

INSPIRING GENERATIONS THROUGH KNOWLEDGE AND DISCOVERY

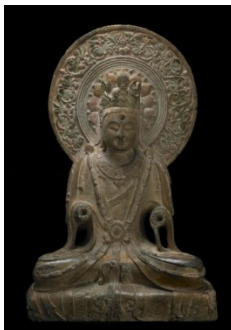
Highlights of New Discoveries and Research Initiatives

The work of Smithsonian curators, historians, and scientists is essential to the Institution's ability to meet the four grand challenges of the Smithsonian Strategic Plan: understanding and sustaining a biodiverse planet, unlocking the mysteries of the universe, valuing world cultures, and understanding the American experience. The following highlights some of the many new discoveries, research programs, and initiatives.

VALUING WORLD CULTURES

Report on the WWII-Era Provenance Research Seminar

As part of the Smithsonian's on-going World War II-era Provenance Research Initiative, dedicated to collection research and training, the Smithsonian co-organized a two-day seminar, "A New Era of Collaboration and Digitized Resources: World War II Provenance Research Seminar," in May 2011, in partnership with the United States National Archives, the Association of Art Museum Directors, and the American Association of Museums, with additional support provided by the Samuel H. Kress Foundation and James P. Hayes. The seminar highlighted the enormous progress in recent years to increase access to materials and documents pertaining to cultural objects looted during the Second World War. More than 150 people attended from 60 museums, 34 states, and ten European countries. Curators, registrars, provenance researchers, and others interested in the processes of archival research learned about new electronic tools, collaborative exchange projects, and strategies for provenance research.



Xiangtangshan: Tomb Sculpture from 6th century China

The current exhibition at the Arthur M. Sackler Gallery, *Echoes of the Past: The Buddhist Cave Temples of Xiangtangshan*, represents an international collaborative project linking the Smithsonian with the University of Chicago, Peking University, and the caves site team in Hebei province, China. Co-organized with the Smart Museum of the University of Chicago, this monographic show was inspired by efforts to reconstruct the most important Northern Qi Buddhist cave site in China (550 – 577), which was severely damaged in the early twentieth century when scores of figures and fragments were removed from the caves to be sold on the international art market.

Haiti Cultural Recovery Project

National Museum of African Art (NMAfA) educator Deborah Stokes traveled to Haiti to further the outreach and sustainability of NMAfA's exhibition, *The Healing Power of Art: Art Work by Haitian Children After the Earthquake* which was on view at the Smithsonian through February 27, 2011. Ms. Stokes delivered the thousands of

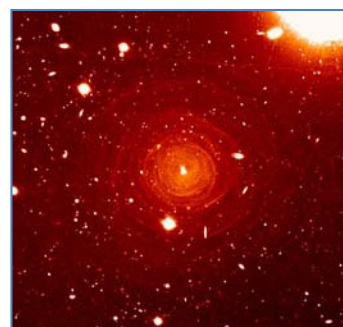
messages and drawings collected during the exhibition's run to the Haitian children. They will be used as the kick-off for the Plas Timoun Foundation whose mission is to continue vital therapeutic work through the arts.

UNLOCKING THE MYSTERIES OF THE UNIVERSE

The rich chemistry around an evolved star helps the Smithsonian Astrophysical Observatory strengthen its understanding about the origin of molecules in space.

Over 170 molecules have been detected in space, from simple diatomic molecules such as carbon monoxide to complex organics with over 70 atoms, fullerene. These molecules play a critical role in the development of molecular clouds as they form new stars and planetary systems, and of course in the chemistry that later develops on the surfaces of planets. A major challenge in modern astronomy is to determine the origin of the molecules. The variable star CW Leo is one of the brightest objects in the sky as seen from Earth. It shines mainly in the infrared (not optical) because the star is surrounded by a dense cloud of dust and gas that it ejected in a late stage of its evolution; that dust blocks the optical light. The dusty material had long been known to be rich in carbon-bearing molecules. Smithsonian Astrophysical Observatory astronomers used the Submillimeter Array (SMA) to study CW Leo in an effort to detect and characterize as many molecules in the star's envelope as possible.

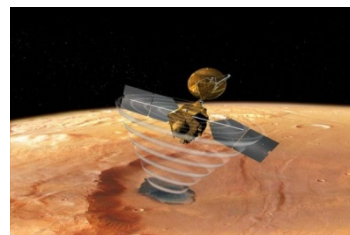
The scientists report an amazing 442 spectral lines from their survey, more than 200 of which detected here for the first time in any astronomical source. In addition to measuring the strengths of the lines, the SMA measures the shapes of the lines to reveal the motions of the molecules responsible for emitting them. The SMA survey also obtained pictures of the diffuse nebosity around the star in the light of each of the molecular species. The new results provide a remarkable view of the rich chemistry around this nearby star, and help to strengthen the conclusion that many complex molecules trace their origin to the envelopes of evolved stars.



An optical image of the carbon star CW Leo, showing traces of its surrounding envelope.

SHARAD radar sounding of Mars leads to discovery of dry ice layers in the planet's polar cap.

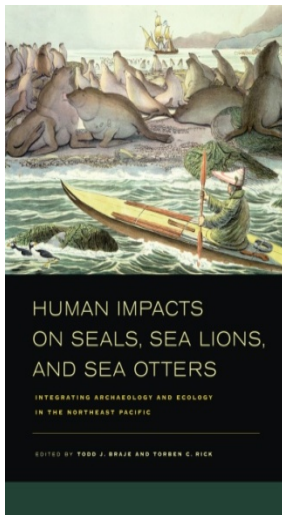
The National Air and Space Museum's (NASM) Center for Earth and Planetary Studies scientist Bruce Campbell and former post-doctoral researcher Lynn Carter were members of a team that recently announced the discovery of massive carbon dioxide ice



SHARAD is a 15-25 MHz radar sounder on the Mars Reconnaissance Orbiter

layers within the south polar cap of Mars. These layers contain enough CO₂ to almost double the current atmospheric pressure. When the gas was all in the atmosphere, dust storms would have been more frequent and more energetic than we see at the present time. This discovery came about from radar sounding observations that use long-wavelength radio signals to see down almost 3 km into the ice and dust of the polar caps. SHARAD results are featured in the new Mars exhibit of NASM's Exploring the Planets gallery.

UNDERSTANDING AND SUSTAINING A BIODIVERSE PLANET



The National Museum of Natural History's archaeological research on the interactions between people and marine mammals provides a unique lens for understanding the human and ecological past.

Analyses of remains from three archaeological sites on California's Northern Channel Islands, dated from 12,000 years ago, show that early inhabitants of coastal North America relied heavily on marine resources over an extended period of time. A recent paper co-authored by archaeologist Torben Rick details the numerous stemmed projectile points and chipped stone crescents found at the sites, which are associated with the remains of a varied marine and aquatic fauna. These findings provide evidence that Paleocoastal peoples used bifaces and projectile points to capture geese, cormorants, and other birds, along with marine mammals and finfish.

This and other archaeological research is emerging as a crucial source of information on contemporary environmental issues as we improve our understanding of the ancient abundance, ecology, and natural history of these species. *Human Impacts on Seals, Sea Lions, and Sea Otters: Integrating Archaeology and Ecology in the Northeast Pacific*, co-edited by archaeologist Torben C. Rick (NMNH, Anthropology) and Todd Braie (Humboldt State University), is a groundbreaking interdisciplinary volume that brings together archaeologists, biologists, and other scientists to consider how archaeology can inform the conservation and management of pinnipeds and other marine mammals along the Pacific Coast.

Reforestation Research in Latin America Helps Build Better Forests

A tropical forest is easy to cut down, but getting it back is another story. In a special issue of the journal "Forest Ecology and Management," leading researchers at the Smithsonian Tropical Research



Institute (STRI) offer new insights on reforestation based on 20 years of research. Forests keep water clean, control soil erosion, store carbon, shelter animals and provide plants that offer pharmacological benefits. Forests also contribute to global-scale economic activity in the form of ecosystem services. The Agua Salud project in the Panama Canal watershed is a 700-hectare experiment that examines the ecosystem services forests provide: water for people and the Canal, carbon storage to mitigate global warming and biodiversity protection in one of the crucial biological corridors between North and South America.

Managing forests for ecosystem services requires tradeoffs. A hectare of teak stores as much carbon as a native forest after 20 years, but will shelter far less biodiversity. In the Agua Salud experiment researchers plant mixtures of native species. Their data predict that some mixtures will surpass the carbon-storage capability of teak and the ability to support other plants and animals. The information highlights potential tradeoffs in ecosystem services with land management and points the way to the next generation of ecosystem service research.

Scientific information to guide reforestation is especially necessary in a world where half of the tropical forests are secondary forests growing on abandoned farm and pasture land. The special issue summarizes results from more than 60 tree species grown in Panama at sites with different rainfall and soil types. Several articles provide guidelines for land managers as they weigh environmental and economic factors in their decision making.



Scuba diver encounters a whale shark

Scientists Discover the Largest Assembly of Whale Sharks Ever Recorded

Whale sharks (*Rhincodon typus*) were often thought to be solitary behemoths that live and feed in the open ocean. Scientists at the Smithsonian Conservation Biology Institute and colleagues, however, have found that actually whale sharks can be gregarious and amass in the hundreds to feed in coastal waters.

Aggregations, or schools, of whale sharks have been witnessed in the past, ranging from several individual sharks to a few dozen. This new research has revealed an enormous aggregation of whale sharks—the largest ever reported—with up to 420 individuals off the coast of the Yucatán Peninsula in Mexico. What brings them together is food.

Understanding this filter-feeder's diet is especially important since food sources determine much of the whale shark's movement and location. During the dozens of surface trips that team members made to the aggregation they used fine nets to collect food samples inside and immediately outside the school of feeding whale sharks. Scientists then used DNA barcoding analysis to examine the collected fish eggs and

determine the species. They found that the eggs were from little tunny (*Euthynnus alletteratus*), a member of the mackerel family. DNA barcoding was a valuable resource that not only allowed scientists to know specifically what this huge aggregation of whale sharks were feeding on, not readily done from only physical observations of eggs, but it also revealed a previously unknown spawning ground for little tunny.

The whale shark is listed as "vulnerable" with the International Union for Conservation of Nature and Natural Resources. Populations appear to have been depleted by harpoon fisheries in Southeast Asia and perhaps incidental capture in other fisheries.

UNDERSTANDING THE AMERICAN EXPERIENCE



Winslow Homer
Veteran in a New Field,
1865, Metropolitan Museum of Art

The Civil War and American Art

The Civil War and American Art is the first large-scale, major art exhibition and scholarly book that considers the impact of the Civil War on American art, focusing on how the fine arts reflected the state of the nation during this turbulent period. This project focuses on major paintings and vintage photographs created between the onset of the war and the 1876

Centennial that eloquently make the case for the pervasive impact the Civil War had on American art, and on the profound changes in landscape and genre painting that develop as a result of the conflict. Each work in this show and in the accompanying book is a primary source for understanding the complex issues each artist grappled with during the war years.

The Civil War shattered the optimism of the Hudson River school and caused a palpable shift in the depiction of narrative scenes of everyday life. Artists struggled to find a balance between images directly invoking the war and allegories conveying the emotional devastation it wrought. The major paintings and sculptures of this period and photographs from the battlefields show the impact of the conflict on American culture and raise questions about how the country could rise from the ashes.

Thomas Jefferson Bible Project

Conservation of the Thomas Jefferson Bible is the most significant object preservation effort at the National Museum of American History (NMAH) since its work on the Star-Spangled Banner. During recent months, intensive investigations were conducted into the Bible's component materials, binding structure, and assemblage process. Baseline data was obtained that informed the treatment decisions and contributed to the historical record. In this process, NMAH



collaborated closely with the Smithsonian's Museum Conservation Institute and experts from other prominent cultural institutions. The study has concluded that the Bible is not an ordinary 19th century book, but is more like a scrapbook. Created by Jefferson, the book is composed of clippings cut from other Bibles and glued to the pages. The stiffness of the binding has caused severe damage to the paper over time and oxygen, humidity, and light exposure combined with acid migration from the adhesives have embrittled the paper and exacerbated the damage.

Based on this research, a well-supported, multi-faceted treatment plan was developed to provide needed flexibility for the Bible while using materials and techniques sympathetic with the original artifact. The conservation treatment will ensure that the Bible can be made accessible to the public and preserved for the future.

National Portrait Gallery's *Capital Portraits* Exhibitions



Ethel Mary Crocker by
Giovanni Boldini, 1906
(private collection)

Sixty American and European painted and sculpted portraits comprise the exhibition *Capital Portraits: Treasures from Washington Private Collections*, on view April 6-September 5, 2011, at the National Portrait Gallery (NPG). These objects were inherited, purchased as part of a larger collection of art, or commissioned by the owners. Approximately 50 of these portraits had never been illustrated previously in a publication or exhibited publically. The curators of this exhibition, Dr. Carolyn K. Carr, NPG Deputy Director and Chief Curator and Dr. Ellen G. Miles, Curator Emerita, using internet resources, the Archives of American Art materials, interlibrary loans, queries to other scholars, and interviews with the owners, researched each of these objects to provide information about the sitter, the artist, and the circumstances surrounding the making of the portrait. This material was published in the catalogue accompanying the exhibition.