

SOLAR SCIENCE

Speaker: Pål Brekke Ph.D.

A Cosmic Voyage Through the Universe

Since the ancients' observations and Galileo's discoveries, humans have been driven to explore the universe. Deep-space finds by sophisticated telescopes and satellites stoke our curiosity. Using imagery from modern space-based telescopes, take a cosmic journey. We'll boldly go where new solar systems are born and visualize black holes, neutron stars, and supernovas.

The Stormy Sun — How Does it Affect our Technology Based Society?

100 years ago, solar storms occurred without humans noticing the damage they caused. Today with satellite systems, GPS, and electrical grids vulnerable to solar weather, it's a different story. Learn about the impact of solar weather activity as well as forecasting, early-warning, and prediction resources. Find out what's hot in sun science!

The Northern Lights: A Message from the Sun

What is more beautiful than the aurora borealis dancing across the sky? Spanning the myths and modern science behind the northern lights, we'll discuss coronal mass ejections, the magnetosphere and solar wind, and the Earth's magnetic field and solar particles. Learn where to see this phenomenon that has fascinated through the ages, and how to predict its appearances.

Does the Sun Contribute to Climate Change?

In the last 150 years the Earth has warmed ~0.7°C. In the same period both concentrations of atmospheric greenhouse gases and the level of solar activity increased. Related phenomena? It's not a trivial task to untangle the two. Dr. Pål Brekke summarizes current understandings and discusses his opinion that the future holds surprising answers on why solar activity varies and the relationship of solar activity and Earth's climate.

ALPINE ARCHAEOLOGY

Speaker: Patrick Hunt, Ph.D.

Medicine in the Ancient Western World

What is the the most profound secret about medicine in the ancient world? Arguably, that while deep superstition and ignorance were elements of medicine in antiquity, logic and rationality entered medical practice early on. Egypt, Mesopotamia, Greece, and Rome have long medical traditions. Hear how significant aspects of ancient medicine are surprisingly familiar.

Science in Archaeology: New Perspectives on Old Problems

Ötzi the Iceman was discovered as a frozen 5300 year-old "ice mummy," high in the Alps in 1991. Through Ötzi's case learn how forensic investigations in microbiology, chemistry, physics, and geology help bring ancient wonders to life.

Four Horsemen of the Apocalypse: Climatic Problems, Famine, Disease, War, and Mass Death in History

Human history records apocalyptic cycles of connected catastrophes through environmental or human causation. Through such disasters, humans have always been susceptible to food-supply famine, which brings malnutrition and at times disease. Dr. Hunt discusses history and current work on paleoclimatic environments as a potential model for understanding the multifactorial and interconnected nature of the impact of global warming. Learn why and what big-picture thinking is required.

Tracking Hannibal

Where did Hannibal lead 38,000 infantry, 8,000 cavalry, and 37 war elephants through the Alps in 218 BCE? The mystery of Hannibal's route has consumed archaeologist Patrick Hunt for over a decade. Hear about Dr. Hunt's quest for the route, using scientific, satellite imaging and historical materials, and his own hair-raising explorations of the Alpine passes.

Curious how magic works? Ready to absorb the latest science, without distraction? Join Scientific American for current science and immersion into German culture and scenic beauty, on a river cruise sailing from Amsterdam, The Netherlands to Basel, Switzerland on AMA Waterways's AmaCello, April 12–20, 2012. Particle physics, cognitive neuroscience, solar science, and alpine archaeology are on our itinerary, along with medieval German cities and Strasbourg, France.

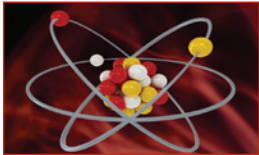
Take a close look at sensory perception and visual illusions. Dig into medicine in the ancient world and the interplay of natural and physical sciences in archaeology. Illuminate the profound Sun-Earth connection. Capture evolving thought in subatomic physics. You can lose yourself in the rich intricacies of science while the AmaCello and its English-speaking staff provide gracious service, comfortable quarters, and superb regional cuisine.

Bright Horizons 12 offers distilled cutting edge science and local brews together with long awaited relaxation with good friends. You can add even more Aha! moments to your itinerary with an optional post-cruise excursion to CERN, or find your inner Parisian on an optional 1, 2, or 3-day post-cruise visit to the City of Lights.

Game for fine times on the Rhine? Visit InSightCruises.com/SciAm-12 or call our Concierge at 650-787-5665 for the full scoop. Make your reservation now, as capacity is limited.

The cruise fare is approximately \$3,674 for either a Category A or B cabin, per person. The Bright Horizons Program costs \$1,195. Taxes and fees are \$199 per person. Gratuities are €105. Program subject to change. **For more info please call 650-787-5665 or email us at Concierge@InSightCruises.com**





PARTICLE PHYSICS

Speaker: Frank Linde, Ph.D.

Quantum Questions

Welcome to the world of the infinitely small and the weird phenomena that come with it, like slow-running clocks and anti-particles. Dr. Linde leads us through the discoveries, concepts, and studies in the puzzling world of quantum mechanics in a session certain to spark your curiosity about the paradoxes and possibilities quantum physics poses.

Past and Present at CERN

To orient us to the Large Hadron Collider (LHC)'s significance, Dr. Linde recaps the highlights of CERN's "low energy" LEP accelerator which studied the Standard Model of particle physics. Learn how physicists think the LHC experiment will address current challenges in particle physics: the origin of particle masses; the mystery of dark matter and the apparent absence of antimatter in our everyday life.

Particle Physics Matters

What has particle physics done for you today? Dr. Linde discusses the societal benefits of his research. Learn how the particle physics field leads to the development of novel technologies and applications in medicine, information technology, energy, finance and commerce, and more. Find out how basic particle research, whose significance might not be obvious, touches on all our lives.

Astroparticle Physics

Parked at the intersection of particle physics, astronomy, and cosmology, astroparticle physics is evolving rapidly. Dr. Linde guides you through the strange terrain of astroparticle physics research rooted at CERN. Hear how deep-sea neutrino telescopes search for ripples in the space-time fabric itself and how huge cosmic-ray observatories are seeking answers to the big questions.



COGNITIVE NEUROSCIENCE

Speakers: Stephen Macknik, Ph.D. & Susana Martinez-Conde, Ph.D.

How the Brain Constructs the World We See

All our understandings of our life experiences are derived from brain processes, and are not necessarily the result of an event in the real world. Neuroscientists are researching the cerebral processes underlying perception to understand our experience of the universe. Discover how our brain constructs, not reconstructs, the world we see.

Windows on the Mind

What's the connection behind eye movements and subliminal thought? Join Drs. Macknik and Martinez-Conde in a look at the latest neurobiology behind microsaccades: involuntary eye movements that relate to perception and cognition. Learn how microsaccades suggest your bias toward certain objects, their relationship to visual illusions, and the pressing questions spurring visual neurophysiologists onward.

Champions of Illusion

The study of visual illusions is critical to understanding the basic mechanisms of sensory perception, and helps with cures for visual and neurological diseases. Connoisseurs of illusion, Drs. Macknik and Martinez-Conde produce the annual "Best Illusion of the Year Contest". Study the most exciting novel illusions with them, and learn what makes these illusions work.

Sleights of Mind

Magic fools us because humans have hardwired processes of attention and awareness that are hackable. A good magician uses your mind's own intrinsic properties against you. Magicians' insights, gained over centuries of informal experimentation, have led to new discoveries in the cognitive sciences, and also reveal how our brains work in everyday situations. Get a front-row seat as the key connections between magic and the mind are unveiled!



SCIENTIFIC AMERICAN Travel HIGHLIGHTS



PRIVATE, INSIDER'S TOUR OF CERN

April 20, 2012 — From the tiniest constituents of matter to the immensity of the cosmos, discover the wonders of science and technology at CERN. Join Bright Horizons for a private post-cruise, custom, full-day tour of this iconic facility.

Whether you lean toward concept or application there's much to pique your curiosity. Discover the excitement of fundamental research and get a behind-the-scenes, insider's look of the world's largest particle physics laboratory.

Our full day will be led by a CERN physicist. We'll have an orientation; visit an accelerator and experiment; get a sense of the mechanics of the large hadron collider (LHC); make a refueling stop for lunch; and have time to peruse exhibits and media on the history of CERN and the nature of its work.

This tour includes: • transfer from Basel (end of cruise) to our Geneva hotel (April 19) • hotel (3 nights) — the nights of April 19, April 20, and April 21 • full breakfasts (3) — April 20, 21, and 22 • transfer from hotel to CERN and back to the hotel on April 20 • lunch at CERN • cocktail party the evening after our visit to CERN (April 20) • free day in Geneva; transfers to/from downtown provided (April 21) • transfer to airport for return home (April 22)

The price is \$799 per person (based on double occupancy). This trip is limited to 50 people. NOTE: CERN charges no entrance fee to visitors

INSIDER'S TOUR OF THE MPIA

Private tours of Max Planck Institute for Astronomy (MPIA) and the newly opened Center for Astronomy Education and Outreach on April 16, 2012 (mid-cruise) (\$275 pp, includes elegant lunch)

We'll board a bus to Heidelberg right after breakfast. Our tour will include a visit to the Max

Planck Institute for Astronomy, a presentation at the Center for Astronomy Education and Outreach including a planetarium show about the latest astronomical research done in Heidelberg, followed by a brief visit to the historical instruments of the Landessternwarte founded by Max Wolf in 1898. We'll conclude our excursion with a memorable lunch in downtown Heidelberg.



A FULL DAY IN AMSTERDAM

What makes Amsterdam a perennial favorite? InSight Cruises invites you to find out on a private, full-day tour of "the Venice of the North". Discover the unique charms of Amsterdam as you get oriented with a coach tour of cultural touchstones. Then anchor your vacation album with images from your cruise through the city's tree-lined UNESCO World Heritage canals, getting a superb view of 17th century gabled homes, old bridges, and bicycles and more bicycles. We focus on the finest, savoring an Old Dutch welcome and contemporary cuisine at one of Amsterdam's best restaurants, and then paint ourselves into the scene at the Rijksmuseum with a visit to "The Masterpieces" exhibit. Start your Bright Horizons memories and fun and join us! \$275 pp.