



Mystère: A Shared-Reality High-Wire Act

Christopher Chomyn, ASC shoots Cirque du Soleil's live
Las Vegas show for Cosm's LED Domes.

By Carolyn Giardina





Cirque du Soleil's Las Vegas show *Mystère* opened at Treasure Island on Dec. 25, 1993, and it is now finding a wider audience through the shared-reality company Cosm, which captured the show for exhibition at its immersive LED Domes in Los Angeles and Dallas.

Cosm venues can be likened to smaller alternatives to the Sphere (AC Oct. '23). The roughly 12K display in the L.A. venue is 87' wide by 60' high, offering 180-degree horizontal and 120-degree vertical fields of view. The L.A. and Dallas locations opened during the summer of 2024 and have since exhibited live sports (a major part of its model); feature films such as *The Matrix*, *Harry Potter and the Sorcerer's Stone* and 1971's *Willy Wonka and the Chocolate Factory*; and other content. At press time, a Cosm venue in Atlanta was imminent, and venues in Detroit and Cleveland were also in the works.

Mystère by Cirque du Soleil is the second collaboration between Cosm and the venerated Canadian contemporary-circus producer, following the aquatic-themed "*O*" by Cirque du Soleil.

Finding New Angles

For cinematographer Christopher Chomyn, ASC, the question was how to film *Mystère* — a whimsical blend of acrobatics, aerial stunts, music, dance and comedy — for an immersive venue. He collaborated closely with director Philippe Safir, Cosm Vice President of Immersive Fabrice Lorraineau, and producers and editors Jhennifer Webberley and Jen Prince, to find the answer.

"I've known Philippe and Jen for more than 20 years," Chomyn notes. "We met when I was one of their professors at USC. I've stayed in contact with Jen over the years, and I was thrilled when she asked me to join them. As a bonus, I learned that Philippe would direct. Although I didn't

know Jhenn or Fabrice prior to this project, I learned that they were also USC alumni from the same years."

Prince says, "For years, I had been looking for a project we could collaborate on, and this opportunity finally brought us together professionally. I felt like Chris' experience, coupled with [his] sense of adventure and curiosity about storytelling in new formats, would be a great fit for our Cirque shooting climate."





Above: Performers hang above the fog-shrouded Cirque du Soleil stage.
Below: A closer view of the aerial ballet.

Research commenced with several trips to Las Vegas to see the live show and tour the theater that was purpose-built for *Cirque du Soleil: Mystère* at Treasure Island. “We saw the show and did some scouting, and we discussed the overall plan with the principals at Cirque,” Chomyn recalls. “We went all the way up to the high grid and all the way down to the cellar to try to figure out where we could put cameras to show a different perspective on the show than most audiences have seen.”

After much planning, the team filmed 10 live shows with available and bespoke gear, including dual-camera arrays of 8K Red V-Raptors shooting a combined 16K at 60 fps with 180-degree wide-angle proprietary lenses designed by and built for Cosm.

Chomyn considered shooting at 120 fps but opted for 60 fps after testing the three Redcode Raw encoding options. “At 120 frames a second, you have to shoot its most compressed LQ format,” he explains. “I did some tests at HQ, MQ and LQ. Surprise, surprise, I preferred HQ. MQ was almost indistinguishable, really, and [with] LQ, you could see more

artifacts.” Select slow-motion sequences were shot at 120 fps.

“The live show itself was quite dark, and I was concerned about underexposure and compression,” he adds. “At times, there were areas [in the arena] where there were no details in the shadows.”

Live shows were filmed from five camera positions, each a bespoke rig that held two cameras, one atop the other with a slight overlap, and the images were stitched together in post. Two additional single-camera positions helped cover the 120-degree vertical. “We reserved the [bespoke] rigs for places where you would see performers and the scope of the venue,” says Chomyn. “Philippe had seen the show many more times than I had, and he created a plan each day for where he wanted to put the cameras.” These positions included front, center, side, rear and at various elevations. Chomyn adds, “We also filmed several acts during rehearsals in order to create shots that we couldn’t make during the live shows without interfering with the live-audience experience.”

Unconventional Crew

Chomyn compares the project to a “well-orchestrated documentary” in that many things couldn’t be changed; this was attributable to both the





live audience and the fact that some lighting positions had been set to ensure performer safety.

With only minimal changes to the show's lighting, the production didn't employ a gaffer. Instead, Chomyn worked with *Mystère's* head of lighting, Sean Jensen. "I did modify, with Sean, some of the color saturation, some of the intensity," the cinematographer recalls. "There were a couple of places where the performers were kind of dark in front of a dark background and I had them either bring up the performer or the background to get some separation. The performers' movements are so interesting that even in silhouette, they're amazing." Of the Cirque team, he adds, "They were very accommodating to the extent that they could be."

The crew varied in other ways, too. Chomyn explains, "Every camera had a camera operator who worked with the grips to mount the cameras on the rigs they built, roll at the start of the show, and deliver the recorded media to the post team. During the shows, cameras were locked off. Once each camera was rigged, Philippe and I checked the framing and double-checked the camera settings."

The cinematographer also worked with Steadicam operator Brian Sergott. "Brian was a camera operator helping to rig cameras for the live show," Chomyn says, "and he served as Steadicam and Trinity operator during the filmed rehearsals."

Chomyn praises the Cirque du Soleil crew, who "were just fabulous. From Senior Company Manager Claude Bourbonniere to Production Services Technical Director Stephanie Weiss, Technical Director Stephen Dietrich, Artistic Manager AJ Lamb and Stage Manager Julie Maury, the entire team was supportive and helpful through the entire production process."

Finding the Language

There was plenty of experimentation with the unconventional canvas. "The rule book isn't written yet," notes Safir. "There was an early version of what the rule book was supposed to be — very restrictive technical rules — but what you find as you're filming is that those rules bend."

A prime example of this is the show's Chinese-poles sequence — captured during rehearsal with a Supertechno48 — in which a performer jumps from one pole to another as the camera snap-rolls 90 degrees and then another 90 degrees, moving through the poles with the performer.

In another frame from the *Cosm* presentation, performers soak up audience applause.

However, camera moves are experienced differently in the Dome, which made the testing phase important. When Chomyn first tried physically rotating the camera, "I thought I was gonna fall out of my chair! I grabbed onto my seat. It was terrifying! We found that if the roll is too slow, the audience will feel like they are turning upside-down in their seats. We tried doing snap rolls very quickly as the performer jumped from pole to pole, and we found that the fast roll did not create the same vertigo effect that the slow rolls caused in the audience. We realized that if you change perspective fast enough, before people have time to feel like they're falling out of their chairs, it's fine. The move is so quick that it almost is a cut, but it is a move. We were able to find ways to exploit some different kinds of movement."

The goal for the Chinese-poles sequences, he explains, was "to move through the poles with the performers. It was thought that this could cause a stitching problem between the two cameras as the poles crossed from one frame to the other, but that was easily solved by our amazing post team, headed up by Chris Roewe."

The filmmakers strove to place the camera in other unique locations as well. Chomyn recalls, "We put cameras overhead for the perspective of the [moving] O-daiko drum coming down or going up. We had the camera straight down, looking up."

Driving such decisions was the desire to make the *Cosm* presentation different from the live show. "We didn't try to duplicate it exactly," Chomyn says, "but we also didn't want to change the spirit of the show." Safir observes that the *Cosm* show "puts you in the middle of the action, next to the performer."

The language for the venue is evolving. "There's a sweet spot where the performers are larger than life and amazing," Chomyn observes. "If they get too close to camera, focus becomes an issue, because in an immersive environment, the audience wants deep focus so they can look wherever they want. If the focus is too near the camera, the depth of field is reduced, and if the performers are too far away, they're just a little small and we don't feel the immediacy. So, you really want to be close, but not too close."

On close-ups, the "sweet spot is probably the bottom two-fifths or



From top: A Supertechno48 crane provided by Elite Camera Support angles in on a performer atop a platform; the crane-mounted camera rig captures a moment; Red V-Raptor cameras, equipped with proprietary Cosm lenses and attached to a vehicle mount, record the lunacy as Béb  Fran ois ("Big Baby") drives around the stage with a "Papa" plucked from the audience.

one-half [of the screen] — no more than three-fifths up." With framing, one also must consider where various guests are seated in the Cosm Dome venue. "If you frame something important at the top, it might be straight over someone's head, and it would be uncomfortable to look at."

The Supertechno48 employed for the Chinese pole act — supplied and operated by Elite Camera Support in Burbank — was also used, during rehearsal, for a quieter act during which two sisters demonstrate great strength. For this segment, which features one performer lying down and supporting the other, "you can get the whole person in frame," Chomyn says, "and you can get pretty close to them. A classic film close-up is difficult in the immersive environment, because you don't expect the characters to be cropped by the frame. But in this act, one sister is lying down and the other is above her, so the camera can get close without cutting them off. It puts the audience practically onstage with the performers. The image is so huge on the screen you can see the performers' eyelashes. It's kind of incredible."

One issue with shooting the rehearsals was that "unless you're shooting straight down or straight up, you're seeing some of the empty seats," Chomyn notes. "So, how do you not make it look like you're cutting from a full theater to an empty theater? One way is to keep the light off the audience as much as you can. There were little LEDs in the egresses of the theater, and we pumped those up a bit to give a little more contrast in that area."

He adds that single cameras had their own uses. "There were certain shots that didn't warrant a rig. For example, when the stage floor lowers, we put a camera below the stage to capture that unique angle of view. And there were the times where we put a camera up high, looking straight down. There's no point in having a second camera for that."

The filmmakers didn't use a traditional video village for all camera positions, though there was a cart with two monitors. "We couldn't run enough cable to connect them all, and we couldn't do it with WiFi, so we just had to trust," Chomyn says. "We had a principal camera; often, I stood by that camera's monitor and watched it throughout the show."

The filmmakers occasionally did pickups from show to show. "There was one show early on that went longer than we expected, and the camera rolled out just before the end. So, the next time, we did it again from that position, but we fired the camera later in the show since we already had the opening."

Different Dailies

There is no traditional dailies process on a Cosm show, but Jon Munoz from Cosm managed the dailies. The filmmakers used various methods to view select footage and cuts. Chomyn recalls, "When we did have dailies, [they weren't stitched]; we saw just the front camera, and we would look at certain shots if we wanted to check on something. It's a huge amount of footage. We'd wrap, and they would download all through the night."

They also watched some dailies using a VR headset, but "not every day," Chomyn says, noting it was more for checking that techniques were working. Another option was viewing sections of the movie, sometimes with proxy materials, either in a Cosm Dome that wasn't in use (which was sometimes in the middle of the night), or at the company Dome — the smaller "Domita" viewing environment. The Domita, located in the Cosm office, is a quarter-scale version of the full dome at the L.A. venue.

Postproduction was done in-house at

Tech Specs: Aspect Ratio | Mastered for 2:1; Cosm format during display at the venue
Cameras | Red V-Raptor 8K VV (dual-camera array and single camera)
Lenses | Proprietary Cosm prime

At right: Director of photography Christopher Chomyn, ASC (standing at left, in baseball cap) observes a rehearsal with the Supertechno48. Middle: A monitor displays the unique frame lines for the Cosm format. The red lines on the sides are the 180-degree lines, and the red line at bottom is where the floor cuts off the Dome; the orange lines are 10-degree safe lines. The blue line shows where the second camera in the rig starts overlapping the main camera (i.e., the “stitch overlap”). There are also 5-degree increment marks on the horizontal and vertical axes. The octagon is to discern foveal vision vs. peripheral vision when audience members are looking at the center of the Dome; the octagon can also feature a rectangle (using the two sides of the octagon) that can serve as a more cinematic framing guide — the cinematic center of the Dome. Bottom: Chomyn lines up a shot.



Cosm’s offices, where the team used various software systems, including some custom, in its proprietary workflows. An offline edit was cut in Adobe Premiere, and grading and finishing was completed in Blackmagic Design’s DaVinci Resolve.

Due to the curved Dome viewing environment, these images are incorrectly mapped when displayed on a flat panel. Chomyn notes that Cosm has created its own workflow for stitching, de-noising and sharpening that caters to the unique specificities of its system.

Mystère was graded in a Cosm Dome by in-house colorist Denley Ryan, working closely with Safir, with the stitched images at their native 17K.

Giving Up Control

Chomyn says if offered another Cosm project, he would do it “in a heartbeat. It was an amazing experience. Most of my career has been narrative, where I have a reasonable amount of control. It’s hard to give up control sometimes, but when you do, you embrace what the thing is naturally. This project was so magical, and the people were wonderful.”

Chomyn, who still teaches cinematography at the University of Southern California, looks forward to further exploring the format’s visual language.

“In classic cinema, the frame — and creating frames within frames — is often used to convey meaning and mood. But in an immersive venue, where even the edge of the display

is outside the viewers’ peripheral vision, there is no frame, there is only full field of view. In a venue without frame lines, where everything is in focus, you have to use light, shadow and movement to direct the eye.”

One of the challenges is the field of view. “All the lighting has to be built into the set. There’s no place else where you can hide a light, so you need to light from within the set. I think we can use that creatively.”

Chomyn concludes, “I would love the opportunity to explore the medium for a narrative project — to really push the boundaries, eliminate the perceived limitations, and demystify the process.”

