

January 27th – February 3rd, 2008

Insight Cruises

SCIENTIFIC  
AMERICAN

Western Caribbean

## Bright Horizons™



Expand your skills. Chat with the experts. Join our community of kindred spirits on this exotic journey.

Our Speakers on Bright Horizons are:

John Rennie, Editor in Chief, Scientific American

Thomas Abel, Ph.D., Lera Boroditsky, Ph.D., Nicholas Hellmuth, Ph.D.

Steve Mirsky, M.Sc., and Bebo White

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## Astrophysics & Cosmology

### The Bright Horizons Conference

The conference fee is \$1,275 and includes all courses, any course materials, and two private InSight Cruises parties. There are six different main categories on Bright Horizons: Astrophysics & Cosmology, Cognitive Psychology, Archaeology, Future Technology & Society, Evolution, and Computational Science. Attendees may freely move, at any time, between these seminars.

In addition, attendees may attend, at no charge, the [poker seminars and "lab"](#) offered during the ["Poker Passion"](#) event.

#### Composition of the Universe (90 minutes)

Speaker: [Thomas Abel, Ph.D.](#)

Of what is the Universe made? How do we know this? Is it really true that 96% of the energy in the Universe is of unknown form? How can we be so sure? Can we still understand the origin of stars and galaxies if we only know the nature of 4% of the universe?

#### The Big Bang Theory and its Successes (90 minutes)

Speaker: [Tom Abel, Ph.D.](#)

We've come a long way in our understanding of the formation and nature of the Universe. Less than 80 years ago, Edwin Hubble showed that the Universe is expanding. Sixty years ago, we learned where all the hydrogen and most of the helium in the Universe were made. About 40 years ago, we started observing the radiation left over from the beginning of the universe. The photons in this background travel 13.7 billion years unimpeded until they are absorbed in our detectors. Over the last 20 years, we've come to understand that without dark matter, there would be no galaxies nor any of us. What will we know in 2029 on the 100th anniversary of Hubble's discovery?



### Computing the Universe (90 minutes)

Speaker: *Tom Abel, Ph.D.*

We ask: How can we numerically solve the equations of fluid dynamics? Reactive flows? Radiation transport? Stellar winds and explosions? Consider the vastness of the scales: The sun is already about a trillion times smaller than the Galaxy! Recently, we have learned to model enormous numbers of bodies and their gravitational effects on each other. We'll discuss the physics that shape the Universe and how we now solve physical equations on modern supercomputers.

### The First Things in the Universe and their Aftermath (90 minutes)

Speaker: *Tom Abel, Ph.D.*

Ab initio simulations tell us what the first things in the universe were in unique detail. The first things are actually very massive isolated stars, which have had an enormous impact on everything that has come since then. These first stars evaporated their parent clouds, expelled the first heavy elements, and seeded the universe with the potential for life. The formation and evolution of galaxies are now being understood-- one star at a time.

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## Cognitive Psychology

### Does The Language You Speak Shape The Way You See The World? (3.5 Hours)

Speaker: *Alice Gaby, Ph.D.*

Does a French speaker think of a bridge as *manly* just because the French word (for bridge) "pont" is gender masculine? It might sound far-fetched, but this is exactly what some recent experiments show. The question of whether speaking different languages leads to different cognitive processes has inspired some of the most exciting recent psycho-linguistic research. In this seminar, Dr. Alice Gaby will argue that you see what you're saying; that the language you speak will not only affect the way you think about the world but even how you perceive it! We will explore how speakers of languages from all over the globe perceive and label color, reckon spatial relationships, and conceptualize time. By the end, you'll be wondering just how differently you might see the world if you pick up a little Q'eqchi' during our stop in Santo Tomás de Castilla.

### Heartbreak in a Hundred Languages: How We Conceive of Abstract Concepts Through Our Bodies (3.5 Hours)

Speaker: *Alice Gaby, Ph.D.*

A foreigner once sang: "I want to know what love is, I want you to show me". But how can we understand an abstract concept like love, or explain it to another person? This question applies equally to other concepts like truth, black holes, and time. The fact that we cannot reach out and touch them doesn't prevent us from talking about them. In fact, "time" is the most commonly used noun in the English language! But in order to talk about — and even think about — concepts, we link them metaphorically to more familiar objects. Most commonly, we start from the most familiar object of all: our bodies. Although the mapping of the abstract onto the more concrete and familiar is pretty much universal across languages and cultures, the particular links and analogies drawn can vary wildly. In this seminar, we'll explore how people around the world conceptualize and describe emotions, spatial relationships, time, and other concepts in terms of the body. Dr. Gaby will also discuss the broader power of metaphor in constructing our beliefs and understanding of the world around us, allowing us to grasp the intangible.





### **Homuncular Flexibility: Adapting Physical Brain Structure to Virtual Bodies (90 minutes)**

Speaker: *Jeremy Bailenson, Ph.D.*

Rather than debating "you can't teach an old dog new tricks" Jeremy Bailenson will explore "can you teach an old dog to re-conceptualize and accordingly execute old tricks?" We'll examine studies about a concept first developed by Jaron Lanier called "homuncular flexibility" — learning to re-map physical degrees of freedom onto digital representations in interactive tasks. The essential question is: Can people learn to re-map degrees of freedom that are not essential to a task in order to control novel digital actions which are relevant to a task? For example, if the task were using a single hand to paint a wall, could a person learn to use one physical hand to *control the position* of five (or so) virtual hands at once?

### **Buying and Selling 1's and 0's: How VR Changes Marketing (90 minutes)**

Speaker: *Jeremy Bailenson, Ph.D.*

Life is becoming digital, with many of us spending large amounts of time and resources online. Virtual worlds are not just points of purchase — they are becoming personalized social spaces which provide entertainment, commerce, well-being, and even a source of personal identity. Dr. Bailenson will highlight the ways in which researchers and consumers are currently using virtual worlds, discuss results from psychological experiments that highlight the similarities and differences between online and face-to-face behavior, and examine the unique opportunities the virtual world provides market researchers.

### **Virtual Bodies and the Human Identity: The Proteus Effect (90 minutes)**

Speaker: *Jeremy Bailenson, Ph.D.*

Cyberspace grants us great control over our self-representations. At the click of a button, we can alter our gender, age, attractiveness, and skin tone. In a series of studies, Dr. Bailenson and colleagues have explored how putting people in avatars of different physical features such as age, race, and gender affect how they behave not only in a virtual environment but in subsequent physical interactions as well. Inquiring minds want to know — as we choose our avatars online, do our avatars change us in turn?

### **Transformed Social Interaction in Virtual Worlds (90 minutes)**

Speaker: *Jeremy Bailenson, Ph.D.*

Over time, our mode of remote communication has evolved from written letters to telephones, email, internet chat rooms, and videoconferences. Collaborative virtual environments (CVEs) and other forms of digital communication promise to substantially evolve the nature of remote interaction. CVEs track verbal and nonverbal signals of multiple participants and incorporate those signals into avatars, a person's three-dimensional digital representation in a shared digital space. Unlike in telephone conversations and videoconferences, interactants in CVEs can systematically filter the physical appearance and behavior of their avatars, amplifying or suppressing features and nonverbal signals in real-time for strategic purposes. Join Dr. B as he updates Grandma's advice to "never judge a book by its cover" and discusses:

- Do CVEs qualitatively change the nature of remote communication?
- What impact does their avatar have on participant's persuasive and instructional abilities?



DAY	PORT	ARRIVE	DEPART	CONFERENCE SESSIONS
SUNDAY, JANUARY 27	<u>TAMPA, FLORIDA</u>	—	5pm	7:15pm, BON VOYAGE COCKTAIL PARTY
MONDAY, JANUARY 28	<u>KEY WEST, FLORIDA</u>	11:30am	6pm	8:30am – 11:30am & 6pm – 7:30pm
TUESDAY, JANUARY 29	AT SEA	—	—	8:30am–NOON, 1:30pm–5pm & 6pm–7:30pm
WEDNESDAY, JANUARY 30	<u>BELIZE CITY, BELIZE</u>	8am	6pm	6pm – 7:30pm
THURSDAY, JANUARY 31	<u>SANTO TOMAS DE CASTILLO</u>	6am	6pm	6pm – 7:30pm
FRIDAY, FEBRUARY 1	<u>COSTA MAYA, MEXICO</u>	8am	5pm	5pm – 7:30pm
SATURDAY, FEBRUARY 2	AT SEA	—	—	8:30am–NOON, 1:30pm–5pm & 6pm–7:30pm
SUNDAY, FEBRUARY 3	<u>TAMPA, FLORIDA</u>	8am	—	

## Pricing & Booking Information

(Full details:

[http://www.geekcruises.com/booking\\_b/sa01\\_booking.html](http://www.geekcruises.com/booking_b/sa01_booking.html))

**Course Fees:** \$1,275. Only passengers booked through InSight Cruises will be admitted.

**Deposit:** \$400 per person, due at time of booking.

Cabin Type:	Cruise Rate (per person)
<b>Inside Cabin:</b>	\$849 [GS* avail.]
<b>Better Inside:</b>	\$949 [GS* avail.]
<b>Outside:</b>	\$1,199 [GS avail.]
<b>Better Outside:</b>	\$1,259 [GS & PC avail.]
<b>Outside w/Balcony:</b>	Sold out
<b>Better w/Balcony:</b>	Sold out
<b>Full Suite:</b>	Sold out

The pricing above is subject to change. InSight Cruises will generally match the cruise pricing advertised, at the time of booking, offered at the Holland America website. If at the time of booking the cruise line notifies us that the price of cruise fare has *increased*, you will be notified of the new pricing before your reservation is booked.

## Archaeology

### **Underwaterworld Iconography of the Classic Maya (90 minutes)**

Speaker: [Nicholas Hellmuth, Ph.D.](#)

The Maya underworld was an underwater world. Dr. Hellmuth will guide us through the mythology and iconography of the Maya underwaterworld. Using a multi-disciplinary approach and a scientist's keen eye for tropical flora and fauna, Dr. Hellmuth will decipher the design motifs of the supernatural plants, animals, and creatures that signal underwaterworld-related aspects of the Maya cosmos and belief systems.

You'll acquire an enhanced baseline understanding of the symbolism of the sacred shark and waterlily and other flora and fauna; the abstracted or abbreviated representations of these things in Maya art, and the status of scientific efforts to document and preserve the corresponding living plants and animals that are associated with the Maya cosmos.

### **Sacred Plants of the 6th-9th Century Maya of Mexico, Belize, Guatemala, and Honduras (90 minutes)**

Speaker: [Nicholas M. Hellmuth, Ph.D.](#)

Plants were not only a central component of the Classic Mayas' physical environment, they richly populated and functioned in the Maya cosmos, and were highly significant in culture and ritual. To deepen your knowledge of the roles of sacred plants such as maize, cacao, flor de Mayo, hule (a rubber tree), the water lily, and a host of other sacred plants and flowers, Dr. Hellmuth will discuss the importance of the Mayas' sacred plants, their uses, and distribution in the Maya world.

You'll gain a sense of the interrelationship of Maya cosmology, botany, culture, agriculture, and history represented in the concept of sacred plants. We'll get a glimpse of Dr. Hellmuth's extensive collection of images showing both living specimens of plants and plant products, and the botanical motifs related to Maya sacred plants in architecture, murals, and pottery.

### **Ethno-botany: Plants Utilized by the Maya from Classic Times through Today**

Speaker: [Nicholas M. Hellmuth, Ph.D.](#) (90 minutes)

We know that plants served an extensive role in the Mayas' relationship with their deities. Back in the earthly Maya realm, what's for supper?

Across the diverse terrain of the Maya world, a wide variety plants served the nutritional needs of the people. From the familiar cacao and vanilla to the odd-looking, night-blooming pitaya, Dr. Hellmuth will orient you to the interesting and exotic fruits and vegetables used by the Maya from pre-Columbian times through today.

\*PC – Physically Challenged;

GS – [GUARANTEED SHARE \(GS\)](#) Fares:

This plan is for passengers who are coming on a Geek Cruise by themselves and wish to share a cabin with another Geek Cruises passenger in an inside or outside cabin only. The prices are the same as the per person double occupancy rates. Share Passengers who smoke are not to do so in the cabin, unless okayed by fellow roommates. We try to match passengers with someone close in age, whenever possible.

**3rd and/or 4th Person Rate:** ages 2 and older, \$450; \$350 for under 2 years old.

**Single Occupancy:**

150% for inside and outside cabins and 200% for cabins with a balcony (i.e., Mini-Suites and above).

**Port Charges, Taxes, & Gratuities:**

Port charges (of \$160 per person) are included; taxes are \$68,38 per person and are additional. Holland America also charges, onboard, \$10 per person per day for gratuities.

**Full payment is due on November 1, 2007**

(or, if you book after **November 1**, at the time of booking).

**Foreign Shipping Fees and Additional**

**Payment Information:** There is a foreign shipping charge of \$60 (to cover the shipping of your cruise tickets, via FedEx) per foreign residence (\$35 per Canadian residence). There is a \$25 charge for returned checks.

**Tomb of the Jade Jaguar: What it was like to be a Harvard student and excavating the tomb of the Ninth Century King of Tikal (90 minutes)**

Speaker: *Nicholas M. Hellmuth, Ph.D.*

It's Indiana Jones time. Dr. Hellmuth presents his experience and his "beginners' luck" in discovering one of the most richly stocked royal burials of the entire ancient Maya realm.

The Tomb of the Jade Jaguar at Tikal included the largest pyrite mosaic mirror yet found in all of Mesoamerica, the greatest number of pottery vessels of any Late Classic Maya burial known in the lowlands, and more jade jewelry than any tomb other than that of Pacal's of Palenque or in Temple I of Tikal.

Dr. Hellmuth will explain the scientific approach to such a find, as well as providing "color commentary" — a month of painstaking excavation to tunnel deep into the pyramid; documentation of progress; ten days of analysis of how best to tackle recording the overfilled tomb chamber and its royal mortuary offerings; and of course, life in the jungle.

Savor the rare opportunity to hear about the discovery of a great king's burial chamber directly from the discoverer!

**Sacred Ballgames of Mesoamerica: Iconography & Ballcourt Architecture**

Speaker: *Nicholas M. Hellmuth, Ph.D. (90 minutes)*

The ritual ballgames of the Maya and neighboring civilizations are the stuff of legend and of a steadily increasing body of fact. Dr. Hellmuth, who has played the Maya ballgame himself (slightly modified rules!), will sort through the archaeology, architecture, evolving sociological and political theories of the game, and of course, the conduct and process of play.

**Pyramid Temples & Palaces: Architectural History of the Pre-Columbian Maya**

Speaker: *Nicholas M. Hellmuth, Ph.D. (90 minutes)*

Think of the Maya, and one of the first images that comes to mind is a pyramidal temple. Approaching the monumental architecture of the Maya can be done from the viewpoint of several disciplines. Dr. Hellmuth brings his learned work in architecture, archaeology, and anthropology, along with his expertise as a photographer and archivist, to this survey of Maya ritual and palace structures. He will illustrate his comments with a choice selection from his collection of more than 8000 images from Maya sites *and* he has promised to not show all 8000.

**Air Add-ons:** Airfare from most major cities is available through the cruise line. You can call our office for this pricing. (These rates include transfers to/from the dock/airport plus transfers to/from your hotel if we've booked the hotel as well.) In most cases, however, you will find better airfares on your own. Online travel sites such as Expedia.com, or Travelocity.com are excellent resources.

**PRE-CRUISE HOTEL STAYS:** Sightsee Tampa from our base, [Tampa Airport Hilton Hotel](#), and/or meet and greet your fellow InSight Cruise guests at our pre-cruise Cocktail Party (see below). A transfer from the airport to the hotel and then from the hotel to the ship (two transfers total), and all taxes, are included in the prices below.

	1 night	Add'l nights
Shared double	\$139	\$99
Single	\$229	\$149
3rd/4th person	\$99	\$99

**NOTE:** Holland America will not accept any booking unless a fully completed Reservation Form is accompanied with a per-person deposit:  
[http://www.GeekCruises.com/booking\\_b/sa01\\_booking.html](http://www.GeekCruises.com/booking_b/sa01_booking.html). Have questions? Want to book voice-to-voice? Please give us a call: 650-787-5665

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## Future Technology & Society

### **Battlegrounds and Roads Forward for Emerging Technologies (90 minutes)**

Speaker: [John Rennie](#) *Editor in Chief, Scientific American*

Nanotechnology, synthetic biology, artificial intelligence, new energy systems and a host of other radical technologies could transform the world as we know it over the next few decades. How they might do so and whether they will get the chance, however, depend strongly on how society copes with some of the dramatic conflicts those technologies will raise on issues such as personal privacy, security and preservation of the environment. John Rennie will explain these new technologies, strip the fiction from the facts about their capabilities and dangers, and discuss how best to prepare for them.

### **Global Warming and the Energy Transition (90 minutes)**

Speaker: [John Rennie](#), *Editor in Chief, Scientific American*

Rising global temperatures and worries about the world's current dependence on fossil fuels will push civilization to make wider use of renewable energy, conservation, established technologies such as nuclear and new ones such as fuel cells. John Rennie will review future energy options and also consider how radical "geo-engineering" projects for reshaping the environment might be deployed if climate change prevention is not enough.

### **Free Will, Genetics, and Neuroscience (90 minutes)**

Speaker: [John Rennie](#), *Editor in Chief, Scientific American*

Notions of free will influence not only our sense of ourselves as individuals but also social institutions like the law. As genetics and neuroscience trace the roots of our behaviors in more detail, however, it becomes harder to see human beings as completely free. How will further advances in science change our views of personal responsibility and legal guilt? After reviewing highlights in the current state of knowledge about human behavior and consciousness, John Rennie will prompt the class to discuss the significance of these findings to the real world.

### **Living Ethically in the Brave New World (90 minutes)**

Speaker: [John Rennie](#), *Editor in Chief, Scientific American*

As technologies once known only through science fiction become part of our daily lives, all of us will increasingly be faced with troubling new ethical problems. Is it right for a grieving parent to try to clone a lost child? Should the wealthy be able to buy transplantable organs if poor people are willing to donate them? If an intelligent machine begs you not to turn it off, should you? Should genetics and neuroscience affect legal definitions of guilt and innocence? John Rennie will lead a Socratic discussion with the class that explores these complex topics.

**Download a Deck Plan (PDF)**

**Inside Staterooms - \$849-\$949**

**Outside Staterooms - \$1,199-\$1,259**

**Balcony Staterooms - SOLD OUT**

**Full Suite - SOLD OUT**

## Evolution

### The Evolution of Evolution (90 minutes)

Speaker: [Steve Mirsky, M.Sc.](#)



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Today's evolution is not your grandfather's evolution. Molecular biology and genetics, crucial to our current understanding of evolution, didn't even exist as scientific disciplines for Charles Darwin. In fact, Darwin's evolution was not even his grandfather's evolution — Erasmus Darwin penned a preliminary tract on evolution. We'll look at how Darwin's basic theory of variation and natural selection as a mechanism for evolution has been modified and augmented as scientists have added 150 years of research to Darwin's foundation. In fact, the last 20 years have seen a huge explosion in our understanding of evolution, specifically in the relationship between development and evolution (evo-devo) and in the evidence to be found in the genomes of extant organisms. Plus, personal reflections on Ernst Mayr, one of the most important evolutionary biologists of the 20th century, who died in 2005 at the age of 100.

### The Evolution of Antievolution (90 minutes)

Speaker: [Steve Mirsky, M.Sc.](#)

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.

### What's So Funny About Science (90 minutes)

Speaker: [Steve Mirsky, M.Sc.](#)

Human beings are funny, science is an activity performed by human beings, therefore science is funny. Or sometimes can be. For the last 11 years, Steve Mirsky has written an allegedly humorous column for Scientific American called Anti Gravity (it's lighter than the gravitas of the rest of the magazine). We'll talk about fun science, funny science, and science that is covered in a funny way; and why even funny science can illustrate important points about the scientific method and the philosophy of science. Highlights include: the man in the moose suit; the bald turkey researcher (the turkeys are bald, not the researcher); an analysis of life histories of invading species in science fiction movies; the dangers of being scientifically illiterate (mixing up the oxytocin with the oxycontin); and more!

### How The Science Sausage Gets Made (90 minutes)

Speaker: [Steve Mirsky, M.Sc.](#)

What is it like to be a science journalist? Steve Mirsky has been a science writer for two decades, the last 11 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, some of whom apparently keep a database of every aspect of the magazine, right down to the photo credits. And we'll talk about how some science fiction winds up appearing in Scientific American.

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## Computational Science

### **Computational Science and Engineering (90 minutes)**

Speaker: [Bebo White](#)

Wikipedia defines computational science (not computer science) as "the field of study concerned with constructing mathematical models and numerical solution techniques and using computers to analyze and solve scientific and engineering problems." What this definition fails to express is how computational science has become an integral component of all scientific disciplines and how it promises to fundamentally change the way in which science will be done in the future. The impact of computational science can only be likened to how the execution of scientific research was changed by the elaboration of the Scientific Method. This lecture will describe the elements of computational science and engineering and research methods that take advantage of these elements. Case studies will be presented to illustrate applications of these methods.

### **An Introduction to High Performance and Grid Computing (3.5 hours)**

Speaker: [Bebo White](#)

When the term "High Performance Computing (HPC)" is used these days it is more often than not referring to large "farms" or arrays of small, low-cost computers working together to accomplish a compute-intensive problem rather than to so-called supercomputers. These "farms" may contain thousands of individual CPUs but give the illusion of a single computing entity. Such "farms" provide high throughput, are scaleable, use inexpensive components and open-source software, and are fault tolerant. Similar to concept to these "compute farms" are "computing grids" where networks (usually the Internet) provide the "glue" thereby creating "a virtual computer architecture." "Computing grids" offer the promise of computing as a "utility" where anyone on the network has access to all the computing resources they want or need.

### **The Once and Future Web (90 minutes)**

Speaker: [Bebo White](#)

Although the technology has only been around for slightly more than a decade, it is difficult to imagine computing without the World Wide Web. Beneath the simplicity that we see in our browsers, the underlying machinery of the Web has changed a great deal. How will the Web evolve in the next ten years and what will be the technological and social forces that drive its changes? Are "Web 2.0" and the "Semantic Web" just hype or genuine indicators of the direction in which the Web is moving? What will the "future Web" look like and how will it be used? This lecture will examine some of the clues of what we might expect in the "future Web" and how we can prepare for the changes to come.