

## Curriculum Vitae Alan C. Love

Department of Philosophy  
University of Minnesota  
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Minneapolis, MN 55455

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### EMPLOYMENT

Assistant Professor, Dept. of Philosophy	Univ. of Minnesota	2006-present
Assistant Professor, Dept. of Philosophy	UC Santa Cruz	2005-2006

### EDUCATION

Ph.D.	History and Philosophy of Science	University of Pittsburgh	2005
M.A.	Biology (Ecol., Evol., & Behav.)	Indiana Univ., Bloomington	2004
M.A.	Philosophy	University of Pittsburgh	2002
B.S.	Biology (Minor: Philosophy)	M.I.T.	1995

### AREAS OF SPECIALIZATION

Philosophy of Biology, Philosophy of Science, Biology

### AREAS OF COMPETENCE

Darwin, History of Biology, Logic, Modern Philosophy/Science, Science and Religion

### PUBLICATIONS

#### *Journal Articles*

Love, A.C. (forthcoming) "Explaining evolutionary innovation and novelty: criteria of adequacy and multidisciplinary prerequisites", *Philosophy of Science*.

Love, A.C. (forthcoming) "Typology reconfigured: from the metaphysics of essentialism to the epistemology of representation", *Acta Biotheoretica*.

Love, A.C. (2008) "From philosophy to science (to natural philosophy): evolutionary developmental perspectives", *The Quarterly Review of Biology* 83:65-76.

Love, A.C., A.E. Lee, M.E. Andrews, and R.A. Raff (2008) "Co-option and dissociation in larval origins and evolution: the sea urchin larval gut", *Evolution & Development* 10:74-88.

Love, A.C. (2007) "Functional homology and homology of function: biological concepts and philosophical consequences", *Biology and Philosophy* 22: 691-708.

Love, A.C., M.E. Andrews, and R.A. Raff (2007) "Gene expression patterns in a novel animal appendage: The sea urchin pluteus arm", *Evolution & Development* 9(1): 51-68.

Love, A.C. (2006) "Reflections on the middle stages of evo-devo's ontogeny", *Biological Theory: Integrating Development, Evolution, and Cognition* 1(1): 94-97.

Love, A.C. (2006) "Evolutionary morphology and evo-devo: hierarchy and novelty", *Theory in Biosciences* 124: 317-333.

Love, A.C. and R.A. Raff (2006), "Larval ectoderm, organizational homology, and the origins of evolutionary novelty", *Journal of Experimental Zoology (Mol Dev Evol)* 306B: 18-34.

Ingram, E.L., E. Lehman, A.C. Love, and K.M. Polacek (2004) "Fostering inquiry in nonlaboratory settings", *Journal of*

*College Science Teaching* 34(1): 39-43.

Raff, R.A. and A.C. Love (2004) "Kowalevsky, comparative evolutionary embryology, and the intellectual lineage of evo-devo", *Journal of Experimental Zoology (Mol Dev Evol)* 302B: 19-34.

Love, A.C. (2003) "Evolvability, dispositions, and intrinsicity", *Philosophy of Science* 70(5): 1015-1027.

Love, A.C. and R.A. Raff (2003) "Knowing your ancestors: themes in the history of evo-devo", *Evolution & Development* 5(4): 327-330.

Love, A.C. (2003) "Evolutionary morphology, innovation, and the synthesis of evolutionary and developmental biology", *Biology and Philosophy* 18: 309-345.

Love, A.C. (2002) "Darwin and *Cirripedia* prior to 1846: exploring the origins of the barnacle research", *Journal of the History of Biology* 35(2): 251-289.

### **Book Chapters and Related**

Love, A.C. (forthcoming) "The structure of evolutionary theory and biological knowledge", in G. Müller and M. Pigliucci (eds.) *Toward an Extended Evolutionary Synthesis*. Cambridge, MA: MIT Press.

Brigandt, I. and A.C. Love (2008) "Reductionism in biology", *The Stanford Encyclopedia of Philosophy*: <http://plato.stanford.edu/entries/reduction-biology/>.

Love, A.C. (2008) "Explaining the ontogeny of form: philosophical issues", in S. Sarkar and A. Plutynski (eds.) *A Companion to the Philosophy of Biology*. Malden, MA: Blackwell Publishers, 223-247.

Love, A.C. (2007) "Morphological and paleontological perspectives for a history of evo-devo", in M. Laubichler and J. Maienschein (eds.) *From Embryology to Evo-Devo: A History of Developmental Evolution*. Cambridge, MA: MIT Press, 267-307.

Love, A.C. (2002) "Comments on Robert Brandon's "The difference between drift and selection: A reply to Millstein"", <http://philsci-archive.pitt.edu/documents/disk0/00/00/08/55/index.html> (web publication).

### **Essay Review Articles / Symposia**

Love, A.C., I. Brigandt, K. Stotz, D. Schweitzer, and A. Rosenberg (2008) "More worry, less love?", (Review symposium of Alexander Rosenberg's *Darwinian reductionism: or, how to stop worrying and love molecular biology* [2006]) *Metascience* 17: 1-26.

Love, A.C. (2006) "Taking development seriously: who, what, where, why, when, how?", *Biology and Philosophy* 21: 575-589. (Essay Review of *Embryology, Epigenesis, and Evolution: Taking Development Seriously*, by Jason S. Robert, [2004])

Love, A.C. (2005) "The return of the embryo", *Biology and Philosophy* 20: 567-584. (Essay Review of *Keywords and Concepts in Evolutionary Developmental Biology*, edited by Brian Hall and Wendy Olson, [2003])

### **Book Reviews**

Love, A.C. (forthcoming) "Scientific realism: just out of reach?", (A Review of *Exceeding our Grasp: Science, History, and the Problem of Unconceived Alternatives* by P. Kyle Stanford [2006]), *Review of Metaphysics*.

Love, A.C. (2008) "Revisiting evolutionary foundations", (A Review of *Making Sense of Evolution: The Conceptual Foundations of Evolutionary Biology* by Massimo Pigliucci and Jonathan Kaplan [2006]), *Mind* 117:201-205.

Love, A.C. (2007) "Revolutionary evo-devo?", (A Review of *Endless Forms Most Beautiful: The New Science of Evo-devo* by Sean Carroll, [2005]), *Journal of the History of Biology* 40(3): 594-597.

Love, A.C. (2007) "The hedgehog, the fox, and reductionism in biology", (A Review of *Darwinian reductionism: or, how to stop worrying and love molecular biology* by Alexander Rosenberg, [2006]), *Evolution* 61(11): 2736-2738.

Love, A.C. (2007) "Putting the pieces together", (A Review of *Fins into Limbs: Evolution, Development, and Transformation* edited by Brian Hall, [2007]), *Science* 317: 1502-1503.

Love, A.C. (2006) "Looking beyond gene concepts", (A Review of *What Genes Can't Do* by Lenny Moss, [2004]), *Philosophy of Science* 73: 247-250.

Love, A.C. (2006) "Plausibility, conceivability, and possibility", (A Review of *The Plausibility of Life* by Marc Kirschner and John Gerhart, [2005]), *BioScience* 56(8): 772-774.

Love, A.C. (2006) "History, scientific methodology, and the 'squishy' sciences", (A Review of *Science Rules: A Historical Introduction to Scientific Methods* edited by Peter Achinstein, [2004]), *Perspectives in Biology and Medicine* 49(3): 452-456.

Love, A.C. (2005) "Thinking historically about embryos and evolution", (A Review of *The Changing Role of the Embryo in Evolutionary Thought: Roots of Evo-Devo* by Ron Amundson, [2005]), *Notre Dame Philosophical Reviews*: <http://ndpr.nd.edu/review.cfm?id=4421>.

Love, A.C. (2002) "Christianity for Darwinians?" (A Review of *Can a Darwinian be a Christian?* by Michael Ruse, [2001]), *Metascience* 11(1): 115-118.

#### AWARDS

- SSHRC (Canada) Grant – "Integrating different biological approaches: a philosophical contribution" (Collaborator/Core Team Member with Ingo Brigandt, University of Alberta), 2009-2011
- CLA Single Semester Leave, 2008-9
- McKnight Arts and Humanities Endowment Summer Fellowship, 2007
- University of Minnesota Faculty Summer Research Fellowship, 2007
- American Philosophical Association/Philosophy of Science Association Travel Grant, 2006
- UCSC COR Faculty Research Grant, 2005-6
- Andrew Mellon Predoctoral Fellowship, 2004-2005
- George Hudock Fellowship, 2003 & 2004
- Harvey Fellowship from the Mustard Seed Foundation, 1999-2002

#### MAJOR PRESENTATIONS († = invited)

"Development and Evolution in Context: Embryos in Erotic Dialogue", Marine Biological Laboratories - Arizona State University History of Biology Seminar, Woods Hole, MA, May 2008. †

"Temporal Dimensions of Reductionism in Biology", Science Studies Symposium: McKnight Summer Fellows Presentation ("Thinking Through Science: Philosophical Perspectives on Biology, Geography, and History"), University of Minnesota, Minneapolis, May 2008.

"The Structure of Evolutionary Theory and Biological Knowledge: Epistemic Materials for a 21st Century Synthesis" Department of Ecology and Evolutionary Biology, SUNY – Stony Brook, New York, March 2008. †

"Respondent to Kevin Theissen's 'Global Warming: What We Know and What We Do Not Know'", North Central Program for Science and Theology, University of St. Thomas, St. Paul, MN, November 2007. †

"Consequences of an Intelligent Discussion about Design with Darwin: Asa Gray's Evolving Perspective on Teleology and Natural Theology", &HPS – Conference in Integrated History and Philosophy of Science, University of Pittsburgh, Pittsburgh, PA, October 2007.

"Explanatory Adequacy in Philosophical Analyses of Reductionism", International Society for the History, Philosophy, and Social Studies of Biology, University of Exeter, Exeter, UK, July 2007.

“Functional Homology and Homology of Function”, International Society for the History, Philosophy, and Social Studies of Biology, University of Exeter, Exeter, UK, July 2007.

“Reduction, Representation, and Temporality in Explanations of Ontogeny”, Center for Philosophy and Ethics of Science, University of Hannover, Hannover, Germany, June 2007. †

“Reduction, Representation, and Temporality in Explanations of Ontogeny”, Department of Philosophy, University of Münster, Münster, Germany, June 2007. †

“From Philosophy to Science: Evolutionary Developmental Perspectives”, Science and Philosophy (Sci-Phi) Symposium, SUNY-Stony Brook (Manhattan), New York, March 2007.

“Functional Homology and Homology of Function”, Philosophy and Developmental Biology Workshop, Vancouver, British Columbia, November 2006.

“Explaining Evolutionary Innovation and Novelty: Criteria of Explanatory Adequacy and Multidisciplinary Prerequisites”, Philosophy of Science Association Meeting, Vancouver, British Columbia, Canada, November 2006.

“Commentary on Robert Wilson’s *Boundaries of the Mind* and *Genes and the Agents of Life* (‘Author Meets Critics’ Session)”, American Philosophical Association Meeting (Pacific Division), Portland, OR, March 2006.\*

“Natural Theology: Recent Developments, Future Potential”, Cornell University, sponsored by Chesterton House and Graduate Christian Fellowship, Ithaca, NY, March 2006.†

“Reductionism, Development, and Time”, Philosophy of Biology Workshop, sponsored by the University of California-Irvine, Laguna Beach, CA, February 2006.†

“Criteria of Explanatory Adequacy in Disciplinary Syntheses: Revisiting ‘Incommensurability’ in the Context of Evolutionary Developmental Biology”, Dept. of Philosophy, University of Minnesota-Twin Cities, Minneapolis, MN, January 2006.†

“Evolutionary Morphology and Evo-devo: Hierarchy and Novelty”, Bay Area Biosystematists Meeting, University of California-Berkeley, Berkeley, CA, January 2006.†

“Comparative embryology and Evo-devo history: Lessons from N.J. Berrill’s embryological investigations of marine invertebrate evolution”, Office for History of Science and Technology, University of California-Berkeley, November 2005.†

“The Structure and Import of Developmental Genetic Explanations of Evolutionary Novelty”, International Society for the History, Philosophy, and Social Studies of Biology, University of Guelph, Guelph, Ontario, July 2005.

“Commentary on ‘Revisiting the Darwinian Revolution’ (Special Issue of the *Journal of the History of Biology*, 2005)”, International Society for the History, Philosophy, and Social Studies of Biology, University of Guelph, Guelph, Ontario, July 2005.†

“Evolutionary Developmental Biology and the Problem of Innovation and Novelty”, Dept. of Philosophy, California State University-Chico, Chico, CA, February 2005.†

“Evolutionary Developmental Biology and the Problem of Innovation and Novelty”, Dept. of Philosophy, University of California-Santa Cruz, Santa Cruz, CA, February 2005.†

“Explaining Innovation and Novelty: A Study on the Nature of Interdisciplinary Epistemology”, Hampshire College, Amherst, MA, February 2005.†

“N.J. Berrill and the evolutionary developmental biology of ascidians”, Division of Humanities, California Institute of

Technology, Pasadena, CA, February 2005.†

“Evolutionary Developmental Biology and the Problem of Innovation and Novelty”, School of Life Sciences, Arizona State University, Tempe, AZ, February 2005.†

“Evolutionary Developmental Biology and the Problem of Innovation and Novelty”, Dept. of Philosophy, University of Chicago, Chicago, IL, January 2005.†

“Problem Agendas in Biological Research: The Case of Evolutionary Innovation and Novelty”, Dept. of Philosophy, University of Missouri-Columbia, Columbia, MO, December 2004.†

“Problem Agendas in Biological Research: The Case of Evolutionary Innovation and Novelty”, Dept. of Philosophy, University of California-San Diego, San Diego, CA, October 2004.†

“Larval Homology, Ectoderm Novelty, and Skeletal Arm Morphogenesis in the Sea Urchin Genus *Heliocidaris*”, Dept. of Biology, Indiana University, IN, April 2004.

“Problem Agendas in Biological Research: The Case of Evolutionary Innovation and Novelty”, Dept. of History and Philosophy of Science, Indiana University, Bloomington, IN, February 2004.†

“Problem Agendas in Biological Research: The Case of Evolutionary Innovation and Novelty”, Division of History and Philosophy of Science, Notre Dame University, South Bend, IN, January 2004.†

“Organizational Homology, Sea Urchin Larvae, and Ectoderm Novelty”, Philosophy and Developmental Biology Workshop, Cambridge, MA, November 2003.

“N.J. Berrill and the evolutionary developmental biology of ascidians”, History of Science Society Meeting 2003, Cambridge, MA, November 2003.

“Evaluating Larval Homologies in Closely Related Species with Different Developmental Modes” (Scientific Poster Presentation), Developmental Basis of Evolutionary Change, University of Chicago, Chicago, IL, October 2003.

“The Problem of Innovation and Novelty”, International Society for the History, Philosophy, and Social Studies of Biology, University of Vienna, Vienna, Austria, July 2003.

“Morphological and Paleontological Perspectives for a History of Evo-Devo”, Evolutionary Morphology Group, University of Chicago, Chicago, IL, May 2003.†

“Concepts and Conceptual Change: A Hybrid Investigative Framework for Philosophy of Science”, Workshop on Cultural Evolution, University of Chicago, Chicago, IL, May 2003.†

“Evolvability, Dispositions, and Intrinsicity”, Philosophy of Science Association Meeting 2002, Milwaukee, WI, November 2002.

“Alternate Histories for Evo-Devo: Morphological and Paleontological Perspectives”, Dibner Institute for the History of Science Workshop, “From Embryology to Evo-Devo”, Cambridge, MA, October 2002.†

“Evolvability, Dispositions, and Intrinsicity”, 1<sup>st</sup> Annual Conference on Recent Work in Biology and Philosophy, Duke University, June 2002.

“Comments on Menser (‘Explaining Patterns of Stasis and Change in Kingdom *Animalia*: Developmental Constraints, Evo-devo, and Devo-evo’)”, Philosophy and Developmental Biology Workshop, University of Texas-Austin, April 2002.†

“Evolutionary Morphology, Innovation, and the Synthesis of Evolutionary and Developmental Biology”, Philosophy of Biology Graduate Student Conference, University of Texas-Austin, April 2002.

“Causal Process Individuation, Contrastive Explanation, and Theoretical Generality. Comments on Brandon’s “The difference between drift and selection: A reply to Millstein”, Philosophy and History of Biology Workshop, University of Pittsburgh, March 2002.

“Evolutionary Morphology, Innovation, and the Synthesis of Evolutionary and Developmental Biology”, Pittsburgh/London Colloquium on Philosophy of Biology and Neuroscience, University of London, London, UK, September, 2001.

“Darwin and *Cirripedia* Prior to 1846”, Joint Atlantic Seminar on the History of Biology, Princeton University, Princeton, NJ, April, 2000.

#### **OTHER INVITED CONFERENCE PARTICIPATION**

“Emergence: From Physics to Biology”, The Seven Pines Symposium XI, Stillwater, MN, May 2007.

Session Chair for “Scientific Practice, Conceptual Change, and the Nature of Concepts”, Concepts and Objectivity: Knowledge, Science, and Values, University of Pittsburgh, September 2006.

Panel Discussion Chair for “Methods and Approaches to Biology”, Southwest Colloquium on the History and Philosophy of Life Sciences, UC-Davis, April 2006.

“Shifting Pasts: Four Dialogues on Change”, Second German-American Frontiers of Humanities Symposium, Hamburg, Germany, October 2005.

“Concept of the Gene in Contemporary Biology” Workshop, University of Pittsburgh, January 2003.

“From Embryology to Evo-Devo”, Dibner Institute Seminar on the History of Biology, Woods Hole, MA, May/June 2001.

#### **PROFESSIONAL AFFILIATIONS**

American Philosophical Association; History of Science Society; International Society for the History, Philosophy, and Social Studies of Biology; National Association of Biology Teachers; National Association of Scholars; Philosophy of Science Association; Society for Integrative and Comparative Biology

#### **SERVICE**

##### ***Institutional***

CLA Freshmen Research Award Faculty Participant (2008-2009); CLA Undergraduate Scholarship Reviewer (Spring 2008); CLA ‘Sneak Preview’ for prospective students (2007)

##### ***Departmental***

Admission and Aid Committee (2008); Woodbridge Scholarship Award Committee (2007); Colloquium Committee (Fall 2007)

##### ***Professional***

\*Referee Service

(2008): Oxford University Press; Springer

(2007): *Biology and Philosophy*; *The Quarterly Review of Biology*; *International Studies in the Philosophy of Science*; *Philosophy of Science* (2x)

(2006): National Science Foundation – Science and Society Division; MIT Press; *BioScience*; *Heredity*; *Journal of Experimental Zoology (Molecular Developmental Evolution)*

(2005): *Journal of the History of Biology*; Stanford Encyclopedia of Philosophy; *Journal of Experimental Zoology (Molecular Developmental Evolution)* (2x)

(2004): *Journal of Experimental Zoology (Molecular Developmental Evolution)*

**Other**

Pitt/CMU Graduate Conference Referee: 1998, 2002; Co-organizer of the History and Philosophy of Science and Mathematics Seminar Series (2005-6; sponsored by the Institute for Humanities Research, UCSC); Faculty of Arts and Sciences Graduate Student Representative for HPS Department, 1999-2001; Graduate Student Representative for HPS departmental meetings, 1999-2002; Instructor for Teaching Assistant Orientation and Training - Center for Instructional Development and Distance Education: (1) 2000: "Getting Started in the Classroom" & "Creating an Inclusive Classroom"; (2) 2001: "The 50-Minute Lecture"; (3) 2001: "Getting Started in the Classroom"

**TEACHING EXPERIENCE (summary only)**

*University of Minnesota*

Spring 2008 – Instructor for undergraduate/graduate course "19<sup>th</sup> Century Philosophy of Science"  
Spring 2008 – Instructor for undergraduate course "Fossils and Philosophy: Historical Knowledge"  
Fall 2007 – Instructor for undergraduate course "Science, Technology, and Society: Darwin and Design"  
Fall 2007 – Instructor for undergraduate course "Scientific Reasoning"  
Spring 2007 – Instructor for undergraduate course "Philosophy of the Biological Sciences"  
Spring 2007 – Instructor for undergraduate course "Scientific Reasoning"  
Fall 2006 – Instructor for graduate seminar "Reductionism in Biology"

*UC Santa Cruz*

Spring 2006 – Instructor for undergraduate course "Philosophy of Biology"  
Spring 2006 – Instructor for undergraduate course "Introduction to Logic"  
Winter 2006 – Instructor for undergraduate course "Nature of Science: An Introduction to Philosophy of Science"  
Fall 2005 – Instructor for undergraduate course "Philosophy of Science: Darwin and Design"

*Indiana University, Bloomington*

Spring 2004 – Associate Instructor for the undergraduate course "Evolution"  
Instructor: Rudolf Raff  
Fall 2003 – Associate Instructor for the undergraduate course "Evolution and Diversity"  
Instructor: Michael Wade  
Spring 2003 – Inquiry Curriculum Enhancement Team, HHMI grant, Dept. of Biology, Indiana University: designed, implemented, and assessed the effectiveness of novel teaching modules in the discussion section curriculum of the introductory lecture course "Evolution and Diversity"  
Fall 2002 - Inquiry Curriculum Enhancement Team (as above)

*University of Pittsburgh*

Summer 2002 - Independent Instructor for undergraduate course "Darwinism and its Critics"  
Summer 2001- Independent Instructor for undergraduate course "Darwinism and its Critics"  
Spring 2000- Independent Instructor for undergraduate course "Myth and Science"  
Summer 1999- Independent Instructor for undergraduate course "Problem Solving"  
Spring 1999- Teaching Assistant for undergraduate course "Einstein for Everyone"  
Instructor: John Norton  
Fall 1998- Teaching Assistant for undergraduate course "Thinking about the Environment"  
Instructor: Bruce Glymour

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Guest Lecture: "Interdisciplinarity in Philosophical Perspective", delivered at the University of Minnesota for the NSF Integrative Graduate Education and Research Traineeship (IGERT) graduate seminar March 2008  
*Primary Instructor:* Claudia Neuhauser, PhD, Ecology and Evolutionary Biology

Guest Lecture: "Temporality in explanations of ontogeny: making the continuous discrete", delivered at the University of Minnesota for the graduate seminar "Matters of Time" April 2007

*Primary Instructors:* David Fox, PhD, Geology and Geophysics; Sally Kohlstedt, PhD, History of Science and Technology; Ann Waltner, PhD, History

Guest Lecture: “Science and Theology in History”, delivered at the University of Minnesota for the undergraduate course “Origins” September 2006

*Primary Instructor:* Chris Macosko, Ph.D., Chemical Engineering and Materials Science

Guest Lecture: “Homology: how can we trace evolutionary history with structure?”, Delivered at Indiana University for the undergraduate course “Evolution” February 2004

*Primary Instructor:* Rudolf Raff, Ph.D., Biology

Guest Lectures: “Darwinism and Christianity”, delivered at Carnegie Mellon University for the undergraduate course “Christianity and Science” March 2002  
March 2001

*Primary Instructor:* Gary Patterson, Ph.D., Physical Chemistry March 2000

Guest Lecture: “Charles Lyell, Geology, and Darwin”, delivered at the University of Pittsburgh for the undergraduate course “Darwinism and its Critics” March 2002

*Primary Instructor:* James G. Lennox, Ph.D., History and Philosophy of Science

### ***Graduate Student and Senior Project Supervision***

Summer 2008 – Dissertation committee member (reader) for Barton Moffatt

Summer 2008 – Graduate Research Partnership Program Supervisor for Tom Doyle

Spring 2008 – 3 Senior Projects Supervised

Fall 2007 – Directed study with Nathan Crowe on “Darwin and Design”

Spring 2007 – 5 Senior Projects Supervised

Fall 2006 – Dissertation committee member (reader) for Toben LaFrancois

Fall 2006/Spring 2007 – Three-paper exam committee member for Jessica Slind

Winter 2006 – Directed study with Robert Harada on “Theories of Scientific Progress” [UCSC]

Fall 2005/Winter 2006 – Qualifying exam committee member for Zachary Fruhling (“Mental Causation and the Problem of Causal Exclusion”) [UCSC]

### **REFERENCES**

- **Paul Griffiths:** School of Philosophical and Historical Inquiry, University of Sydney
- **James Lennox:** Dept. of History and Philosophy of Science, University of Pittsburgh
- **Sandra Mitchell:** Dept. of History and Philosophy of Science, University of Pittsburgh
- **Robert Olby:** Dept. of History and Philosophy of Science, University of Pittsburgh
- **Rudolf Raff:** Dept. of Biology, Indiana University (Bloomington)
- **Michael Wade:** Dept. of Biology, Indiana University (Bloomington)
- **Günter Wagner** Dept. of Ecology and Evolutionary Biology, Yale University