

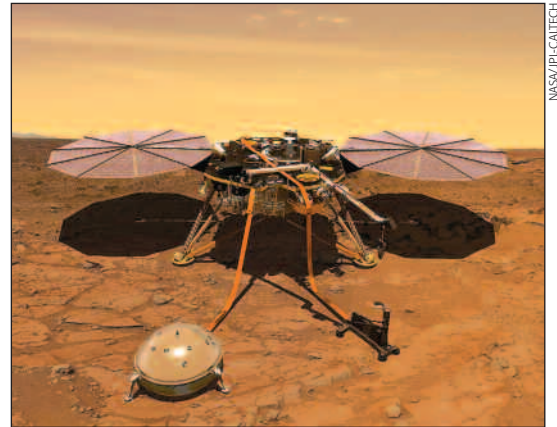
Exploring Mars: What's Next?



Why are we so fascinated with Mars? Why is it so like our own Earth in some ways, and so utterly different in others? Spacecraft from NASA and the European Space Agency are scrutinizing Mars to determine the planet's geologic history. NASA's InSight lander launches from the California coast to the plains of Mars in May, on a mission to explore the planet—its first thorough check-up since it was formed 4.5 billion years ago.

Kelly Beatty, senior editor for *Sky & Telescope* magazine, leads an examination of the Red Planet from afar and up close. Learn where to locate it in the night sky as it comes especially near in the coming months. (In July, Mars comes its closest to Earth since 2003). Get a sense of what can be seen through a backyard telescope, and delve into the real odds of finding life there. Part of the interplanetary tour puts you right on the dusty Martian surface, thanks to 3D imagery (with glasses provided).

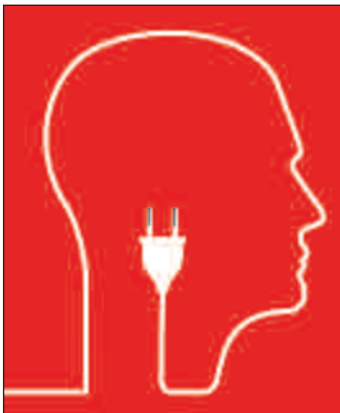
Mon., June 4, 6:45 p.m.; Ripley Center; CODE 1L0-199; Members \$30; Nonmembers \$45



An artist's rendition of the InSight lander operating on the surface of Mars

NASA/JPL-CALTECH

Learning To Learn The New Science of Learning



We have a lot to learn about how we learn. Conventional wisdom has been flipped on its head in recent years: It turns out there is little evidence that some people learn better visually or by listening while highlighting and re-reading are proving to be ineffective learning strategies. Recent research has even shown that forgetting can be a good thing.

Join **Ulrich Boser**, author and senior fellow at the Center for American Progress, who shares specific, highly effective ways to learn, such as self-explaining, as well as the value of feedback, forgetting, and reflection. Highlighting examples like the story of Roger Craig, who once dominated the game show “Jeopardy” using the science of learning, Boser explores new ways to freshen up our brains and make learning stick.

Boser's book *Learn Better* (Rodale Books) is available for sale and signing after the program.

Thurs., June 7, 6:45 p.m.; Ripley Center; CODE: 1H0-340; Members \$30; Nonmembers \$45



The Serengeti Spectacle



The wildebeest migration is the world's most massive animal movement: 1.2 million of them cross the savanna every year in an 1800-kilometer circuit between Kenya and Tanzania as they follow the rains. Along the way, they consume more than 4,500 tons of grass daily and deposit heaps of dung, transforming the landscapes they cover.

Driven from the parched savanna of South Serengeti, the wildebeest move north in search of better grazing, drawn by the promise of early rain hinted at by the distant flickering of lightning visible at night far beyond the horizon. But before they can reach those richer foraging grounds, they must cross the Mara River.

Join veteran safari guide and raconteur **Russell Gammon** for an evening of fascinating storytelling and stunning imagery as he brings this epic migration to life. A third-generation Zimbabwean, Gammon's insights gathered over 28 years of observation reveal the driving force behind the greatest wildlife spectacle on earth and its importance to East Africa's web of life.

At the conclusion of the program, join Gammon at an optional light reception.



Wed., June 13, 6:45 p.m.; Rasmuson Theater, American Indian Museum; CODE 1A0-056; Members \$30; Nonmembers \$45 (program only); Members \$55; Nonmembers \$65 (program and reception)




Crossing on the Mara River in North Serengeti

RUSSELL GAMMON

Unnatural Selection

Katrina van Grouw's Evolutionary Illustrations

inside science  Is your schnoodle (a schnauzer-poodle cross) an example of evolutionary success? If it appears to have the necessary traits for survival in the company of humans, the answer is yes. And it didn't take eons to happen. Unlike wild animal species, domesticated animals provide a more observable model of evolution in action. But evolution's mechanics are often hard to explain.

Katrina van Grouw, a natural science illustrator, has found a way through that problem, fusing science and art in her beautifully illustrated new book, *Unnatural Selection*, which illuminates evolutionary patterns.

Following Charles Darwin's analogy drawn 150 years ago comparing selective breeding in domesticated animals to natural selection, van Grouw maintains that identical traits can occur in both wild and domestic animals and are governed by the same evolutionary principles. It is a tribute to what Darwin might have achieved had he known how individual traits are passed from one generation to the next.

Unnatural Selection (Princeton University Press) is available for sale and signing.


Tues., June 12, 6:45 p.m.; Ripley Center; CODE 1A0-053; Members \$20; Nonmembers \$30



Katrina van Grouw's illustration of a display in the Natural History Museum: a testimony to the human-canine bond

Lost Texts Revealed

Ancient Manuscripts Meet High-Tech Imaging

inside science  Digital scholars can now conduct research on manuscripts from early civilizations that were painstakingly inscribed more than a millennium ago, and that had remained unseen for centuries. Modern technology is rediscovering palimpsests, text and drawings on parchment that had been scraped off and overwritten centuries ago.

In a pioneering effort in 2008, advanced imaging revealed the erased text and diagrams of Archimedes' unique mathematical works. This year, researchers couriered a translation of an early medical work by Galen to one of the world's most powerful X-ray sources in an attempt to reveal obscured texts. And images of erased religious and historical texts from the library of St. Catherine's Monastery in the Sinai are freely accessible online.

Michael B. Toth, president of R. B. Toth Associates in Oakton, Virginia, looks at early efforts to reveal historic palimpsests and how the international teams of researchers he leads today use advanced camera systems and X-ray synchrotrons to reclaim precious texts once thought lost forever.

Wed., June 13, 6:45 p.m.; Ripley Center; CODE 1W0-029; Members \$30; Nonmembers \$45



Archimedes Palimpsest Folio 177r

A Natural History of the Mid-Atlantic

Stories of Calvert County, Maryland

The geography and environment of the Mid-Atlantic was shaped over hundreds of millions of years, reflecting influences that include the impact of a massive meteor; four tectonic mountain-building events; ice sheets and tropical oceans; plants and animals; and at least 15,000 years of human habitation.

Environmental historian and storyteller **Hayden Mathews** interprets the amazingly rich and varied natural history of the region as he leads a tour to three sites in Calvert County, Maryland: Battle Creek Cypress Swamp, Calvert Marine Museum, and Flag Ponds Beach and Nature Center.

Mathews's shares tales of colliding continents, changing climate, species new and old, and fascinating people. Smell sea salt and pines in the air; see towering Bald Cypress trees; a rare albino snapping turtle; the bones of ancient whales, camels, and mastodons; and the tools of the watermen's trades. Stop at the 30-acre Annmarie Sculpture Gardens and Arts Center in Solomons, a Smithsonian Affiliate, to view the large collection of outdoor sculpture in a serene setting.



Entrance to Annmarie Garden, Solomons, Maryland



Driftwood at Flag Ponds Nature Park



Sat., June 16, 8:45 a.m.–6:15 p.m.; bus departs from the Holiday Inn Capitol, 550 C St., SW; outdoor boxed lunch, weather permitting; wear comfortable clothes and walking shoes; CODE 1ND-028; Members \$135; Nonmembers \$185

The Science and Culture of Bread



Bread oven at a baked joint



Bread is among the oldest and most important foods world-wide. It's a staple of many diets and can take dozens of forms. But what exactly makes pain de mie fluffy or a baguette crisp? How do you make a sourdough chewy, crusty, and airy?

Bread bakers **Omar Qazi** and **Nora Velazco**

offer the answers as they share their passion for the processes behind the combinations of grain, water, and yeast that produce the delicious diversity of baked goods offered at their shop, a baked joint, in Washington's Mount Vernon neighborhood. They explore the science, history, and culture of bread making as they follow the lifecycle of their handcrafted loaves, baked daily using organic wheat and a long, naturally leavened fermentation process.

With TASTING

In an after-hours program, Smithsonian guests enjoy bread demonstrations, a tour of the bread kitchen, and a curated tasting. (Two freshly made artisanal breads; charcuterie spread of prosciutto, house-made butter, jams, olive oil, honey, and goat cheese.) Arrive early and enjoy a drink or a snack.

Mon., June 18, 6:30 p.m.; a baked joint, 440 K St. NW; tasting and demi-loaf of handcrafted bread included; additional bread, beer, and wine available for purchase before and after the program; program subject to limited capacity; CODE 1A0-054; Members \$55; Nonmembers: \$65

Discovery Theater



The Doubtful Sprout with Liz Joyce

Liz Joyce brings an ecological wonderland to life with several styles of puppets, projections, and song. *Funded in part by a Family Grant from the Jim Henson Foundation.*

Ages 4 to 8; Pre-K-3rd Grade
Fri., June 1

10:15 and 11:30 a.m.

Discovery Theater, Ripley Center



Around the World with Yosi

Yosi will sing and dance audiences "around the world" with his newest tunes. Every show is a party where new friends meet, play, and have fun together—so join us!

Wed.-Fri., June 27-29; 10:30 a.m. and Noon

Ripley Center, Smithsonian
Ages 3 to 8; Pre-K-3rd Grade

Discoverytheater.org

Generous support for Discovery Theater is provided by the D.C. Commission on the Arts & Humanities, an agency supported in part by the National Endowment for the Arts, DC Public Schools, The Nora Roberts Foundation, Philip L. Graham Fund, PNC Foundation, Smithsonian Women's Committee, Smithsonian Youth Access Grants Program and Sommer endowment.



Crayfish are part of the creek's ecosystem and can be seen up close at the nature center

Sunset Kayaking at Mattawoman Creek

With Wine and Cheese

Explore a globally rare ecosystem just 30 miles south of Washington from the vantage point of a kayak on a summer evening. Mattawoman Creek, a tributary of the Potomac, is loaded with diverse flora and fauna. Expect to see ospreys, great blue heron, red-winged blackbirds, and more species as you glide through a tidal freshwater marsh loaded with wild rice, cattails, and other plants that

have long been used by native people.

Naturalist and interpretive guide **Judy Lathrop** weaves natural and human history into the program as you explore this regional treasure. Afterward, sample local wine and cheese in the nature center as you enjoy close-up views of the aquatic food chain—and see

exactly why the large-mouth bass earned that name.

Each 3 ½ hour program is guided; all participants use tandem kayaks; beginning-level kayakers are welcome.



THREE OPTIONS: Sun., June 24 (CODE 1NS-A04); Fri., June 29 (CODE 1NS-B04); Sun., July 1 (CODE 1NS-C04); 5:30–9 p.m., meeting at Mattawoman Creek Nature Center, 108A Mattingly Ave, Indian Head, Maryland; parking available at or near center; information is emailed to participants in advance; Members \$90; Nonmembers \$120



Kayaking on Mattawoman Creek



Strange and Curious Smithsonian Jobs



Smithsonian High and Low

In this occasional series, go behind the scenes to meet Smithsonian experts who have some of the most intriguing professional specialties. In this session, meet two scientists whose research takes them from the tops of the forest canopy to the ocean floor, collecting uniquely Smithsonian stories along the way. Moderator **Tony Cohn** is co-producer and host of Smithsonian's podcast Sidedoor.

Chris Meyer, research zoologist and curator of Mollusca at the Natural History Museum, and **Jess Parker**, senior scientist in forest ecology at the Smithsonian Environmental Research Center (SERC), share the challenge of trying to collect information about vast ecosystems.

Tracking species is key to the study of how marine ecosystems function and respond to change. Meyer led the Mo'orea Biocode Project to build a comprehensive genomic inventory of life around the French Polynesian island. Those efforts led to the development of standardized sampling using autonomous reef monitoring



Chris Meyer recovering autonomous reef monitoring structures in Mo'orea, French Polynesia

structures (ARMS), which collect marine life on the sea floor. Meyer leads the Global ARMS project at the Natural History Museum.

At SERC, Parker also investigates how ecosystems function, but instead of a wetsuit, he uses construction cranes. His work in measuring how forests "breathe" as they collect and emit carbon contributes to the Forest Global Earth Observatory network's research on how climate change affects forests globally.



Jess Parker at work, suspended 200 feet high in an old-growth Douglas fir forest canopy

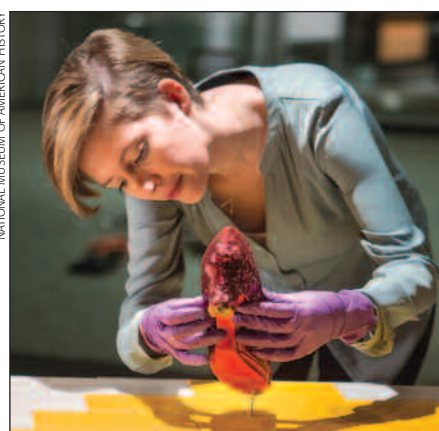
Thurs., June 21, 6:45 p.m.; Ripley Center; CODE 1A0-055; Members \$30; Nonmembers \$45

Real Gems: Rubies and Ruby Slippers

Pursuing more "Strange and Curious" jobs, moderator **Tony Cohn** goes behind the scenes with some of Smithsonian's most sparkling treasures: the National Gems and Minerals Collection and Dorothy's Ruby Slippers.

Jeffrey Post is a geologist and chair of the mineral science department at the Natural History Museum. In 30 years of working at Smithsonian, he has gathered his fair share of fascinating stories. As the curator of the National Gem and Mineral Collection, he and his colleagues are always seeking new gem and mineral acquisitions and analyzing specimens to resolve scientific questions. They use powerful X-ray beams and other tools to study the crystal structures of fabulous gems (including the Hope Diamond) and fine-grained, environmentally significant minerals.

In the American History Museum, object curator **Dawn Wallace** is at work keeping the ruby slippers glittering for generations to come. Wallace analyzes the iconic footwear's more than 12 different materials and how those compounds age, allowing curators to create a controlled environment for preserving and displaying the shoes.



Dawn Wallace installs the Ruby Slippers in the "American Stories" exhibit



Jeffrey Post installs the Dom Pedro aquamarine



Mon., Aug. 6, 6:45 p.m.; Ripley Center; CODE 1A0-061; Members \$30; Nonmembers \$45

Niagara Falls: A Summer Spectacular

3-DAY
TOUR

One of North America's most awe-inspiring natural wonders is the perfect destination for a summertime visit that includes all the don't-miss attractions of Niagara Falls.

The group's guided visit to Niagara Falls State Park includes stops at Goat Island, Luna Island, the American Falls and Bridal Veil Falls, and Prospect Point, site of the US-side observation tower. Board the *Maid of the Mist* for a spectacular view of the thundering waters, enjoy a buffet lunch at the Fallsview Dining Room, and later experience the Journey Behind the Falls attraction for a close-up view of the Canadian Horseshoe Falls.

The day ends with dinner at the Prince of Wales Hotel in the charming Ontario town of Niagara-on-the-Lake. Accommodations are at the new



The Lotus Pool at the Arboretum at Penn State

DoubleTree by Hilton in Niagara Falls, New York, which offers lovely views of the Niagara River.

The trip to Niagara Falls includes a stop at Penn State University's arboretum. And what could be better on a warm day than a visit to the university's famous Berkey Creamery, which has been dishing out ice cream treats since 1889?

Jim Zimelman, a planetary geologist at the Air and Space Museum serves as the tour's study leader.



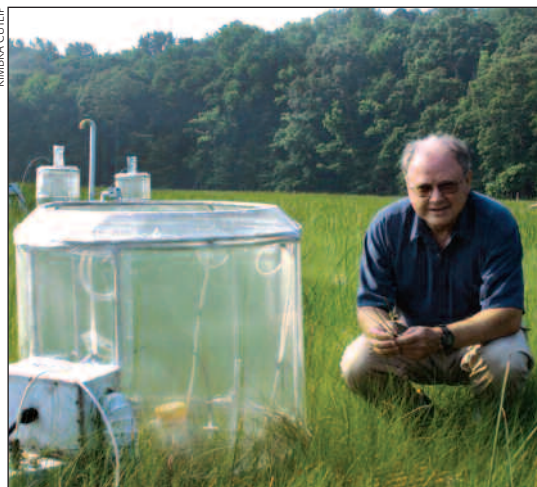
The Maid of the Mist in the basin of Horseshoe Falls



Thurs., July 12, 7 a.m.–Sat., July 14, 8:30 p.m., bus departs from Mayflower Hotel, Connecticut Ave. and DeSales St. NW, with a stop at the I-270 Urbana carpool lot at about 7:55 a.m.; valid U.S. passport required to enter Canada; boxed lunch en route, dinner Thursday, all meals Friday, and breakfast and lunch Saturday included; purchase dinner at rest stop on the return trip; singles registering at double-room rate are paired (on a nonsmoking basis) if possible, but must pay the single-room supplement (\$220) otherwise; detailed information mailed about four weeks prior to departure; purchase of trip insurance recommended; CODE 1WN-NIA; Members \$885; Nonmembers \$1,180

Making Sense of Climate Change

Hardly a day goes by when we don't see, feel, or read about the effects of global warming and climate change. Facing and dealing with climate change is one of today's greatest challenges, and how we respond will have a direct impact on the reality of tomorrow.



Bert Drake at his CO₂ research site at the Smithsonian Environmental Research Center

The first step toward positive action is to be informed, says **Bert Drake**, emeritus scientist and plant physiologist with the Smithsonian Environmental Research Center. His 40 years of tracking how plants respond to changes in temperature, water, and carbon dioxide have given him a wide perspective on this important issue. He draws on that experience as he lays out the foundational pillars of understanding global warming and climate change.

Drake explains how greenhouse gases are changing temperature around the globe and why so many Americans today are skeptical about climate change—or even in denial about its existence. He discusses the effects rising temperatures are having on polar ice caps and sea levels, and explains how rising atmospheric CO₂ and rising temperatures threaten the world's food supply and its nutritional value. Finally, he talks about how much carbon dioxide humans are producing and possible ways to reduce it, from renewable energy to geo-engineering.

JUL 16 The History and Physical Science of Global Warming

JUL 30 The Effects

AUG 13 The Challenge

3 sessions; Mon., July 16, July 30, and Aug. 13, 6:45 p.m.; Ripley Center; CODE 1A0-059; Members \$80; Nonmembers \$130

Tesla

The Man, the Mystery, the Inventor of the Modern

Nikola Tesla (1856–1943), a Serbian immigrant, was a magnificently bizarre genius who dressed impeccably but also was known to converse with pigeons in the park. But he invented the radio, the induction motor, the neon lamp, the remote control, and more. Tesla felt inventing required the linking of science and the humanities. Unlike his better-known rival Thomas Edison, he was not motivated by profit and preferred working in isolation. Although his breakthrough alternating-current technology proved successful in a test to distribute electric power over long distances, many of his ideas remained in the dark for years.



Tesla in front of his high-voltage coil transformer, 1896

Drawing on his new book, *Tesla: Inventor of the Modern* (W.W. Norton), **Richard Munson** shines a light on the man behind the legend and his unique way of doing things. Tesla died nearly penniless, but left the world a far richer place.

Munson's book is available for sale and signing.

Mon., July 23, 6:45 p.m.; Ripley Center; CODE 1A0-060; Members \$20; Nonmembers \$30



World Without Mind

The Existential Threat of Big Tech



We shop with Amazon, socialize on Facebook, turn to Apple for entertainment, and rely on Google for information. While their algorithms make modern life intoxicatingly convenient, could this digital utopia lead to total automation and homogenization of social, political, and intellectual life?

Franklin Foer, national correspondent at *The Atlantic*, sits down with **Melissa Chiu**, the director of the Hirshhorn Museum and



Smithsonian
Spotlight

Sculpture Garden, for a discussion about the vexing issues posed by the growing power of "Big Technology."

Foer draws from the intellectual history of computer science—from Descartes and the Enlightenment up to today's Silicon Valley—to provide historical context to our current reality in his new book, *World Without Mind: The Existential Threat of Big Tech*. He and Chiu examine such issues as whether the companies that market themselves as champions of individuality and pluralism instead press users into conformity and lay waste to privacy.

World Without Mind (Penguin Press) is available for sale and signing.

Thurs., July 26, 6:45 p.m.; location indicated on ticket; CODE 1A0-057; Members \$20; Nonmembers: \$30



The Garden in Your Beer

In Collaboration with Smithsonian Libraries and the American History Museum



With
TASTING

Did you know that the ingredients critical to making beer come from the garden? Barley and hops, two of its primary components, can be grown in gardens all over the world. In addition, many ingredients used to flavor beer—everything from fruits like cherries and oranges to herbs and spices like coriander, ginger, and cumin—begin in a garden.

Since the beginnings of beer, brewers have used a variety of cultivated and foraged ingredients for added flavor and preservation. While sourcing unique elements from around the globe is now commonplace, many ingredients start with a good seed catalogue and can be found in a backyard garden or orchard.

In a guided tasting with **Doug Campbell**, president of Brewery Ommegang, hear about the innovative brewing practices of American craft brewers who interpret centuries-old traditions with a contemporary twist. Take a look at the garden through the lens of the botanicals, spices, wild yeasts, fruits, berries, and hops that flavor your favorite beer. Enjoy light food pairings with the beer samples.

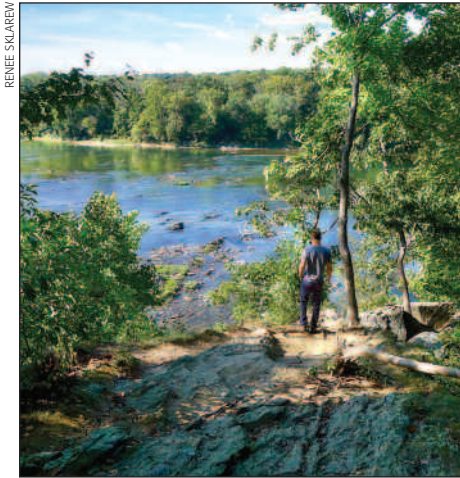


Smithsonian
Spotlight

After the tasting, Smithsonian Libraries' related exhibition, *Cultivating America's Gardens*, is open after-hours exclusively to ticket holders.

Thurs., Aug. 16, 6:45 p.m.; Eat at America's Table Café, American History Museum; CODE 1L0-206; Members \$50; Nonmembers \$70

What's Inside Science? It's an ongoing series of expert-led programming. It is also a community of like-minded participants who have the opportunity to participate in a lively online learning exchange. **Visit smithsonianassociates.org/science**



Scott's Run Nature Preserve, Virginia

Discover Your Backyard

Great Hikes Within and Around the Beltway

Washington, D.C., may be a bustling urban center, but it is surrounded by abundant green spaces and natural wonders that meet every type of outdoor interest. Hiking fans (and would-be hikers) overwhelmed by so many choices can turn to **Renee Sklarew** and **Rachel Cooper** for suggestions on excursions to nearby interesting, scenic, and historic hiking locations mentioned in their book *60 Hikes Within 60 Miles of Washington, D.C.* (Menasha Ridge Press).

For great views, head to Rock Creek's Boulder Bridge trail or Maryland's Calvert Cliffs. Learn about finding history while hiking Roosevelt Island and the abundant wildlife to be seen hiking McKee-Beshers Wildlife Management Area's miles of trails.

Hiking with the family? Find out why kids are fans of Black Hills Regional Park in northern Montgomery County. For more challenging hikes, try Virginia's Difficult Run Trail or the 8-mile loop at Catoctin Mountain Park. Both offer unforgettable views.

Wed., Aug. 22, 6:45 p.m.; Ripley Center; CODE 1B0-263; Members \$35; Nonmembers \$50 (a copy of the book is included)

The Buzz on Bees

There's been a lot of news about bees recently, and much of it hasn't been good. Reports of colony collapses along with the commercialization of bees point to serious trouble for these crucial members of our ecosystem. In a day spent looking at the pollinators through various lenses, discover the ways humans and bees are inextricably linked, and how much we rely on them.

Sam Droege, a wildlife biologist from the USGS Bee Inventory and Monitoring Lab (BIML), Patuxent Wildlife Research Center, presents a primer on the basic anatomy, habitat, and behavior of bees, and considers the state of the current bee population.

Amy Johnson, a biologist studying native pollinators and other wildlife for Virginia Working Landscapes at the Smithsonian Conservation Biology Institute, describes research on the ecological relationship between bees and other pollinators and their environment. **Matthew Willey**, an artist and founder of The Good of the Hive Initiative, talks about how he is raising awareness about the well-being of honeybees through his murals. **Toni Burnham**, president of the D.C. Beekeeper's Alliance, offers a guide to urban beekeeping, with suggestions on how to make urban and suburban spaces more pollinator friendly.



The green metallic *Augochlorella aurata* is the most common bee in the DC area



Matthew Willey paints a mural in Gastonia, North Carolina

Burnham's talk ends with a tasting of honeys produced by bees that forage in different environments.

9:30 a.m. Bee Basics

11 a.m. Smithsonian Perspectives: Native Biodiversity and Conservation

12:15 p.m. Lunch (participants provide their own)

1:30 p.m. Bees and Art: The Good of the Hive

2:30 p.m. Urban Beekeeping and Honey Tasting

Sat., Aug. 11, 9:30 a.m.–4 p.m.; Ripley Center; CODE 1A0-058; Members \$90; Nonmembers \$140

With TASTING