

# BRIGHT HORIZONS #9 PROGRAM

## Sunday, May 8, 2011

**6:30pm – 7:30pm**     **Bon Voyage Party** — [ *Crow's Nest* ]

## Monday, May 9, 2011

**8:30am – 10am**     **The Mysterious Universe**  
*Max Tegmark, Ph.D. – [ Wajang ]*

With a cosmic flight simulator, we'll take a scenic journey through space and time. After exploring our local Galactic neighborhood, we'll travel back 13.7 billion years to explore the Big Bang itself. We'll see how state-of-the-art measurements are answering many questions about our cosmos while also revealing new mysteries like the nature of dark matter, dark energy, our origin and our ultimate fate.

**10:30am – Noon**     **The Brain's Odyssey through Life: Development and Aging Across the Lifespan**  
*Nancy C. Andreasen, M.D., Ph.D. – [ Half Moon ]*

This presentation will take listeners on a voyage during which they learn how the brain develops during childhood and adolescence, achieves maturity, and changes during later years in both good ways and bad. A human child is helpless at birth, because the brain is extremely immature. After birth each individual human brain goes on its own odyssey, as its owner responds to a vast range of individual life experiences. These changes are in part hard-wired—governed by a variety of genes that regulate brain development. But they are also dependent on extrinsic influences that have powerful effects on brain development. Thanks to the development of modern neuroimaging tools, we can now chart the trajectory of changes that occur in the human brain across the lifespan and answer many of the questions that we all ask. How much do environmental factors affect brain development during childhood and adolescence? When does the brain become fully mature? When does the brain begin to age? Can we predict whether a given individual will age well or poorly. How do diseases of aging arise? What can an individual do to protect his or her brain and minimize the effects of aging?

**1:30pm – 3pm**     **Virtual Reality and You: Psychological Travel via Avatars**  
*Jim Blascovich, Ph.D. – [ Half Moon ]*

Arguably, the concept referred to today as “virtual reality” is as old as humanity itself. Humans seem particularly predisposed to mental travel between physical and virtual realities and have invented many ingenious media technologies to do so -- from story telling through the creative arts, the printing press, photography, electronic media and digital technology. The latest — immersive technology — allows face-to-face social interaction via digital avatars in three-dimensional settings. Dr. Blascovich will describe the conceptual, theoretical, and ethical issues brought about by the digital virtual revolution as well as heretofore impossible psychological experiments and applications. Something for the futurists in all of us!

**3:30pm – 5pm**     **The Belle Glade Culture — Earthworks of the Lake Okeechobee Basin, 500 BC to AD 1700**  
*Jerry Milanich, Ph.D. – [ Half Moon ]*

Perhaps the most remarkable earthworks constructed by the pre-Columbian Indians of the Eastern United States dot the old shoreline of Lake Okeechobee and the surrounding wet savannah. Excavations at Fisheating Creek in Glades County have revealed many of the secrets of these complex sites and the people who built them. The importance of the Belle Glade societies is reflected in the gold and silver artifacts found in their sixteenth and seventeenth century mounds, items recovered from Spanish ships and brought inland. Yet the Belle Glade culture has remained totally unknown except to archaeologists.

**6pm – 7:30pm**     **The Bermuda Triangle and Other Weird Things that People Believe**  
*Michael Shermer, Ph.D. – [ Wajang ]*

As we sail into the Bermuda Triangle our expert on pseudoscience and paranormal claims will explain the legends and myths that have grown up around the triangular area allegedly associated with the mysterious disappearance of ships and planes over the decades, which have been variously attributed to an energy vortex, time travel, aliens and UFOs, the lost continent of Atlantis, dark matter, black holes, and all manner of secret government experiments. Dr. Shermer will explain what really happens in the Bermuda Triangle, as well as explore and explain many other mysteries such as UFOs and alien abductions, mind-reading and psychics who talk to the dead, reincarnation and life after death, out-of-body and near-death experiences, urban legends and satanic panics, and how the mind works to find patterns when none exist and to impart intentional agency to those patterns to perceive ghosts and gods, demons and angels, intelligent designers and government conspiracists.

## Tuesday, May 10, 2011

**8am – 2:30pm**     **BIOS Field Trip** — [ *meet in Half Moon, then off to St. George's* ]

**6pm – 7:30pm**     **The Creative Brain: The Neuroscience of Genius**  
*Nancy C. Andreasen, M.D., Ph.D. – [ Wajang ]*

The capacity to be creative—to produce new concepts, ideas, inventions, objects, or art—is perhaps the most important attribute of the human brain. We know very little, however, about the nature of creativity or its neural basis. Some important questions include: how should we define creativity? How is it related (or unrelated) to high intelligence? What psychological processes or environmental circumstance cause creative insights to occur? What is happening at the neural level during moments of creativity? How is it related to health or illness, and especially mental illness? How can creativity be enhanced or nurtured, or can it? This presentation will review introspective accounts from highly creative individuals. It will discuss the nature of the creative process and ways that creativity can be enhanced. It will also review existing data from neuroimaging on the neural basis of creativity and its relationship to unconscious processes. And it will review evidence concerning familial transmission of creativity and its relationship to brain disorders.

## Wednesday, May 11, 2011

**6:30pm – 7:30pm**     **Party** — [ *The Retreat* ]

## Thursday, May 12, 2011

**8:30am – 10am**      **“Challenge”! The Neurophysiology of “Flow” (Or, how we mapped motivational states onto the heart, literally)**  
*Jim Blascovich, Ph.D. – [ Half Moon ]*

For centuries, theorists have tried to explain what motivates people to act in the ways they do. From ancient theories involving “humours” to the unconscious in the 19th century, “drive theories” in the early 1900s, “disposition theories” in the mid 20th century to genetic evolutionary and unconscious processes in the late 20th century, scholars have had their say. Many of these processes can be integrated within a biological-psychological-social (biopsychosocial) framework. Dr. Blascovich will describe the processes, theory, and cardiovascular markers and their value as predictors of success.

**6:30pm – 7:30pm**      **Party** — *[ The Retreat ]*

## Friday, May 13, 2011

**2pm – 3:30pm**      **Photographing Florida’s Seminole Indians: The S. Florida Adventures of A.W. and Julian Dimock, 1905–1910**  
*Jerry Milanich, Ph.D. – [ Half Moon ]*

It was April 12, 1905 when New York financier Anthony Weston Dimock and his adult son Julian motored their houseboat across Chokoloskee Bay and tied up at the dock of George Storter’s store in the small outpost of Everglade on the southwest coast of Florida. At the time, Everglade, today called Everglades City, was on the edge of civilization. To the south lay the Ten Thousand Islands, a sparsely settled labyrinth where the Gulf of Mexico and the rivers draining southern Florida mixed amid a bewildering maze of land, water, and wetlands. Eastward were the Big Cypress Swamp and the Everglades.

At Storter’s store the Dimocks saw several Seminole Indians who had come from their isolated camps in the interior of South Florida to shop and trade. Julian, an accomplished photographer, set up his tripod and camera and began to take pictures. Through his lens he and his father would step into a new world, the world of the Seminole Indians. Over the next five years they would amass an unprecedented photographic record of Seminole people and their surroundings. The photographs, glass negatives of which were recently discovered in the American Museum of Natural History’s research library, and the Dimocks’s adventures in southern Florida make for an amazing tale.

**4pm – 5:30pm**      **The Inflating Universe**  
*Max Tegmark, Ph.D. – [ Half Moon ]*

Dr. Tegmark describes what is arguably the most crazy-sounding theory ever to gain mainstream acceptance, and how experiments may be on the verge of providing smoking gun evidence for it. Cosmological inflation theory predicts that what put the bang into our Big Bang was a subatomic region repeatedly doubling its size when every decillionth of a second or so, thereby explaining a host of astronomical observations. However, fresh controversy has been ignited by the recent claim that inflation typically never ends, generating not just the part of space that we can observe, but also a rather fractal multiverse of parallel universes quite different from our own.

**6pm – 7:30pm**      **Why Darwin Matters: Evolution, Intelligent Design, and the Battle for Science and Religion**  
*Michael Shermer, Ph.D. – [ Half Moon ]*

Evolution happened, and the theory describing it is one of the most well-founded in all of science. Then why do half of all Americans reject it? There are religious and political reasons, and in *Why Darwin Matters*, historian of science and bestselling author Dr. Michael Shermer diffuses these fears by examining what evolution really is, how we know it happened, and how to test it. Shermer then discusses what science is through a brief history of the evolution-creation controversy—from the Scopes’ Monkey Trial of 1925 through the creationism trials of the 1960s and 1970s, to the landmark U.S. Supreme Court case of 1987, to the Intelligent Design controversies of the 1990s and 2000s—demonstrating clearly how and why creationism and Intelligent Design theory are not science. Dr. Shermer builds a powerful case for evolution as the theory that most closely parallels the Christian model of human nature and the conservative model of free market economics. Dr. Shermer was once an evangelical Christian and a creationist, and is now one of the best-known public intellectuals defending evolutionary theory, so *Why Darwin Matters* provides readers with an insiders’ guide to the evolution-creation debate, in which he shows why creationism and Intelligent Design are not only bad science, they are bad theology, and why science should be embraced by people of all beliefs.

## Saturday, May 14, 2011

**8:30am – 10am**      **‘In 1492 Columbus Sailed the Ocean Blue ...’  
Then What Happened? Colonial Spain in the Southeastern United States**  
*Jerry Milanich, Ph.D. – [ Wajang ]*

By the time of the founding of Jamestown in the first decade of the 1600, Spanish St. Augustine was already up for urban renewal. The story of Spain’s sixteenth-century colonial activities in the Southeast and their impact on the American Indians who lived there is a fascinating and little-known story, one that has been uncovered through archaeological and archival research.

On the heels of Columbus’s initial voyage to the Bahamas and Hispaniola, Spanish sailors and conquistadors (Ponce de León, Lucas Vásquez de Ayllón, Pánfilo de Nárvaez, Hernando de Soto, Tristán de Luna, and others) set out to explore and colonize the Southeast. They all failed, some rather spectacularly. From 1562–1565 France was able to establish two colonies, one of which was soon abandoned and the other destroyed by Pedro Menéndez de Avilés, who founded St. Augustine. Menéndez’s lofty plans, however, never saw fruition; his knowledge of North American geography was horribly wrong and the Native Americans who inhabited the region made it impossible for numerous Spanish outposts to survive. Even so, Spain retained its hold on St. Augustine, today the oldest continuously occupied European town in the mainland United States.

**10:30am – Noon**      **Virtual Reality, Challenge, and Medical Treatment**

*Jim Blascovich, Ph.D. – [ Half Moon ]*

Where do people go when they are anxious? Often, they try to find ways to escape the threat that accompanies their anxiety. Nature has imbued humans with internal ways to do so via dreams and daydreams. Nature and pharmacology have made contributions via a plethora of legal and illegal, natural and synthesized substances. Humans have often turned to distracting media to escape anxiety. Dreaded diseases such as cancer are among the most personally threatening situations people face. Dr. Blascovich will explain how immersing patients in challenging digital virtual worlds can help them during treatments such as chemo- and radiation therapy.

**1:30pm – 3pm**      **Venus vs. Mars or the Age of Androgyny?**

**Gender and the Brain**

*Nancy C. Andreasen, M.D., Ph.D. – [ Half Moon ]*

On the one hand, we live amidst many gender stereotypes. Women are from Venus and men are from Mars. On the other hand, in most economically and socially advanced countries, men and women are sharing more and more responsibilities that were once considered to be gender-specific, such as child-rearing or being a breadwinner. How much of gender-based behavior and cognition arises from innate differences between men and women? What can we learn about this question by applying tools from neuroscience and neuroimaging? This presentation will review some of the findings that have been obtained using these tools. Some findings are paradoxical and equivocal. For example, men and women have measurable differences in brain size, volume of gray matter and white matter, and rates of cerebral blood flow. These differences persist even after correction for differences in body size; however, their significance is unclear, given that men and women are equivalent in intelligence (IQ). Some findings suggest that there may be differences. For example, men and women also show differences in cerebral blood flow in studies that examine aspects of social cognition: gender recognition and recognition of familiar faces. Some findings indicate differential vulnerability to brain diseases between men and women. These differences will be described, and their possible relationship to genes, and particularly the X chromosome, will be discussed.

**3:30pm – 5pm**      **The Mathematical Universe**

*Max Tegmark, Ph.D. – [ Half Moon ]*

The idea that our universe is in some sense mathematical goes back at least to the Pythagoreans of ancient Greece, and has spawned centuries of discussion among physicists and philosophers. In the 17th century, Galileo famously stated that the universe is a “grand book” written in the language of mathematics. More recently, the physics Nobel laureate Eugene Wigner argued in the 1960s that “the unreasonable effectiveness of mathematics in the natural sciences” demanded an explanation. I’ll push this idea to its extreme and argue that our universe is not just described by mathematics — it is mathematics. While this hypothesis might sound rather abstract and far-fetched, it makes startling predictions about the structure of the universe that could be testable by observations, and also transforms ones view of concepts like randomness, complexity, existence, and the flow of time.

**5:30pm – 7pm**

**The Mind of the Market:  
Compassionate Apes, Competitive Humans,  
and Other Lessons from Evolutionary Economics**

*Michael Shermer, Ph.D. – [ Wajang ]*

How did we evolve from ancient hunter-gatherers to modern consumer-traders? Why are people so irrational when it comes to money and business? Bestselling author Dr. Michael Shermer argues that evolution provides an answer to both of these questions through the new science of evolutionary economics. Drawing on research from neuroeconomics, Shermer explores what brain scans reveal about bargaining, snap purchases, and how trust is established in business. Utilizing experiments in behavioral economics, Shermer shows why people hang on to losing stocks and failing companies, why business negotiations often disintegrate into emotional tit-for-tat disputes, and why money does not make us happy. Employing research from complexity theory, Shermer shows how evolution and economics are both examples of a larger phenomenon of complex adaptive systems. Along the way, Shermer answers such provocative questions as, Do our tribal roots mean that we will always be a sucker for brands? How is the biochemical joy of sex similar to the rewards of business cooperation? How can nations increase trust within and between their borders? Finally, Shermer considers the consequences of globalization and what will happen if nations allow free trade across their borders.

**7pm – 8pm**

**FAREWELL PARTY — Crow’s Nest**