CANADA AND NEW ENGLAND

Bright Horizons™ 7

SCIENTIFIC AMERICAN

May 29th – June 5th, 2010

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Partake of intellectual adventure in the company of experts and fellow citizens of science. Join Scientific American Travel on a cruise down the mighty St. Lawrence Seaway into the heart of contemporary cosmology, genetics, and astronautics. Black holes, parallel universes, and the Big Bang itself are among the abstract ports of call Dr. Max Tegmark shows us. You'll have a new perspective on the significance of food choices after indulging in a discussion with Dr. Paul Rozin. Satisfy your curiosity about navigating space, from the science behind solar sails to mapping the Interplanetary Superhighway, with Dr. Kathleen Howell. Maneuver through the newly charted territory of the human genome, genetic medicine, genetic agriculture, and all their nuances and consequences with Dr. David Sadava. Set the scene for Summer on the Bright Horizons 7 conference on Holland America Line's m.s. Maasdam, sailing Montreal to Boston May 29–June 5, 2010.

ASTROPHYSICS & COSMOLOGY

Speaker: Max Tegmark, Ph.D.

The Mysterious Dark Side of Cosmology

A recent avalanche of accurate measurements has revolutionized our understanding of cosmology, but also stumped us with new puzzles. What are the dark matter and dark energy that together make up 96% of the stuff in our universe? Learn about some of the most promising candidates and some of the experiments that may solve these mysteries.

How Did It All Begin — Or Did It? How Will It All End?

Humans have asked the big questions for as long as we've walked the Earth. We've made spectacular progress on answers in recent years, and have discarded much of what cosmology textbooks told us until quite recently. Get the latest on competing ideas about the origin of the universe, their implications and how they can be experimentally tested.

I've Got Questions: Black Holes Edition

Join Dr. Max Tegmark and get the scoop on what we know about black holes and what remains mysterious. Plus, using a fully general-relativistic flight simulator take a scenic orbit of the monster black hole at the center of our Galaxy.

Parallel Universes

Is physical reality larger than the part that we can observe? Dr. Tegmark argues that not only are parallel universes likely to exist, but that there may be as many as four different levels of them.

A Brief History of Our Universe

With our 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 and how state-of-the-art measurements are transforming our understanding of our cosmic origin and ultimate fate.

Cosmology and the Meaning of Life

When skygazing on a clear night, it's natural to wonder if we have company in the observable universe. Join Dr. Tegmark for a a status report on the search for extrasolar planets and extraterrestrial life. We'll discuss and speculate about possible long-term futures for life on earth and in the cosmos.

SCIENTIFIC AMERICAN TRAVEL

ASTRODYNAMICS
Speaker: Kathleen Howell, Ph.D.

Mission Design: Exploring the Solar System

Scientific mysteries and huge surprises await solar-system space explorers. Dr. Howell lays out the principles and process of designing a space mission. Get the scoop on the successful engineering techniques and the challenges in getting humans and robots to space destinations.

Astrodynamics: Natural Orbits from Epicycles to Chaos

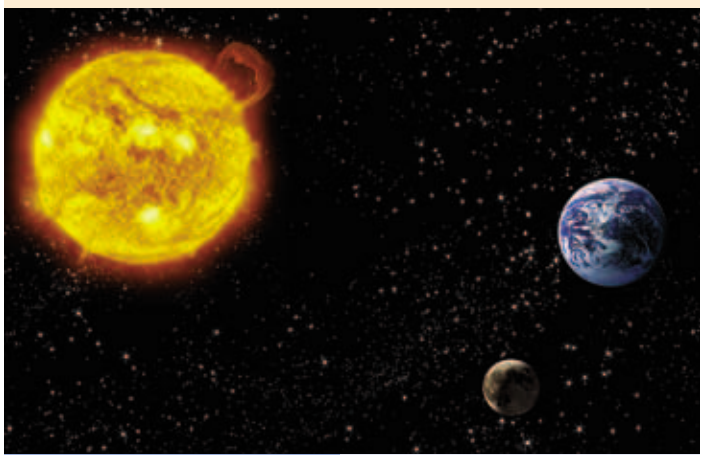
From the dawn of time the paths of the planets, moons, and other natural bodies have fascinated humans. Join Dr. Howell and take a look at the key areas of orbital mechanics. You'll have a sharper perspective on space exploration, and will be well equipped to follow important open questions in astrodynamics.

Solar Sailing

400 years ago, Johannes Kepler observed tha comet tails are sometimes blown about by a "solar breeze". Taking that cue, scientists have designed solar sails that transfer the momentum of light energy to their spacecraft—pushing it without using fuel. Today scientists are building test sails, analyzing solar sail capabilities, and planning solar sail missions. Learn the facts with Dr. Howell.

Riding the Interplanetary Superhighway

The gravity fields of the Sun, planets, and solar system bodies interact creating the interplanetary superhighway. Picture a vast network of "tubes" that indicate low-energy trajectories throughout the solar system. If you'd like to swing on a celestial body, tune in as Dr. Howell covers the practical applications of libration points, and the use of the interplanetary superhighway in spacecraft missions.



GENETICS: THE DNA OF LIFE
Speaker: David Sadava, Ph.D.

The Personal Genome

If the 20th century was the "century of physics", the 21st is the "century of biology", particularly genetics. This century opened with the deciphering of the human genome. Join Dr. Sadava and you'll learn what a genome is, and what we know about it. Discover insights into where we may have come from, both as human groups and in relation to the other creatures with whom we share the Earth.

Can Knowledge of Genomes Transform Agriculture?

Many people are concerned with what they eat. Fewer people worry about the human food supply. Genetics and DNA have a lot to say about both of these topics. With Dr. Sadava as your guide, get the latest on the "green revolution", the interaction of the human genome with foods, and the potential and risks of genetically altered crops.

Cloning and Stem Cells

The first plant was cloned in the mid-1950s and the first animal several decades later. In this lecture, you will learn how and why these feats were accomplished. Human cloning is now a possibility and the promise of using stem cells to treat diseases and even improve athletic performance in healthy people is something we'll also discuss.

Genetic Medicine: Can Knowledge of the Genome Transform Medicine?

Your health is determined by both heredity and environment. Progress has led to the near-elimination of many infectious diseases and treatments for other diseases. Dr. Sadava will show you that through studies of the genome, we can describe what goes wrong in the many diseases that have a genetic component, such as cancer and heart disease. Get a researcher's input on how these descriptions may lead to cures and personalized treatments.

THE PSYCHOLOGY OF FOOD
Speaker: Paul Rozin, Ph.D.

Obesity and Unhealthy Food Choices in Cultural Perspective: The French-American Contrast

Americans worry about their weight and eat low fat food, and French eat a higher fat diet than Americans and worry less. Doesn't that make you wonder why obesity is much lower in France than in the USA? Settle into a sedentary session with Dr. Rozin and we'll compare how French and Americans adapted to major changes in the food world and get the scoop on how the French have managed to be less afflicted by obesity and more engaged in the enjoyment of eating.

Psychological, Cultural, and Biological Perspectives on Some Foods

Why do billions of people in the world add hot chili pepper, which irritates their mouth, on most of their foods? Would you drink pure water recycled directly from sewage water? How do you feel about T-bone steaks? Why is chocolate irresistible? Dr. Rozin will shed light on the biological and cultural history of these substances.

The Emotion of Disgust

How did a basic food rejection mechanism designed to protect the body from toxins and disease culturally evolve to become a reaction to all sorts of offenses like incest, murder, and cheating? Get a behind-the-scenes look at disgust, and the factors that shape it. Join Dr. Rozin for an exploration of the meanings of disgust, and the wide-ranging implications of the fundamental processes behind it.

Hunter-Gatherer Thinking in The 21st Century

Humankind's adaptations to our ancestral environment have equipped us with feelings and mental shortcuts which often aid us in the modern world. However, sometimes they are maladaptive in our rapidly evolving world. Explore the methods humans use to determine what to eat and what to avoid, and how humans deal with the many potential risks that the modern world presents.

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Cruise prices vary from $999 for a Better Inside to $3,599 for a Full Suite, per person. (Cruise pricing is subject to change. InSight Cruises will generally match the cruise pricing offered at the Holland America website at the time of booking.) For those attending the conference, there is a $1,275 fee. Taxes and gratuities are $182.

THE GRAND FINALE:

Private tour of the MIT campus and luncheon/tour at the MIT Museum
(June 5, 11am–3pm)

Max Tegmark, Ph.D. Associate Professor of Physics at The Kavli Institute for Astrophysics & Space Research at MIT, along with some of his MIT associates, will direct our private "insiders" tour of the MIT campus and research facilities.

After our campus tour we'll break for lunch in the MIT Museum. We'll then continue with our private tour—inside the museum. "MIT Museum, founded in 1971, is the museum of the Massachusetts Institute of Technology, located in Cambridge, Massachusetts. It hosts collections of holography, artificial intelligence, robotics and history of MIT. Its holography collection of 1800 pieces is the largest in the world, though not all of it is exhibited." [from Wikipedia] (This tour is optional and costs $95 per person. Lunch and a one-way transfer from pier to MIT are included.) ▼


MIT campus