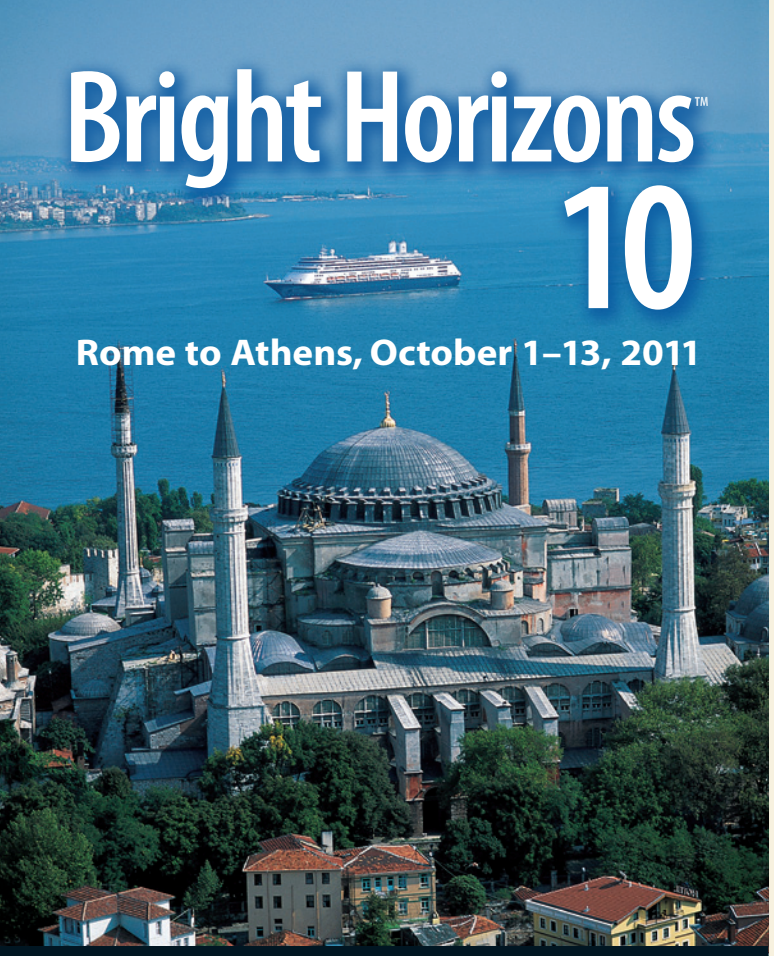
Bright Horizons™ 10

Rome to Athens, October 1–13, 2011



www.InSightCruises.com/SciAm-10

Set a course for intellectual adventure on the Black Sea with your curiosity as a guide and Scientific American to take care of the details. Join Scientific American on the Bright Horizons cruise conference on Holland America Line's ms Rotterdam, sailing Rome to Athens October 1–13, 2011.

As you ply the wine-dark seas, join Dr. John Steele in tracing the astronomical legacies of the Babylonians and Greeks. Dr. Michael Wysessions conveys the impact of volcanoes and tsunamis in the flow of civilization. Sit with Dr. Michael Benton as he brings dinosaurs to life. Tune in to Dr. Mohammed Noor, as he details the nature of species. Get the latest concepts on comets with Dr. Mark Bailey. Illuminate dark matter with Dr. Lawrence Krauss.

The Draconid meteor shower will punctuate your Black Sea sojourn. Typically a minor celestial event, the 2011 shower is forecast to be a humdinger.

Cover new terrain, from Rome to Odesa to the Kuiper Belt. Celebrate ancient civilizations and the current moment with a friend. Find the how-tos and details at www.InSightCruises.com/SciAm-10 and join kindred spirits on a voyage of discovery.

Cruise prices vary from $1,799 for an Interior Stateroom to $5,299 for a Deluxe Suite, per person. For those attending our program, there is a $1,475 fee. Government taxes, port fees, and InSight Cruises' service charge are $208.91 per person.
For more info please call 650-787-5665 or email us at Concierge@InSightCruises.com

COSMOLOGY

Speaker: **Lawrence Krauss, Ph.D.**

Quantum Man: Richard Feynman's Life in Science — It took a man who was willing to break all the rules to tame a theory that breaks all the rules. Learn about the scientific legacy of one of the greatest and most colorful scientists of the 20th century, and in turn get insights into the questions driving the science of the 21st century.

An Atom from Greece — Every atom in your body was once inside a star that exploded. Lawrence Krauss will present the life history of an atom in a glass of wine you will have with dinner, from the beginning of the universe to the end. The story is rich in drama and surprises, and will leave you thinking differently about your place in the cosmos.

The Dark Side of the Universe: From Black Holes, to Dark Matter, and Dark Energy — The most interesting things in the universe apparently cannot be seen. Learn why scientists are fascinated by them, and why they hold the key to understanding our origins, and our future.

Hiding in the Mirror: Extra Dimensions, CERN, and the Universe — The largest machine humans have ever built has turned on in Geneva, and happily has not created a black hole that destroyed the world. But what might be discovered there, and will it tell us that there is, literally, infinitely more to the universe than meets the eye?

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PALEONTOLOGY

Speaker: **Michael J. Benton, Ph.D.**

The Life and Times of the Dinosaurs — Many people think images of dinosaurs in museums and films are largely imaginary. Find out how paleobiologists reconstruct the life of the past using a combination of three modern scientific methods. Dr. Benton will share the standard tools, unexpected finds, and new engineering approach to understanding how these ancient giants looked, moved, and fed, putting dinosaur discoveries and imagery in a new light.

Origins and Extinctions — Life has existed on Earth for four billion years, punctuated by origins and extinctions. From the origin of life to the origin of humans we'll look at one of the grandest questions in science: where did we come from . . . and can we be sure? Dr. Benton then explores international research from North America, Russia, China, and Europe on the causes and consequences of extinctions.

Origins of Modern Biodiversity — Life today is hugely diverse. Darwin wondered at this richness, and argued that life was more diverse than it had to be! Research efforts now concentrate on reconstructing the evolutionary 'tree of life' using genomes and fossils, bound by massive computing power. Get the scoop on biodiversity and the latest on biogeographic investigations, fossil data, and number crunching of the new genomic sequences.

The Dinosaurs of Eastern Europe and the Mediterranean — In the days of the dinosaurs, continental drift and sea level change led to ever-changing geography. See how geologists create paleogeographic maps to locate the dinosaur fauna of what is now Eastern Europe. Meet colorful characters from early days of paleontology. Learn how regional research changed during the Iron Curtain days and how current researchers are bringing Europe's unique dinosaurs back to life.

SCIENTIFIC AMERICAN TRAVEL

BRIGHT HORIZONS

VATICAN OBSERVATORY

When in Rome, do as the Romans who are astronomy buffs wish they could do—visit to the new digs of the Vatican Observatory and get a privileged look at its world-class meteorite collection.

Join Bright Horizons on an optional pre-cruise trip to Castel Gandolfo, Italy on a private insider's tour of the Observatory's laboratory, home to a 135 kg collection of 1081 samples, from 469 meteor falls. See a bit of Mars on your Mediterranean trip! Perhaps almost more intriguing is the Observatory's library. We'll browse over the shoulders of giants, seeing historic and antique astronomy books including early editions of Newton, Copernicus, Galileo, Kepler, Brahe, Clavius, and Secchi. VO astronomers will brief us on the Vatican's interest in astronomy and the latest on VO research at Steward Observatory, Mount Graham, Arizona.

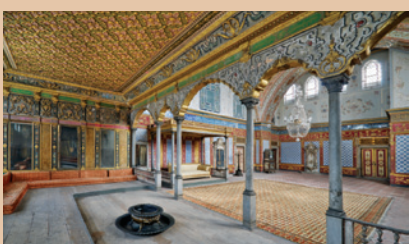
We'll lunch on the shores of Lake Albano, an extinct volcano, and linger to enjoy the scenic and historic nature of the Castel Gandolfo area before returning to the bustle of Rome.

ISTANBUL TOUR

It's impossible to describe, and has mesmerized travelers for millennia. Layered, amalgamated, flowing. Ancient and modern, secular and sacred. Plunge into Istanbul's cultural whirlwind with Bright Horizons staff, who have been there, done that.

On your itinerary: Hagia Sophia. It was the largest cathedral in the world for a thousand years, then a mosque, now a secular museum (so Istanbul). The Blue Mosque is defined by its 20,000 Iznik tiles. We'll peruse the sweets, spices, and nuts at the Spice Bazaar (A little hazelnut-pomegranate nougat, perhaps?).

Onward to our learning lab in Turkish hospitality, doing lunch at Topkapi Palace's former guard house. Then we'll immerse ourselves in the context and treasures of Topkapi, including the Treasury, Harem, and Holy Relics sections. Risking total sensory overload, we'll conclude our day at the Istanbul Archaeology Museum.



COMETS

Speaker: **Mark Bailey, Ph.D.**

Meteors, Meteor Showers, and the Draconids — Meteors or shooting stars are fragments of dust from comets, burning up in the Earth's atmosphere. The time of this lecture coincides with a predicted outburst of the annual Draconid meteor shower. It is expected that activity will increase to a peak over a 2- to 3-hour period beginning around 8pm, with up to several hundred meteors per hour possibly being seen, depending on local weather conditions. After a brief introduction to meteors and meteor storms, we go up on deck to observe the "dragon's" fiery flame.

Comets and Concepts in History — Humans have a love-hate relationship with comets. We'll look at the oldest theories of the nature of comets and the role they played in astronomy's development. Blaze a trail with Dr. Bailey through the historic observations, arguments, and theories leading to the realization that comets are largely Oort cloud products, formed with the Sun and planets 4.5 billion years ago.

The Life, Times, and Persistent Puzzles of Comets —Broaden your horizons delving into 20 years' worth of discoveries on comets and their origins — whether in the Edgeworth-Kuiper belt just beyond Neptune, the trans-Neptunian disc, or the Oort cloud. Survey the natural history of comets in the inner solar system, and discover the persistent puzzles and uncertainties in this vibrant, active field of solar-system research.

Risks Posed by Comets and Asteroids — Comets occasionally descend on the Earth with catastrophic effect. At one extreme, such impacts can change the course of evolution disrupting the normal "Darwinian" process. At another extreme, relatively small impacts may have important implications for the development of civilization. Find out how the risk of rare, high-consequence events is assessed.

EVOLUTION

Speaker: **Mohamed Noor, Ph.D.**

What is "Evolution" Anyway and Why Should I Care? — The mere word "evolution" conjures images in the public ranging from movie dinosaurs to something vaguely half-human-half-gorilla. What does the word evolution actually mean in the biological sciences, what is the evidence that it is true, and why should the general public know and care? In fact, evolution affects your everyday life, from your health to your livelihood — come learn why!

On the Origin of Species, Really — Although Darwin's book title suggested that he defined 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. Dr. Noor will talk about how species are identified (in practice and in principle), how to modern evolutionary biologists use this type of information to get a handle on how species are formed, and what questions remain.

Genetics, Genomics, and You: Don't Fear Your Genotype! — The missing element to Darwin's theory was how it worked in terms of inheritance. Genetics answered that. Today "personal genomics" issues span medical, legal, ethical, and other areas and pose big question. Get ready for discussion and a lab exercise to help understand the lingo, opportunities, and issues associated with living in the genomics era.

Life in the US Academic Sciences — What happens behind closed doors in the "Ivory Tower" of an academic scientist? Scientists at universities juggle multiple roles. What do these people actually do all day? What are these scientists trained well to do and what are areas where they really are not trained well? What is a typical career trajectory in the sciences, and how are scientists evaluated? Get an inside look from a noted academic.

ANCIENT ASTRONOMY

Speaker: **John Steele, Ph.D.**

Astronomy in Ancient Babylon —Cuneiform writing on thousands of clay tablets documents the astronomical activity of the ancient Babylonians. These texts circa the first millennium BC, include lists of astrological omens, astronomical observations, and calculations of the positions and phenomena of the moon and the planets. Join Dr. Steele to investigate the astronomical traditions of the ancient Babylonians and their invention of scientific astronomy.

Ancient Greek Astronomy — How could Ptolemy insist that the earth was the center of the Universe? The ancient Greeks didn't invent astronomy, but they were the first to combine philosophy with mathematics to model the motion of the heavens using geometry. Along the way they figured out the size of the Earth, the distance of the moon from the Earth, and developed geometrical methods for modeling planetary motion. Delve into the legacy of Greek astronomy, and trace its impact in the medieval Islamic world and Renaissance Europe.

The Antikythera Mechanism: An Ancient Mechanical Universe — In 1900 sponge divers off the tiny island of Antikythera discovered an ancient Roman shipwreck laden with works of art. Almost unnoticed were the poorly preserved remains of a small mechanical device — the Antikythera Mechanism. Through painstaking reconstruction and analysis over the past century, we now know the device was a mechanical astronomical computer of great ingenuity. Learn the story of research on the mechanism — and what it has revealed about ancient Greek science and technology.

Eclipses in History — Eclipses are one of the most awe-inspiring astronomical events. Throughout history eclipses were viewed with fear, excitement, astonishment, and scientific curiosity. Take a look at how eclipses have been observed, interpreted, and commemorated in different cultures around the world and discover how scientists today benefit from ancient eclipse records.

DRACONID METEOR SHOWER
"Every year around Oct. 8th, Earth passes through a minefield of dusty debris from Comet Giacobini-Zinner, source of the annual Draconid meteor shower. On Oct. 8, 2011, Earth will have a near head-on collision with a tendril of dust, setting off a strong outburst of as many as 750 meteors per hour. People in Europe, Africa and the Middle East will have a front-row seat for what could be the strongest shower since the Leonid storms a decade ago." From SpaceWeather.com.

ATHENS' BEST

Visit the new Acropolis Museum and the National Archaeological Museum with our skilled guide who will add immeasurably to your experience. See the Parthenon frieze, exquisite sanctuary relics, and Archaic sculpture at the Acropolis Museum. Lunch, of course, is tucked away at a taverna favored by Athenian families. For dessert, we'll visit the richest array of Greek antiquities anywhere at the National Archaeological Museum.

EPHESUS

Many civilizations left their mark at Ephesus. It's a many layered, many splendored history, often oversimplified. Bright Horizons pulls together three important elements of Ephesus rarely presented together. Meander the Marble Road, visit the legendary latrines, check out the Library, and visit the centers of the city. A visit to the Terrace Houses enlivens your picture of Roman Ephesus. Lunch on Mediterranean cuisine in the countryside, and then visit the Ephesus Museum where you get a fuller look at local history, from the Lydians to the Byzantines.

GEOLOGY

Speaker: **Michael Wysession, Ph.D.**

Changing Climates, the Black Sea Flood, and the Rise of Civilization — The philosopher Will Durant said, "Civilization exists by geologic consent, subject to change without notice." The history of climate change illustrates this richly. Dr. Wysession lays out the factors controling the climate and how climate change has been the driving factor for the course of human history. You'll get a detailed look at the Black Sea Flood of 7500 years ago, and enrich your understanding of the impact of climate change.

Santorini and the History of Megatsunamis — 3600 years ago, Thera/Santorini saw one of most powerful volcanic eruptions known, leaving just the island ring we see today, burying the Minoan city of Akrotiri under 60 feet of ash, creating a megatsunami that devastated the entire Mediterranean. The the U.S. Northwest's 1700 M-9 earthquake, Lisbon's 1755 quake, Krakatoa's 1883 eruption, and the devastating Sumatra 2004 quake created similarly catastrophic tsunamis. Survey the terrain of megatsunamis, and learn potential future tsunami triggers.

The Eruption of Vesuvius and the Impact of Volcanoes — The term "Plinian volcanic eruptions" honors Pliny the Elder who chronicled the 79 CE eruption of Vesuvius. These eruptions eject ash high in the atmosphere, having their greatest impact through global climate change. From Peru to Russia, from eruptions 74,000 BCE to the French Revolution, you'll focus on the impact of volcanos on history. Time well spent with Dr. Wysession, who keeps his eye on the Yellowstone Caldera!

Fermi's Paradox and the Likelihood of Finding Another Earth — During a discussion on the likelihood of intelligent civilizations existing elsewhere, the physicist Enrico Fermi asked "Well, where is everybody?" Geologic research shows that the conditions required for life to exist continuously for nearly four billion years are stringent, and may rarely occur in the galaxy. Learn all of the factors that had to happen just right to produce Earth's spectacular and potentially unique diversity of geologic and biologic environments.

SCIENTIFIC AMERICAN TRAVEL

BRIGHT HORIZONS