The opera *Laika the Spacedog* will tell the story of the first animal to be sent into orbit.

LISTINGS

Hot tickets for 2013 in science and art

This is your year if you want to rub shoulders with canine cosmonaut Laika or astronomer Galileo Galilei; travel through time, oscillate, get lost in a fog sculpture or ponder extinction; or listen to sound projected through liquid nitrogen. **Jascha Hoffman** offers his top tips on science's cultural calendar.

Laika the Spacedog
Science Museum, London
22–25 January (then on tour)

Canine cosmonaut Laika was the first animal launched into orbit, in 1957. This "highly interactive" opera about the Soviet pooch is intended to galvanize science-hungry schoolchildren. Physical forces, the Solar System, rocket science and health are explored through singing, animated film, puppetry and live action in this English Touring Opera production, with music by Russell Hepplewhite and lyrics by Tim Yealland. There is even a chance to play a theremin. A happy ending may not be in the offing, however: a victim of the space race between the Soviets and Americans, Laika died in orbit.

A Life of Galileo
Swan Theatre, Stratford-upon-Avon, UK
31 January to 30 March

Bertolt Brecht's masterly evocation of science at bay, *A Life of Galileo*, gets the Royal Shakespeare Company treatment in this new production. Current writer-in-residence Mark Ravenhill has penned a fresh translation of the seventeenth-century physicist–philosopher's grim battles with the Church over heliocentrism. Ian McDiarmid takes the title role; Roxana Silbert directs. Ravenhill, whose debut was *Shopping and Fucking* (1996), is unabashedly political, so the Marxist tones of Brecht's work may be writ large.

JUDE MUNDEN

MICHAEL HANNA

OSCILLATOR
Science Gallery, Dublin
7 February to 14 April

Circadian rhythms, resonating bridges, erupting geysers and volatile markets — Dublin's dynamic Science Gallery kicks off its 2013 season with an exploration of oscillation, including cultural fads that cycle in and out of vogue. Curator is media artist Douglas Repetto, founder of the worldwide network Dorkbot, which brings together artists, designers, scientists and innovators working in electronic art. Dizzy visitors may realize that everything comes in waves — even shows such as this one, which makes way for exhibitions on risk, illusion and synthetic biology later in the year.

Extinction: Not the End of the World?
Natural History Museum, London
8 February to 8 September

The main hall of London's iconic Natural History Museum is dominated by the 26-metre-long cast of a fossilized *Diplodocus* skeleton. Hundreds of the taxidermied beasts that throng its rooms, imprisoned in cabinets, are gone for good outside its walls. So the museum is the ideal spot to explore extinction, the subject of this major show. It will pull together images and specimens of species already lost, as well as those teetering on the brink, to probe issues around how human exploitation and other factors have depleted the variety of life.

NATURAL HISTORY MUSEUM

The Medici: People, Power and Passion
The Reiss-Engelhorn Museum, Mannheim, Germany
17 February to 28 July

Some of the most sumptuous art of the Italian Renaissance was bankrolled by the Medici — and the dynasty also supported science for centuries. Members of the illustrious clan backed the likes of Galileo Galilei and contributed to natural history, medicine and applied mathematics. When the last of the ducal line, Anna Maria Luisa de Medici, died in 1743, she bequeathed to the city of Florence the family treasures — and,

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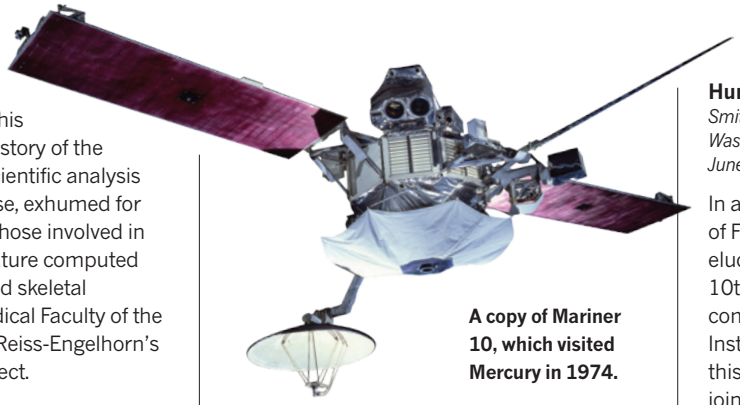
NATIONAL AIR AND SPACE MUSEUM, SMITHSONIAN INSTITUTION



A copy of Mariner 10, which visited Mercury in 1974.

unwittingly, a marvel of a different sort to posterity. This exhibition on the cultural history of the Medici will showcase the scientific analysis of Anna Maria Luisa's corpse, exhumed for the purpose in late 2012. Those involved in the project — which will feature computed tomography animations and skeletal remains — include the Medical Faculty of the University of Florence and Reiss-Engelhorn's own German-Mummy Project.

Time and Navigation: The Untold Story of Getting from Here to There
Smithsonian National Air and Space Museum, Washington DC
Opens 29 March

Timekeeping has been essential to navigation since the eighteenth century, when British carpenter John Harrison invented a clock accurate enough for sailors to determine their longitude using deviations in the positions of celestial bodies. And it is still a necessity in the age of the Global Positioning System; atomic clocks in orbiting satellites must be synced to within nanoseconds to allow mobile phones to triangulate their position. This exhibition, a collaboration between the Smithsonian Institution's National Air and Space Museum and National Museum of American History, takes in the history of navigation with an emphasis on timekeeping. It features the clock Charles Lindbergh used to navigate the *Spirit of St Louis* across the Atlantic in 1927; a spacecraft whose navigation system propelled it to Mercury in the 1970s using the gravity field of Venus; and a self-navigating Volkswagen named Stanley.

Margaret Guthman Musical Instrument Competition
Georgia Institute of Technology, Atlanta
11–12 April

This competition at Atlanta's public-research hotspot offers US$10,000 in prizes for innovations in "musicality, design and engineering". Winning entries in years past have included a device that turns everyday objects such as a whisk into musical instruments and a vintage slot machine by Berlin-based artist Christian Graupner and partners that allows players to remix musical video clips into an "audio-visual triptych". This year's judges (among them Berkeley computer musicologist David Wessel and performance artist Laurie Anderson) will face hard choices, if last year's inventions are anything to go by. Those included the textile-based *Audio Skin* and the *Resistor JelTone*, a part-edible toy piano by NYC Resistor, the New York-based hacker collective.

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Exploratorium
New building at Pier 15, San Francisco, California
Opens 17 April

When it was opened in 1969 by physicist Frank Oppenheimer, who worked on the Manhattan Project with his better-known brother, Robert, the Exploratorium was one of the first museums to favour an interactive science education. Now, as it relocates to the city's waterfront, the Exploratorium is expanding its artist-in-residency programme through its new Center for Art & Inquiry. The museum will unveil site-specific works, including an Aeolian, or wind, harp by Doug Hollis that plays the breezes from the bay between Piers 15 and 17, and a 'fog sculpture' by Japanese artist Fujiko Nakaya.

Human Genome exhibition
Smithsonian National Museum of Natural History, Washington DC
June 2013 to June 2014

In a year that sees both the 60th anniversary of Francis Crick and James Watson's elucidation of DNA's structure and the 10th anniversary of the human genome's complete decoding, the Smithsonian Institution in is pulling out all the stops. For this exhibition, its natural history museum joins forces with the National Human Genome Research Institute in Bethesda, Maryland, to explore what the genome is, what it tells us and how this information could revolutionize health care and our understanding of our place in the world. After its time on the National Mall, the show will travel around North America.

Ars Electronica Festival
Linz, Austria
Early September

Founded in Linz in 1979, Ars Electronica has long been the festival at the cutting edge of electronic art. Over the years it has expanded from galleries and conference halls to tunnels, factories and even a nearby monastery in its effort to bring technology-driven art to the public. This year, the festival teams up with the budding artist-in-residence programme at particle-physics powerhouse CERN, near Geneva in Switzerland, to premiere a new installation by US sound artist Bill Fontana. Mimicking the protocol of a scientific experiment, Fontana will project short bursts of sound through various substances — air, water, liquid nitrogen and metal, for example — to compare their speed of conduction and sonic properties.

Large Hadron Collider
Science Museum, London
8 November 2013 to 30 April 2014

After last year's thrilling announcement of the discovery of a Higgs boson, it was inevitable that the Large Hadron Collider, built and operated by some 10,000 scientists and engineers, would earn its own exhibition. When the travelling show debuts at London's Science Museum, visitors will see the small bottle of hydrogen gas that fed protons into the 27-kilometre accelerator at CERN, the world's largest particle-physics laboratory, near Geneva in Switzerland. Also on display will be a giant superconducting magnet used to bend the particle beams, which approach the speed of light, and historical devices such as the apparatus that led to the discovery of the electron in 1897.

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