



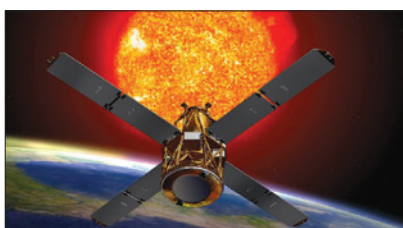
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Escape to the Baltic for midnight sun and fresh scientific finds. Call on Cold War hotspots and put the Iron Curtain in context. Satisfy your curiosity about this historically and culturally rich region on Bright Horizons 21's cruise conference aboard Holland America's Eurodam, roundtrip Copenhagen Denmark, May 23rd – June 4th, 2014. Share your appreciation for science and explorer's perspective with kindred spirits.

Warm up to solar science. Absorb practical perspectives on plant biology. Learn all about "nothing," as pondered in physics. Delve into the history of polar science. Explore the mechanics and ethics of robotics. Along the way, savor the serene beauty of the Stockholm archipelago, the Baltic's cultural abundance, and northern summer's White Nights.

Deep complex history, classic design, compelling science, and distinctive cuisine add up to an experience that will stay with you. Reserve now and let us make simple, seamless arrangements for you and a friend. For full details, visit [www.InsightCruises.com/SciAm-21](http://www.InsightCruises.com/SciAm-21) or contact [Concierge@InsightCruises.com](mailto:Concierge@InsightCruises.com).

Cruise prices vary from \$1,999 for an Interior Stateroom to \$5,399 for a Neptune Suite, per person (pp) based on double occupancy. For those attending our Program, there is a \$1,575 fee. Add'l. pp fees: gov't. taxes and fees (\$339), booking service fee (\$149), and gratuities (\$11.50/day). The Program, cruise pricing, and options are subject to change.



### Astronomy

Speaker: John Brown, Ph.D.

#### Our High Energy Sun

Eruptions on the sun are dramatic events that have consequences on Earth, such as aurorae (Northern and Southern Lights), as well as disrupted power grids and satellite communications. Learn about the solar science advances that were enabled by NASA's RHESSI spacecraft from the mission's U.K. co-investigator.

#### Comet-Sun Impacts

The sun is continually pummeled by impacting cosmic debris, and has close encounters with more than 100 comets a year. Learn how these sun-plunging supersonic snowballs interact with the Hellish conditions near the sun, and the possible terrestrial consequences of a large comet-sun impact.

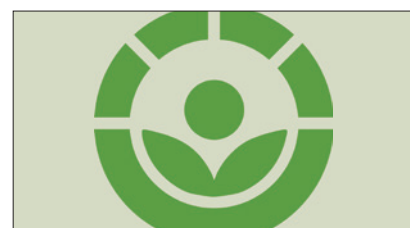
#### Gravity, Black Holes & White Rabbits

Through the lens of magic tricks, learn what gravity is and how it affects the universe, particularly black holes — the strongest sources of gravity and the most bizarre objects in the cosmos. We'll explore space-time distortion, gravitational lensing, Hawking radiation, multiverse creation, and other cosmic mysteries.



### A Historical Tour of Scottish Astronomy

The Scots and their ancient ancestors have recorded aspects of the sky since before the pyramids of Egypt. We'll discuss highlights from the work of some early great astronomers, such as James Gregory, Alexander Wilson and others, and explore the great modern astronomical heritage they created.



### Plant Biology

Speaker: Daniel Chamovitz, Ph.D.

#### What a Plant Knows

Take a captivating journey into the sensory lives of plants, and discover the surprising similarities between humans and green, leafy organisms. Highlighting the latest research in plant science, we'll look into the sensory lives of different types of plants, and even consider whether plants are aware.

#### Hunger and the Quest to Feed the World

More than half of the world's population suffers from some form of food insecurity. Rapid increases in global population, increased demand for food, and dwindling agricultural resources have put critical strains on our ability to feed the world. We'll examine the problem and some ideas to address it.

#### A Rational Look at GMO Food

Many of us are concerned by food labeled "GMO." But is GMO food inherently inferior to organic food? We'll examine what happens when GMO technology turns plants into factories, and delve into the scientific basis of genetic engineering with a view toward how it influences our lives.

## The Scientific Life

Hear the story of a life in science from a researcher who started as a graduate student studying beta-carotene in bacteria, and became director of an institute trying to solve issues of world hunger. Learn about the hypotheses that have powered the science throughout, and the experiments and findings behind them.



## Theoretical Physics

Speaker: Frank Close, Ph.D.

### Antimatter: Facts and Fiction

The Big Bang produced matter and antimatter in equal amounts, yet there is very little antimatter in our universe. Where has all the antimatter gone? Could antimatter solve the world's energy problems, or even make the ultimate weapon of mass destruction? The answer to both questions is no — learn why.

### Nothing: Mysteries of the Vacuum

If you take away the Earth, moon and stars, what remains? The concept of the void — nothing — has alarmed and fascinated humans from the dawn of time. We'll move from the philosophical speculations of early civilizations to the cutting edge thinking of modern science to ask: Can we understand nothing?

### Neutrino: Ghost Particle of the Cosmos

Ghostly neutrino particles stream through Earth by the billions as if it wasn't there. This is the story of how these extraordinary particles were sought and found — a story of heroic endeavor, of lifetimes spent chasing the near-impossible — and the scientific revelations neutrinos have enabled.

### A Lopsided Universe

Nature produces structured asymmetric patterns prolifically: Even human life is lopsided, with spherical embryos somehow giving rise, ultimately, to creatures whose inner organs are asymmetric. This is the story of a quest for the origins of structure in nature, which has culminated in the discovery of the Higgs Boson particle.

### The Story of the Higgs Boson

Roughly 50 years ago a new theory of the basic structure of matter was inspired by the work of Peter Higgs and others. In July 2012, Higgs's boson was finally found. Hear the story behind this amazing discovery, and delve into the ideas that inspired it.



## History of Science

Speaker: Edward Larson, Ph.D.

### Scientific Exploration of the Arctic

Scientists and geographers knew virtually nothing about the Arctic until 150 years ago, when Fridtjof Nansen and his protégé Roald Amundsen became legends by exploring this mysterious territory. While cruising through the beginning of the Arctic in Scandinavia, we'll follow their exploits as they opened the Arctic for science.

### Amundsen, Scott, and Science in the Antarctic

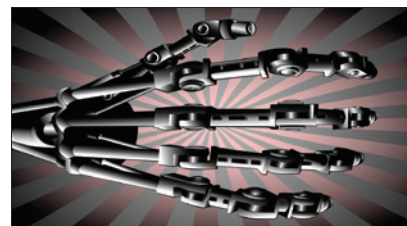
The Antarctic was a mystery to humanity until the Royal Society-backed expeditions of Robert Scott and Ernest Shackleton, followed by Roald Amundsen's entry in the field. We'll follow the adventure and the science of the early research at the South Pole.

### The Evolution Controversy

Creationism has changed, creationists say, but has it? Rooted in supposed biblical truths, almost by definition creationism cannot evolve, but creationist tactics do. We'll explore the world of modern creation science, intelligent design, and the 21st-century American battle over teaching evolution.

### The Neo-Darwinian Synthesis

Charles Darwin was central to the story of modern evolutionary theory, but he wasn't its founder. We'll trace this grand breakthrough from Lamarck and the dawn of evolutionary science through Darwin to the modern neo-Darwinian synthesis of the 1930s, when genetics finally explained how evolution operated.



## Robotics

Speaker: Alan Winfield, Ph.D.

### Robotics: The State of the Art

Robots are moving out of factories and into homes, hospitals and offices. Robots are now mobile and working alongside humans. We'll delve into the state-of-the-art in intelligent robotics, defining what a robot is through examples from current research. Learn how the latest robots differ drastically from earlier generations.

### A Brief History of Robotics

Trace the history of robotics from Classical Greece to the modern day, from Aristotle's early reference to the idea of an intelligent tool that could replace human labor, to Leonardo da Vinci's programmable automata, and W. Grey Walter's 1940s robot "tortoises," regarded as the first autonomous electronic mobile robots.

### Robot Ethics

Like any transformative technology, intelligent robotics has the potential for huge benefit, but is not without ethical or societal risk. We'll explore whether there are situations where robots should be banned, and the issue of whether intelligent robots themselves could or should be ethical.

### The Thinking Robot

Could robots ever truly think like humans, or have feelings? We'll explore how intelligent present-day intelligent robots really are, and the future prospects of designing robots that not only have increased abilities, but also have a sense of self.

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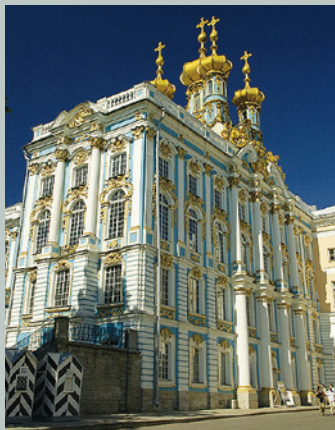
Travel

HIGHLIGHTS

ST. PETERSBURG

MAY 26 & 27

Plan to visit the Pushkin Museum, the Hermitage Museum, and Peterhof Palace.



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