

NEW MEXICO



Deep sky country

ON THE SPACE TRAIL, WITH AN EYE TO THE HEAVENS

BY KARI BODNARCHUK | GLOBE CORRESPONDENT

SIERRA COUNTY — Near an old stagecoach route where broken wagon wheels and cowboy camps languish in the bush, anyone with deep pockets and an adventurous spirit can soon blast into space. Spaceport America in south-central New Mexico will offer the world's first commercial space flights starting in 2013 aboard Richard Branson's Virgin Galactic ships.

Pony up the \$200,000 and you will undergo a two- to three-day training program that gets you physically prepared to handle the G-forces of rocket travel and mentally ready for space flight.

"The goal is to get people as mentally prepared and as comfortable as they can be," says Carolyn Wincer, head of sales for Virgin Galactic. "You don't want to just throw people out there and light a rocket under them."

Then you, five other passengers, and two pilots will blast 70 miles into space on a craft that is just over half the size of NASA's space shuttles. After separating from the "mothership," your unpowered spaceship will complete a suborbital arch — during which you can experience a few minutes of weightlessness — before gliding back down and landing on Spaceport America's runway. Maximum flight time: two hours.

"This is an ideal location because with White Sands Missile Range nearby, we have 1,200 square miles of restricted air space, so you don't see any jet aircraft here," says David Wilson, a Spaceport America spokesman.

New Mexico has long drawn scientists and stargazers be-

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ROBYN BECK (ARRAY) AND CHRIS JACKSON (SPACESHIP ONE)/AFP/GETTY IMAGES

The Very Large Array, made up of 27 giant dish-shaped antennas, sits on the Plains of San Agustin. Above, a model of Richard Branson's Virgin Galactic ship, which takes riders into space.

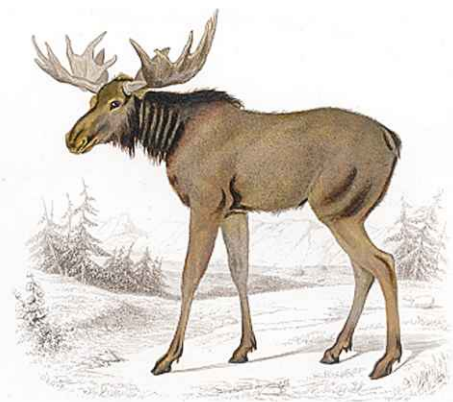
INSIDE

Apples? Oysters? Chocolate? Match the festival to your taste. **M3**

EXPLORE NEW ENGLAND

On a moose safari in Maine, timing — and luck — matter. **M5**

With foliage about to turn, it's time to take a hike. **M5**



ISTOCKPHOTO

COPENHAGEN



SARA DROWER (MIDDLE AND LEFT) AND DENISE DROWER SWIDEY FOR THE BOSTON GLOBE

From left: salad root, juniper, and green strawberries; shrimp; and duck egg.

At Noma, cooking up a Nordic cuisine

By Denise Drower Swidey
GLOBE CORRESPONDENT

Earlier this summer, I was eating lunch at the current No. 1-ranked restaurant in the world, and my appetizer was moving. Not a whole lot — perhaps slowed by its crushed ice bed, inside the covered Mason jar it had arrived in. I shouldn't

have been that surprised. The server did introduce the dish as "very, very, very, very fresh" fiord shrimp. Was the head flavorful and the tail creamy, as the server promised? Was the accompanying brown butter emulsion the perfect foil? Hard to say, as I was more concerned with demobilizing the shrimp in my jaws before it tried

to claw its way back up my esophagus. After the soft shell popped and crackled in my mouth, the taste was so fresh and clean that, for a moment, it did bring me right to the north shores of Zealand, Denmark's largest island in the North Sea, where it had been caught only hours earlier in a Danish sound

called Isefjord.

That fleeting yet transporting moment is what Noma is all about. The Copenhagen restaurant prides itself on intimately connecting the diner with the time and place of the ingredients, all of which — except the coffee, chocolate, and wine —

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Taking off at the Space Trail, gateway to the galaxy

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cause of its clear skies, open space, and lack of light or air pollution. A map released earlier this year identifies 52 space- and astronomy-related sites scattered throughout the state on the newly designated New Mexico Space Trail. About one-third of these sites welcome visitors. See everything from ancient pictographs with celestial themes, the world's first rockets, extraterrestrial exhibits, and observatories that can probe the far reaches of the universe.

You will need about a week to hit the highlights. Start your tour with a visit to the New Mexico Museum of Natural History and Science in Albuquerque, where you can get a good overview of how ancient cultures used the sun and the stars, and trace the history of the state's space frontier (don't miss the full-scale replica of the Mars Rover).

Then drive 150 miles, or three hours, northwest of Albuquerque to Chaco Culture National Historical Park, the only national

park in the country with an observatory. Chaco has five telescopes, including (for those in the know) a 25-inch Obsession Newtonian reflector, and runs astronomy programs three times a week.

By day, take a guided or self-guided tour of the area's pueblo ruins, and find out why some people believe the ancient buildings were oriented to correspond with celestial events.

"There's one corner door that aligns with the winter solstice," explains park guide G.B. Cornucopia, referring to an architectural feature at the famous Pueblo Bonito ruins. "These buildings are also angled 17 degrees off true north."

The ancient Chacoans may have used such alignments to help them tell time, plan their harvests, and track seasonal changes, but without any written record, it is impossible to know for sure. Images on the canyon's red cliff walls suggest that they also recorded astronomical events: One pictograph depicts a bright star and a crescent that,



PHOTOS BY KARI BODNARCHUK FOR THE BOSTON GLOBE

Sights along the Space Trail include a six-story rocket booster, an exhibit at the New Mexico Museum of Space History, that launched monkeys into space in the '50s (right) and the Terminal Hangar Facility (above), part of Spaceport America.

many believe, records the supernova of 1054 AD; others aren't so sure.

The only thing that is certain here: "The sky has changed very little over time, so we actually get to experience it pretty much as the Chacoans did 1,000 years ago," says Cornucopia.

On the Plains of San Agustin, 50 miles west of Socorro and 7,000 feet above sea level, you

will find another intriguing site: 27 giant dish-shaped antennas that together form a radio telescope that is effectively 22 miles in diameter. The Very Large Array (VLA), as it is called, is considered "the most scientifically productive ground-based telescope in the history of astronomy," says David Finley, public information officer for the National Radio Astronomy Observatory.

It has helped scientists witness a gamma ray burst at the farthest observable point in the universe, 13 billion light years away; detect a massive hole in the universe; and answer a "chicken-or-egg" question about which comes first: a galaxy or a black hole (answer: a black hole).

"If you had the resolving power of the VLA, you could stand on a street corner in New York City and see a Volkswagen in [Los Angeles]," says Finley.

Wander around the VLA's small visitors center for a good overview of the technology and history of radio observatories, and then take a self-guided walk to the base of one of the 94-foot-high, 230-ton antennas. Guided tours run monthly, and on certain dates (see website) you can get a behind-the-scenes look at the electronics heart of the observatory and its control room.

When passing through the town of Truth or Consequences, make time for a three-hour bus tour to Spaceport America. You'll see the airfield and the futuristic-looking Terminal Hangar Facility, which has a swoopy roofline and fluid curves that make it blend into the landscape like a stingray on the ocean floor. When complete, the three-story building overlooking the San Andres Mountains will likely have a visitors' area from which you can watch launches, a restaurant, a mission control center, a spacecraft hangar, a departure lounge, spacesuit dressing rooms, and a cutting-edge museum.

Southeast of Spaceport America, on the other side of the Organ Mountains, lies the White Sands Missile Range, where the first atomic bomb was tested, guided missiles were developed, and the Columbia space shuttle landed in 1982. More than 50 rockets and missiles once tested onsite stand on display in a park that sits on US Army land, but is open to the public. In the adjacent museum, don't miss the German-made V-2 rocket, the Mercury Redstone missile, and the Trinity Site exhibit (the actual site is open twice a year, when you can see where the first atomic bomb, also known as "the gadget," was detonated).

The New Mexico Museum of Space History, located on a hillside overlooking Alamogordo, packs a lot of interesting facts and displays into a small space. Outside, wander around the John P. Stapp Air and Space Park, where you can peer into the gaping mouth of an F1 rocket engine, see a six-story rocket booster that launched monkeys into space in the '50s, and lean against the Sonic Wind 1, a rocket sled that Stapp, dubbed "the fastest man alive," propelled to 632 miles per hour at nearby Holloman Air Force Base to test pilot and astronaut restraint systems.

"These eventually became modern-day seat belts," says Mike Shinabery, the museum's education specialist. "The early models were called Stapp straps."

Inside the museum, you will see a moon rock that was collected on the Apollo 17 mission, one of the world's three Sputnik models, and the space suit and pressurized pod belonging to HAM, the first chimpanzee to blast into space. Another highlight: a hands-on exhibit that lets you simulate a shuttle landing.

"I've had pilots come in and tell me it's really realistic," Shinabery says of the Shuttle Land-



If you go . . .

New Mexico Museum of Natural History and Science

866-663-4667

www.nmnaturalhistory.org

Chaco Culture National Historical Park

505-786-7014

www.nps.gov/chcu

Free guided tours, twice daily.

Spaceport America

www.spaceportamerica.com

Three-hour bus tours run Fridays and Saturdays 9 a.m. and 1 p.m.; Sundays 9 a.m. Adults \$59, under 12 \$29. Tours: 866-428-4786, www.ftstours.com.

Very Large Array

575-835-7243

www.vla.nrao.edu

Visitors center open daily 8:30 a.m. to sunset. Free guided tours the first Saturday of every month at 11 a.m., 1 and 3 p.m.; open house, first Saturday in April and October.

White Sands Missile Range Museum and Missile Park

575-678-8824

www.wsmr-history.org

Museum open weekdays 8 a.m.-4 p.m.; 10-3 Saturdays;

closed Sundays. Missile park open daily, free.

New Mexico Museum of Space History

Alamogordo

877-333-6589

www.nmspacemuseum.org

Daily 9 a.m.-5 p.m.; closed

Thanksgiving and Christmas.

Adults \$6, seniors \$5, 4-12 \$4, 3 and under free.

National Solar Observatory (Sunspot)

575-434-7190

<http://nsosp.nso.edu>

Daily 9 a.m. to 5 p.m. Adults

\$3, military and 55 and older

\$1.50, 11-17 \$1, 10 and under free.

International UFO Museum

800-822-3545

www.roswellufomuseum.com

Daily 9 a.m.-5 p.m. Adults \$5,

5-15 \$2, 4 and under free.

Roswell Museum of Art and Culture

575-624-6744

www.roswellmuseum.org

Open 9 a.m.-5 p.m. Monday to

Saturday; 1-5 Sundays and

holidays. Free.

er.

Leave the hot plains behind and head into the Sacramento Mountains, where it's often 25 degrees cooler among the ponderosa pines. Drive 16 miles south of Cloudcroft along New Mexico Route 6563, a scenic byway named after the deep red color produced by the sun's atmosphere. Here, you will find the National Solar Observatory, known as Sunspot, at 9,500 feet.

A small, information-packed visitors center has a display that puts everything in perspective: It includes a model of the sun that measures 18 feet in diameter and of the earth that is 2 inches wide. Touch meteorite samples, and learn all about space weather and solar activity.

One of the big questions scientists are trying to answer is how to predict solar flares, which are magnetic explosions on the sun's surface.

"We're about as good as TV weathermen 30 or 40 years ago," says Dave Dooling, Sunspot's education officer. "We need to be better so we can warn satellite controllers, space crews, and power grid operators. The Hydro-Québec blackout in 1988 was caused by a geomagnetic storm driven ultimately by a solar flare, and it caused millions of dollars in damage."

Outside, take a self-guided walking tour. You will see a solar telescope that was used on Antarctica to study the sun round-the-clock during the polar summer, a telescope that can create its own eclipses so scientists can study the sun's corona (or outermost layer), and a vacuum solar telescope that stands 135 feet above ground, and has a telescoping barrel that plunges 220 feet underground. Pause to look out over the Tularosa Basin and the dazzling sand dunes of White Sands National Monument (well worth a visit).

The city of Roswell, half a

day's drive from Sunspot, has never been the same since an unidentified flying object (UFO) landed on a ranch 30 miles north of town. The US Army maintained that it was a fallen weather balloon. Others claimed it was a UFO containing aliens. Either way, Roswell has never been the same.

The mothership of all things otherworldly is the International UFO Museum, an information-rich emporium of alien evidence, folklore, photos, and tales. Shop for "I crashed in Roswell" T-shirts and other kitschy creations around town, get a milkshake at the world's only UFO-shaped McDonald's and, if you're here in July, attend the Roswell UFO Festival.

Before heading back to Albuquerque, stop at the Roswell Museum and Art Center, where you will find a re-created workshop of Robert H. Goddard, considered the father of modern rocketry, who was born in Worcester, taught at Clark University, and eventually relocated to Roswell.

"Goddard had 214 patents for everything from radio tubes and solar energy to magnetic levitation," says museum director Laurie Rufe. "The important thing about Goddard is that he was working with a really small crew in a very remote area with materials that were not advanced, and he proved that anything is possible."

Perhaps he found inspiration while gazing at the stars.

We may not know what ancient pictographs really depicted, whether or not aliens landed on the Roswell ranch, or what causes solar flares. But what's almost always a sure thing is a fabulous, clear view of the Milky Way and celestial bodies, high in the heavens over New Mexico at night.

Kari Bodnarchuk can be reached at travelwriter@karib.us.

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