



Arecibo Observatory

Exercise your science curiosity in the surprisingly suitable Caribbean. Cast off on Bright Horizons 11 and explore a slate of science topics inspired by the islands. Based on Holland America Line's m.s. Eurodam, our community of science experts and science buffs head for tropical climes, January 14–21, 2012, round-trip Fort Lauderdale, Florida.

Take a cue from our island journey and delve into the form and function of flowers and plant evolution on islands with Dr. Spencer Barrett. Open a door to thought-provoking developments in primatology with Dr. Frans de Waal. Enjoy the fruit of crossdisciplinary work in bioarchaeology when Dr. Patrick McGovern details discoveries about ancient fermented beverages. Dr. Marc Davis guides us through physical cosmology and the latest on the search for exoplanets. Explore sun science and energy futures, and grasp "Einstein in a Nutshell" through Dr. Richard Wolfson's sessions.

We'll go behind the scenes at the Arecibo radio telescope on an optional excursion with briefings on the radio astronomy, planetary radar and climatology research there. Plus, we'll boldly go where ordinary visitors are not permitted at the telescope, using the password "Scientific American".

See what's brewing in astrophysics and climatology, primatology, botany, and bioarchaeology. Add vivid colors and beautiful beaches, elegant dining and gracious service, sunsets and fun with friends, and you have the Bright Horizons 11 picture. Please join us! For full details, email concierge@insightcruises.com or call (650) 787-5665.

Cruise prices vary from \$699 for an Interior Stateroom to \$2,699 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 \$183.80 per person. **For more info please call 650-787-5665 or email us at Concierge@InSightCruises.com**



Holland America Line



PRIMATOLOGY

Speaker: Frans B.M. de Waal, Ph.D.

A Darwinian View of the Moral Emotions in Man and Animals

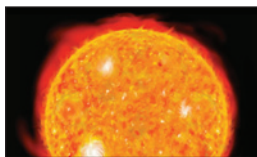
Thomas Huxley held that we are born nasty and selfish. Charles Darwin differed, believing in continuity between animals' social instincts and human morality. Learn how modern psychology and neuroscience support Darwin's view. Join Dr. de Waal and review the evidence supporting the view that the building blocks of morality are older than humanity.

On the Possibility of Animal Empathy

Learn about expressions of empathy in animals. Dr. de Waal will present a "Russian doll" model of how animals perceive others. This model permits responses to be geared specifically to the other's situation, thus increasing the effectiveness of sympathetic support, care, and reassurance, as observed in dolphins, apes, and elephants. Absorb primatology's observations of emotionally mediated interactions, and explore the latest thinking on animal empathy.

What Primates Know About and Learn From Each Other

Primates live in complex societies in which they compete, try to become dominant, but also help friends and kin. We'll take a look at recent experiments on the role of policing by high-ranking peacekeepers, how primates distinguish gender, and what primates learn from each other. Delve into the up and coming field of "cultural primatology" and find out about the surprising foundations of primate societies.



ASTROPHYSICS, ASTRONOMY, AND RELATIVITY

Speakers: Richard Wolfson, Ph.D., Marc Davis, Ph.D.

Einstein in a Nutshell

Does it "take an Einstein to understand" Einstein's ideas? No! Einstein's theory of relativity is based on an idea so simple it can be stated in a single English sentence. From that simple idea follow conclusions that have revolutionized our notions of space, time, and causality. Learn how the seemingly bizarre and sometimes paradoxical results of relativity are logical consequences of the theory's underlying simple principle.

The Search For Exoplanets

In the past decade research has shown that planets are very common to stars like our own. Take an in depth look at the major research being done by NASA's Kepler spacecraft. Learn how the Kepler, Spitzer, and Hubble programs differ in their search for exoplanets.

Gravitational Lensing

A 1918 solar eclipse made Einstein a celebrity when it confirmed his prediction that the

sun can bend light, now called gravitational lensing. Dr. Marc Davis will present the basics on gravitational lenses, relate the discoveries they've facilitated and show some fabulous examples of this phenomenon.

Galaxies and the Clustering of Galaxies

Survey the cosmic terrain and the large-scale structure of the universe. Get a handle on landmarks such as the Great Wall and the gigantic clusters of galaxies connected to each other by huge filaments and voids. How did this structure originate? With Dr. Davis as your guide you'll get a grasp of the surprising cosmography of the universe.

Why Does Our Universe Have a Beginning?

We know that the universe is 13.7 billion years old. Why is it that old? Why does it have a beginning? The best answer, Inflation, is so convincing that all cosmologists believe in Inflation, in spite of its speculative nature. Learn about Inflation's support and the alternative theories so you can enjoy the confirmations and developments to come.

Wild Sun!

Our Sun seems a stable, reliable star, but actually seethes with activity. Violent eruptions send high-energy particles into interplanetary space. These solar storms damage satellites and disrupt communications and terrestrial power systems. New spacecraft offer an unprecedented look at our star's activity. Explore new discoveries about the Sun and about the intimate link between Sun and Earth that recent imaging and technology advances have made possible.



THE ANCIENTS AND CHEMISTRY

Speaker: Patrick E. McGovern, Ph.D.

Uncorking The Past: The Quest For Wine, Beer, and Extreme Fermented Beverages

Drawing upon recent archaeological discoveries, molecular and DNA sleuthing, and the texts and art of long-forgotten peoples, you'll take an in-depth look at the archaeological study of ancient fermented beverages, from residues on a potsherd to laboratory analyses to commercial re-creations of ancient brews. You'll gain a renewed appreciation of fermented beverages' role in the world's collective heritage.

Royal Purple: The Dye of Gods And Kings

Enter a mythical past with Dr. Patrick McGovern, and explore the most valuable dye of antiquity, Royal Purple. The story is about chance discovery and pioneering biomolecular archaeological investigation in producing direct chemical documentation of true molluscan Purple. You'll learn how intense interdisciplinary research illuminated a luxury product of antiquity, whose color still captivates.

The First Wine: An Archaeochemical Detective Story

Grape wine, the premier fermented beverage of Mediterranean and Near Eastern civilizations with its medicinal benefits and psychotropic effects, was discovered early in human prehistory. Biomolecular archaeology now reveals the beginnings of the Near Eastern "wine culture" and how wine eventually

spread worldwide. See wine as an element of religions, socio-economies, cuisines, and pharmacopoeias of the ancient world.

Ancient Beer: A Global Perspective

Beer powered the ancient world from Africa's millet and sorghum beers, to the Middle East where barley and wheat beers were kings, to east Asia's rice beers. Join Patrick McGovern and discover the significant role beer played in societies worldwide, and the laboratory science that confirms and ties together historical aspects of beer.



BOTANY

Speaker: Spencer C.H. Barrett, Ph.D.

Plant Sex Made Easy

Flowering plants display spectacular floral diversity and complex sex lives. Knowledge of plant reproduction is crucial for understanding plant breeding and biotechnology, conservation biology, and genetically modified crops. Plant sex is fascinating — learn its evolution, details and implications for daily life.

Darwin's Legacy: the Form and Function of Flowers

Charles Darwin studied floral biology for over 40 years. Many of Darwin's insights, gained from careful observations and experiments on diverse species, remain remarkably relevant and have stimulated current research on floral function and the evolution of mating systems. Discover a key yet lesser known aspect of Darwin's studies, updated.

Plant Evolution on Islands

Why do islands provide such a rich source of biological novelty for evolutionary enquiry? Learn the answers when we look at characteristic features of plant species on islands

and compare the reproductive biology and genetics of island and mainland plant populations. Find out about the problems that are faced by plants that colonize and persist on islands.

Plant Invasions — More Than Just a Nuisance

Biological invasions cause huge economic losses and are also a major threat to biodiversity and ecosystem function. Where do plant invaders come from, what are their characteristic features and how best can we control them? Hear how the latest research is making progress toward protecting the environment and containing the risks of plant invasion.



ENVIRONMENTAL SCIENCE

Speaker: Richard Wolfson, Ph.D.

Global Warming: State of the Science

The first decade of the 21st century was the warmest since record keeping began in the mid-nineteenth century — and probably of the past two millennia. Observations and modeling suggest the dominant cause of this warming is human activity. Get the latest evidence for human-induced global warming, explore the science behind our changing climate, and learn scenarios for possible climate futures.

Energy Futures

Most of humankind's energy comes from fossil fuels — which are running out and which damage our planet. We face the monumental task of reshaping our energy system to run on sustainable sources that inflict less environmental harm. We'll assess current patterns of energy use and how we got here, and then take a realistic look at sustainable energy futures.



SCIENTIFIC AMERICAN Travel HIGHLIGHTS



ARECIBO OBSERVATORY

Explore the contributions and potential of radio astronomy at the celebrated Arecibo Observatory. Get an unparalleled behind-the-scenes tour of the iconic facility, and absorb an in-depth look at the unique contributions derived from Arecibo research and development.

Join us as we wind through the rainforest-blanketed karst terrain of Northern Puerto Rico. We'll get a sense of the massive physical scope of the Arecibo radio telescope. We'll boldly go where ordinary visitors are not permitted. NAIC scientists will update us about the radio astronomy, planetary radar discoveries, and climatology research at the observatory. From the monitoring of near-earth objects to cosmology, astrophysics, and global warming research, you'll gain insight into the vital activities at Arecibo. This \$275 optional six-hour tour includes transportation, lunch, and entrance fees.



NASA'S KENNEDY SPACE (KSC) CENTER

NASA's launch headquarters, on the Space Coast, is the only place on Earth where you can tour launch areas, meet a veteran astronaut, and grasp the true enormity of the Space Program. Experience fun and wonder with Bright Horizons companions in this private pre-cruise, custom, full-day tour. Get ready to walk among and beneath giant rockets, discover what it takes to launch the Space Shuttle from preparation to liftoff, and soak in Kennedy Space Center's "The Right Stuff" vibe.

The KSC excursion is \$575 pp and includes all of the above plus breakfast, lunch, and dinner; one-night hotel; and transportation to/from the KSC to our hotels in Ft. Lauderdale.

