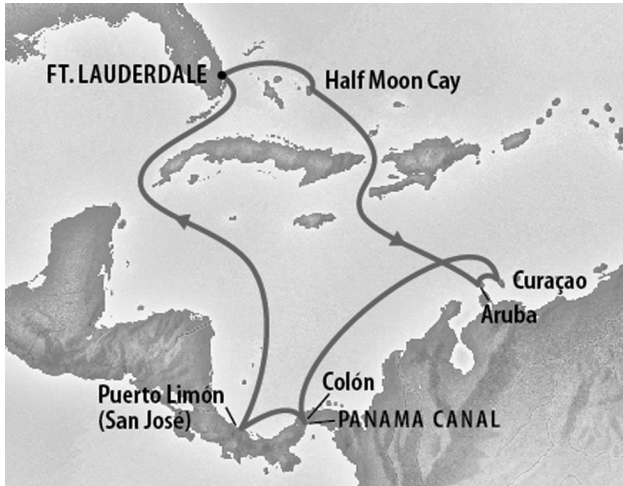


February 27 – March 9, 2009

# Evolution Emanation



## GUIDE TO PROGRAM & EVENTS

DATE	PORT	ARRIVE	DEPART
Fri., Feb. 27	Ft. Lauderdale, FL		5pm
Sat., Feb. 28	Half Moon Cay, Bahamas	8am	3pm
Sun., March 1	At Sea	—	—
Mon., March 2	Oranjestad, Aruba	Noon	11pm
Tues., March 3	Willemstad, Curaçao	7am	6pm
Wed., March 4	At Sea	—	—
Thurs., March 5	Panama Canal	5am	7pm
Fri., March 6	Puerto Limón, Costa Rica	6am	4pm
Sat., March 7	At Sea	—	—
Sun., March 8	At Sea	—	—
Mon., March 9	Ft. Lauderdale	8am	

# EVOLUTION EMANATION PROGRAM

## 27th of February — Friday

**5pm** Ship Departs from Fort Lauderdale

**6pm – 7pm** Bon Voyage Cocktail Party  
[ Lido Deck, Indoor Pool ]

## 28th of February — Saturday

**8am** Ship Arrives Half Moon Cay

**3pm** Ship Departs from Half Moon Cay

**4pm – 5:30pm** The History of Life on Earth  
Stephen J. Freeland, Ph.D. — [ Queens Lounge ]

Batten down the hatches and take a trip back through four billion years of evolution, filtered through the senses and sensibilities of a molecular evolutionist/geneticist/computer scientist. Dr. Freeland's itinerary: from the 21st century to the origin of our species; from the "age of mammals" back to the Cambrian explosion; from the age of single celled life back to the Last Universal Common Ancestor (LUCA); and finally, from LUCA to the origin of life.

**6pm – 7:30pm** 1859: The Impact of a Dangerous Idea  
Jerry Coyne, Ph.D. — [ Queens Lounge ]

On Nov. 22, 1859, with the publication of *On the Origin of Species*, Charles Darwin forever changed not only biology, but also the way humans view their place in nature. There is a good case to be made that Darwinism is the best idea anyone ever had. In this series of five seminars by Dr. Coyne we will look at Darwin's theories, how he developed them, the amazing variety of evidence supporting them, and what they mean for us humans, both biologically and philosophically.

In this first session we'll trace the origin of Darwin's "dangerous idea" (actually several ideas) beginning with his famous voyage on the HMS Beagle. We will learn what Darwin really proposed, what impact the ideas of evolution and natural selection had on the Victorian world, and why Darwinism was — and still is — considered a dangerous idea.

## 1st of March — Sunday (Sea Day)

**8:30am – 10:30am** On the Origin of Species, Really  
Mohamed Noor, Ph.D. — [ Queens Lounge ]

Although Darwin's book title suggested that he provided us with insights on the origin of species, in fact, he only focused on the process of divergence within species and assumed the same processes "eventually" led to something that could be called a new species. In this session, we'll talk about how species are identified (in practice and in principle), and then how modern evolutionary biologists use this type of information to get a handle on how species are formed.

**11am – 12:30pm** Out of the Armchair and Into the Lab: How Cognitive Psychology Can Help Us Answer Philosophical Questions  
Tania Lombrozo, Ph.D. — [ Hudson ]

Philosophical investigation has traditionally proceeded by finding a comfortable armchair, sitting down, and thinking hard. However, recently philosophers have begun to abandon their armchairs for psychology labs, exploring how age-old questions can be answered using the methods of cognitive psychology. How can people's responses on questionnaires tell us about the nature of knowledge or the nature of mind? Can cognitive neuroscience resolve debates from moral philosophy? We'll explore how cognitive psychology is informing philosophy through case studies involving issues in philosophy of language, philosophy of science, philosophy of mind, epistemology, and moral philosophy, with an eye towards the promise and perils of applying empirical methods to philosophical questions.

**12:30 – 2pm** LUNCH

**2pm – 3:30pm** How Do We Know It's True? The Evidence for Evolution  
Jerry Coyne, Ph.D. — [ Hudson ]

Darwin provided convincing evidence for his theories in 1859, but since then biologists have amassed mountains of additional data supporting them. In this session we'll examine the fascinating evidence for evolution and natural selection, drawing from areas as diverse as fossils, embryology, and the distribution of living and extinct species over the planet.

**4pm – 5:30pm** The Evolution of the Genetic Code  
Stephen J. Freeland, Ph.D. — [ Hudson ]

Why should all life use two utterly different chemical languages with which to construct itself? Why did it arrive at a single, set of encoding rules for translating between them? How can the precise choice of coding rules influence life's struggle to stay one step ahead of extinction? You'll get the bottom line (as it stands now) on the origin and subsequent evolution of the genetic code from Dr. Freeland, including:

- the central dogma that unifies life
- the non-random "design" of genetic code words
- emergence from an RNA world
- the great unknowns

Get the scoop on the properties of standard genetic code that set it apart from theoretical alternatives, the instances of its diversification, and the persistent questions that occupy evolutionary geneticists' thoughts.

**6pm – 7:30pm** Fresh From the Field  
Steve Mirsky — [ Hudson ]

The American Association for the Advancement of Science wraps up its annual meeting February 16, 2009, immediately before Evolution Emanation. Coincidentally, this year's theme is "Our Planet and Its Life: Origins and Futures" — marking the 200th anniversary of Charles Darwin's birth and the 150th anniversary of the publication of his book *On the Origin of Species by Means of Natural Selection*. Our man Mirsky will be on the scene at the AAAS, and will brief us on the latest thought in evolution-related topics plus give us the gist of a second pressing concern of the assembled AAAS members, namely how scientific collaborations can help meet global challenges.

## 2nd of March — Monday

- Noon** **Ship Arrives Aruba**
- 10pm** **Ship Departs from Aruba**
- 8:30am – Noon** **Evolution of Individuality and Complexity Through Cooperation and Conflict**  
*Richard Michod, Ph.D. — [ Queens Lounge ]*

Our understanding of life is being transformed by the realization that evolution occurs not only among individuals within populations, but also through the integration of groups of cooperating individuals into new higher-level individuals — that is, through evolutionary transitions in individuality (ETIs). The major landmarks in the diversification of life and the hierarchical organization of the living world are consequences of a series of ETIs: from genes to gene networks to the first cell; from prokaryotic to eukaryotic cells; from cells to multicellular organisms; from asexually reproducing individuals to sexually reproducing pairs; and from solitary individuals to societies. How do groups become new individuals? Cooperation and conflict play a major role in these evolutionary transitions. Join Dr. Michod and come away with a new perspective on the process of evolution and what it means to be an individual.

## 3rd of March — Tuesday

- 8am** **Ship Arrives Curaçao**
- 5pm** **Ship Departs from Curaçao**
- 5:30pm – 7pm** **The Mathematics of Mind: Exploring the Formal Foundations of Human Thought**  
*Tom Griffiths, Ph.D. — [ Queens Lounge ]*

Over the last two millennia, scientists and philosophers have used approaches such as logic, artificial neural networks, and probability theory to develop scientific and mathematical models of thought. Dr. Griffiths will talk about current status of work to understand the formal principles that underlie human thought and our ability to solve the computational problems we face in everyday life.

## 4th of March — Wednesday (Sea Day)

- 8:30am – 10am** **Unconscious Design: Natural Selection**  
*Jerry Coyne, Ph.D. — [ Hudson ]*

While the idea of evolution was immediately accepted by 19th-century biologists, the concept of natural selection — the purposeless driving force of evolution and adaptation — has been much more controversial. This talk will describe what natural selection really is and see examples of how it works in nature. We will also examine the complementary theory of sexual selection, which explains the remarkable difference in appearance and behaviour between males and females in many species.

- 10:30am – Noon** **Evolution and Natural Selection — Are the Winners Always the Fittest?**  
*Mohamed Noor, Ph.D. — [ Hudson ]*

Darwin is often caricatured as someone who was obsessed with change by natural selection. However, he would be the first to admit that some evolutionary changes probably have little or nothing to do with natural selection. In this session, we talk a bit about the role of natural selection in evolution as well as other forces that also contribute to evolutionary change. This session will be primarily instructional on basic microevolutionary theory.

- Noon – 2pm** LUNCH
- 2pm – 3:30pm** **From Magic to Muons: Why People Believe in Strange Things**  
*Tania Lombrozo, Ph.D. — [ Hudson ]*

Much of our knowledge is about things that we cannot see or touch. By studying human reasoning we can begin to understand both how people make scientific discoveries and how these processes can lead to some surprising errors in understanding our world. We'll consider the debate over evolution and intelligent design as a case study in people's understanding of and preference for different kinds of explanations for the world around us.

- 4:30pm – 7:30pm** **Genetics, Genomics, and You: Don't Fear Your Genotype!**  
*Mohamed Noor, Ph.D. — [ Queens Lounge ]*

The missing element in Darwin's theory was how it worked in terms of inheritance. Today, such a problem is so distantly past that it is hard to even conceive it used to be an issue. With human and other genome sequences readily available, and "personal genomics" opportunities arising, a host of issues spanning medical, legal, ethical, and other areas are all being forced into the forefront. Movies like "Gattaca" paint a grim view of how such information could create a cold world, but is this realistic? What is going on, what are possible benefits to you, what are things to watch out for, and what the hairy heck does it all mean? This will be an extended discussion, with some on-board "lab demonstrations" to try to get participants to understand the lingo, opportunities, and issues associated with living in the genomics era.

## 5th of March — Thursday

- 5am** **Ship Arrives Panama Canal**  
(no Evolution Emanation Events on this day)

Enter Panama Canal	5am
Gatun Lake, Panama	9am – 10am
Exit Panama Canal	1pm
Cristobal, Panama	2pm – 7pm

## 6th of March — Friday

**6:30am**            **Ship Arrives Costa Rica**

**4pm**                **Ship Departs from Costa Rica**

**4pm – 5:30pm**    **Sex and Selection**

*Jerry Coyne, Ph.D. — [ Queens Lounge ]*

In many species of animals, such as the peacock, males and females look and behave very different from each other. This long posed a problem to evolutionists, but now we have a good understanding of how selection can create such differences between the sexes. This lecture illustrates the stunning diversity of traits that have evolved by “sexual selection,” and explains modern views of how this process (first suggested by Darwin) really works.

**5:45pm – 6:30pm**    **How The Science Sausage Gets Made**

*Steve Mirsky — [ Queens Lounge ]*

What is it like to be a science journalist? Steve Mirsky has been a science writer for two decades, the last 12 years at Scientific American. He'll talk about the process by which science gets turned into articles for a general audience, along with some of the more amazing moments that have occurred during that process (like the editor who confused Caesar the Roman with Caesar the salad). He'll also share some of the interactions that occur between writers and readers at Scientific American.

**6:30pm – 7:15pm**    **Evolutionary Medicine**

*Steve Mirsky — [ Queens Lounge ]*

The theory of evolution is a lens through which many scientific disciplines can be refracted. Steve Mirsky discusses evolutionary medicine — the developing field that studies the implications of evolutionary principles for medical practice and health policy. From the evolution of microorganisms to immune mechanisms to contemporary diet, life expectancy, and physical fitness, Steve updates you on the broad developments in evolutionary medicine.

## 7th of March — Saturday (Sea Day)

**8:30am – 10am**        **How Machine Learning Affects Your Life, and Could Explain How People Think**

*Tom Griffiths, Ph.D. — [ Hudson ]*

Artificial intelligence (AI) research has drawn inspiration from human thought processes. If you're curious about the behind-the-scenes mechanisms of Google's PageRank mechanism, Amazon book recommendations, and the tough work of email spam filters get the basics on the ideas behind the methods used to solve these problems. Dr. Griffiths will discuss how cognitive science is currently scrutinizing the successes of AI to better understand how human minds work.

**10:30am – Noon**      **Mimicry: The Evolution of Duplicity**

*Jerry Coyne, Ph.D. — [ Hudson ]*

Animals and plants show a diverse and bizarre group of adaptations designed to hide them or make them mimic features of their environment. This lecture illustrates the wonderful panoply of such adaptations but also uses them to illustrate the diverse ways that natural selection can operate.

**Noon – 2pm**            LUNCH

**2pm – 3:30pm**        **The Emergence of an Amino Acid “Alphabet”**

*Stephen J. Freeland, Ph.D. — [ Hudson ]*

From interstellar dust to humans, oak trees and E. coli — Dr. Freeland will explore current theories for how and why one standardized ‘alphabet’ of 20 chemical letters came to define life, and how and why scientists of the 21st century are seeking to expand this fundamental biochemical reality:

- from synthetic biology to astrobiology: life on earth as just one possible biochemical reality
- the pre-biotic milieu: three scenarios
- emerging technologies that offer new insight
- the great unknowns

By the end of this session, you'll hold a very big picture indeed: from the roles of chance and necessity in forming life's fundamental biochemistry, to the battle for “synthetic biology” to create biomolecules that have never before existed on planet earth.

**4:30pm – 6pm**        **The Evolution of Antievolution**

*Steve Mirsky — [ Queens Lounge ]*

Evolution has been a subject of waxing and waning controversy since the day that Darwin published *The Origin of Species*. We'll look at some of the history of the antievolution movement, with special attention to the “creationist science” and “intelligent design” efforts of the last three decades. One of the seminal events in this period — perhaps the biggest evolution trial since Scopes — was the 2005 Kitzmiller lawsuit in Dover, PA, brought by parents against an “intelligent-design” friendly school board. Steve Mirsky attended opening arguments and some of the testimony of the month-long Dover trial and will discuss the case background, the events in the courtroom and the groundbreaking decision rendered by Judge Jones. We'll also spend some time on the Cobb County, GA, textbook sticker antievolution case, and share mail from some Scientific American readers still unconvinced about the scientific validity of evolution.

**6:15pm – 7:15pm**    **Party!**

*[ Queens Lounge ]*

All Invited!

## 8th of March — Sunday (Sea Day)

**8:30am – 10am**        **The Origin of Life — Here on Earth ... and Elsewhere?**

*Stephen J. Freeland, Ph.D. — [ Hudson ]*

To what extent do we belong in this universe, and how could we know? Was evolution dominated by unpredictable events such as the meteorite that wiped out the dinosaurs, or does it contain subtle drives towards intelligence and even consciousness? Are we likely to be alone in the universe, or on the brink of finding an endless array of extraterrestrial biology? How could we possibly hope to bring such questions under the spotlight of science?

- the status of humanity from a 20th century perspective
- the role of chance in evolutionary orthodoxy
- repeatable evolution re-examined

- fundamental difference in approach between biologists and physicists
- the scientific quest for the 21st century

In his final lecture, Dr. Freeland will examine the 20th century orthodoxy of a lucky species on a lucky planet to disentangle what we know from what we guess. He will show that our place within the universe is far less well understood than you might think, and that new technologies and powerful computers are finally enabling us to approach some of the deepest questions of our existence.

**10:30am – Noon** Teaching the Evolution of Complexity: Intelligent Design or Darwinian Evolution?  
*Richard Michod, Ph.D. — [ Hudson ]*

Episodic and ongoing controversies in American schools involve the teaching of evolution, “intelligent design”, and creationism. The diversity of life is usually taught with little discussion of complexity per se. Dr. Michod shares his views that, by not addressing the issue of complexity directly when teaching about the diversity of life, biology curricula have opened the door to claims like those of “intelligent design” which argues that so-called “irreducible” complexity cannot be explained by Darwinian principles. Dr. Michod proposes forging a modern approach to teaching evolution using, as case studies, the major evolutionary transitions in individuality (ETIs), such as the transition from unicellular to multicellular life. Using the social principles of cooperation and conflict in biology curricula should provide an intuitive framework for students — they are social individuals and experience the opportunities of cooperation and the temptation and risks of cheating in their lives. By using these intuitive principles to understand the remarkable transitions in complexity during the history of life we can address an important social issue that threatens rationality in our schools.

**Noon – 2pm** LUNCH

**2pm – 3:30pm** Evolution Today: What About Us? What Remains to be Done?  
*Jerry Coyne, Ph.D. — [ Hudson ]*

Although Darwin largely got it right in 1859, he did not by any means solve all the problems of evolution. In this final session we will examine the mysteries still remaining about evolution, and what is being done to solve them, including some of my own work on the origin of species. In addition, we will discuss how humans typify many principles of evolution, how they are unique among animals, and, finally, what evolution means to our lives, society, and mores.

**4:30pm – 8pm** Evolution of Sex and the Immortality of Life  
*Richard Michod, Ph.D. — [ Queens Lounge ]*

Sex is a problem. Given the high biological cost of sexual reproduction, what are the benefits that lead it to evolve? From the basic tension between the preservation of cellular individuality and the need to address genetic error and promote healthy genetic variation, you’ll get the groundwork for the rationale for sexual reproduction in terms of gene repair and genetic mixing. Gain an understanding from Dr. Michod about the role of oxidative stress in triggering the development of sex, and the advantages and rejuvenation that genetic mixing and gene repair bring to life. Spend some time with Dr. Michod developing a uniquely biological concept of immortality, and you’ll gather food for thought on immortality as an activity and process rather than as a state or continuity of an individual organism.

## SPEAKER PROFILES

**Jerry Coyne, Ph.D.** is a Professor in the Department of Ecology and Evolution at the University of Chicago. His work is focused on the origin of species and on understanding this process through the genetic patterns it produces. While he is the author (with H. Allen Orr) of *Speciation* and is the author of numerous peer-reviewed publications, Dr. Coyne’s direct impact (or notoriety) in society is heavily weighted toward his non-reviewed and lay-oriented articles, commentaries, and book reviews addressing the non science-based phenomena of “creationism” and “intelligent design”.

Dr. Coyne earned a B.S.(summa cum laude) in Biology from The College of William and Mary where he also served as valedictorian of the Class of 1971 and became a member of Phi Beta Kappa. He was National Science Foundation Predoctoral Fellow from 1973–1976 prior to attaining a Ph.D. in Biology from Harvard University. Coyne undertook an NIH postdoctoral fellowship in the Department of Genetics at the University of California, Davis during 1979–1982. Dr. Coyne was a John Simon Guggenheim Foundation Fellow in 1989 and received an Award of Excellence and Meritorious Service from the Illinois Public Defender Association, 1993 (for forensic DNA work).

Dr. Coyne was an assistant professor and subsequently associate professor in the Department of Zoology of the University of Maryland during 1982–1986. He worked as an associate professor in the Department of Ecology and Evolution at the University of Chicago during 1986–1991 and has served as Professor from 1991 to the present. Coyne has served as Distinguished Visiting Professor at the University of Paris-Sud, Orsay, France in 1994 and at the Université Pierre et Marie Curie (University of Paris VI) in 1998. He was a Visiting Professor at the Centre National del la Recherche Scientifique, Université de Bourgogne, Dijon, France in 2005–2006.

Dr. Coyne’s ongoing interests include tropical ecology, speciation, the dynamics of chromosome evolution and the ecological and evolutionary genetics of *Drosophila*.

**Stephen J. Freeland, Ph.D.** is an evolutionary biologist who studies the origin and evolution of the genetic code, the interface by which genes are processed into living organisms.

Rather than treating the code as a baseline assumption of molecular biology, Dr. Freeland’s laboratory recognizes it as a complex product of evolution with many interesting properties. He views the code as a product of natural selection, as sophisticated in structure as a wing or an eye. His group’s research explores the nature, cause and effect of this adaptation and its role in steering the early evolution of life on earth.

Dr. Freeland earned a B.A. in Zoology from Oxford University and an M.Sc. in Biology and Computer Science from the University of York. He was awarded a Ph.D. in Genetics and Molecular Evolution by Cambridge University. Freeland was a post-doctoral fellow in Molecular Evolution at Princeton University 1999–2001.

Dr. Freeland has served as an Assistant Professor of Biological Sciences at the University of Maryland, Baltimore County since August 2001. Formerly, he was Lecturer in Evolutionary Ecology, a Long-Term Fellow of the Human Frontiers Science Program, and a Visiting Fellow in Discrete Mathematics and Theoretical Computer Science, in the Department of Ecology & Evolutionary Biology at Princeton University.

Questions like: How did the “standard” code evolve? What factors influenced this process? How and why has it subsequently changed in various lineages? What complex web of interactions link the precise structure of the code to the general pattern of evolution (and thus to the

organization and composition of modern genomes)? are ongoing interests of Dr. Freeland and his colleagues. Developments and details are available at <http://www.evolvingcode.net>.

**Thomas Griffiths, Ph.D.** has served as an Assistant Professor in the Department of Psychology at the University of California, Berkeley since July 2006. Griffiths studies the problems of induction that people face in everyday life (such as probabilistic reasoning, learning causal relationships, acquiring and using language) which require inferences from limited data. He analyzes these aspects of human cognition by comparing human behavior to optimal or “rational” solutions to the underlying computational problems.

Dr. Griffiths earned a B.A. in Psychology from the University of Western Australia and an M.A. in Psychology and M.S. in Statistics from Stanford University. Subsequent to completing Master's degrees, he performed a climate change and worked as an Exchange scholar in the Brain and Cognitive Sciences Department and Computer Science and Artificial Intelligence Laboratory of the Massachusetts Institute of Technology from 2002–2004. He was awarded a Ph.D. in Psychology from Stanford University in 2005. Griffiths was an Assistant Professor in the Department of Cognitive and Linguistic Sciences at Brown University from January 2005 until July 2006.

In addition to authoring numerous papers, book chapters, and other professional publications, Dr. Griffiths is a frequent speaker, is a consulting editor for *Journal of Experimental Psychology: Learning, Memory, and Cognition*, and an ad hoc reviewer for many publications and conferences, among them Proceedings of the National Academy of Sciences, Science, Cognitive Science, Cognition, the Annual Conference of the Cognitive Science Society, the International Conference on Machine Learning, and the International Joint Conference on Artificial Intelligence.

On the occasion of the 50th anniversary of the first artificial intelligence conference IEEE Intelligent Systems magazine honored Tom Griffiths among its “AI Ten to Watch” award list.

When people ask what **Tania Lombrozo, Ph.D.** studies, she says “explanation”, which is clearly an answer that requires explanation. A new area of study in cognitive psychology, the motivation for studying explanation comes from the potential to learn about other areas of cognition. Explanation is at the core of basic cognitive processes like learning, inference, and categorization. Investigating these basic aspects of cognition involves the marriage of experimental methods from psychology with the conceptual analysis of analytic philosophy. Accordingly, much of Dr. Lombrozo's work is informed by philosophy of science, epistemology, and moral philosophy. She also studies the structure of conceptual knowledge and how it changes through time, particularly the parallel between scientific development within communities and conceptual change within individuals.

Dr. Lombrozo earned a B.A. in Philosophy and a B.S. in Symbolic Systems from Stanford University and an M.A. and Ph.D. in Psychology from Harvard University. Since 2006, she has been an assistant professor in the department of psychology at the University of California, Berkeley. She is also a member of Berkeley's Institute for Cognitive and Brain Sciences and an affiliate of the philosophy department. Her research has received support from the National Science Foundation and the McDonnell Foundation, and has appeared in leading journals, including the Proceedings of the Royal Society, Psychological Science, and Cognitive Psychology. She is on the editorial board of *Cognition*, a leading journal in cognitive science, as well as *Evolution: Education & Outreach*, a new journal focusing on evolution education.

Dr. Lombrozo is continuing to explore why we are driven to seek explanations, what makes some explanations more satisfying than others, and how we represent and reason about theoretically fundamental concepts like causation, functions, and moral status.

**Richard Michod, Ph.D.** is Professor and Department Head of the Department of Ecology and Evolutionary Biology at the University of Arizona. Our understanding of life is being transformed by the realization that evolution occurs not only among individuals within populations, but also through the integration of groups of individuals into new higher-level individuals. Indeed, the major landmarks in the diversification of life and the hierarchical organization of the living world are consequences of a series of evolutionary transitions in individuality: from genes to gene networks to the first cell, from prokaryotic to eukaryotic cells, from cells to multicellular organisms, from asexual to sexual populations, and from solitary to social organisms. Dr. Michod's research group is interested in understanding the diversity of life by understanding the evolution of interactions among individuals and how these interactions can create the new kinds of evolutionary individuals just described. He is especially interested in cooperation and conflict during the origin of multicellularity and the evolution of sex. He is interested in the consequences of sex in terms of coping with genetic error (mutation and damage), and how sex affects evolutionary transitions in individuality. The methods used in his work involve mathematical and computer models, experiments with micro-organisms, and philosophical analysis. His ongoing experimental work concerns the evolution of cooperation, multicellularity and sex in volvocine green algae. Richard Michod earned a B.S. in Zoology from Duke University, an M.A. in Mathematics from the University of Georgia, and was awarded a Ph.D. in Genetics and Zoology from the University of Georgia. He joined the faculty of the University of Arizona in 1978. Dr. Michod has published over 100 scientific works including the following books: *Darwinian Dynamics* (1999); *Eros and Evolution: A Natural Philosophy of Sex* (1995); *The Origin of Values* (with others, 1993) and; *The Evolution of Sex: An Examination of Current Ideas* (with others, 1988). More information about him can be found at his website [www.michod.com](http://www.michod.com).

**Steve Mirsky, M.Sc.** has been an editor at Scientific American magazine for 11 years. Mirsky's personal evolutionary path encompasses a degree from the American Academy of Dramatic Arts, acting in summer stock, a bachelors' degree from City University of New York, hosting a morning radio show and a masters' degree in chemistry from Cornell University. Mirsky left chemistry (to the relief of the American Chemical Society) for journalism after receiving an American Association for the Advancement of Science (AAAS) Mass Media Fellowship in 1985, which he spent at the NBC TV affiliate in Miami. Other academic fellowships include two stints (general, 1993, and molecular evolution, 2001) at the Marine Biological Laboratory at Woods Hole, a Reuters Foundation Fellowship in Medical Journalism at Columbia University in 1997 and the Knight Science Journalism Fellowship at MIT for the 2003–2004 academic year (during which he also attended a semester of criminal law with Alan Dershowitz at Harvard Law School).

Mirsky is in his 12th year writing the Antigravity column, a rare venue for (alleged) humor in the world of science. In February, 2006, he launched the weekly podcast of Scientific American, “Science Talk”, which was followed in September by the daily podcast, “60 Second Science.” Both are available at iTunes and at the Scientific American website, [www.sciam.com](http://www.sciam.com). He is also an award-winning wildlife photographer.

**Mohamed A.F. Noor, Ph.D.**, Professor and Associate Chair of the Duke University Department of Biology, tells us that one of the greatest unsolved questions in biology is how continuous processes of evolutionary change produce the discontinuous groups known as species. In addition to the obvious historical perspective this question seeks, with the continued loss of species worldwide from human activities work arising from this question will become increasingly important in identifying the processes that generate and maintain biodiversity on the planet.

Dr. Noor has focused on understanding the processes that cause the evolution of barriers to gene exchange between diverging species, particularly hybrid sterility and species mating discrimination. The proposed work has strong evolutionary and medical implications. Understanding the nature of genetic interactions causing sterility gives direct insights into what makes one species different from another, and hence, can explain the process of the origin of new species. In addition, insights on genetic interactions causing sterility can help identify other genes whose disruptions in humans may cause infertility.

Dr. Noor earned a B.S. in Biology from the College of William and Mary, 1992 and a Ph.D. in Ecology & Evolution from the University of Chicago in 1996. He was a postdoctoral resident in Genetics & Development at Cornell University from 1996–1998. Noor won the American Society of Naturalists' Young Investigator Prize in 1998, and Sigma Xi's Regional Young Investigator Prize in 1999. He served on the faculty at Louisiana State University from 1998 to 2005 and received a College of Basic Sciences Research Award, an LSU Phi Kappa Phi Untenured Faculty Award in Natural and Physical Sciences, and a Louisiana State University, College of Basic Sciences Undergraduate Teaching Award. Dr. Noor won the 2007 Gordon G. Hammes Faculty Teaching Award from Duke University School of Medicine.

Dr. Noor is currently on the editorial boards of PLoS Biology, the Proceedings of the Royal Society of London Series B, and BMC Evolutionary Biology. He serves as a standing member of the Genetic Variation and Evolution grant review panel at the National Institutes of Health and is an elected Council member for both the Society for the Study of Evolution and the American Genetics Association. Noor was editor of *Evolution* 2006–2007 and associate editor of *Evolution* 2001–2005.

Among other endeavors, Dr. Noor and his Noor Lab team are now examining the fine details of the genetic architecture of the chromosomal rearrangements that occur when one animal species becomes two. In the few minutes per week he doesn't find himself working, Noor relaxes by running, spending time with his family, or watching movies, particularly science fiction.