

# curb appeal meets science education



With Lexington's Help,  
Discovery Science Center  
Adds an Argentinosaurus  
and a Delta III Rocket to  
its "Eiffel Tower"

By Judith Rubin

First things first.

In order to stimulate the minds of your target audience by engaging them with your content, you first have to get them in the door. To get them in the door, you first have to get their attention.

The Discovery Science Center (DSC) is a relatively new, educational nonprofit competing for a share of the family leisure market in Orange County, Calif. – competing with such formidable nearby attractions as Disneyland, Knott's Berry Farm and the Queen Mary. Under the circumstances, DSC needs to be highly visible.

It has met this steep challenge by branding its facility with curb appeal of the iconic, skyline-altering kind. First came architect Bernardo Fort-Brescia's 108-foot-high tilted cube, fiberoptically lit at night. "In all modesty," said James Ray, chairman of the Board at the 1998 opening ceremony, "I predict that the cube will become the architectural symbol for Orange County – much like the Eiffel Tower is for Paris."

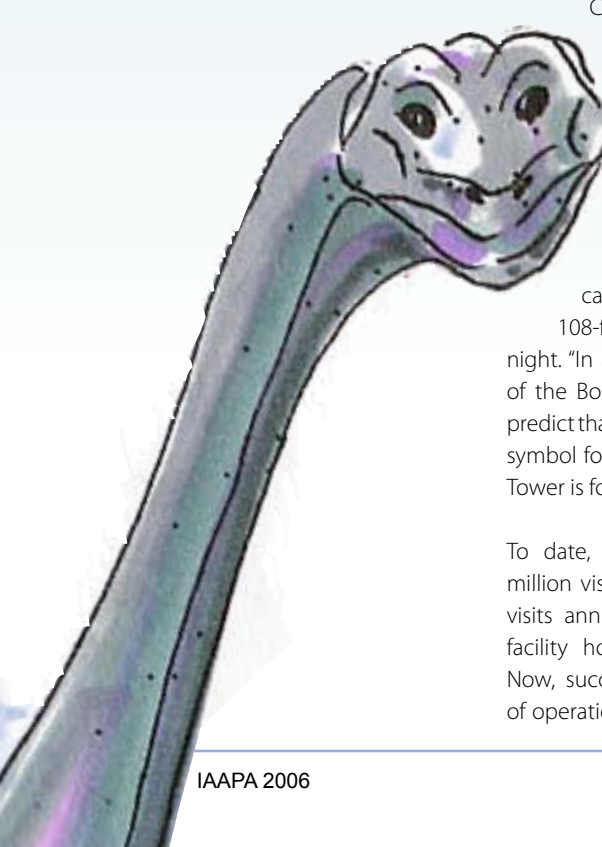
To date, DSC has welcomed more than 1.5 million visitors and now receives about 300,000 visits annually. The 69,000-square-foot learning facility houses some 120 interactive exhibits. Now, successfully rounding out its eighth year of operation, it has added two new icons sure to

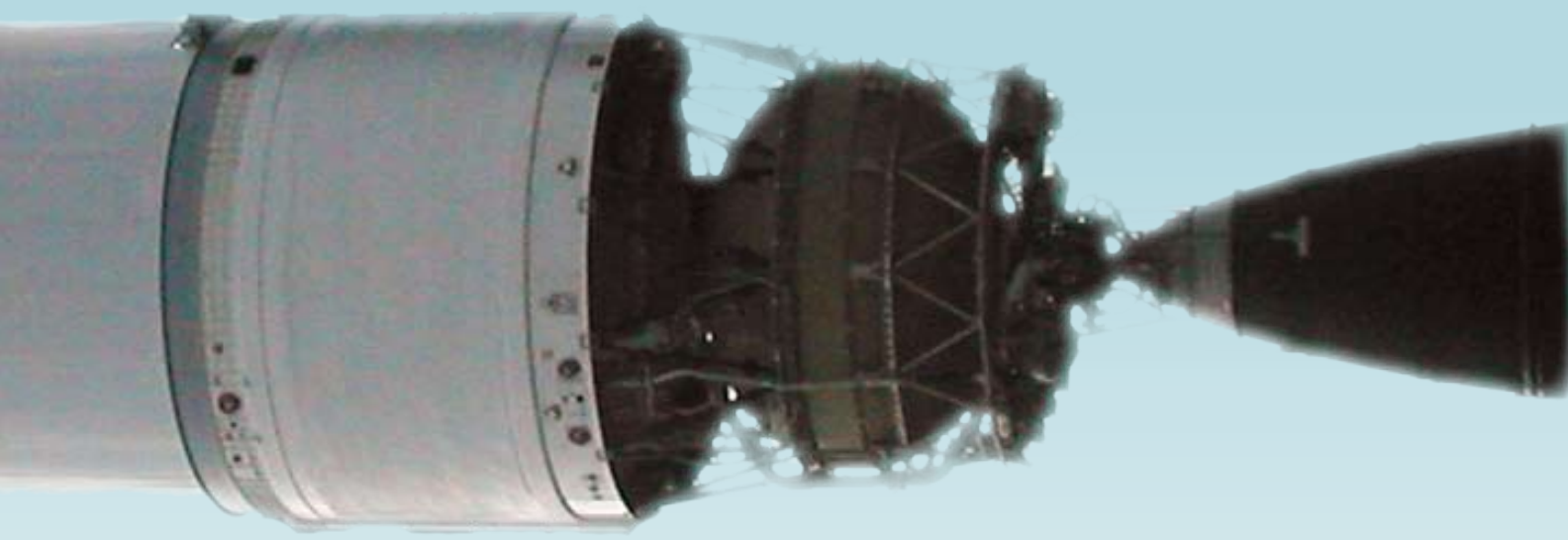
catch the notice of children riding in the family car and compel the adults to slow down and take the next exit. The cube has been joined by a 26-foot high Argentinosaurus and an 85-foot high Boeing Delta III rocket.

Representing the largest dinosaur known to science, the Argentinosaurus is the centerpiece of DSC's new Dino Quest exhibit, which opened in May 2006. The Delta III Rocket took up its position the previous month. It anchors the far end of the property, marking the site of parking and future expansion.

To build these two gigantic new structures – the Argentinosaurus and the Delta III Rocket – DSC called on Lexington, a well-known fabrication house based in Los Angeles. Lexington's museum client list includes the California Science Center, Kennedy Space Center, Space Center Houston, Kidspace Children's Museum (Pasadena) and most recently, the Omaha Children's Museum.

In the case of the Argentinosaurus, Lexington's job was to build the creature from scratch, inside and out. Its exterior must win the approval of research scientists and educators. Its accessible interior would house a number of interactive exhibits based on the internal workings of a dinosaur. The Delta III rocket, on the other hand, existed in part. Boeing had donated a genuine test model which consisted of the rocket propulsion system – Lexington would need to build the shaft and





nose cone to match Boeing's original design and appear completely authentic. Both structures must conform to building codes, including earthquake codes, and weather the harsh Southern California desert climate. Further, the high-traffic interior of the dino must be childproof.

Lexington's decades of experience building items large and small, indoors and outdoors, for museums, theme parks, restaurants, hospitals, broadcast facilities and many other venues enabled the company to carry out these two vast projects with relative ease. "There's not much we couldn't build," remarks Nick Drobis, Lexington's project manager for both of DSC's new icons. "We have a tremendous shop with amazing artisans, and everyone works together like cogs in a wheel." Prior to joining Lexington four years ago, Drobis spent 18 years at Universal Studios parks, where he was technical director and worked on such titanic-scale projects as the King Kong and Conan attractions.

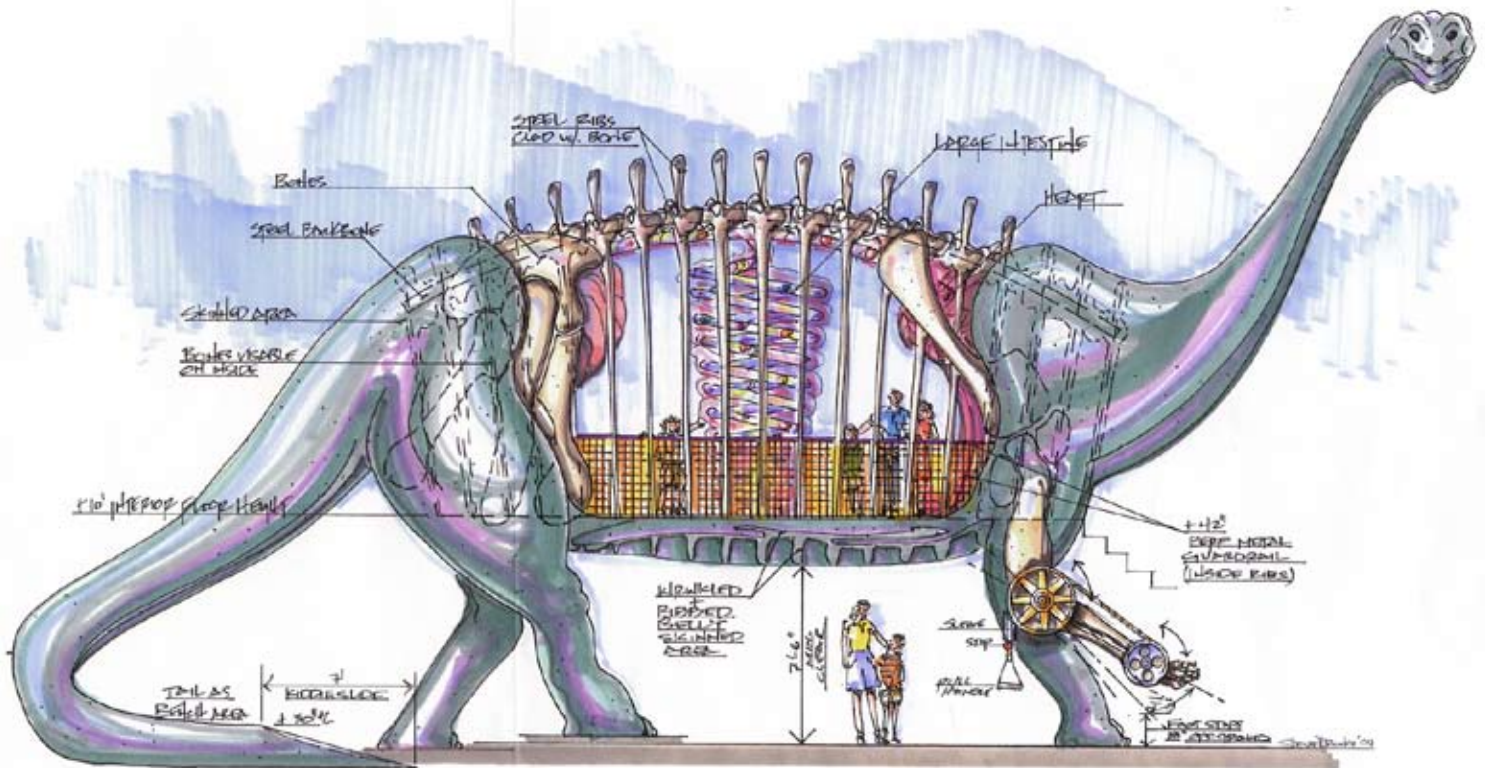
The rocket was the more straightforward assignment. With the overall design based on Boeing's own Delta III specs, Lexington constructed the rocket shaft in four segments and the nosecone likewise. Each of the eight parts was framed of structural steel, welded together and then fitted with its portion of aluminum "skin" precision-machined on Lexington's computer-controlled router and powder-coated in "Boeing white." The DSC logo was painted on the side of the rocket using a punch-pattern stencil.

When the weather was conducive to heavy crane work, Lexington delivered the rocket to the site in sections. The rocket base was already there, mounted on its platform. The sections, which together weigh more than 4 tons, were assembled and bolted together onsite, then lifted into place by crane in a seamless blend of artifacts and scenics. Lexington spent about eight weeks on fabrication. Rick Graham was Lexington's lead tech designer; about 65 people altogether were involved in the project. The Delta rocket budget of \$57,000 US included all design development done in collaboration with the museum, and technical design through installation by Lexington.

**Top: The fully assembled Delta III** rocket stands 85 feet tall, anchoring one end of the Discovery Science Center property. Founded on Boeing's own design for the Delta III, Lexington created precise building specs to produce an authentic-looking, durable facsimile that would dovetail exactly with Boeing's real rocket base. Photo: Lexington

**Below: The rocket shaft framework** is assembled to check that all four parts align properly. Lexington maintains a full workshop facility with the capacity to build life-size rockets and dinosaurs. Photo: Lexington





**Artist's rendering of the Argentinosauros,** showing its cutaway belly and interactive exhibits. Photo: Lexington

Overall Discovery Science Center Brontosaurs / Apatosaurus concept elevation.

The total rocket assembly looms almost nine stories high on land provided by the city of Santa Ana. It will be visible to some 10 million cars per year in its location beside Interstate 5, California's main north-south artery and the primary route between Orange County and Los Angeles.

containing an interactive walk-through, and the kiddie slide at the end of its tail.

According to Drobis, when Lexington first sat down to the project in early 2005, no scientifically accurate scale model of the Argentinosauros yet existed - so they built one. "We have an amazingly talented sculpting department," he enthuses. The resulting clay model, about three feet long and 1.5 feet high, was reviewed and modified until it satisfied DSC's team of experts. Throughout the subsequent sculpting and fabrication process, Lexington would continue to fine-tune the dino's looks to meet the approval of the scientists as well as the creative team led by art director Steve Brooks, who was engaged by DSC to make the dino exhibit aesthetically compelling. Brooks formed his design creed of "always knowing the audience you're designing for" in his years as a Disney Imagineer. "Always seek to work with others who wish to help see your visions become reality," he adds. "Lexington is that kind of partner."

The scale model in clay was followed by a 3D laser scan of the model which was used to create a CAD file from which to build the metal superstructure. After a structural engineer

The Argentinosauros (Argentinosauros huiculensis) walked the earth about 90 million years ago, but now it's back. Fossilized remains were first unearthed in Argentina in 1989. It was

determined to be a new species of dinosaur in 1993 by Dr. José Bonaparte and Rodolfo Coria. To date only a few bones - including a back vertebra five feet high - have been recovered. At 120 feet long, 26 feet tall and weighing 100 tons it is the largest known dinosaur ever found. The lifelike representation built by Lexington is 67 feet long and 27 feet tall. It departs from scientific accuracy in only a few deliberate details - such as the cutaway belly

**The Discovery Science Center's iconic "Eiffel Tower"** draws guests into the interactive exhibits within the museum. Photo: Lexington



confirmed that the design was to code, the drawings went to the city of Santa Ana for formal review by building inspectors. (In addition, since the dinosaur had the status of a building, DSC had to go through the standard building review process with the city's planning commission.)

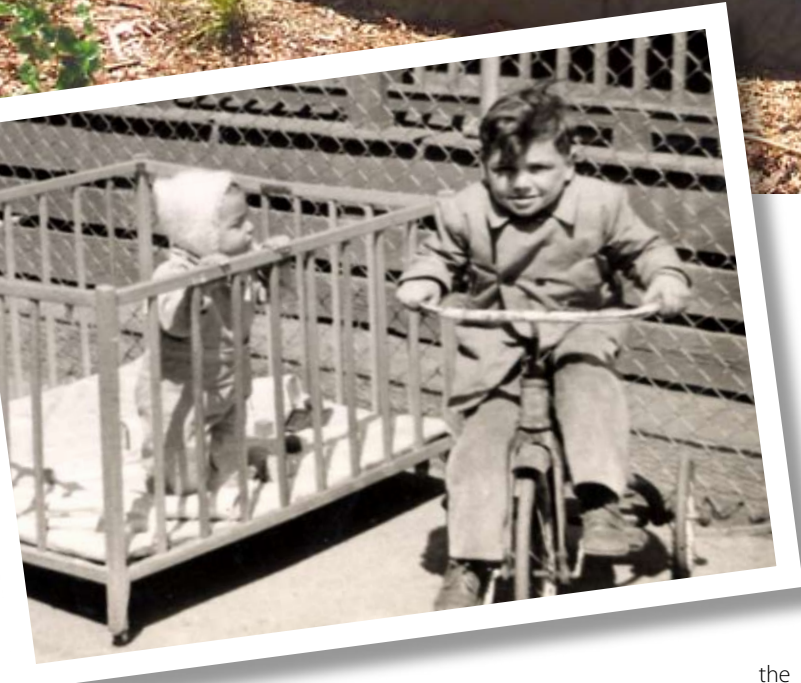
Next, Lexington built the platform and framework, and packed foam on the framework for sculpting the exterior which, once approved, was cut into sections and molded in fiberglass. The platform, constructed of solid steel superstructure with steel decking and weighing 10,000 lbs, was shipped to the site, along with the dino, in pieces.

Lexington's wasn't the only team doing an installation at DSC; numerous other teams were busy filling Dino Quest's 10,000 square feet with a variety of interactive exhibits. "Here we come with a giant crane and 20,000 lbs of steel," remarks Drobnis. Having anticipated the situation, Lexington had devised a plan for doing part of the dino assembly in the air, about seven feet off the ground in an aerial ballet of cranes and lifts. "We raised the [5-ton] platform up with a crane and with it suspended, brought the legs in one at a time using a lift," recounts Drobnis. "The feet were already attached to the platform. We'd spin a leg into position, bolt it to its foot, then spin the platform and place the next leg."

With all four legs joined, the platform was lowered to the ground, and the neck, tail, ribs and backbone of the dino were craned in and attached. Welding was next. "For days and days, we had welders crawling all over it with torches and lifts," says Drobnis. Meanwhile, the fiberglass skin was being completed and trucked in, in sections. Starting at the bottom, the crew worked its way up the dino, attaching some 100 pieces, each of which weighed 200 to 300 lbs and had to be lifted in place with a crane or forklift. "Once the panels started going into place, the sculptors came back to butter the seams," says Drobnis. "They were buttering at the bottom while still assembling at the top. Then the scenic artists came in to paint it. Then we put on a clear coat to protect against UV. We used hundreds of gallons."



**Top to bottom: Recreating a 90-million-year-old dinosaur** with scientific accuracy and I-beams, in the wide open spaces of Lexington's facility in Los Angeles; On a clear day in Southern California, an *Argentinosaurus* is installed at the Discovery Science Center; Tomorrow's paleontologists. Photos: Lexington



**Kids still just want to have fun!** Children learn through experiences like playing around in a giant dinosaur (above), while Richard and Frank Bencivengo (left) have been working (and playing) side-by-side for over 50 years. Photos: Lexington

The next step was to install a safe deck of super-durable rubber playground material on the inside of the dino and install the interactives, which are a stylized representation of the dinosaur's digestive system and its heart. "These had to be child-proof, which is not the same as adult-proof," comments Drobni. "We have learned a lot from doing projects for children's museums and theme parks, about what is the most child-proof and low-maintenance."

Inside the belly of the dino, kids operate hand pedals to drive a model representing the dino's heart, and gauge the pumping of their

own hearts on a heart-rate monitor. Colored balls move through Rube Goldberg-like representations of the esophagus, stomach, small intestine, large intestine and colon. Water flows from two tanks that represent the kidneys, into a single tank that represents the bladder. Kids delight in pulling the flush-style handle of the bladder tank, which releases "dino urine" (actually a very fine water mist) on whoever is standing below. To complete the cycle, kids plop into a soft-play pile that represents "dino poop."

"Dino Quest is a new science learning resource and a 'world's first' exhibit located here in Orange County," said Joe Adams, president of Discovery Science Center. "We are very excited about Dino Quest because it uses the wow factor of life-size dinosaurs to teach our guests about life sciences." About two years passed between concept and completion

with actual design and installation for the Argentinosaurus totaling about seven months, plus a several months' break for fundraising. The budget of \$866,000 US included all the design development done in collaboration with the museum and Steve Brooks, and Lexington's process of technical design through installation.

In addition to its fabrication skills, Lexington prides itself on the versatility that enables it to meet the needs of museums, helping to realize exhibits that have a modern storytelling flair while adhering to scientific and educational standards, and conforming to budget. "We know what works," comments Lexington COO Frank Bencivengo, "and we know that a museum's budget is limited and hard-won. We wholeheartedly join their team, we identify with their mission, we feel their pain. I think we do a very good job of it. Even when you have a relatively luxurious budget," he adds, "you don't want to spend millions and then fail! One of the things we do is advise museums on how to allocate the money judiciously. We're sensitive to their goals and we want to be part of a viable operation."

For more information on Lexington, visit [www.lex-usa.com](http://www.lex-usa.com)

For more information on Discovery Science Center, visit [www.discoverycube.org](http://www.discoverycube.org)

*Judith Rubin is a freelance writer/editor for the attractions industry, active in the field since 1987. She is currently based in Richmond, Virginia.*

**Kids learn** about dino digestion in the belly of the beast. Photo: Lexington



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