P. Johnson, U. Gullberg
4:00	141	The Effect of Recombination on Adaptive Peak Shifts in a Structured Population. *F.B-G. Moore, R. Lenski
4:15	142	Estimating Ancestral States of Behavior Under Varying Microevolutionary Scenarios *E.P. Martins
4:30	143	Rates of Evolution in Changing Environments *S. Otto, M. Whitlock
4:45	144	Population Dynamics Under Cytonuclear Selection *M.A. Asmussen, C.S. Babcock

		<u>Old Main Chapel</u>
3:30-5:00		Session 23 - Sexual Selection Chair: Andy Snedden
3:30	146	The Influence of Opposing Selection Pressures on Cricket Calling Behavior *S. Bertram
3:45	147	Genetic Tradeoffs in the Calling Behavior of Male Field Crickets *W.E. Wagner Jr.
4:00	148	Females Prefer Leading Males: Precedence Effects Drive Chorus Structure in the Tengara Frog *W.A. Snedden, A.S. Rand, M.K. Tourtellot
4:15	149	Precedence Effects and the Evolution Of Chorusing *M. Greenfield, W.A. Snedden, M.K. Tourtellot
4:30	150	Species and Mate-Quality Recognition in Spadefoot Toads *K. Pfennig
4:45	151	Historical Influences on Mate Recognition: Using Neural Networks to Model Sensory Biases in the Tungara Frog *S.M. Phelps, M.J. Ryan
		<u>Fine Arts N141</u>
3:30-5:15		Session 24 - Speciation and Cladogenesis Chair: Chris Schneider

- 3:30 153 Historical Allopatry, Divergence, and Speciation in the Prosobranch Snail Genus *Nucella*
*P. Marko
- 3:45 154 Phylogeographic Patterns in Lowland Amazonian Frogs
*A. Chek, S. Loughheed, J. Bogart, P. Boag
- 4:00 155 Multiple Independent Origins of Tetraploid *Tragopogon* Species (Asteraceae): Evidence from RAPD Markers
*L.M. Cook, P.S. Soltis, S.J. Brunfeld, D.E. Soltis
- 4:15 156 Recent Ice Age Origins for North American Songbirds: A Failed Paradigm.
*J. Klicka, R.M. Zink
- 4:30 157 The Effect of Pleistocene Climate Change on Diversification in Australian Rainforests: The End of the Pleistocene Speciation Model
*C. Schneider, C. Moritz
- 4:45 158 A Phylogenetic Assessment of the African Pycnonotidae and Its Implications for Speciation in the Afrotropics
*K. O'Keefe, T.B. Smith
- 5:00 159 Adaptive Radiations in the Shrub Genus *Ceanothus*: An Examination of Proposed Models Using Internal Transcribed Spacer (ITS) Region Sequence Data.
*T.M. Hardig, P.S. Soltis, D.E. Soltis

UMC 235

3:30-5:00 Session 25 - Molecular Evolution
Chair: Hsiu-Ping Liu

- 3:30 160 Evolution of Two Mitochondrial Gene Regions in a Sea Star (*Leptasterias*) Cryptic Species Complex
*A.W. Hrinevich, D.W. Foltz
- 3:45 161 End Products of Animal MtDNA Recombination
*D.H. Lunt, B.C. Hyman
- 4:00 162 Evolutionary Patterns of Doubly Uniparental Inheritance in Freshwater Mussels
*H-P Liu, M. Mulvey, J.B. Mitton
- 4:15 163 Evolution of Mitochondrial COII and New World Monkeys (Primates, Platyrrhini)
*M. Von Dornum, M. Ruvolo
- 4:30 164 How Many Types of Mitochondrial DNA in a Grasshopper?
*D. Bensasson, D. Zhang, G.M. Hewitt
- 4:45 165 Cytochrome-b Evolution in Birds and Mammals: Evidence for Increased Constraint in Birds?
*S. Stanley

Ramaley C250

3:30-5:00 Session 26 - Population Genetics
Chair: Victoria Apsit

- 3:30 167 Population Genetic Variation in the Alpine Endemic *Eutrema penlandii* (Brassicaceae) and Its Widespread Relative *E. edwardsii*.
*R.C. Hardwick, L.P. Bruederle
- 3:45 168 Population Genetics of Mexican Plants: Does Genetic Differentiation Reflect High Speciation Rates?
*L.E. Eguiarte, J. Nuñez-Farfán
- 4:00 169 Population Genetics of *Rhizophora mangle* from Mexico
*J. Nuñez-Farfán, L.E. Eguiarte, C.A. Dominguez, R. Dirzo
- 4:15 170 Fragmentation and Pollen Movement in a Costa Rican Dry Forest
*V.J. Apsit, J.L. Hamrick
- 4:30 171 DNA Sequence Variation at Two Basic Chitinase Genes in *Arabidopsis fecunda*, a Rare Plant
*J. Bishop, T. Mitchell-Olds, D. Pedersen, B. Stranger
- 4:45 172 The Effect of Mutation and Adaptive History in Experimental Evolution Of *E. coli*
*A. de Visser, C. Zeyl, J. Blanchard, R. Lenski

- Chemistry 140
3:30-5:00 Session 27 - Molecular Systematics
Chair: Paul Chippindale
- 3:30 174 The Evolution of Diapause in the Rivulidae: A Molecular Phylogenetic and Biogeographic Perspective
*T. Hrbek, A. Larson
- 3:45 175 Ancient Species Flocks in Marine Fishes? Tests Based on Molecular Phylogenetic Appraisals of the Sebastes Rockfish and Other Groups
*G.C. Johns, J.C. Avise
- 4:00 176 Molecular Systematics and Evolution of the Strike in Natricine Snakes (Colubridae)
*M.E. Alfaro
- 4:15 177 Phylogenetic and Population Genetic Utility of the Mitochondrial D-Loop Region in Central Texas Spring and Cave Salamanders, *Eurycea* and *Typhlomolge*
*P. Chippindale, K. Burnside, P. Perryman, J. Willard
- 4:30 178 Examining the Hypothesis of a Phylogenetic Radiation in Caribbean Anoline Lizards Using Molecular Sequence Data.
*T. Jackman, J. Losos, A. Larson, K. de Queiroz
- 4:45 179 Evolution of North American Softshell Turtles: A Possible Exception to the Theory of Slow Rates
*D.W. Weisrock, F.J. Janzen

- Chemistry 142
3:30-5:15 Session 28 - Phylogenetic Methodology
Chair: Guy Hoelzer
- 3:30 181 Bayesian Phylogenetic Inference Using DNA Sequences
*B. Rannala, Z. Yang

- 3:45 182 Extracting Species Trees from Complex Gene Trees
*R. Page, M. Charleston
- 4:00 183 Relative Apparent Synapomorphy Analysis (RASA): A Tree-Independent Method of Phylogenetic Data Analysis.
*G.A. Hoelzer, J. Lyons-Weiler
- 4:15 184 Detection and Remediation of the Effects of Long Branch Attraction Using RASA
*J. Lyons-Weiler, G.A. Hoelzer
- 4:30 185 Molecular Systematics and Biogeography of Antillean Plant Groups
*E. Santiago-Valentin, R.G. Olmstead
- 4:45 186 Inferring Species Trees from Gene Trees
*J.B. Slowinski, R. Page
- 5:00 187 Causes And Consequences of Star-Phylogeny
*M. Hedin
-
- 4:30-5:30 UMC Forum
SSE Presidential Address:
Genetics, Evolution and Conservation
*Russell Lande
-
- 4:30-6:30 UMC East Ballroom
Poster Session I
- 188 Non-Linear Simulation of Natural Selection with Feedback
*M.C. Grant, D. Robertson
- 189 Detecting Epistatic Fitness Interactions in Haploids And Diploids
*A.D. Peters
- 190 A Computer Simulation Model of Parapatric Speciation
*T. Gregg, J. Bloom
- 191 A Graphical Model for the Occurrence and Frequency of Cannibalism in Polyphenic Salamanders
*C. Beck
- 192 How the Life History of Carp (*Cyprinus carpio*) Has Adapted to Regulated Rivers: The Role Of Naturalization and Domestication
*P.D. Driver, R. Norris, G. Closs, J. Harris
- 193 Genetic Diversity for Reaction Norms to Nutrient Availability in *Datura stramonium*
*J. Núñez-Farfán, J.E. Fornoni, S.A. Careaga, F.A. Bazzaz
- 194 The Genetic Architecture of Shade Avoidance Responses in *Impatiens capensis*
*K. Donohue, J. Schmitt
- 195 Tests of Evolutionary Hypotheses Using Hybrids Between *Drosophila serrata* and *D. birchii*.
*D. Berrigan, M. Blows

- 196 Site-Directed Mutations Reveal Long-Range Compensatory Interactions in the Adh Gene of *Drosophila melanogaster*
*J. Parsch, S. Tanda, W. Stephan
- 197 Evolution of Senescence in Laboratory Populations of *Drosophila melanogaster*
C.A. Michieli, K. McGill, *P.M. Service
- 198 The Hormonal Basis of Life-History Variation: Juvenile Hormone Levels in Genetic Stocks of *Gryllus firmus* Differing in Early Reproduction
*G. Cisper, A.J. Zera
- 199 Theories of Aging: Testing a Fundamental Assumption
*P. Mack, L. Pearse, D. Promislow
- 200 Female Preference and Male Age in *Drosophila*
*D. Price
- 201 When Are Good Genes Good? Variable Outcome of Female Choice in Wax Moths
*F. Jia, M. Greenfield
- 202 Hybridization Among Three Species of *Strongylocentrotus* Urchins in the Pacific Northwest
*W.C. Prather, D.R. Levitan
- 203 An Association Between X-Linked Traits and Speciation in Fall Armyworm Moths
*D.P. Prowell, M. McMichael
- 204 Phylogeography of Lake Populations of *Daphnia* in Oregon
*D. Straughan, N. Lehman
- 205 Arthropod Phylogeography in Hawaii: 4 Paths in Paradise
*R. Gillespie, G. Roderick
- 206 Plant Response to Environmental Variation in the Big Sagebrush Hybrid Zone
*J.H. Graham, D.C. Freeman, H. Wang, E.D. McArthur
- 207 Selection Against Mating with Immigrants as a Mechanism of Sympatric Speciation - Computer Simulation.
*N. Mugue
- 208 Decline in a Cline: P Elements in Eastern Australian *Drosophila melanogaster* Populations
M. Itoh, *I.A. Boussy, R.C. Woodruff
- 209 Molecular Composition of B Chromosomes in the Grasshopper *Eyprepocnemis plorans*
*J. Cabrero, M.D. López-León, M. Bakkali, J.P.M. Camacho
- 210 Long Term vs. Short Term Genetic Structures of Self-Incompatible Populations Revealed by S-Allele and Neutral Gene Genealogies
*Y. Lu, N. Takahata, M.K. Uyenoyama
- 211 Interspecific Evolution of Linked Microsatellites in the Adaptively Radiating Hawaiian Silversword Alliance
*M. Barrier, R.H. Robichaux, M. Purugganan
- 212 Using Molecular Phylogeny to Infer Direction of Flight Evolution in Stoneflies
*M.R. Wolf, K.A. Walsh, G.H. Fitzhugh, J.H. Marden

- 213 RAGE (Rapid Assessment of Genomic Evolution): An Approach Based on Random Sequencing, and a Trial Application to the Genome of the House Fly (*Musca domestica*)
*S.A. McCommas, L. Fulton
- 214 Characterization of the Alpha-Tubulin Gene from the Macronucleus and Micronucleus of Two Ciliate Species: *Chilodonella uncinata* and *Euplotes crassus*
*E. Curtis, L.A. Katz, L.F. Landweber
- 215 Heterochrony in the Molecular Development Cascade of *Drosophila*
*J. Kim, J. Kerr
- 216 Characterization of LINE-1 Elements in *Microtus*
*C.D. Yarber, R.A. Grahn, H.A. Wichman
- 217 Factors Maintaining Androdioecy in the Desert Shrimp, *Eulimnadia texana*
*S.C. Weeks, N. Zucker
- 218 Microsatellite Markers Reveal Details of Family Structure in Ants
*J.M. Herbers
- 219 Hybrids as General-Purpose Genotypes: Phenotypic Plasticity and Predator-Driven Species Dynamics in *Daphnia* Hybrid Systems
*C. Wilson
- 220 Mating System and Progeny Characteristics of Nectar and Nectarless Honey Mesquites (Mimosoideae): Is Nectar Production an Adaptation?
*J. Golubov, L. Eguiarte, J. Lopez-Portillo, M. Madujano, C. Montana
- 221 Likelihood-Based Paternity Inference in Natural Populations
*T. Marshall, J. Slate, L. Kruuk, J. Pemberton
- 222 Climate Changes and Community Stability in a California Rocky Intertidal System
*S.E. Gilman, R.D. Sagarin, C.H. Baxter, J.P. Barry
- 223 An Ultrasensitive Method for Detection of Single Crab Larvae (*Sesarma reticulatum*) Using PCR Amplification of Highly Repetitive DNA Sequences
*A.L. Evans, D.L. Felder, J.E. Neigel
- 224 Modeler's Tool: An Algorithm for Teachers and Researchers
*R.F. Shaw
- 225 Mutation Rate: A Simple Concept Has Become Complex
*J.N. Thompson Jr., R.C. Woodruff
- 226 Population Genetic Structure of the *Begonia dregei* Complex Along the East Coast of South Africa
*L.O. Matolweni, T. McLellan, K. Balkwill
- 227 Sex Differences in Coalescent Times (A Theoretical Model)
*R.B. Campbell
- 228 Genetics and Evolution of the Mariner DNA Element in *Drosophila simulans*
*A.L. Russell, R.C. Woodruff

- 229 Within and Among-Population Size Homoplasy at a Microsatellite Locus in the Freshwater Snail *Bulinus truncatus* (Basommatophora: Planorbidae)
*F. Viard, M-P Dubois, P. Jarne
- 230 The Effects of Unidirectional Incompatibility Selection on Cytonuclear Disequilibria in Hybrid Zones
*R. Dean, J. Arnold
- 231 Estimates of Heritability of Male Effects on Female Oviposition in Two Populations of *Drosophila melanogaster*
*E. Guthrie, P. Service
- 232 Juvenile Hormone Esterase and the Evolution of Flightlessness in *Gryllus firmus*
*H. Yuan, A. Zera
- 233 Multivariate Evolution: An Island-Continent Model with Selection and Gene Flow
*A. Qucral-Regil, R.B. King
- 234 Elongation Factor 1-Alpha Sequences Elucidate Phylogenetic Relationships Within the Swallowtail Butterfly Genus *Papilio* (Lepidoptera: Papilionidae).
*R.D. Reed, F.A.H. Sperling
- 235 Conflicting Phylogenetic Signals from a Single Molecular Data Set
*B.N. Campbell, P.T. Boag
- 236 Phylogeny of *Ips* Bark Beetles (Scolytidae) Based on Mitochondrial Cytochrome Oxidase I Sequence
*A.I. Cognato, F.A.H. Sperling
- 237 Population Structure and Intraspecific Phylogeny of the Flour Beetle, *Tribolium castneum*
*L.D. Roberts, P.T. Chippindale, N.A. Johnson
- 238 Evolution of Hawaiian Island and Insular Pacific *Pittosporum* (Pittosporaceae) Species as Estimated by Nuclear Ribosomal DNA Internal Transcribed Spacer Sequences
*C.E.C. Gemmill, W.L. Wagner, E.A. Zimmer
- 239 Phenetic and Phylogenetic Comparisons Between 5.8S Ribosomal DNA in Plant Parasitic Cyst Nematodes and *C. elegans*
*V.R. Ferris, J.M. Ferris, J. Faghihi
- 240 Phylogenetic History and Diversity of the Ant Genus *Gnamptogenys* in the New World
*J. Latke
- 241 On Weighting and Congruence
*M.W. Allard
- 242 Semicongruence Between Phenetic and Cladistic Analysis in *Polymesoda* (Bivalvia: Corbiculidae): The Effect of Size Convergence.
*H. Severeyn, Y.G. De Severeyn
- 243 Phylogeography of the California Legless Lizard *Anniella pulchra*: Evidence for Parallel Evolution of the Nigra Phenotype from Cytochrome b Sequence Data
*D.E. Pearse, G. Pogson
- 244 Climatic Change and the Molecular Biogeography of Coleoptera
*R.A. Reiss

- 245 **A New Polynomial Time Method for Inferring Trees Which Is Consistent and Has Great Statistical Power**
P. Erdos, K. Rice, M. Steel, L. Szekely, *T. Warnow
- 246 **Large-Scale Experimental Study of Different Phylogenetic Reconstruction Methods on Very Large Trees**
*K. Rice, T. Warnow
- 247 **Phylogeny of the *Terebellomorpha* and *Sabellida* (Annelida) and the Evolution of Larval Developmental Modes**
*D. McHugh
- 248 **Estimating Food Preference in the Eastern Gray Squirrel, *Sciurus carolinensis***
*E.L. Barthelmess
- 249 **Stabilimenta and Prey Capture Success in *Argiope* (Araneae: Araneidae)**
*T.A. Blackledge
- 250 **Molecular Evolution of Duplicated Growth Hormone Genes in Salmonid Fishes**
*S. Mckay, R. Devlin, M.J. Smith
- 251 **Seed Number, Ethylene Production, and Sex Expression in *Cucurbita texana***
*G.A. Krupnick, A.G. Stephenson
- 252 **Self-Sterility in Milkweeds: Distinguishing Between Late-Acting Self-Incompatibility and Inbreeding Depression**
*S. Lipow
- 253 **Inbreeding Depression in Autogamous and Outcrossing Populations of *Arenaria uniflora* (Caryophyllaceae)**
*L. Fishman
- 254 **Intra- and Interspecific Genetic Variation Among Groups of Freshwater Mussels in North Carolina: Implications for Conservation**
*A.E. Stiven
- 255 **Analysis of Genetic Diversity in the Western Mosquitofish, *Gambusia affinis*, Using Microsatellite DNA Techniques**
*C.C. Spencer
- 256 **The U.S. National Committee for the International Union of the Biological Sciences: A U.S. Voice for International Cooperation.**
*T. Bert, B. Chernoff
- 257 **Evidence of Positive Selection in the Mammalian Milk Protein Kappa-Casein**
*T. Ward, R. Honeycutt, J.N. Derr
- 258 **Conservation Genetics of *Tursiops truncatus***
*A.P. Rooney, D.B. Merritt, S.H. Ridgeway, J.N. Deer
- 259 **Temporal and Spatial Variation in Hybridization Between Two Toads in Central Arizona**
*K. Malmos, B. Sullivan

- 260 Problems in G-Protein Coupled Receptor Evolution
*L. Vawter, K. Rice

8:00-9:00	<u>Macky Auditorium</u> Address by Professor E.O. Wilson: Biodiversity
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9:00-11:00	Social for E.O. Wilson (In Front of Macky)
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Monday, 16th June

- UMC Center Ballroom
- 8:00-12:00 Symposium 3 - Slightly Deleterious Mutations in Evolution
Organizers: Michael Nachman and Nancy Moran
- 8:00 265 Slightly Deleterious Mutations in Animal Mitochondrial DNA
*M. Nachman
- 8:15 266 Slightly Deleterious Mutations in Endosymbiotic Bacteria
*N. Moran
- 8:30 267 Evolution by Nearly Neutral Mutations
*T. Ohta
- 9:00 268 Deleterious Alleles in Populations with Fluctuating Sizes
*J. Gillespie
- x 9:30 269 Mitochondrial DNA Mutations, Aging, and Degenerative Diseases
*M. Brown
- 10:00-10:30 Break
- 10:30 270 Decline of Fitness in two Panmictic Populations of *Drosophila melanogaster* Maintained under Relaxed Natural Selection
S.A. Shabalina, L.Y. Yampolsky, *A.S. Kondrashov
- 11:00 271 Natural Selection and the Population Genetics of "Silent" DNA Mutations in *Drosophila*
*H. Akashi
- 11:30 272 Deleterious Mutation Accumulation in the Mitochondrion
*M. Lynch
- *****
- JILA Auditorium
- 8:30-10:00 Session 29 - Life Histories and Development
Chair: Chi-hua Chiu
- 8:30 273 Body-Patterning Genes and the Evolution of Asexual Reproduction and Regeneration in Annelids
*A.E. Bely, G.A. Wray

- 8:45 274 Bet-Hedging and Sex Specific Differences in the Size at Phase Change in the Bluehead Wrasse, *Thalassoma bifasciatum*
*L. Rogers
- 9:00 275 Sexual Modes of Modular Animals: Gonochorism, Hermaphroditism, or Both at Once?
*K. Wasson
- 9:15 276 Genetics of Sex Determination in a Parasitoid Wasp
*A.K. Holloway, M.F. Antolin
- 9:30 277 What Controls the Timing of Ovarian Maturation in Larvally Reproductive Gall Midges (Insecta: Diptera: Cecidomyiidae): Parallelisms or Simple Convergence?
*J. Hodin, L. Riddiford
- 9:45 278 Spontaneous Facultative Parthenogenesis in Snakes
*G.W. Schuett, P.J. Fernandez, W.F. Gergits, D. Chiszar, H.M. Smith, J.B. Mitton

Chemistry 140

8:30-10:00 Session 30 - Molecular Systematics
Chair: Jerome Reiger

- 8:30 279 The Scaling of the Phylogenetic Estimating Problem
*J. Kim
- 8:45 280 Comparison of Morphological and Molecular Divergence in the *Anopheles minimus* Complex of Malarial Mosquitoes from Thailand
*R. Sharpe, R. Butlin, R. Harbach
- 9:00 281 Phylogenetic Signal in the COI and 16S Mitochondrial Genes for Inference of Generic Relationships Among Microgastrine Parasitoid Wasps
*P. Mardulyn, J.B. Whitfield
- 9:15 282 Phylogeny of the Tachinid Family-Group (Diptera) Based on Mitochondrial DNA
*J.D. Wells, T. Pape, F.A.H. Sperling
- 9:30 283 Phylogenetic Characterization of Bacterial Endosymbionts of Adelgids and Psyllids (Hemiptera: Sternorrhyncha)
*A. Spaulding, C.D. Von Dohlen
- 9:45 284 Nuclear Genes for Arthropod Systematics
*J.C. Reiger, J.W. Schultz, C. Mitter

CIRES Auditorium

8:30-10:00 Session 31 - Combined-Data Systematics
Chair: Barry Campbell

- 8:30 285 Morphology Versus Molecules in the Caribbean Boas.
*B.N. Campbell, P.T. Boag
- 8:45 286 Comparing and Combining Molecular and Morphological Data: Practical Approaches in the Anatini
*K.P. Johnson, M.D. Sorenson

- 9:00 287 Combined-Data Analysis Can Amplify Phylogenetic Signal: A Computer Simulation Study
*A.D. Yoder, T. Eriksson, M. Donoghue
- 9:15 288 Evolution of the Chiropteran Hindlimb: A Phylogenetic Perspective Based on a Combined-Data Analysis of Fossil and Extant Bats
*W.A. Schutt, Jr., J. Geisler, N.B. Simmons
- 9:30 289 Molecular Phylogenetics of the Carnivorans (Mammalia, Carnivora): Evidence from Intron I of the Transthyretin Gene
*M. Nedbal, J. Flynn
- 9:45 290

Fine Arts N141
8:30-10:00 Session 32 - Biogeography
Chair: Cristina Miyaki

- 8:30 291 Biogeographic Constraints on Patterns of Colonization and Migration in *Melanochromis auratus* (Cichlidae) During the Most Recent Inundation of the South-Eastern Basin of Lake Malawi: An Analysis of Fine Scale Population Structure Using SSR Loci
*J. Markert, P. Danley, M. Arnegard, T. Kocher
- 8:45 292 Parrot Evolution and Paleogeographic Events: Mitochondrial DNA Evidences
*C.Y. Miyaki, S.R. Matioli, T. Burke, A. Wajntal
- 9:00 293 Mitochondrial DNA Control-Region Sequences Indicate a Sequential Range Expansion and Low Current Levels of Gene Flow Among European Populations of Common Chaffinches (*Fringilla coelebs*)
*H.D. Marshall, A.J. Baker
- 9:15 294 Role of the Columbia River Gorge in Shaping Ground Squirrel Phylogeography: Vicariance or Dispersal Barrier?
*G.J. Kenagy, F.X. Villablanca
- 9:30 295 MtDNA Variation in Stephen's Kangaroo Rat (*Dipodomys stephensi*): The Influence of Landforms
*A.E. Metcalf, L.P. Nunney, B.C. Hyman
- 9:45 296 Speciation and Phylogeography Within the Dusky Shrew (*Sorex monticolus*) Species Complex
*J.R. Demboski, J.A. Cook

UMC Forum
8:30-10:00 Session 33 - Phylogenetic Methodology
Chair: Paul Lewis

- 8:30 297 Recovering Reticulation in Human Evolution: Trees, Nets, and Polynesian Languages
*R.D. Gray
- 8:45 298 Evolution of the Rate of Molecular Evolution
*J.L. Thorne, H. Kishino

- 9:00 299 The Consistency of Maximum Likelihood Estimation of Phylogenetic Trees from Nucleotide Sequences
*J.S. Rogers
- 9:15 300 Estimating Parameters of Mixed-Distribution Models of Among-Site Rate Variation in ML Phylogenetic Analysis Is Difficult, but Does It Matter?
*J. Sullivan, D.L. Swofford
- 9:30 301 Fast Algorithm for the Maximum Likelihood Method of Phylogenetic Reconstruction
*A. Rodin, W-H Li
- 9:45 302 A Genetic Algorithm for Inferring Phylogeny
*P. Lewis

- UMC 235
8:30-10:00 Session 34 - Behavior
Chair: Richard Prum
- 8:30 303 Phylogeny of the Frog Genus *Physalaemus* with Implications for Evolution of Call Types in the Group
*M. Holder, D. Cannatella, S. Rand, M. Ryan
- 8:45 304 The Sensory Basis of Background Color Matching in a Color-Polymorphic Treefrog: Implications for the Evolution of Assortative Mating Within an Interbreeding Population.
*W.H. Wentz, J.B. Phillips
- 9:00 305 Why Birds of a Feather Should Flock Together
*C.W. Benkman, J. Smith, K. Coffey
- 9:15 306 Hormonal Correlates of Breeding Behavior in Female Eastern Bluebirds: Implications for Alternative Mating Strategies
*N. Buschhaus, P. Gowaty, J. Downhower, J. Harder
- 9:30 307 Phylogeny and Social Behavior Evolution of the *Cotingas* (Cotingidae: Aves).
*R.O. Prum
- 9:45 308 Unequal Partitioning of Reproductive and Investment Tasks Between Cooperating Queens in the Fire Ant, *Solenopsis invicta*, as Revealed by Microsatellites
*G. Bernasconi, M.J. Krieger, L. Keller

- UMC 158
8:30-10:00 Session 35 - Evolution of Sex and Recombination
Chair: Jack da Silva
- 8:30 309 Test of Synergistic Interactions Among Deleterious Mutations in Bacteria
*S.F. Elena, R.E. Lenski
- 8:45 310 Sex Facilitates Adaptation to a Changing Environment: An Experiment with *Chlamydomonas*
*J. da Silva

9:00	311	Embryonic Mortality in Parthenogenetic <i>Dugesia polychroa</i> (Plathelminthes; Tricladida). Evidence for Deleterious Mutations? *M. Storhas, R.P. Weinzierl, N.K. Michiels
9:15	312	Virulence and Infectivity of Microsporidians in Sexual and Parthenogenetic Snails *S.G. Johnson
9:30	313	Multiple B Chromosomes in a Parthenogenetic Hermaphrodite: Lineage Markers or Remnants of Genetic Leakage? *T.F. Sharbel, L.W. Beukeboom, N.K. Michiels
9:45	314	

10:00-10:30 Break

		<u>JILA Auditorium</u> Session 36 - Molecular Evolution Chair: Ian Boussy
✕	10:30	315 Evidence for Recent Selection on Codon Usage in <i>Drosophila</i> *R.M. Kliman, A. Eyre-Walker
✕	10:45	316 Molecular Evolution Is Not Male-Driven in <i>Drosophila melanogaster</i> And <i>D. simulans</i> *V.L. Bauer, C.F. Aquadro
✕	11:00	317 A Strand Bias to Non-Neutral Mitochondrial DNA Evolution: Evidence from the CytB and ND5 Genes in <i>Drosophila</i> *L.M. Kann, D.M. Rand
✕	11:15	318 The Hobo Transposable Element Invaded <i>Drosophila melanogaster</i> Twice *I.A. Boussy, M. Itoh
➤	11:30	319 Molecular Evolution of P Elements: Snail's Pace for a Jumping Gene? *J.C. Silva, J. Clark, P.M. O'Grady, M.G. Kidwell
	11:45	320 Molecular Evolution in Pheromone Systems in Moths: Pheromone Binding Proteins of the European Corn Borer (<i>Ostrinia nubilalis</i>) *C.S. Willett

		<u>CIRES Auditorium</u> Session 37 - Quantitative Genetics Chair: Charles Fenster
	10:30	321 Quantitative Genetic Analysis of Seed Dormancy, a Threshold Trait in <i>Collinsia verna</i> (Scrophulariaceae). *D.A. Thiede, S. Kalisz, M. McPeck
	10:45	322 The Role of Epistasis in Population Differentiation in <i>Chamaecrista fasciculata</i> : A Common Garden Experiment *L.F. Galloway, C.B. Fenster

- 11:00 323 The Role of Epistasis in Population Differentiation of *Chamaecrista fasciculata*: A Natural Field Experiment.
*C.B. Fenster, L.F. Galloway
- 11:15 324 Components of Variance in an Experimentally Inbred Population of *Nemophila menziesii*
*D. Byers, F. Shaw, R. Shaw
- 11:30 325 Between Year Genetic Correlations in the Annual Plant, *Nemophila menziesii*
*R. Shaw, G.A.J. Platenkamp
- 11:45 326

Chemistry 140

- 10:30-12:00 Session 38 - Molecular Systematics
Chair: James Danoff-Burg
- 10:30 327 Quantitative Phylogenetic Analysis of Life-History Evolution in the Bark Beetle Genus *Dendroctonus* (Coleoptera: Scolytidae).
*S.T. Kelley, B.D. Farrell
- 10:45 328 Phylogenesis of Host Use and Host Specialization in *Papaipema* (Lepidoptera: Noctuidae)
*P.Z. Goldstein
- 11:00 329 Phylogeny of Noctuid Moths (Insecta: Lepidoptera) Inferred from Two Nuclear Genes, EF-1 Alpha and DDC
*A. Mitchell, Q.Q. Fang
- 11:15 330 Phylogeny of *Papilio* (Insecta: Lepidoptera)
*M.S. Caterino, F.A.H. Sperling
- 11:30 331 Utility of Nuclear 18S rDNA in Reconstructing Relationships Among Basal Beetles (Coleoptera: Polyphaga)
*J.A. Danoff-Burg
- 11:45 332 Evolution of Species-Rich Lineages: Cladogenesis, Biogeography and Sequence Variation in *Cicindela* Tiger Beetles
*A.P. Vogler, T.G. Barraclough, A. Diogo

Fine Arts N141

- 10:30-12:00 Session 39 - Speciation and Cladogenesis
Chair: Jim Leebens-Mack
- 10:30 333 Host-Plant Dependent Tradeoffs in the Apple Maggot Fly, *Rhagoletis pomonella*: The Relationship Between Larval Emergence, Fruit Rot and Allozyme Loci.
*K. Filchak, J.L. Feder, J.B. Roethele, U. Stolz
- 10:45 334 Host-Plant Associated Fitness Tradeoffs in the Apple Maggot Fly, *Rhagoletis pomonella*: A Synopsis of the Past, and Perspective for the Future
*J.L. Feder, J.B. Roethele, K. Filchak, U. Stolz
- 11:00 335 Genomic Structure in the Apple Maggot Fly, *Rhagoletis pomonella*: Is Inversion Polymorphism Involved in Reducing Effective Gene Flow Between the Host Races?
*J.B. Roethele, J.L. Feder

- 11:15 336 Host Associations and Patterns of Diversification Among Yucca Moth Populations
*J. Leebans-Mack, O. Pellmyr
- 11:30 337 Reproductive Mode and Speciation: Why We Need Alternatives to the *Drosophila* Model System
*D.W. Zeh, J.A. Zeh
- 11:45 338 What Initiates Speciation in *Heliconius* Butterflies?
*C. Jiggins

UMC Forum
10:30-12:00 Session 40 - Macroevolution
Chair: Richard Palmer

- 10:30 339 The Influence of Phylogenetic Scale in Determining Evolutionary Patterns
*P.A. Zani
- 10:45 340 Taxonomies and Temporal Patterns of Lineage Diversity: Alternative Simulations
*H. Robeck, C. Maley, M. Donoghue
- 11:00 341 Evolution and Development of Flower Symmetry in Asterid Angiosperms
*M. Donoghue, R. Ree, D. Baum
- 11:15 342 Alternative Evolutionary Routes to Fixed Bilateral Asymmetry: The Ontogenetic Role of Genotype Versus Environment
*A.R. Palmer
- 11:30 343 Juvenile Delinquency and Clandestine Variation in the Macroevolution of Heart Urchins
*G. Eble
- 11:45 344 Interpreting Sister-Group Tests of Key Innovation Hypotheses
*A. de Queiroz

UMC 235
10:30-12:00 Session 41 - Geographic Variation and Hybrid Zones
Chair: Robert Latta

- 10:30 345 Microgeographic Patterns of CpDNA Introgression in *Carpobrotus* (Aizoaceae)
*V.V. Symonds, K.A. Schierenbeck
- 10:45 346 Influence of Historical and Contemporary Gene Flow Patterns on Geographic Variation in Ponderosa Pine
*R.G. Latta
- 11:00 347 The Historical Pattern of Gene Flow Among Migratory and Non-Migratory Populations of Prairie Warblers (Aves: Emberizidae)
*C.A. Buerkle
- 11:15 348 Inferring the Relative Influences of Drift and Gene Flow on Regional Population Structure Via Correlation Analyses
*D. Hutchison

- 11:30 349 What Type of Data Is Best for the Estimation of Migration Rate?
*P. Beerli
- 11:45 350 Non-Equilibrium Patterns of Genetic Differentiation Across Partial and Complete Gene Flow Boundaries
*A. Porter

UMC 158

- 10:30-12:00 Session 42 - Evolution of Sex and Recombination
Chair: Shawn Meagher
- 10:30 351 The Effect of Sex on Fitness in Experimental Yeast Populations
*C. Zeyl
- 10:45 352 Evidence for a Cost of Sex in a Freshwater Snail *Potamopyrgus antipodarum*
*J. Jokela, C.M. Lively, M.F. Dybdahl, J.A. Fox
- 11:00 353 Fitness Effects of Facultative Parthenogenesis in the Cockroach, *Nauphoeta cinerea*
*L.S. Corley, A.J. Moore
- 11:15 354 Sex and the Single Worm: An Examination of the Utility of Outcrossing in the Partially Selfing Nematode, *Caenorhabditis elegans*
*A. Stewart, P.C. Phillips
- 11:30 355 Fitness Consequences of a Single Generation of Full-Sib Mating in Wild House Mice (*Mus domesticus*)
*S. Meagher, W. Potts
- 11:45 356 Parasitism, Mutation Accumulation and the Maintenance of Sex Under Epistatic Fitness Functions
S. Howard, *C.M. Lively

12:00-1:30 - Lunch

- ASN Business Meeting (12:30-1:30) - UMC 157

- UMC Forum

NIH Grants Workshop

I.A. Ekstrand (Genetics & Developmental Biology Division)

UMC Center Ballroom

- 1:30-5:00 Symposium 4 - Systematics and the Evolution of Developmental Patterns
Organizers: Billie J. Swalla and Andres Collazo
- 1:30 357 Systematics and Developmental Biology: A Future for Experimental Biology
*E. Zimmer
- 2:00 358 Morphological Homology and the Pharyngula Stage
*A. Collazo
- 2:30 359 Molecular Approaches to Understanding the Origin and Diversification of Echinoderm Body Architecture
*G.A. Wray

- 3:00-3:30 Break
- 3:30 360 Developmental Processes as Sources of Characters in Systematics
*R. Desalle
- 4:00 361 Developmental Regulatory Mechanisms and the Evolution of Arthropod Body Patterns
*S. Carroll
- 4:30 362 Evolution of the Chordate Body Plan: Lessons from the Urochordate Larvae
B.J. Swalla

- Fine Arts N141
- 1:30-3:00 Session 43 - Adaptation and Plasticity
Chair: Kenneth Halama
- 1:30 363 Adaptive Significance of Territoriality in the Australian Scincid Lizard, *Ctenotus fallens*
*W.B. Jennings
- 1:45 364 A Quantitative Study of Background Matching and Alternative Cryptic Defenses Among Populations of the Oregon Tiger Beetle (*Cicindela oregona*)
*T.D. Schultz
- 2:00 365 Testing Models of Habitat Selection in Ricefishes
*J. Albert
- 2:15 366 Morphological Correlates to Habitat Selection in Western Fence Lizards: Evidence for a Resource Polymorphism?
*K.J. Halama
- 2:30 367 Developmental Plasticity and the Ecology of Body Size in Two Seed Beetles
*C.W. Fox, U.M. Savalli
- 2:45 368 Genetic and Environmental Components of Differential Hostplant Use in a Specialist Herbivore (Coleoptera: Curculionidae)
*S.L. Solarz, R.M. Newman

- UMC 235
- 1:30-3:00 Session 44 - Molecular Evolution
Chair: Jonathan Eisen
- 1:30 369 Molecular Evolution of Colicin Gene Clusters in *E. coli*
*Y. Tan, M.A. Riley
- 1:45 370 Coalescent Approaches to Studying HIV Populations
*A. Rodrigo, G. Learn, J. Felsenstein, J. Mullins
Allan
- 2:00 371 Comparative Study of the Molecular Evolution of HIV-1 Epidemics: A Coalescent Approach
*G. Learn, A. Rodrigo, J. Mullins
Gerald

X. Gu M. Nei Evolution of LHR.

- 2:15 372 Riodinid, Lycaenid And Nymphalid Butterflies: Different Rates of DNA Evolution?
D. Campbell
- 2:30 373 Evolution of DNA Repair Genes and Processes: Comparison of Repair in Bacteria, Archaea,
and Eukaryotes.
*J.A. Eisen, P.C. Hanawalt

2:45 374

Old Main Chapel

1:30-3:00 Session 45 - Ecological Genetics
Chair: William Etges

- 1:30 375 Inversion Phylogenies and Parallel Population Structures in Cactophilic *Drosophila*
mojavensis and *D. pachea*.
*W.J. Etges, W.R. Johnson, G. Huckins, G.A. Duncan, W.B. Heed
- 1:45 376 The Effect of Queen Number on Queen and Colony Survivorship in the Facultatively
Polygynous Ant *Myrmica tahoensis*
*J. Evans
- 2:00 377 A Micro-Evolutionary Study of the *Drosophila-Macrocheles* System: Fitness Consequences
of Ectoparasitism and Heritability of Resistance
*M. Polak
- 2:15 378 Analysis of Paternity and Sperm Competition in Dungeness Crab (*Cancer magister*) Using
Microsatellites
*P.C. Jensen, P. Bentzen
- 2:30 379 Factors Influencing Host Colonization by the Plant Virus BYDV
*S.K. Remold, A.G. Power
- 2:45 380

JILA Auditorium

1:30-3:00 Session 46 - Population Genetics
Chair: David Rand

- 1:30 381 A Prototype Population Genetics Object Database for Animal mtDNA
*J. Neigel
- 1:45 382 New Software for Measuring Genetic Relatedness and Kinship Patterns in Populations
*K.F. Goodnight
- 2:00 383 Near Neutrality or Relaxed Selection?: Neutrality Tests of Amino Acid Polymorphism in
Commensal and Non-Commensal Species
*D.M. Rand, L.M. Kann
- 2:15 384 Sex Linkage Among Genes Controlling Sexually-Selected Traits in Animals
*K. Reinhold
- 2:30 385 Inbreeding Effective Size: Comparisons Among Complex Life Histories
*B. Milligan, A. Strand

2:45 386 Testing Hypotheses About Heterosis Using Meta-Analysis
*D. Houle

UMC 157
1:30-3:00 Session 47 - Quantitative Genetics
Chair: Susan Jacobs

1:30 387 Apparent Selection Inferred From Pleiotropic Effects of P-Element Insertions
*A. Clark

1:45 388 Quantitative Trait Loci for Fluctuating Asymmetry of Quasi-Continuous Skeletal Characters
in Mice
*L.J. Leamy, E.J. Routman, J.M. Cheverud

2:00 389 Variation in Hox Gene Expression in Threespine Stickleback Fish.
D-G Ahn, *G. Gibson

2:15 390 Evolution of Mandibular Morphology Among Tamarins
*S.C. Jacobs, J.M. Cheverud

2:30 391 Composite Traits and the G Matrix: Does Ontogeny Matter?
*J. Reeve

2:45 392 Patterns of Quantitative Trait Variation in *Daphnia arenata*
*M. Pfrender

Chemistry 140
1:30-3:00 Session 48 - Molecular Systematics
Chair: Kevin Omland

1:30 393 Population Structure and Glacial Refugia Inferred from MtDNA Control Region Sequences
in the Song Sparrow
*A.J. Fry, R.M. Zink

1:45 394 Sexual Selection, Hybridization, and Phylogenetics in the Avian Genus *Manacus*
*R.T. Brumfield, M.J. Braun

2:00 395 MtDNA Sequence Phylogeny for Orioles (*Icterus*): A Framework for Studying Plumage
Evolution
*K.E. Omland, S.M. Lanyon

2:15 396 Phylogenetic Relationships and the Evolution of Migration in the Avian Genus
Muscisaxicola
*R.T. Chesser

2:30 397 Birds and Amazonian Headwaters: Molecular Evidence of Genetic Structure
*J. Bates, J. Haffer

2:45 398 Evolutionary Relationships of the Hawaiian Hawk and Phylogeny of the Genus *Buteo*
*R.C. Fleischer, P. Cordero, C. McIntosh

- Ramaley C250
 1:30-3:00 Session 49 - Plant Mating/Breeding Systems
 Chair: David Carr
- 1:30 399 The Genetic Basis of Inbreeding Depression in Two Species of *Mimulus* with Contrasting Mating -Systems
 *D.E. Carr, M.R. Dudash
- 1:45 400 How Much Inbreeding Depression in *Mimulus guttatus* Is Caused by Mutations of Large Effect?
 *J.H. Willis
- 2:00 401 Evolutionary Implications of Stigma Closure in *Mimulus aurantiacus*
 *A.E. Fetscher
- 2:15 402 Sexual Variation in a Highly Clonal Plant, *Decodon verticillatus* (Lythraceae)
 *M. Dorken, C.G. Eckert
- 2:30 403 The Mixed Mating System of the Chestnut Blight Fungus, *Cryphonectria parasitica*
 *R.E. Marra, M.G. Milgroom
- 2:45 404 Among-Family Differences in Inbreeding Depression in Gynodioecious *Lobelia siphilitica*
 *P. Mutikainen, L. Delph

3:00-3:30 Break

- UMC 235
 3:30-5:00 Session 50 - Molecular Evolution
 Chair: Dennis Powers
- 3:30 405 Natural Selection of the Ldh-B Promoter and Coding Region Within and Between Populations of the Teleost, *Fundulus heteroclitus*
 *D.A. Powers, P. Schulte
- 3:45 406 Directed Selection on Ldh-B Proximal Promoter
 *D.L. Crawford
- 4:00 407 Molecular Evolution in an Alternating Environment
 *W.D. Crill, J.J. Bull, A. Gulati
- 4:15 408 Redundancy, Pleiotropy, and the Shape of Multigene Family Evolution
 *M. Ronshaugen, A. Martin
- 4:30 409 Correlated Evolution in Proteins
 *D. Pollock, W. Taylor
- 4:45 410 Phylogenetic Signal and Structural Constraints on the Evolution of Protein-Coding Genes
 *C. Griffiths

Fine Arts N141

3:30-5:15 Session 51 - Phylogenetic Methodology
Chair: Michel Milinkovitch

- 3:30 412 Problems with the Interpretation of Partial Warps as Biological Variables
*F.J. Rohlf
- 3:45 413 Why Morphometrics Isn't Special: Coding Quantitative Data for Phylogenetic Analysis
*D.L. Swiderski, M.L. Zelditch, W.L. Fink
- 4:00 414 Are Morphometrics and Phylogenetics Incommensurable
*M.L. Zelditch, W.L. Fink, D.L. Swiderski
- 4:15 415 Phylogenetic Analysis of Interspecific Polymorphism in Higher-Level Terminal Taxa
*J.J. Wiens
- 4:30 416 Matrix Representation as a Means of Combining Phylogenetic Information
*O.R.P. Bininda-Emonds, H.N. Bryant
- 4:45 417 Analytical Developments Help to Solve the Whale Phylogeny Controversy
*M.C. Milinkovitch
- 5:00 418 Allozyme Data and Phylogenetic Analysis: A Comparison of Coding Methods
*M.J. Mahoney

Old Main Chapel

3:30-5:00 Session 52 - Coevolution
Chair: Dieter Ebert

- 3:30 419 Host-Parasite Interactions and Local Adaptation of Two Microparasites of *Daphnia magna*
*D. Ebert
- 3:45 420 Parasite Host-Range Evolution: Experimental Analyses of Host-Specific Adaptation and Host-Switching
*A. Gemmill
- 4:00 421 A Population Genetic Model for a Host-Pathogen System
*M.S. Sanchez, M. Asmussen, J. Arnold
- 4:15 422 Evolution of Host Range in Nematodes Parasitizing *Drosophila*
J. Jaenike, *S. Perlman
- 4:30 423 Differential Susceptibility to Parasitism in Two Populations of Pea Aphids
*R.A. Hufbauer, S. Via
- 4:45 424 Evolution of Expanded Host Range in Wild Viruses by Recombination Between Strains
*G.P. Krukonis, F.M. Cohan

JILA Auditorium

3:30-5:00 Session 53 - Population Genetics
Chair: Michael Purugganan

- 3:30 426 Temporal Changes in Allele Frequencies in Two Directionally Selected Maize Populations
*J.A. Labate, K.R. Lamkey, M. Lee

- 3:45 427 Genetic Variation at the CAULIFLOWER Locus, an *Arabidopsis* Floral Homeotic Gene
*M. Purugganan, J. Suddith
- 4:00 428 The Effective Size of an Age-Structured Population that Reproduces Partially by Selfing
*E. Pollak
- 4:15 429 DNA Sequence Variation at Glb1: No Evidence of a Bottleneck Associated with the Domestication of Maize
*H. Hilton, B. Gaut
- 4:30 430 Quantitative and Molecular Population Genetics at Enzyme Loci In *Arabis fecunda* and *A. lyrata*
*J-Z Lin, T. Mitchell-Olds
- 4:45 431 Disentangling Pollen from Seed Dispersal: Molecular Genetics of *Aquilegia*
*A. Strand, B. Milligan

Chemistry 140

3:30-5:15 Session 54 - Molecular Systematics
Chair: Steve O'Kane

- 3:30 433 Phylogeny of the Family Bignoniaceae Based on CpDNA Sequences of RbcL and NdhF
*R.E. Spangler, R.G. Olmstead
- 3:45 434 Molecular Evolution and Systematic Implications of Two Non-Coding Chloroplast DNA Regions in Cyperaceae Tribe Cariceae.
*A.C. Yen, R.G. Olmstead
- 4:00 435 Phylogenetic Utility of the Nuclear Gene Vicilin in Sterculiaceae
*B.A. Whitlock, D.A. Baum
- 4:15 436 Testing Assumptions About Sequence Evolution: Implications for Parsimony Analysis
*R.G. Olmstead, P. Reeves, A. Yen
- 4:30 437 Phylogeny of Apioideae (Apiaceae): A Comparison of Chloroplast Restriction Site Data to DNA Sequence Data
*G.M. Plunkett, S.R. Downie
- 4:45 438 A Molecular Systematic Examination of *Lesquerella* and *Physaria* (Brassicaceae)
*S.L. O'Kane, Jr.
- 5:00 439 Phylogenetic History of *Narcissus* L. (Amaryllidaceae) Based on the Chloroplast Gene NdhF
*S.W. Graham, S.C.H. Barrett

UMC 157

3:30-5:15 Session 55 - Biogeography
Chair: Townsend Peterson

- 3:30 440 Intraspecific Phylogeography Across the Pt. Conception Biogeographic Boundary
*R.S. Burton
- 3:45 441 Breaching of the Eastern Pacific Barrier by Genes of the Sea Urchin *Echinothrix*
*H.A. Lessios, B.D. Kessing

- 4:00 442 Independent Invasions of Fresh Water: Analysis of the Phylogeny and Physiology of a Cosmopolitan Copepod
*Carol Eunmi Lee
- 4:15 443 Speciation, Gene Flow and Allopatric Divergence in Australian *Daphnia*
*C. Wilson, P.D.N. Hebert, J. Colbourne
- 4:30 444 When Distributional Models Fail: Mirroring History, Ecology, and Speciation
*A.T. Peterson, S.L. Egbert, J. Soberón-Mainero
- 4:45 445 Phylogeography of the American pika (Lagomorpha)
*K. Agnew
- 5:00 446 Transatlantic Flight: Systematics and Biogeography of the Locust Genus *Schistocerca*
*N.R. Lovejoy, R.G. Harrison, R.F. Chapman, G.A. Sword

- Ramaley C250
3:30-5:15 Session 56 - Plant Mating/Breeding Systems
Chair: Mikkel Heide
- 3:30 447 Evolution of Self-Fertilization in Perennials
*M.T. Morgan, D.J. Schoen, T.M. Batailliou
- 3:45 448 Pollination and Late-Acting Self-Incompatibility in *Apocynum cannabinum*
*S. Lipow
- 4:00 449 Evolutionary Dynamics of Sporophytic Self-Incompatibility Alleles in Plants
*M.H. Schierup, X. Vekemans, F.B. Christiansen
- 4:15 450 The Evolution of Autogamy in *Arenaria uniflora* (Caryophyllaceae): Reproductive Insurance Against Interspecific Pollination?
*L. Fishman, R. Wyatt
- 4:30 451 Pollen Transfer Dynamics and the Evolution of Gametophytic Self-Incompatibility
*J. Steinbachs, K. Holsinger
- 4:45 452 Implications of Selfing and Inbreeding Depression for Plant Colonization of Marginal Habitats
*R. Sherry, C. Galen
- 5:00 453 Mixed Mating, Gene Flow, and Founder Effects in the Native Hawaiian Colonizer *Odontosoria chinensis* (Lindsaeaceae)
*T.A. Ranker, C.E.C. Gemmill, P.G. Trapp

4:30-6:00 UNC East Ballroom
Poster Session 2

- 454 A Test for Gene Conversion and Its Application to HLA Polymorphism
*T. Wiehe, J. Mountain
- 455 Long Term Evolutionary Dynamics of Gene Substitutions in Populations Undergoing Darwinian Selection
*D.A. Vasco

- 457 Evolution of Reaction Norms: Genotype-Environment Interactions Across Three Light Environments in a Natural Population of *Collinsia verna*
*B.B. Black, S. Kalisz
- 458 Density Dependent Selection in *Arabidopsis thaliana*
*L. Strong, L. Dorn, J. Schmitt
- 459 Are Genetic Differences in Response to Gibberellic Acid in *Impatiens capensis* Linked to the Shade Avoidance Response?
*S. McGee, K. Donohue, M.S. Heschel, J. Schmitt
- 460 Phenotypic Selection on Maximal Aerobic Metabolism of High Altitude Deer Mice
*J.P. Hayes, C.S. O'Connor
- 461 Phenotypic Responses to Group Selection on Population Size in a Poeciliid Fish
*C. Baer
- 462 Does Pleiotropy or Selection Explain Ubiquitous Colicin Resistance in Natural Populations of *Escherichia coli*?
*M. Feldgarden, M.A. Riley
- 463 Individual Variation in Reproductive Performance in Plants: Effects of Herbivory
*J. Leverich
- 464 Environmental Influence on the Expression of a Body-Patterning Gene in Sea Urchins
*L. Issel-Tarver, C. Lowe, G. Wray
- 465 The Ontogeny of Sexual Dimorphism in Some Chironomids (Diptera: Chironomidae)
*J.K. Cooper
- 466 Virulence and Transmission of a Digenetic Trematode (*Echinostoma caproni*) Infecting a Molluscan Intermediate Host (*Biomphalaria glabrata*)
*A.L. Graham
- 467 The Evolution of Sexual Dimorphism in Neotropical Moths
*D.A. Wiggins, D.H. Janzen
- 468 A Model for Understanding Sexual Role Reversal Based on Bateman's Principle
*P.D. Lorch
- 469 A Model of the Interaction Between "Good Genes" and Material Benefits
*L.F. Bussiere
- 470 Reinforcement of Threespine Stickleback Mate Choice: Sympatry Breeds Contempt
*H.D. Rundle, D. Schluter
- 471 Adaptation and Speciation in *Neochlamisus* Leaf Beetles: An Integrated Approach
*D.J. Funk
- 472 A Different Tempo of Mitochondrial Evolution in Birds and Their Parasitic Lice
R.D.M. Page, P.L.M. Lee, S.A. Becher, R. Griffiths, *D.H. Clayton
- 473 Documenting the History of the Speciation of *Rhagoletis pomonella* and *R. zephyria* (Diptera: Tephritidae)
*J. Smith, G. Bush

- 474 Niche Differentiation Across the Big Sagebrush Hybrid Zone in Utah
*H. Wang
- 475 An Integrative Phylogenetic Approach to the Evolution of Body Size in the *Anolis roquet* Group of the Southern Lesser Antilles, West Indies
*N. Giannasi, R.S. Thorpe, A. Malhotra
- 476 Gene Flow Between Chromosomal Races of House Mice Inferred from Microsatellite Alleles
*C.J. Hanus, M.W. Nachman
- 477 Molecular Evolution of Enzyme Loci in the Plant Genus *Leavenworthia*
*F. Liu, D. Charlesworth, L. Zhang
- 478 A Mosaic Hybrid Zone Between Grasshoppers of the *Biguttulus* Group of *Chorthippus* in Northern Spain
*J. Bridle, R. Bailey, R. Butlin, C. Thomas
- 479 Conservative Evolution of Olfactory Receptor Genes Expressed in Mammalian Testis
A. Branscomb, *J. Seger
- 480 Sequence Variation in Nuclear Introns Studied Using SSCP Analysis
*B.C. Congdon, D.A. Harrison, M.G. Kidd, V.L. Friesen
- 481 Rapid Copy Number Evolution of the Sex-Determining Gene, *Sry*, in New World Rodents (Genus *Akodon*)
*H.E. Hoekstra, S.V. Edwards
- 482 Conservation of Both Molecular and Developmental Aspects of TGF-Beta Signaling Between *Drosophila* and Vertebrates
*R.G. Wisotzkey, C.E. Dohrmann, X. Liu, L.A. Raftery
- 483 Gamma-Globin Gene Evolution and Expression in New World Monkeys (Platyrrhini, Primates)
*C-H Chiu, M. Goodman
- 484 Heterosis in the Earthworm *Eisenia fetida andrei*: Effects of Coarse-Grained Environmental Heterogeneity
*T.C. McElroy, W.J. Diehl
- 485 Heterosis in the Earthworm *Eisenia fetida andrei*: Effects of Fine-Grained Environmental Heterogeneity
*W.J. Diehl, D.E. Hart
- 486 VNTRs, IBMs, RATS and RAM: A Spatially Explicit Model of Gene Flow in Fragmented Landscapes
*C.E. Jordan, E.K. Steinberg
- 487 Intergenomic Coadaptation: Coevolution of Nuclear and Mitochondrial Genes Involved in Cytochrome C Oxidation and COX Activity
*P.D. Rawson, R.S. Burton
- 488 The Community-Level Implications of Plastic Invaders
*L. Hartt

- 489 Interspecific Competition Between *Hetagonvstilum minense* and *Cotesia flavipes*, Parasitoids of Sugercane Borer
*E. Weir, L. Sagarzazu
- 490 Frequency and Distribution of t-Haplotypes in the House Mice (*M. m. castaneus*) in Taiwan
*S-W Huang, K.G. Ardlie, F-H Yew, H-T Yu
- 491 Genetic Variation in the Grass Shrimp *Palaemonetes paludosus* from the Florida Everglades
*A. Quinones, J. Trexler, T. Turner
- 493 Phylogeny of the Selaginellaceae and Variation in the Chloroplast Gene RbcL
*P. Korall, P. Kenrick
- 494 Molecular Population Genetics of G6PD in Humans
*S.M. Peterson, M.W. Nachman
- 495 MHC Sequence Variation in the Northern Elephant Seal from the Southern California Channel Islands
*D. Weber, B. Stewart, N. Lehman
- 496 Genetic Basis of Plasticity for Flowering Date in *Arabidopsis*
*D. Stratton
- 497 Quantitative Genetics and the Persistence of Environmental Effects in Clonally Propagated Organisms
*K. Schwaegerle
- 498 Software for the Analysis of Covariance Matrices and Quantitative Genetic Data Using Resampling Methods
*P.C. Phillips
- 499 Molecular Systematics of the Old World Monkeys (Cercopithecidae): Evidence from Gamma-Globin Nucleotide Sequences
*S.L. Page, C-H Chiu, M. Goodman
- 500 Apparent Rates of Morphological Evolution and Genotype-Environment Interactions in the Mediterranean Fruit Fly, *Ceratitidis capitata*, in Hawaii
*D. Foote
- 501 Molecular Phylogeny of *Gryllus* spp. Based on Cytochrome B and Nuclear rDNA Sequences
*M. Sutherlin, R. Bromley, H. Yuan, A. Duhachek, D. Siegel-Causey, A. Zera
- 502 Phylogeny of the Ophionoid Subfamilies (Insecta: Hymenoptera: Ichneumonidae) Inferred from Mitochondrial DNA Sequences
*K.I. Suh, J.B. Whitfield
- 503 Ribosomal RNA and Phylogeny of the Ascaridoidea (Nemata: Secernentea)
*S.A. Nadler, D.S.S. Hudspeth
- 504 Recent Radiation of New Zealand Alpine Cicadas (*Maoricicada*)
T. Buckley, P. Arensburger, *G. Chambers, C. Simon
- 505 Molecular Systematics of *Lipotlyphla* Using 12S rRNA and NADH2 Sequences
*G.L. Emerson, M.W. Allard

- 506 A Cladistic Analysis of Hemichordate Morphology
*C.B. Cameron
- 507 Phylogeny of the Lower Brachycera (Insecta: Diptera): Combined and Separate Analyses of Multiple Datasets
*B.M. Wiegmann, D. Yeates, S-C Tsaur
- 508 Phylogeny of Scaphopoda Inferred from Morphological and COI MtDNA Sequence Data
*P. Reynolds
- 509 Phylogeography of *Nesotes conformis* as Revealed by MtDNA Cytochrome Oxidase II Sequence Data
*D.J. Rees, B.C. Emerson, P. Oromi, G.M. Hewitt
- 510 Phylogeography of the Sagebrush Lizard, *Sceloporus graciosus*, in California: Preliminary Results from a Combined Data Set.
*L.J. Frabotta
- 511 How to Validate Phylogenetic Trees? A Stepwise Procedure
*F-J Lapointe
- 512 Deep Phylogenetic Splits in Neotropical Vertebrate Taxa?
S.C. Loughheed, *A.A. Chek, P.T. Boag, P. Handford, J.P. Bogart
- 513 Ecological Correlates of Reproductive Success in the Burying Beetle, *Nicrophorus investigator*
*R.J. Smith
- 514 Evolutionary Patterns and Correlates of Venom Variation in Hawaiian *Tetragnatha* (Araneae)
*G. Binford
- 515 Maternal Effects in Urchins: Vitellogenin Gene Expression and Developmental Mode
*J. Villinski, E. Popodi, M. Byrne, R. Raff
- 516 Evolution of the Reproductive System of *Erythroxylum havanense*, a Heterostylous Plant
*C.A. Dominguez, L. Eguiarte
- 517 Timing Is Everything: Pollination and Stigma Receptivity in *Silene latifolia*
*H. Young, L. Gravitz
- 518 Maintenance of Male Sterility in Gynodioecious Populations of *Geranium richardsonii*
*C. Williams
- 519 Conservation Genetics of the Threatened Freshwater Mussel, *Margaritifera hembeli*
*J.P. Curole, K. Brown, D. Foltz
- 520 The Genetic Impacts of Tropical Forest Fragmentation on Plant Mating Patterns and Population Structure
*M. Hamilton
- 521 Partial Sequence of a Demosponge Mitochondrial Genome
*R.F. Watkins

- 522 Kin Selection and Dynamic Optimization in Evolutionary Biology
*T. Day, P.D. Taylor
- 523 Population Structure of the Vector of Bird Malaria in Hawaii, *Culex quinquefasciatus*:
Preliminary Data from Microsatellite and MtDNA Variation
*D.M. Fonseca, C.T. Atkinson, R.C. Fleischer

6:00-7:45 Barbecue - (Williams Village)

8:00-9:00 Macky Auditorium
ASN Presidential Address:
The Ecology of Informational Advantage: Transforming Natural History into an Economic
View of Evolution
*G. Vermeij

Tuesday, 17th June

- 8:30-11:30 UMC Center Ballroom
Symposium 5 - ASN Young Investigators Symposium
Organizer: Tim Wootton
- 8:30 529 Estimating Genomic Mutation Parameters in Natural Populations
*H-W Deng
- 9:00 530 Quantitative Trait Evolution in Partially Self-Fertilizing Populations
*J. Kelly
- 9:30 531 Some Implications of Direct Positive Interactions for Community Species Diversity
*S. Hacker
- 10:00-10:30 Break
- 10:30 532 Beetle Development Limits Male Horn Evolution: Perturbation Experiments Reveal
Allocation Tradeoffs Between Horns and Eyes
*D.J. Emlen
- 11:00 533 The Genetics of Inbreeding Depression: Implications for Conservation
*L. Pray

- UMC 157
8:30-10:00 Session 57 - Evolutionary Theory
Chair: Daphne Fairbairn
- 8:30 535 The macroevolutionary consequences of sexual conflict in the water strider
genus *Rheumatobates* (Heteroptera: Gerridae)
*K. Westlake
- 8:45 536 A Model of the Effects of Gene Flow on Reinforcement
*M. Servedio, M. Kirkpatrick

- 9:00 537 The Evolution and Adaptive Significance of Sexual Size Dimorphism in the Water Strider, *Aquarius remigis*
*D. Fairbairn, R. Preziosi, J. Reeve
- 9:15 538 Multi-Locus Data, Migration, and Hybrid Zones
*M.E. Orive, N.H. Barton
- 9:30 539 Niche Evolution in "Black-Hole" Sink Populations Maintained by Recurrent Immigration
*R. Gomulkiewicz, R.D. Holt, M. Barfield
- 9:45 540 The Maintenance of Genetic Variance in a Subdivided Population
*M. Whitlock

UMC 235

8:30-10:00 Session 58 - Life Histories and Development

Chair: Anthony Zera

- 8:30 541 Fitness Consequences of Overwintering: The Cost of Diapause in the Pitcher-Plant Mosquito, *Wyeomyia smithii*
*W.E. Bradshaw, P.A. Armbruster, C.M. Holzapfel
- 8:45 542 Physiology of Life-History Trade-Offs: Characterization of a Hormonally-Induced Life-History Trade-Off in *Gryllus assimilis*
*A.J. Zera
- 9:00 543 On the Virtue of Being the First Born: The Influence of Date of Birth on Components of Fitness in the Mosquitofish, *Gambusia affinis*
*D. Reznick, E. Schultz, S. Morey
- 9:15 544 Fitness Consequences of Alternative Life Histories in Tiger Salamanders
*H. Whiteman
- 9:30 545 Physiologically Structured, Individual Based Models, Genetic Algorithms and Tradeoffs Between Offspring Size and Number
*P.H. Niewiarowski, A.E. Dunham
- 9:45 546 Potential Adaptive Variation in the Sex-Ratio of the Least Killifish, *Heterandria formosa*
*J. Leips, J. Travis

UMC Forum

8:30-10:00 Session 59 - Sexual Selection

Chair: David Haskell

- 8:30 547 Color Polymorphism in the Bioluminescent Click Beetle, *Pyrophorus plagiophthalmus*: Measures of Spectral Emission and Absorbance
*U. Stolz, J.L. Feder, K. Filchak
- 8:45 548 Genetic Basis of Female Mate Preferences in an Ultrasonic Moth (*Achroia grisella*, Pyralidae, Lepidoptera)
*Y. Jang, M. Greenfield

- 9:00 549 Evolution of Sexual Dichromatism in Birds: The Roles of Carotenoid- Versus Melanin-Based Plumage Coloration
*A. Badyaev, G. Hill
- 9:15 550 The Darwin-Wallace Debate Revisited: Can Natural Selection on Female Plumage Color Explain Interspecific Variation in Avian Sexual Dichromatism?
*D. Haskell
- 9:30 551 Dimorphic Males in an Amphipod: Do Juveniles with High Growth Rates Choose to Be Minors?
*J.P. Kurdziel, J.S. Levinton
- 9:45 552 Evolution of Novel Wing Morphology for Sound Production by Sexual Selection in *Machaeropterus* (Aves)
*K.S. Bostwick, R.O. Prum

JILA Auditorium

- 8:30-10:00 Session 60 - Molecular Evolution
Chair: Frank Cipriano
- 8:30 553 Microsatellites in Genus *Apodemus* with Implications to Multiple Paternity and Evolution of Repeat Flanking Sequences
*K.D. Makova, J.C. Patton, R.K. Chesser, R.J. Baker
- 8:45 554 6000 Miles Across the Pacific: Microsatellite and MtDNA Variation in Dolphins from Peru and New Zealand
*F. Cipriano, K. Ingram, S.R. Palumbi
- 9:00 555 A Test for Heterogeneity of Levels of Microsatellite Variation
*J.K. Pritchard
- 9:15 556 Fast Approximate Likelihood Calculations for Microsatellites, Mostly Within Species
*J. Felsenstein, P. Beerli
- 9:30 557 Microbial Microsatellites: Genome Structure, Stability and Evolution
*D. Field, C. Wills
- 9:45 558 Tests for Selection at MtDNA Loci in Natural Populations of Western Minnow (Genus *Gila*)
*A.S. Gerber, C.A. Tibbetts, T.E. Dowling

Chemistry 140

- 8:30-10:00 Session 61 - Molecular Systematics
Chair: Doug Eernisse
- 8:30 559 Mitochondrial DNA Evolution in North American Bufonids
*A.M. Goebel
- 8:45 560 Molecular Systematics and Biogeography of Caribbean Rock Iguanas (*Cyclura*)
*C.L. Malone, T. Wheeler, J.F. Taylor, S.K. Davis
- 9:00 561 Molecular Systematics of the *Anolis* Lizards of the Southern Lesser Antilles
*D. Creer, K. de Queiroz, T. Jackman, J. Losos, A. Larson

- 9:15 562 Phylogenetic Relationships Among Phrynosomatid Sand Lizards as Inferred from Mitochondrial DNA Sequences
*J. Wilgenbusch, K. de Queiroz
- 9:30 563 A Molecular Analysis of Chelicerate Head Development and Arthropod Phylogeny
M.J. Telford, *R.H. Thomas
- 9:45 564 Why Have Previous 18S rRNA Analyses Not Found a Monophyletic Mollusca?
*D.J. Eernisse

8:30-10:00 CIRES Auditorium
Session 62 - Macroevolution
Chair: Brian Farrell

- 8:30 565 A Critical Evaluation of the Reality of the Cambrian Explosion Based on 18S rRNA Data
E. Abouheif, R. Zardoya, *A. Meyer
- 8:45 566 Modeling the Cambrian Explosion: Recovering Trees Successfully from Simulated Sequence Data
*J. Levinton, L. Dubb, J. Felsenstein, G. Wray
- 9:00 567 K-T Mass Extinction, Explosive Paleocene Diversification, and Cenozoic Diversity Equilibrium in Mammals: The Fossil Record Says Yes
*J. Alroy
- 9:15 568 Haldane's Conundrum Explained: Why There Are so Many Beetles
*B.D. Farrell
- 9:30 569 Morphological Evolution of the Fishes of the Genus *Bryconops* (Teleostei: Characidae)
*B. Chernoff, A. Machado-Allison
- 9:45 570 Adaptive Radiation in Spiders: The Role of Key Innovation in the Orb Weaving Clade
*J.E. Bond, B.D. Opell

8:30-10:00 Fine Arts N141
Session 63 - Behavior
Chair: Hugh Dingle

- 8:30 571 The Association of Activity Level, Burst Speed, and Caudal Morphology with Vulnerability to Predation in Two Species of Salamanders
*C.S. Wells, R.N. Harris, S.K. Babcock
- 8:45 572 Pathogen Transmission as a Selective Force Against Cannibalism
*D. Pfennig
- 9:00 573 Evolved Migration Syndromes: Migration Is Not Dispersal and Vice-Versa
*H. Dingle
- 9:15 574 A Theoretical Analysis of Costly Signaling Among Relatives
*C.T. Bergstrom, M. Lachmann

- 9:30 575 Maternal Effects on Offspring Fitness in the Strawberry Arrow Poison Frog, *Dendrobates pumilio*
*M. Maple
- 9:45 576 Correlates of Relatedness in the Western Harvester Ant, *Pogonomyrmex occidentalis*
*B.J. Cole, D.C. Wiernasz

10:00-10:30 Break

- 10:30-12:00 UMC 157
Session 64 - Adaptation and Plasticity
Chair: Leonard Nunney
- 10:30 577 Local Adaptation Despite Plasticity in a Marine Invertebrate
*D. Brumbaugh
- 10:45 578 Maternal Death Relaxes Developmental Inhibition in Nymphal Aphid Defenders
*J.H. Withgott, D.K. Abbot, N.A. Moran
- 11:00 579 The Effect of Temperature on Fecundity in Female *Drosophila melanogaster*: Evidence for Adaptive Plasticity
*L. Nunney
- 11:15 580 Host Specificity and Mode of Transmission: Their Role in Parasitic Nematode Speciation
*S.N. Bennett, M.L. Adamson
- 11:30 581 When Do Specialists and Generalists Evolve? Insights from Experiments with *Chlamydomonas*
*R. Kassen, G. Bell
- 11:45 582 Diet- and Temperature-Induced Norms of Reaction for Size and Age in Grasshoppers
*D.B. Thompson

- 10:30-12:00 UMC 235
Session 65 - Life Histories and Adaptation
Chair: Steven Orzack
- 10:30 583 Demographic Effects of Size and Inter-Colony Fusion in a Reef Coral
*D.B. Carlon
- 10:45 584 Foundations of Gregariousness: A Dispersal Polyphenism Among the Larvae of a Marine Invertebrate
*R.J. Toonen, J.R. Pawlik
- 11:00 585 Bateman's Principle and Gamete Evolution in Sperm-Limited Sea Urchins
*D.R. Levitan
- 11:15 586 Reproductive Effort in Variable Environments or Environmental Variation Is for the Birds
*S. Orzack, S. Tuljapurkar
- 11:30 587 Divergence in Life History and Architecture Between Grazed and Ungrazed Populations of *Silene gallica*
*D.S. Posner, M.L. Stanton

11:45 588 Size Variation in Reproductives and Reproductive Allocation in the Western Harvester Ant, *Pogonomyrmex occidentalis*
*D.C. Wiernasz, B.J. Cole

UMC Forum

10:30-12:00 Session 66 - Sexual Selection
Chair: Daniel Promislow

10:30 589 Sexual Selection in the Western Harvester Ant, *Pogonomyrmex occidentalis*
*A.J. Abell, B.J. Cole, D.C. Wiernasz

10:45 590 Sexual Selection and the Fitness Consequences of Male Body Size in a Seed Beetle
*U. Savalli, C. Fox

11:00 591 Sexual Differences in Response to Larval Food Stress in Katydid: Do Females Conserve Characters Important to Sexual Competition? (Orthoptera: Tettigoniidae)
*D. Gwynne

11:15 592 Fitness Consequences of Sexual Selection in *Drosophila*: Artificial Selection Experiments
*D. Promislow, L. Pearse

11:30 593 Effects of Sex Ratio Manipulation on Female Fitness in *Drosophila melanogaster*
*K.A. McKean

11:45 594 Sperm Transfer and Copulation Duration in *Drosophila silvestris* and *Drosophila heteroneura*
*M. DeAngelis

JILA Auditorium

10:30-12:00 Session 67 - Molecular Evolution
Chair: Brandon Gaut

10:30 595 Molecular Evolution and Expression of Anthocyanin Multigene Families in *Ipomoea purpurea* (Morning Glory)
*B.C. McCaig, M.L. Durbin, M.T. Clegg

10:45 596 Molecular Evolution of C1, a Regulatory Gene in the Anthocyanin Pathway, in the Grass Family
*V.M. Oberholzer, M.T. Clegg

11:00 597 DNA Sequence Evidence for the Segmental Allotetraploid Origin of Maize
*B.S. Gaut, J.F. Doebley

11:15 598 Molecular Evolution of Three Noncoding Regions in Angiosperms
*E. Friar, J.M. Porter

11:30 599 Evolution of Orthologous and Homoeologous Nuclear Sequences from Diploid and Allopolyploid Cottons
*R. Cronn, J.F. Wendel

11:45 600 Evolution in Group II Introns in Chloroplasts as Shown by the Rpl16 Intron
*S. Dickie, S. Kelchner, R. Wallace, J. Wendel

CIRES Auditorium

10:30-12:00
Session 68 - Ecological Genetics
Chair: Michael Turelli

- 10:30 601 Changing Genetic Structure of a Bur Oak Savannah: Microsatellite Analysis of Adults and Saplings
*M.V. Ashley, B.D. Dow
- 10:45 602 Complex Inheritance of Plant Size and Fitness in *Ipomoea purpurea* (Common Morning Glory)
*R. Miller, D. Higdon, M. Rausher, E. Simms
- 11:00 603 Protected Polymorphism for Flower Color in *Linanthus parryae*: Wright Sings the Blues
*M. Turelli
- 11:15 604 Genetic Constraints: An Experimental Approach Using Induced Mutations in *Arabidopsis thaliana*
*M.D. Camara, N. Turner, M. Pigliucci
- 11:30 605 Fingerprint-Based Spatial Genetic Tests for Isolation by Distance and Local Adaptation in the Coastal Plant *Limonium carolinianum*
*M. Hamilton
- 11:45 606

Chemistry 140

10:30-12:00
Session 69 - Molecular Systematics
Chair: Carey Krajewski

- 10:30 607 Improved Resolution of Crane Phylogeny from Combined Cytochrome b and ND6 Sequences
*M. Fain, C. Krajewski
- 10:45 608 Molecular Systematics and Evolution of the Honeyeaters (Passeriformes: Meliphagidae)
*A.C. Driskell
- 11:00 609 Multigene Analysis of Phylogeny Within Dasyurid Marsupials
*C. Krajewski, M. Westerman
- 11:15 610 Comparisons of MtDNA Gene Regions in Resolving Avian Species Relationships
*G. Voelker, S.V. Edwards
- 11:30 611 A Multiple Gene Perspective on the Phylogeny of the Avian Genus *Tachyphonus*
*K.J. Burns
- 11:45 612 Fibrinogen Introns and Avian Systematics
*S. Hackett, F.K. Barker, E. Grismer

Fine Arts N141

10:30-12:00
Session 70 - Conservation Genetics
Chair: Laura Lundquist

- 10:30 613 Patterns of Geographic Genetic Differentiation and Lack of Inbreeding Depression in a Rare Perennial
*D. Leeper, T. Mitchell-Olds
- 10:45 614 Genetic Consequences of Extensive Clonality in the Endangered Shrub *Haloragodendron lucasii*
*M. Sydes, R. Peakall
- 11:00 615 The Role of Genetic Variation in Stress Tolerance and Population Persistence: An Experimental Study with *Brassica rapa*
*C.A. Wise, Y.B. Linhart, T. Ranker
- 11:15 616 Extraordinary Genetic Variation in a Narrow Endemic Annual Plant Species
*N.J. Ferguson, N.C. Ellstrand, R. Whitkus
- 11:30 617
- 11:45 618
-
- 12:00-1:30 - Lunch
- SSB Business Meeting (12:30-1:30) - UMC 157
- UMC Forum
NSF Population Biology: Open Discussion - The role of model organisms in research in population biology
L. Lyons & M. Courtney (Population Biology)
-
- Chemistry 140
1:30-5:00 Symposium 6 - Know Thyself: Evolution of Self-Recognition Systems
Organizers: Georgiana May and Xavier Vekemans
- 1:30 619 Population Genetics and Genealogical Properties of Self-Recognition Systems
*X. Vekemans
- 2:00 620 Allelic Genealogy and Its Application to HLA DNA Sequence Data
*N. Takahata
- 2:30 621 Evolutionary Process and the Structure of Genealogies among Self-Incompatibility Alleles in Flowering Plants
*M. Uyenoyama
- 3:00-3:30 Break
- 3:30 622 Evolution in the Extreme: Variation at Fungal Mating Loci
*G. May
- 4:00 623 The Spawning Game: Evolution of Gamete Recognition Loci in Free-Spawning Marine Species
*S. Palumbi
- 4:30 624 Sequence Divergence of Mating Incompatibility Genes at the Population Level
*A. Richman

UMC 157

1:30-3:00 Session 71 - Hybridization and Sexual Isolation
Chair: Daniel Howard

- 1:30 625 The Effect of DNA Sequence Divergence on Sexual Isolation in Bacteria
*J. Majewski, F. Cohan
- 1:45 626 Reproductive Isolation and Divergence of Gamete Recognition Proteins Between Allopatric Versus Sympatric Species of Tropical Sea Urchins.
*M.A. McCartney
- 2:00 627 Conspecific Sperm Precedence Is an Effective Barrier To Hybridization Between Closely Related Species
*D.J. Howard, P.G. Gregory, J. Chu
- 2:15 628 Courtship Song & Sexual Isolation in *Drosophila pseudoobscura* and *D. persimilis*
*M.A.F. Noor, C.F. Aquadro
- 2:30 629 Haldane's Rule in the Fruit Fly *Anastrepha*: Why so Different from *Drosophila*?
*P. Dos Santos, S.R. Matioli
- 2:45 630 Head Width, a Sexually Selected Trait in *Drosophila heteroneura*, Is Not Used by Females in Species Recognition
*C.R.B. Boake, D.K. Andreadis

UMC 235

1:30-5:00 Session 72 - Adaptation and Plasticity
Chair: Mark Belk

- 1:30 631 Predator Induced Temporary Colour Changes in Tadpoles of the European Waterfrog (*Rana esculenta*)
*C. Rauter
- 1:45 632 Morphological Evolution of Utah Chub, *Gila Atraria*, in Populations with and Without Predation from Cutthroat Trout, *Oncorhynchus clarki*
*M.C. Belk, M.A. Nannini, C. Walser, J.B. Johnson
- 2:00 633 Evidence For Phenotypic Selection on Escape Performance in Natural Populations of Guppies
*A.J. Cullum, A.F. Bennett
- 2:15 634 Can Predation History or Locomotor Phenotype Predict Predator Avoidance Success? An Experimental Test Among Guppy (*Poecilia reticulata*) Populations of Trinidad
*S. O'Steen, A.F. Bennett
- 2:30 635 Ontogenetic Reaction Norms: Predator Induced Morphological Shape Change in a Dragonfly Larva
*F. Johansson
- 2:45 636 Why Be a Generalist? Insights from a Lycaenid Butterfly with Multiple Ant Associates
*A.M. Fraser

- JILA Auditorium
 Session 73 - Population Genetics
 Chair: Craig Moritz
- 1:30-3:00
- 1:30 637 Segregating Sites in Wright's Island Model
 *J.R. Wakeley
- 1:45 638 Molecular Population Genetics of the Cane Toad (*Bufo marinus*)
 *C. Moritz
- 2:00 639 Effects of Variable Population Size and Heterogenous Mutation Rate on Estimation of
 Population Genetic Parameters
 *D.A. Vasco, H-W Deng, X-X Fu
- 2:15 640 Tracking Geographic Variation in Cave Swallows (*Hirundo fulva*) Using Microsatellites
 *J.J. Kirchman
- 2:30 641 Polymorphism and Divergence at Mitochondrial Genes in South American Rodents
 *P. Kennedy, M.W. Nachman
- 2:45 642 Gene Flow in the Squid, *Loligo pealei*, in the Atlantic Ocean and the Northern Gulf of
 Mexico
 *S.W. Herke, D.W. Foltz

- Old Main Chapel
 Session 74 - Molecular Systematics
 Chair: Ken Halanych
- 1:30-3:00
- 1:30 643 Issues and Answers in the Molecular Phylogeny of the Crustacea
 *T. Spears, L.G. Abele
- 1:45 644 Vestimentiferan and Pogonophoran Origins Based on Nuclear Ribosomal Genes; An
 Assessment of Phylogenetic Signal.
 *K.M. Halanych, R.C. Vrijenhoek
- 2:00 645 Phylogenetic Relationships Within the Anthozoa (Phylum Cnidaria) as Inferred from 18S
 rDNA Sequences Obtained from Recent Specimens and Historical Museum Collections
 *E.A. Berntson, F.M. Bayer
- 2:15 646 Molecular Diversity of Zooxanthellae in Octocorals
 *T.L. Goulet, M.A. Coffroth
- 2:30 647 A New Hypothesis for the Evolution of Scleractinian Corals Based on Mitochondrial 16S
 and Nuclear 28S Ribosomal RNA
 *S.L. Romano
- 2:45 648 Use of Ribosomal ITS Sequences to Resolve Intrageneric Relationships in the Soft Coral
 Genus *Alcyonium*
 *C.S. McFadden

- Ramaley C250
 Session 75 - Combined-Data Systematics
 Chair: Bradley Shaffer
- 1:30-3:00

- 1:30 649 **Between Scylla and *Caryopteris*: Struggling with the Linnaean Strait Jacket**
*P.D. Cantino, R.G. Olmstead, S.J. Wagstaff
- 1:45 650 **Tests of Turtle Phylogeny: The Effect of Fossils on Phylogenetic Stability**
*H.B. Shaffer, P. Meylan, M.L. McKnight
- 2:00 651 **Does Total Evidence Reweave or Unravel the Avian "Tapestry"? 1. Morphology Versus Molecules**
*P. Beresford, J. Cracraft
- 2:15 652 **Does Total Evidence Reweave or Unravel the Avian "Tapestry"? 2. Morphology and Molecules**
*J. Cracraft, S. Stanley, P. Beresford, A. Espinosa, J. Feinstein
- 2:30 653 **Bird Vocalizations as Phylogenetic Characters: A Heron Example**
K.G. McCracken, *F.H. Sheldon
- 2:45 654 **Expected Divergence Times Within Crocodylia from Molecules and Fossils: Conflict and Congruence**
*C. Brochu

UMC 158
1:30-3:00 **Session 76 - Comparative Method**
Chair: David Ackerly

- 1:30 655 ***Phrynosoma* Morphology and Diet: Re-Evaluating the Relationship Using Independent Contrasts.**
*W.L. Hodges
- 1:45 656 **Ontogeny and Phylogeny in Swordtail Fishes: Understanding Growth Patterns in a Phylogenetic Context.**
*J.M. Marcus, A. McCure
- 2:00 657 **Prey Capture Thread Stickiness and the Evolution of Orb Weaving Spiders: A Comparative Approach**
*B.D. Opell
- 2:15 658 **Phylogenetic Tests of Natural Selection Using Catostomid Gill Rakers**
*P. Willink
- 2:30 659 **Community Assembly and Comparative Methods**
*D. Ackerly
- 2:45 660 **Increasing Statistical Complexity in Comparative Studies: Is It Always Worth It?**
*E. Abouheif

UMC Forum
1:30-3:00 **Session 77 - Conservation Genetics**
Chair: Francis Villablanca

- 1:30 661 **Genetic Identity of the Invasive Ruffe *Gymnocephalus cernuus* (Teleostei: Percidae) in the Great Lakes: DNA Sequence Evidence for a Southern European Origin and a "Cryptic" Species**
*C.A. Stepien, A.K. Dillon

- 1:45 662 **Microsatellites, Allozymes and Conservation Genetics of the White Sands Pupfish**
*C.A. Stockwell, M. Mulvey, A.G. Jones
- 2:00 663 **Reproductive Success of Captively-Reared, Naturally Spawning Coho Salmon**
*L. Park, B. Berejikian, J. Hard, E. Lahood
- 2:15 664 **Assessing the Utility of Genetic Markers as Indicators of Habitat Fragmentation: Lessons from Real and Virtual Pocket Gophers**
*E. Steinberg, C. Jordan
- 2:30 665 **Paraphyletic Clades and the Conservation Genetics of Black-Footed Ferrets**
*F. Villablanca
- 2:45 666 **Can Molecular Genetics Assist Species Recovery Programmes? Arabian Oryx as a Case Study**
*T. Marshall

3:00-3:30 **Break**

3:30-5:15 UMC 235
Session 78 - Adaptation and Plasticity
Chair: John Graham

- 3:30 667 **Why Is There Not a Positive Relationship Between Phenotypic Plasticity and Environmental Variability? A Test of Three Hypotheses**
*G. Davidowitz
- 3:45 668 **A Theory of Developmental Stability**
*J.H. Graham, D.C. Freeman, J.M. Emlen
- 4:00 669 **A Selection Model for Plasticity in Coarse-Grained Environments in Its Simplest Form**
*P.H. van Tienderen
- 4:15 670 **Experimental Analyses of Selection on Wing Size and Wing Loading in Pierid Butterflies**
*J. Kingsolver, R. Srygley
- 4:30 671 **Effects of Stressful Larval Environment on Adult Phenotype in an Aposematic Ladybird Beetle**
*C.P. Grill, A.J. Moore
- 4:45 672 **Geographic Variation and Phenotypic Plasticity in Shell Shape Within the Pulmonate Pond Snail Genus *Physella*: Implications for Classification of Extant and Fossil Mollusca**
*C.A. Burnside, R.F. McMahon
- 5:00 673 **Factors of Safety in the Structure of Crab Claws; Variation Among Six Parasymphatric *Cancer* Species of the Pacific Northwest**
*G.M. Taylor, A.R. Palmer, A. Barton

3:30-5:15 UMC 157
Session 79 - Molecular Evolution
Chair: Laura Katz

- 3:30 674 **Local Clocks Between Snapping Shrimps in Different Ecological Environments**
*C.L. Morrison, L.G. Abele

- 3:45 675 Rate Heterogeneity in MtDNA 16S rRNA Genes in the Genus *Centropomus* and Evolutionary Divergence Between Its Transisthmian Species-Pairs
*M.D. Tringali, T.M. Bert
- 4:00 676 Comparative Genomics of Extreme Microbes
*R. Feldman, G. Olsen, E. Delong, C. Woese, R. Swanson
- 4:15 677 Isocitrate Dehydrogenase and Carboxylesterase: Two Extreme Cases of Gene Evolution
*A. Nekrutenko, J.C. Patton, R.D. Bradley, R.J. Baker
- 4:30 678 Phylogenetic Analyses and Chromosomal Mapping of the CXC Chemokine Subfamily
*W.S. Modi, A. Chidambaram, T.L. Chen, T. Yoshimura
- 4:45 679 The Importin Gene in Ciliates: New Perspectives on the Evolution of an Important Protein
*L.A. Katz
- 5:00 680 Modular Evolution of Spider Silk Genes
*C.Y. Hayashi

JILA Auditorium

- 3:30-5:15 Session 80 - Ecological Genetics
Chair: Michael Antolin
- 3:30 681 Small Scale Genetic Variation in Marine Mussels: Evidence for Selection?
*D. Heath
- 3:45 682 Phylogeography of MtDNA Sequences in Barred Owls (Aves: Strigidae)
*G.F. Barrowclough, J.G. Groth
- 4:00 683 Microsatellite and MtDNA Analyses of a Highly Polymorphic Cichlid Species, *Cichlasoma citrinellum*
*K. Noack, A. Meyer
- 4:15 684 The Melding of Demographics and Genetics in the Townsend's Ground Squirrel
*M.F. Antolin, B. Van Horne
- 4:30 685 Microstratigraphic Variation and Selection in Fossil Stickleback Fish
D.M. Blow, *M.A. Bell
- 4:45 686 Extinction, Persistence, and Evolutionary Change in Response to Environmental Stress in the Pitcher-Plant Mosquito, *Wyeomyia smithii*
*P. Armbruster, A. Steiner, W.E. Bradshaw, C.M. Holzapfel
- 5:00 687 Balancing Selection at the Mpi Locus in *Semibalanus balanoides*
*P. Schmidt, D. Rand

Old Main Chapel

- 3:30-5:15 Session 81 - Molecular Systematics
Chair: Roberta Mason-Gamer
- 3:30 688 Phylogenetics of Subtribe Orchidinae (Orchidoideae, Orchidaceae) Based on Nuclear ITS Sequences and Polyphyly of *Orchis* s.l.
*A.M. Pridgeon, R.M. Bateman, A.V. Cox, M.W. Chase

- 3:45 689 Chromosome and Genome Size Evolution in the Slipper Orchids (Cypripedioideae: Orchidaceae)
*A.V. Cox, G.J. Abdelnour, M.D. Bennett, I.J. Leitch
- 4:00 690 Phylogenetic Relationships Within Orchidaceae as Inferred From RbcL and MatK Sequence Data
*P. Kores, J. Freudenstein, K. Cameron, M. Chase, M. Molvray, D. Goldman, M. Whitten, D. Jarrell
- 4:15 691 Saprophytism in Orchidaceae: Origins and Character Evolution
*M. Molvray, P. Kores, K. Cameron, J. Freudenstein, M. Chase
- 4:30 692 A Revolutionary View of the Parasitic Scrophulariaceae/Orobanchaceae
*N.D. Young, K.E. Steiner, C.W. DePamphilis
- 4:45 693 Addition of Nuclear Starch-Synthase Gene Sequences to the Ongoing Phylogenetic Analysis of the Triticeae (Poaceae).
*R.J. Mason-Gamer, E.A. Kellogg
- 5:00 694 Neighboring Base Composition and Substitution Rate in Chloroplast Genes
*B.R. Morton

UMC Forum

- 3:30-5:15 Session 82 - Conservation Genetics
Chair: Suzanne Edmands
- 3:30 695 Implied Population Structure for the Bornean Orangutan
*C. Muir, A.T. Beckenbach
- 3:45 696 Genetic Mechanisms Underlying Outbreeding Effects in an Intertidal Copepod
*S. Edmands
- 4:00 697 MtDNA and Microsatellite Data Suggest a Recent Origin for Pacific Swordfish Populations out of the Atlantic
*C. Reeb, B. Block, L. Arcangeli
- 4:15 698 Genetic Monitoring in the Restoration of Endangered Chinook Salmon in the Snake River Basin
*P. Moran, D.A. Dightman, R.S. Waples, L.K. Park
- 4:30 699 Extinction through Hybridization: A Simulation Study
*D.E. Wolf, L.H. Rieseberg
- 4:45 700 Patterns Of Genetic Diversity in Rare and Widespread Plant Congeners: Do Rare Species Have Low Genetic Variability?
*M.A. Gitzendanner, P.S. Soltis
- 5:00 701 Analysis of Populations of an Endangered *Clematis* and an Endangered *Sencio* Using Molecular Marker and Sequence Data
*R. Bellsey, D. Mount

UMC 158

3:30-5:15 Session 83 - Plant/Animal Interactions
Chair: Duncan Mackay

- 3:30 702 Consequences to the Reproductive Fitness of Predatory Wasps from Consuming Chemically Defended Caterpillar Prey.
*L.S. Rayor
- 3:45 703 Phylogenetic Analysis of Host-Use Evolution in Agromyzidae (Diptera): Evidence from DNA Sequence Data
*S.J. Scheffer, B.M. Wiegmann
- 4:00 704 Evolution of Host Plant Use in Leaf Beetles (*Phratora* sp.)
*N. Rank, A. Koepf
- 4:15 705 Macroevolutionary Chemical Trends in Host Plant Use by *Blepharida* (Chrysomelidae) Beetles
*J.X. Becerra
- 4:30 706 Geographic Variation in Dispersal and Seed Characteristics of an Australian Euphorb
*D. Mackay, M. Whalen
- 4:45 707 Inter- and Intra-Seasonal Variation in Effective Pollinators of Swamp Milkweed (*Asclepias incarnata*)
*C.T. Ivey, R. Wyatt
- 5:00 708 The Costs and Benefits of Sequestering Plant Toxins in North American and Finnish Nymphalid Butterflies.
*M.D. Camara, N. Turner, M. Pigliucci

Ramaley C250

3:30-5:15 Session 84 - Evolution of Sex and Recombination
Chair: Rosie Redfield

- 3:30 709 Evolution of RecA Homologs in Deep-Branching Eukaryotes: Implications for the Origin of Meiosis
*J.M. Logsdon, Jr., W.F. Doolittle
- 3:45 710 The Hotspot Paradox and the Evolution of Meiotic Crossing Over
A. Boulton, R.S. Myers, *R.J. Redfield
- 4:00 711 Add Sex and Stir: On the Evolution of Recombination and Meiosis
*D. Gessler
- 4:15 712 Sequence Variation Within and Between the Neo-X and Neo-Y Chromosomes of *Drosophila americana*, Implications for Sex Chromosome Evolution
*B. McAllister
- 4:30 713 The Evolution of Sex Ratio Diversity in *Neochlamisus* Leaf Beetles
*D.J. Funk, L.H. Shapiro
- 4:45 714 Sequence and Karyotype Evolution of Obligately Parthenogenetic Aphids (Tribe Tramiini)
*B. Normark

- 5:00 715 Red Queen Coevolution: Differential Infection of Common Snail Clones in Natural and Experimental Populations
*M. Dybdahl, C. Lively
-

4:30-6:30 UMC East Ballroom
Poster Session 3

- 716 Logistic Regression for Statistical Analyses of Multivariate Selection
*F. Janzen, H. Stern
- 717 Regulation of Transposable DNA Elements in Heterochromatin: The P Element of *Drosophila melanogaster*
*B.S. Haller, R.C. Woodruff
- 718 Rapid Evolution and Genetic Instability Coupled Via Clustered Mutations
*H. Huai, R.C. Woodruff
- 719 Physiological Mechanisms of Evolved Urea Resistance in *D. melanogaster*
*V. Pierce, A. Gibbs
- 720 Evolution of Water Balance in the Genus *Drosophila*
*A. Gibbs, L. Matzkin
- 721 Experimental Evolution of an Essential Transgene: A Role for Single Mutations of Large Effect?
*W.D. Crill
- 722 A Quantitative Genetic Model for the Maintenance of Predator-Induced Polymorphism
*W. Hazel, R. Smock
- 724 Sudden Evolution in the Soapberry Bug: Distinguishing Selective Pathways
*S. Carroll, H. Dingle
- 725 Molecular Evidence for Sympatric Divergence in Madeiran Storm Petrels (*Oceanodroma castro*)
*V. Lodha
- 726 Suites of Life History Traits (Growth Trajectories, Maturation Patterns, Asymptotic Sizes) in Guppies from Different Predation Regimes
*F.H. Rodd, J.A. Stamps, D.N. Reznick
- 727 The Functional Matrix and Evolutionary Innovations in Bats
*R.A. Adams, S.C. Pedersen
- 728 Interpretation of Developmental Ossification Patterns in Teleost Fishes
*P. Mabee, C. Cabbage
- 729 Know Thy Self or Know Thy Kin: Crossfostering Reverses MHC Mating Preferences
D. Penn, *W. Potts
- 730 The Evolution of Sterile Spermatophores in the Hawaiian Cricket *Laupala cerasina*
*K.L. Shaw, A.H. Khine

- 732 ***Synodontis multipunctatus* - The Cuckoo Catfish from Lake Tanganyika**
*A. Cruz, S. Pawlowski, C. Wilks
- 733 **Peripheral Speciation in Indo-West Pacific Sea-Urchins**
*L.B. Geyer, S.R. Palumbi
- 734 **Molecular Phylogeny and Historical Biogeography of the South American Genus *Austrofundulus***
*T. Hrbek, J.E. Thomerson, A. Larson
- 735 **Gene Flow in the Killifish *Fundulus heteroclitus***
*K.A. Callicott, D.A. Powers
- 736 **A Genomic Parasite (B Chromosome) and an Ectoparasite (Mite) Decrease Female Fertility in a Grasshopper**
*J.P.M. Camacho, E. Muñoz, F. Perfectii
- 737 **The KNOTTED Family of Angiosperm Homeodomain Proteins--Origin and Evolution**
*G. Bharathan, B-J Janssen, E.A. Kellogg, N. Sinha
- 738 **Reshaping the Zootype: Cnidarians and the Evolution of the Hox Clusters**
*D. Martinez, D. Bridge, K. Kuhn, P. Cartwright
- 739 **A Molecular Phylogeny of New-World Jays Based on Mitochondrial Control Region**
*M.A. Saunders, S.V. Edwards
- 740 **A Phylogeny for Isoptera**
*S. Kambhampati
- 741 **Evolution of HOM-C Complex in Arthropods**
*A. Abzhanov, T.C. Kaufman, A. Popadic
- 742 **Substitution Processes and the Molecular Clock**
*S. Schrodi, J. Gillespie, R. Hudson
- 743 **Variation at Homologous Microsatellite Loci in Three *Poecilia* (Poeciliidae) Species**
*J.S. Taylor, F. Breden
- 744 **Identification of Polymorphic Microsatellites in Baboons Using Human PCR Primers, and Construction of a Baboon Genetic Map**
*P.A. Morin, C.M. Kammerer, J. Rogers
- 745 **Impact of Insularization on Genetic Variation Among Deer Mice (*Peromyscus maniculatus*) Populations**
*P-A Landry, F-J Lapointe
- 746 **Local Coadaptation Between Lupines and Bradyrhizobia**
*E.L. Simms, L. Gades, A. Pringle
- 747 **Local Genetic Structure Of *Sagittaria isoetiformis* (Alismataceae) Along an Environmental Gradient**
*A.L. Edwards, R.R. Sharitz
- 748 **Patterns of Extra-Pair Paternity in Multiple Broods of the Tree Swallow**
*T.M. Rooneem, R.J. Robertson, C. Crossman, P.T. Boag

- 749 Ecological Strategies of Invading Ants in Hawaii
*K. Ingram
- 750 Genetic Structure Across a Univoltine and Bivoltine Gradient in the Mud-Daubing Wasp, *Trypoxylon politum*
*S.A. Chien, H.J. Brockmann
- 751 Microsatellite Genotypes in the Four-Toed Salamander (Caudata: Plethodontidae)
*I. Knight, R.N. Harris
- 752 Effects of Geographic Isolation on Genetic Diversity in the Western Pond Turtle, *Clemmys marmorata*: A Study Based on Microsatellites
*C.M. Ingram
- 753 Comparisons of Rough-Winged Swallow Populations Using Mitochondrial DNA Sequences
*M.J. Babin
- 754 Mitochondrial DNA Diversity of the Modern, Cosmopolitan Peoples of Mexico
*L. Green, J. Derr, A. Knight
- 755 Hollywood Medfly: Alien or Resident at $P < 0.05$?
*G. Roderick, F. Villablanca, N. Davies, S. Palumbi
- 756 Population Structure of *Strongylocentrotus purpuratus*: Genetic Analysis of Recruits and Young of the Year
*P.E. Moberg, R.S. Burton
- 757 Detecting Recent Immigration Using Multilocus Genotypes
*J.L. Mountain, B. Rannala
- 758 Mutation Accumulation for Chemosensory Behavior in the Nematode, *Caenorhabditis elegans*
J. Morphew, *P.C. Phillips
- 759 Preponderance of Mildly Deleterious Mutations Affecting Male Fertility in Long-Term Mutation Accumulation Lines of *Drosophila melanogaster*
*J.D. Fry, T.F.C. Mackay
- 760 Methods for Estimating Phenological Assortative Mating, with an Application to Australian *Ranunculus* Species
*G.A. Fox, C.M. Pickering
- 761 Phylogenesis of Host Range in Heliathine Moths (Insecta: Lepidoptera: Noctuidae)
S. Cho, *C. Mitter, J. Reiger
- 762 Phylogenetic Relationships Among Megapode Birds (Megapodiidae): Preliminary Results from Non-Coding Nuclear DNA Sequences
*S.M. Birks, S.V. Edwards
- 763 Morphological Evolution and Biogeography in Pines Using Phylogenetic Evidence from ITS Sequences and Restriction-Site Variation
*G. Mendez-Cardenas, A. Castañeda, S. Ortiz-Garcia, A. Liston, E. Alvarez-Buylla, D. Piñero

- 764 Phylogenetic Relationships of Eastern North American *Phlox* L. (Polemoniaceae) Based on Molecular Data: Evidence for Hybrid Speciation?
*C.J. Ferguson, R.K. Jansen
- 765 Microsatellite Variation Across Three Species of Non-Domestic Felids
*C. Driscoll, S. O'Brien
- 766 Molecular Systematics of the Myriapods
*J. Shultz, J. Reiger
- 767 Testing Hypotheses of the Evolution of the Genus *Kikihia* (New Zealand Cicadas)
*P. Arensburger, C. Simon, T. Buckley, G. Chambers
- 768 Phylogenetic Position of the Lithodidae (Crustacea: Decapoda: Anomura: Paguroidea) Using Early Ontogenetic Characters
*S. Zaklan
- 770 Global Diversity of the Cool Desert Green Alga *Bracteacoccus*
*L.A. Lewis
- 771 Molecular and Fossil Evidence on an Early Divergence of Neotropical Pygmy Squirrels
*V.L. Roth, M.H. Kim, J.M. Mercer
- 772 Evolution in Tetraploid Plant Populations
R.D. Overath, *M.A. Asmussen
- 773 A Cladistic Biogeography of *Gleditsia* Based on NdhF and Rpl16 Chloroplast Gene Sequences
*A. Schnabel, J.F. Wendel
- 775 Ordinal Relationships and Character Evolution in Holothuroidea (Echinodermata)
*A.M. Kerr
- 776 The Association of Nest Material and Mandible Shape: A Morphometric Comparison
*N.M. Williams, K. Goodell
- 777 De Novo Evolution of Sense Organs Mediating a Postural Reflex in Flies
*C. Gilbert, R. Edgecomb
- 778 A Phylogenetic Analysis of Tent Caterpillar Social Evolution (Lasiocampidae: *Malacosoma* spp.)
*J.T. Costa
- 779 Initial Estimates of Inbreeding Depression in Rapid Cycling *Brassica rapa*
*P.V. Mandrekar, D.M. Waller
- 780 Geitonogamous Selfing Balancing the Effect of Herkogamy in *Ipomoea purpurea*
*S-M Chang
- 781 Association Between Floral Traits and Inbreeding Depression in *Gilia achilleifolia* (Polemoniaceae)
*N. Takebayashi

- 782 Natural Selection and Genetic Constraints on the Evolution of Tolerance to Herbivory in the Common Morning Glory, *Ipomoea purpurea*
*P. Tiffin
- 783 Sex Ratio Bias and Recombination in a Neo-Y Chromosome in the Housefly (*Musca domestica*)
*M.E. Clark, E.H. Bryant
- 784 Isolation and Initial Characterization of Clones from the W and Z Chromosomes in Birds
*N.W. Kahn, T.W. Quinn
- 785 Molecules, Morphology and Movement: Transcontinental Mitochondrial Analysis of Sage Grouse Includes a Morphologically and Behaviorally Unique Newly Described Species
*T.W. Quinn, C.E. Braun, J.R. Young, N.W. Kahn
- 786 Developmental Anomaly in Bristle Formation in Interspecific Hybrid of *Drosophila*
*T. Takano

5:30-6:30	<u>Williams Village Darley Commons 103</u> ASN/SSB/SSE Coordinating Council Meeting
6:00-7:45	<u>UMC Center Ballroom</u> Banquet
8:00-9:00	<u>Macky Auditorium</u> SSB Presidential Address: A frog he would a-wooing go *Jay M. Savage

Wednesday, 18th June

- 8:30-10:00 CIRES Auditorium
Session 85 - Adaptation and Plasticity
Chair: Pamela Diggle
- 8:30 791 Competition, Photomorphogenesis and Fitness
*C. Weinig
- 8:45 792 Patterns of *Danthonia spicata* (Poaceae) Reproductive Allocation in Relation to Environmental Heterogeneity
*M. McCormick, K. Gross
- 9:00 793 Phenotypic Plasticity and Constraints of Inflorescence Architecture in *Arabidopsis thaliana*
*P. Diggle
- 9:15 794 The Labile Evolution of Epigyny in *Lithophragma* (Saxifragaceae)
*R.K. Kuzoff, L. Hufford, D.E. Soltis
- 9:30 795 Genotype-Environment Interaction and Natural Selection in Field Populations of *Arabidopsis*
*B. Stranger, T. Mitchell-Olds
- 9:45 796 Patterns of Phenotypic Plasticity in *Clarkia* (Onagraceae): Allopolyploids and Their Diploid Relatives
*J.J. Butler, C.D. Schlichting

UMC 157

8:30-10:00 Session 86 - Life Histories and Development
Chair: Robert Krebs

- 8:30 797 Evolutionary Constraints on Thermotolerance Across the Life Cycle of *Drosophila melanogaster*
*R.A. Krebs
- 8:45 798 Evolution of the First Step in Development: Axis Specification in Nematode Embryos
*B. Goldstein
- 9:00 799 Heterochrony in the Evolution of Pigment Patterns in Fishes of the Genus *Danio* (Teleostei: Cyprinidae)?
*M. McClure
- 9:15 800 Genetic Variation of Senescence Reaction Norms Among Populations
*J.L. Dudycha
- 9:30 801 Limbs: An Embryonic Innovation in Direct-Developing Anurans
*T.F. Carl, J. Hanken
- 9:45 802 Molecular Phylogenetic Analysis of Life History Evolution in Asterinid Starfish
*M.W. Hart, M. Byrne, M.J. Smith

UMC 235

8:30-10:00 Session 87 - Hybridization and Sexual Isolation
Chair: Michael Wade

- 8:30 803 Hybrid Fitness in the Louisiana Irises: Evidence from Experimental Analyses
*J.M. Burke, S.E. Carney, M.L. Arnold
- 8:45 804 Are Hybridizing Acacias Adapted to Soil Type?
*A. Hempel, J.M. Burke, M.L. Arnold
- 9:00 805 A Putative Case of Very Rapid Hybrid Speciation in Sunflowers (*Helianthus*)
*S.E. Carney, L.H. Rieseberg
- 9:15 806 Pollen Swamping and Hybridization by an Introduced Plant (*Spartina alterniflora*) Threaten an Endemic Cordgrass (*Spartina foliosa*)
*C.K. Anttila, C.C. Daehler, N.E. Rank, D.R. Strong
- 9:30 807 Crop to Weed Gene Flow?
*N. Ellstrand
- 9:45 808 Gene Interactions and the Origin of Species
*M. Wade

Fine Arts N141

8:30-10:00 Session 88 - Molecular Evolution
Chair: Ronald Adkins

- 8:30 809 Molecular Evolutionary Biology of Pax Genes -- Implications for Eye Evolution
*H. Sun, A. Rodin, Y-H Zhou, D. Dickinson, W-H Li
- 8:45 810 Variation at the Human Melanocyte Stimulating Hormone Receptor Locus -- Possible Role
in Human Skin Pigmentation Variation
*B. Rana, D. Hewett-Emmett, W-H Li
- 9:00 811 Molecular Evolutionary Genetics of Primate Color Vision
*W-H Li, S-K Shyue, Y-H Zhou, S. Boissinot
- 9:15 812 Structural and Functional Coevolution of Human Growth Hormone and Its Receptor
*R.M. Adkins, W-H Li
- 9:30 813 The Evolution of Visual Pigment Genes in Butterflies (Lepidoptera)
*A. Briscoe
- 9:45 814 The Evolution of Codon Bias at the PsbA Locus of Flowering Plants
*B.R. Morton

UMC Forum

8:30-10:00 Session 89 - Population Genetics
Chair: Michael Nachman

- 8:30 815 Silencing of Duplicate-Gene Expression in a Highly Selfing Polyploid Freshwater Snail
*T. Staedler
- 8:45 816 Determinants of Microsatellite Evolution in *Drosophila melanogaster*
*M.D. Schug, C.F. Aquadro
- 9:00 817 Molecular Population Genetics of the Y Chromosome in *Drosophila melanogaster* and
D. simulans
*W. Eanes, M. Zurovcova
- 9:15 818 Polymorphism and Divergence at the Pgm Locus of *Drosophila*
*B.C. Verrelli, W.F. Eanes
- 9:30 819 Queen Relatedness in Fire Ants Estimated with Nuclear and Mitochondrial Markers
*M.A.D. Goodisman, K.G. Ross
- 9:45 820 DNA Variability, Selection, and Recombination at X-Linked Genes in House Mice and
Humans
*M.W. Nachman, V.L. Bauer, S.L. Crowell, C.F. Aquadro

Chemistry 140

8:30-10:00 Session 90 - Combined-Data Systematics
Chair: Sandra Baldauf

- 8:30 821 Consensus Phylogeny of Eukaryotes Based on Molecular Data
*S. Baldauf, W.F. Doolittle
- 8:45 822 Molecular Phylogenetics of *Cancer* Crabs: DNA, Morphology, and Fossils
*M. Harrison, B. Crespi

- 9:00 823 The Evolution of Bipedal Hopping in Kangaroos
*A. Burk, M. Springer, M. Westerman
- 9:15 824 Is Saturation of Substitutions Such a Big Problem?
*Z. Yang
- 9:30 825 Monophyly of the Ant Genus *Messor*
*M. Bennett

9:45 826

JLA Auditorium

8:30-10:00 Session 91 - Biogeography
Chair: Michael Charleston

- 8:30 827 Species Range Expansion and *Drosophila*-Parasitoid Interaction
H.R. Koepfer, *P.C. Chabora, A. Kermarrec
- 8:45 828 Jungles: A New Solution to the Host/Parasite Phylogeny Reconciliation Problem
*M.A. Charleston
- 9:00 829 Phylogeny and Biogeography of the North Temperate Disjunct *Aralia* sect. *Aralia*
(Araliaceae)
*J. Wen
- 9:15 830 Rarity and the Biogeography of the Large-Flowered Piptoloboid Clade of *Astragalus* L.
(Fabaceae).
*J.W. White
- 9:30 831 Genetic Structure of the Giant Tiger Prawn, *Penaeus monodon*, in Australia: MtDNA
Evidence of Founder Effect and Post-Glaciation Population Spread
*J. Benzie, E. Ballment
- 9:45 832

10:00-10:30 Break

CIRES Auditorium

10:30-12:00 Session 92 - Experimental Evolution
Chair: Laura Landweber

- 10:30 833 Experimental Evolution of Temperature Sensitivity in *Drosophila*: Fitness Estimates on
Selected Lines
*G.W. Gilchrist, R.B. Huey
- 10:45 834 Expression of the 70-kD Heat Shock Protein in *Drosophila* Populations: Laboratory
Evolution at Different Temperatures
*B.R. Bettencourt, M.E. Feder, S. Cavicchi
- 11:00 835 In Vitro Evolution of a Small RNA Ligase Ribozyme from Random Sequences
*L. Landweber
- 11:15 836 An Experimental Test of Fisher's Geometric Model: Evolution by Small or Large Steps?
*C.L. Burch, L. Chao

- 11:30 837 The Consequence of Genetically Homogeneous and Heterogeneous Host Passages for Population Size, Virulence, and Infectivity of a Viral Pathogen
*G. Park, S.E. Kelley
- 11:45 838 Propagation of a Vertically Transmitted Virus in an Experimental Population Under Relaxed Selection
L.Y. Yampolsky, *C. Webb, A. Kondrashov, S. Shabalina

UMC 157

10:30-12:00 Session 93 - Sexual Selection
Chair: Joseph Travis

- 10:30 839 Polygynandry in Two Species of Male-Pregnant Pipefish (*Syngnathus floridae* and *S. typhle*): An Analysis Based on Microsatellite Data
*A.G. Jones, J.C. Avise
- 10:45 840 Evolutionary Reconstruction of Sexually Selected Characters in the Trinidad Guppy and Related Species
*F. Breden, M. Bertrand
- 11:00 841 Interspecific Female Choice Between High-Fin and Low-Fin Species of Mollies (*Poecilia latipinna*, *P. mexicana* and *P. orri*)
*M.B. Ptacek
- 11:15 842 The Evolution of Vertical Body Bars in Swordtail Fishes
*M.R. Morris
- 11:30 843 Secondary Sex Character Differentiation in Male Sailfin Mollies (*Poecilia latipinna*)
*J. Travis, M. Ptacek, N. Martin
- 11:45 844 Paternity Distributions in a Pelagically Spawning Fish - *Thalassoma bifasciatum*
*L. Wooninck

UMC 235

10:30-12:00 Session 94 - Speciation and Cladogenesis
Chair: Lisa Marie Meffert

- 10:30 846 Unstable Courtship Repertoire of Founder-Flush Populations of the Housefly
*L.M. Meffert
- 10:45 847 Change in Pigmentation Pattern As it Relates to Speciation in Caribbean *Drosophila*
*H. Hollocher, J. Hatcher
- 11:00 848 Individuals, Food Webs, and Speciation in a Simulated Ecosystem
*C.C. Maley
- 11:15 849 Systematics and Evolution of New Zealand Cicadas
*P. Arensburger, C. Simon, T. Buckley, G. Chambers
- 11:30 850 Sexual Selection, Courtship Signals and Species Diversity in Teleost Fishes: Has Sexual Dimorphism Promoted Diversification?
*S. Mesnick

11:45 851 Contrasting Diversification Patterns Between Sister Clades *Lavigeria* and *Nassopsidia* (Gastropoda: Thiaridae) from Lake Tanganyika: Morphology and DNA Sequence Variation
*E. Michel

Fine Arts N141

10:30-12:00 Session 95 - Geographic Variation and Hybrid Zones
Chair: Theresa Bert

10:30 853 Signs for the Hybrid Speciation on the *Fundulus heteroclitus* (Teleostei; Fundulidae) Subspecies Boundary
*N. Mogue, J. Weis

10:45 854 Social Incompatibility and Gene Flow Across a Behavioral Hybrid Zone
*S. Cahan

11:00 855 Mitochondrial DNA Variation in a Supposed Hybrid Zone Between "*Akodon*" *olivaceus* and "*Akodon*" *xanthorhinus* (Rodentia: Sigmodontinae)
*M.F. Smith

11:15 856 Geographic Differentiation in the Jumping Spider *Habronattus pugillis*: Evidence for Sexual Selection on a Gene Tree?
*S. Masta, W. Maddison

11:30 857 The Project from Hell: Spanish Sardines, Speciation or Ecophenotypic Variation?
*T. Bert, B. Chernoff

11:45 858 Sexual and Microgeographical Variation in Body Size and Trophic Morphology Among Island Populations of Water Snakes
*A. Queral-Regil

Chemistry 140

10:30-12:00 Session 96 - Population Ecology
Chair: Emily Lyons

10:30 859 Geographic Distribution of *S. latifolia* and *M. violaceum* in the Eastern U.S.
*E.J. Lyons, A.M. Jarosz

10:45 860 Consequences of Phenotypic Variation in the Pheromone System of a Bark Beetle
*A.M. Shumate

11:00 861 A Population-Regulatory Mechanism for Limiting the Spread of Cheating in a Mutualism
*D.W. Yu, N.E. Pierce

11:15 862 Detection and Quantification of Stone Crab Larvae (*Menippe* sp.) from Marine Plankton Samples Using Competitive PCR
*J.G. MaKinster, D.L. Felder, J.E. Neigel

11:30 863 Host-Parasite Interactions in Populations of Monarch Butterflies (*Danaus plexippus*) and a Protozoan Parasite (*Ophryocystis elektroscirrha*): Disease Dynamics in Relation to Host Migratory Behavior
*S.M. Altizer

11:45 864 Spatial Dispersion and Sexual Selection in the Digger Wasp, *Microbembex*
*T. Fraizer

UMC Forum

10:30-12:00 Session 97 - Population Genetics
Chair: Ellen Williamson

10:30 865 Developmental Rate, Polymorphism, and Natural Selection in *Fundulus heteroclitus*
*E. Williamson, L. DiMichele

10:45 866 Microsatellite Analysis of Genetic Relatedness and Inbreeding in *Oncotrichps*
*T. Chapman, B. Crespi

11:00 867 Genetic Structuring in Populations of European Wild Rabbits (*Oryctolagus cuniculus*)
*A.K. Surridge, D.J. Bell, G.M. Hewitt

11:15 868 Fig Wasps and the Effect of Population Size on Genetic Divergence
*C. Machado

11:30 869 The Mediterranean-Atlantic Connection: MtDNA Variation Among Different Geographical
Population of Several Species of Marine Teleosts (Sparidae, Perciformes)
*L. Bargelloni, E. Penzo, L. Ostellari, T. Patarnello

11:45 870 Gone with the Wind Drift: Intraspecific MtDNA Variation for Two Circum-Antarctic Fish
Species with Different Dispersal Ability
*L. Bargelloni, E. Penzo, L. Ostellari, T. Patarnello

JILA Auditorium

10:30-12:00 Session 98 - Molecular Evolution
Chair: Niles Lehman

10:30 872 Continuous Evolution in Vitro of a Ligating Ribozyme
*N. Lehman, M. Wright

10:45 873 An Ancient Retrovirus-Like Element, Mys 9, Is at a Hot Spot for SINE Insertion
*M.A. Cantrell, B.J. Filanoski, A.E. Ingerman, H.A. Wichman

11:00 874 Comparison of Orthologous Mys Retrotransposons in Two Species of *Peromyscus*
*L. Scott, R. Sawby, C.J. Brown, H.A. Wichman

11:15 875 Competitive Dominance of Symbiotic Bacteria in a Luminous Bacterial-Squid Mutualism
*M.K. Nishiguchi, E.G. Ruby, M.J. McFall-Ngai

11:30 876

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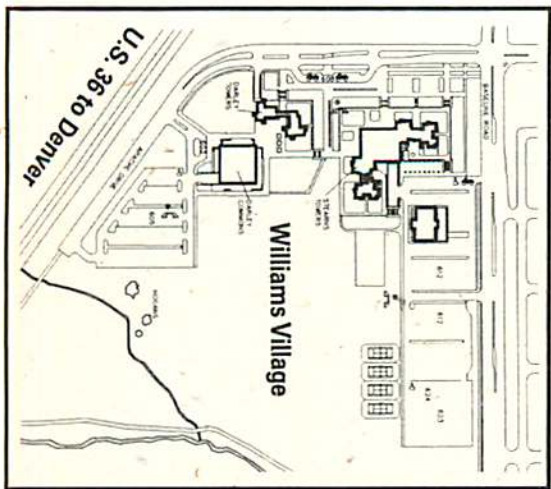
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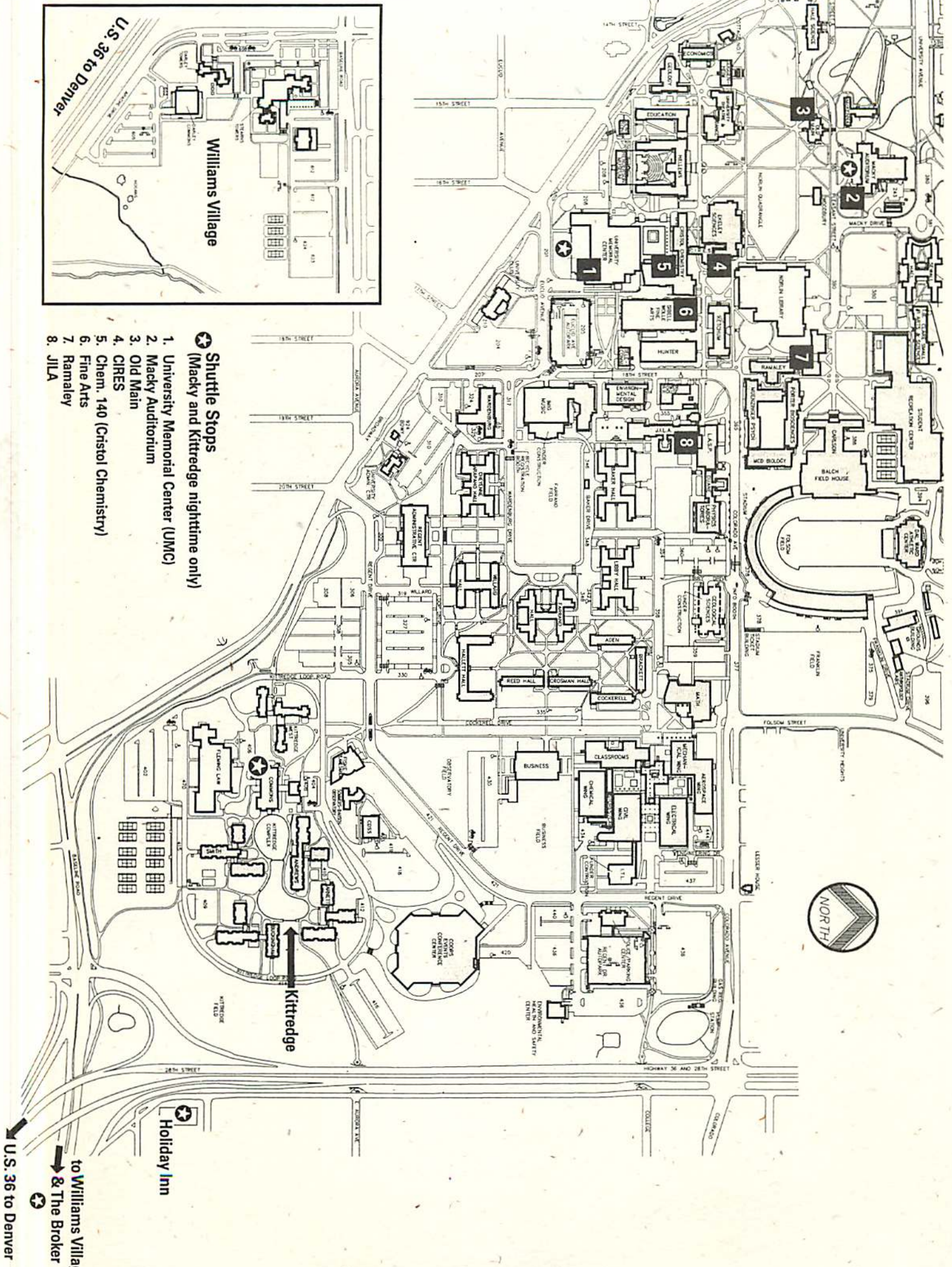
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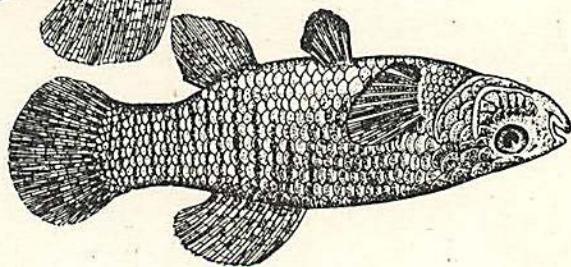
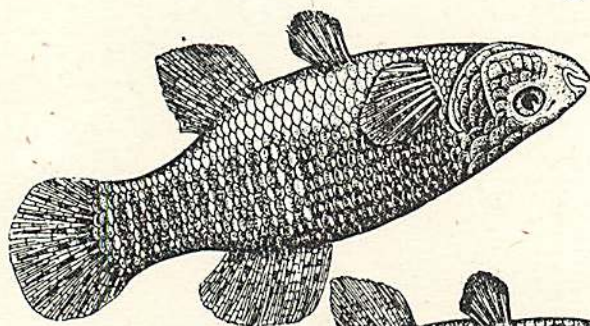
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