



What's Never Been Seen --- IPS2016

[Presentation 30: What Makes a Fulldome Show Catchy]

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Presented at IPS2016 by Carolyn Sumners, Houston Museum of Natural Science

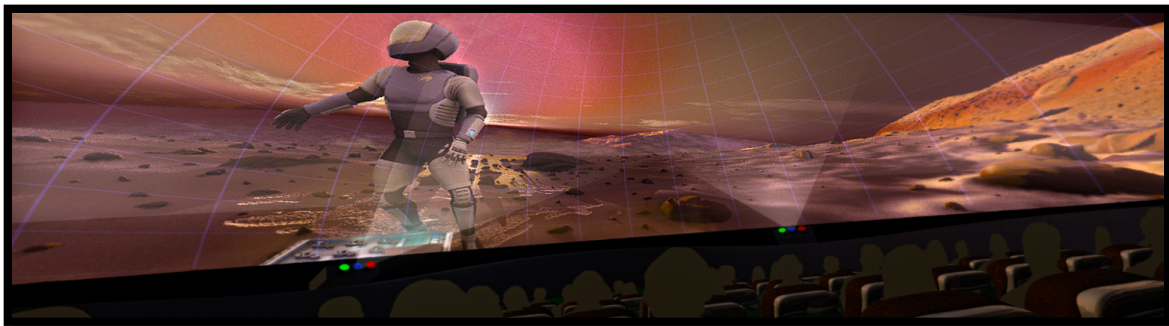
Based on the material presented at the IPS2016 conference [as well as a similar presentation at IMERSA2016], this paper will address some of the creative aspects we at Home Run Pictures have experienced during production when aiming towards "Successful visualizing for fulldome storytelling."

I am including the verbiage from the PowerPoint slides for reference at the beginning of each section and then a further description of the idea presented.

ABSTRACT:

The script is written and the storytelling is effective. But there are calls for visuals that don't yet exist and real data representations that haven't been visualized prior. Storytelling for immersive fulldome environments requires producers to take the "artist concept" to a new level. How do we manage good communication between the technical and creative, between the left and right brain thinking processes? And most importantly, how do we create an entertaining story and still meet our educational goals? Case histories of successful productions will be highlighted giving clues to what works... and sometimes what doesn't.

From the full abstract for the presentation, I want to highlight a couple sentences that specifically lay out what we will address here. The first being: "How do we manage good communication between the technical and creative, between the left and right brain thinking processes?" This can be interpreted as the scientist giving input vs. the creative person implementing, as well as the technical vs. the creative disciplines within the production pipeline. And secondly: "...how do we create an entertaining story and still meet our educational goals?" In other words, a "catchy" story educates better only if it does educate.

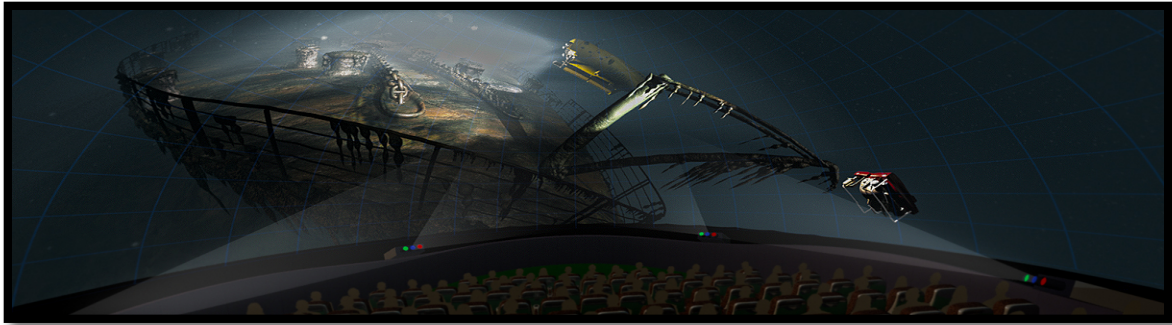


The Traveler's Guide to Mars – Buhl Planetarium

WE WILL INVESTIGATE FROM SEVERAL PERSPECTIVES

- ☐ A Creative Theory Behind Visualizing Science Concepts:
- ☐ A Science Understanding Approach to Achieving This:
- ☐ A Sampling of How This Works:

There are three areas I will briefly cover... What might be the most successful creative approach to science visualizations... The necessity of really understanding the science we are visualizing... And some sample application of these approaches during real productions the past few years..



Night of the Titanic - Houston Museum of Natural Science

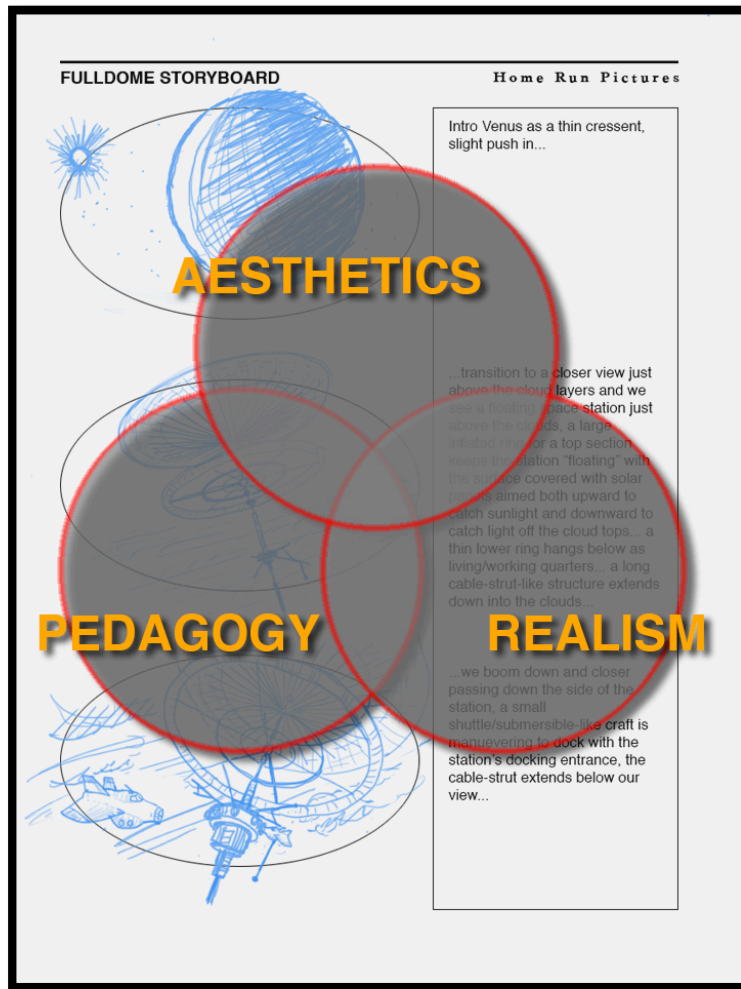
INFAMOUS QUOTES FROM REAL PRODUCTIONS

- ☐ "I'll give you 5 minutes..."
- ☐ "That render test is beautiful... but more cartoon then science visualization!"
- ☐ "Guys, stop the Buck Rodgers stuff, or we will never get another NASA grant!"
- ☐ "I just looked at the final and was glued to the screen watching the depth and realism of the concept unfolding before my eyes..."

So here are a few what I like to call infamous quotes from over 15 years of fulldome content creation. The first is my favorite. On a rather complex fulldome visualization of the Big Bang theory, where the expert was a Nobel Prize winning astrophysicist, he calls and curtly says, "I'll give you five minutes." Now I then assume, he is assuming that as a creative I had no concept of the mathematics involved... so I started talking as fast as I could. Even threw some math back at him when I could. So then at one point he pauses and asks, "so you understand this?" I said, "well I know you could get over my head very quickly, but yes, I have some math background." He paused again and said, "I'll give you ten minutes." Then we have a quote we don't want to hear, "That render test is beautiful... but more like a cartoon than a science visualization!" Or humorously, "Guys, if we don't stop the Buck Rodgers stuff, we will never get another NASA grant!" And finally what we want to hear... "I just looked at the final and was glued to the screen watching the depth and realism of the concept unfolding before my eyes..."



Solar Quest - Buhl Planetarium

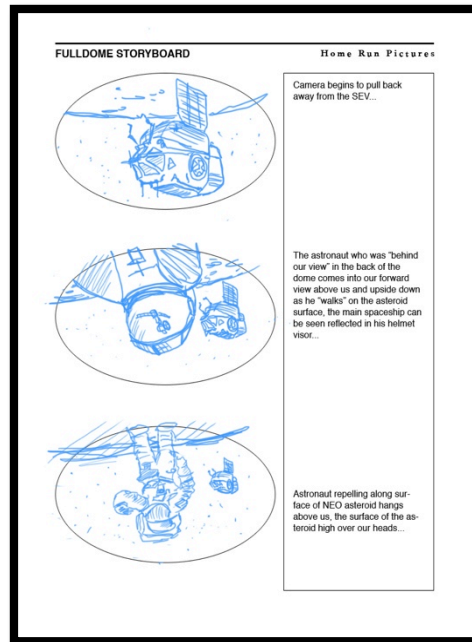
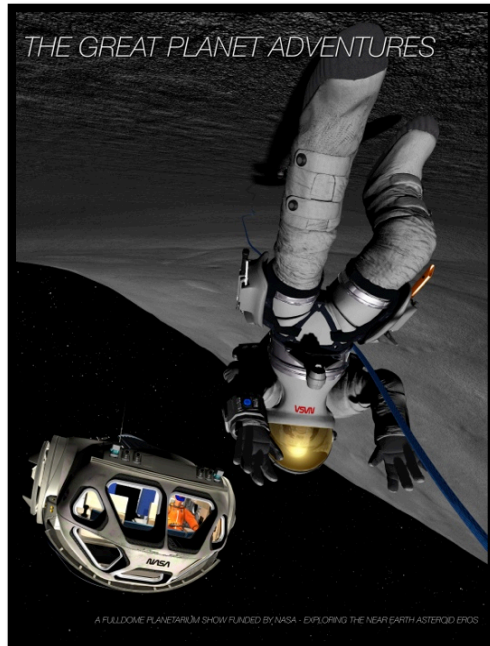


BEFORE YOU START STORYBOARDING

Understand the three overlapping concerns of successful scientific visualization

- ☐ Aesthetics/Drama/Cinema
- ☐ Realism/Believability
- ☐ Pedagogy – Does it teach?

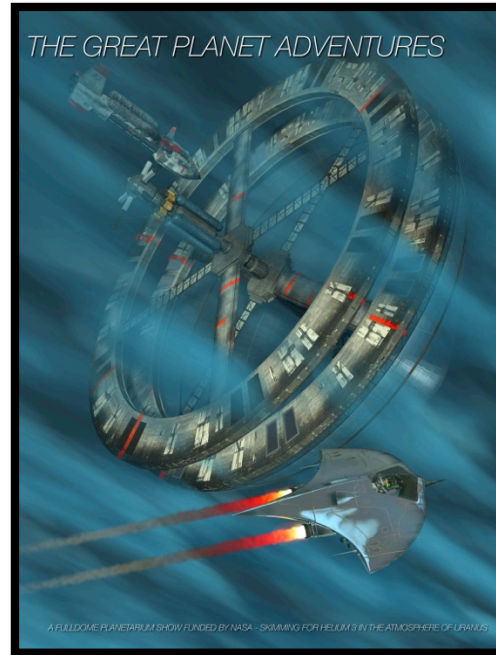
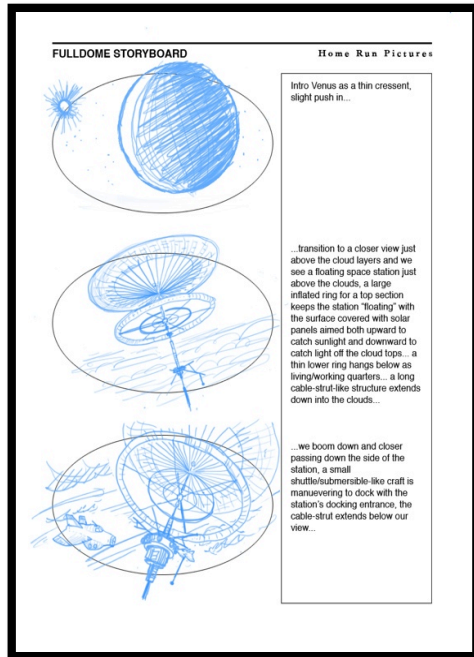
Let's look at three aspects of visualization content creation and fit them into this venn diagram superimposed over a storyboard. First we have the aesthetics, the creative area of making it beautiful. Then there's realism, important to the scientist, but not always having to be a necessary factor. You would not do a visualization of the solar system to scale, since it can be explained better without that perfect realism. And then there is pedagogy... or simply, does it teach well? In real production life, we have found that the aesthetics is most important because without it being done well, the other two areas will always fail. But we must obviously aim to hit the overlapping center of the diagram to meet our overall goal.



REALLY GET TO KNOW THE SCIENCE AND THE SCIENTIST

Be prepared to develop a solid relationship with the experts you have contact with... don't try to sound like you know all about the subject... and get well versed in the subject before hand.

This may sound incredibly obvious, but acquire as much knowledge about the subject as you can... but don't try to be too much "in the know," or sound like an expert. Our egos of wanting to sound knowledgeable can sometimes trap us. The best goal is to make the expert we are working with for the visualizations feel you are truly listening and comprehending. Ask if you are not understanding what is being said, your ego will survive.



KNOW HOW TO RESEARCH THE SCIENCE

Thankfully Google is around today as our science library since our experts are sometimes too busy to be available every time we need them. Learn to use Google well.

Research, research, and more research. The internet gives us access to a wealth of science material. There are even books available giving insight how to use Google more effectively. I really can't stress this too much. Considering the amount of time and effort it takes to get to the finished visualization in our modern digital world, a mistake can really be a big deal.



Impact Earth – Houston Museum of Natural Science

“All representation relies to some extent on what we have called ‘guided projection.’
When we say that the blots and brushstrokes of the impressionist landscapes
‘suddenly come to life,’ we mean we have been led to project a landscape into these
dabs of pigment.”

From Gombrich’s “Art and Illusion”

Much of what we think we see in anything or we design to be seen is supplied through our memory or our audience’s from somewhere else. In this quote from the book “Art and Illusions” the idea of using the basis of what the audience may already comprehend or has experienced before, is key to teaching something new. Setting up the new understanding using something that may already be part of our or our audience’s experience. I’ll explain a little later with an example using the poster visual shown here from a past planetarium show.



Dinosaur Prophecy - Houston Museum of Natural Science

"There is something about serendipity and the 'happy accident' that you can't get on a computer... Every result must be thought of and programmed. It is often that unexpected happenstance that makes the shot real, and organic, and truly satisfying."

Richard Edlund in "Art of Visual Effects"

Then there is the "happenstance" effect, as visual effects director Richard Edlund from Star Wars calls it, that "makes something real." Now this is hard to design on purpose, but this you can more often reach by NOT locking yourself into the first idea or telling of the concept you come up with. Don't get so attached to your approach that you don't investigate further on in the production process. Let's admit it, we creative-types get stuck on our "art." And this can be difficult to overcome because of the amount of effort today's complex digital pipeline involves if we have to change something during production.

WITNESS FROM IMPACT EARTH

Here is a scene [below] from the show, Impact Earth. The Houston Museum of Natural Science was digging up a 150 pound meteorite in a Kansas wheat field. The science team handling the dig said evidence pointed to a 10,000 year ago impact. So we came up with the idea of a witness seeing the impact. So what might be a good setting for the most drama? This connects back to the quote about working with something in our memories, something similar to what we've seen before. So obviously a clear dark Moonless night, snow covered forest area for contrast... a lone paleo-indian guarding his family's camp as he warms himself by the fire. A nice setting from our imagination or is it something we've experienced before, maybe at a picnic or campout? In our memory we begin to feel we are standing next to the lone witness by the fire. There is the serendipity of a few early shooting stars overhead and then the the big meteorite dramatically and unexpectantly comes from behind the witness, and us as well in the audience. The wide spread of rocks found in this area says that a bigger one probably broke apart when it hit the atmosphere. So we visualize a bright event overhead. The meteorite's light creates moving shadows enhancing the drama. This is an example of the "happenstance" approach in the tune of a surprise... so here we are creating drama by design and thus the storytelling becomes more effective.

http://homerunpictures.com/2015/KANSAS/KANSAS_400.mov

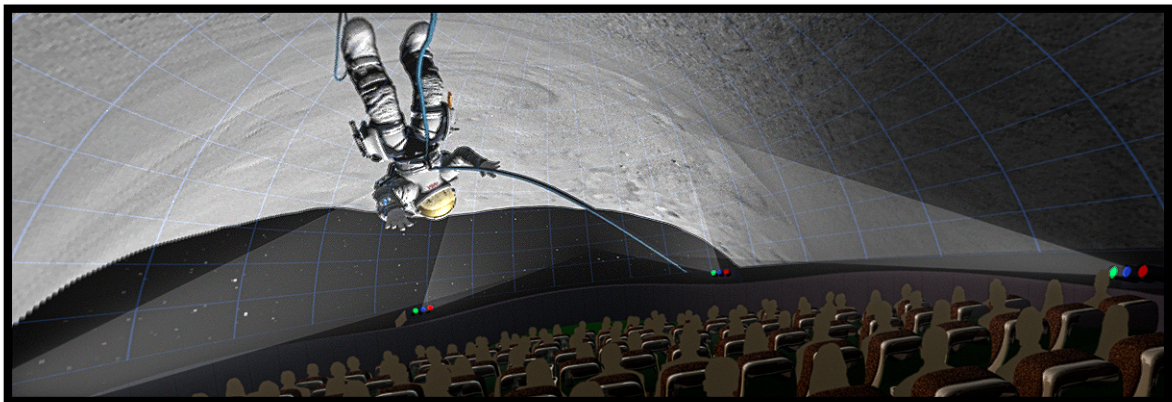


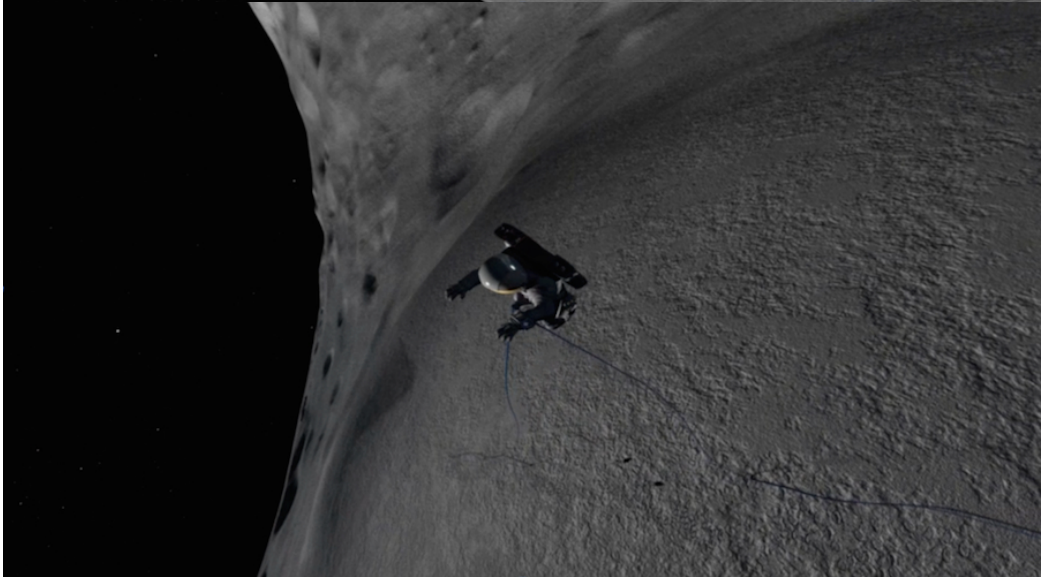
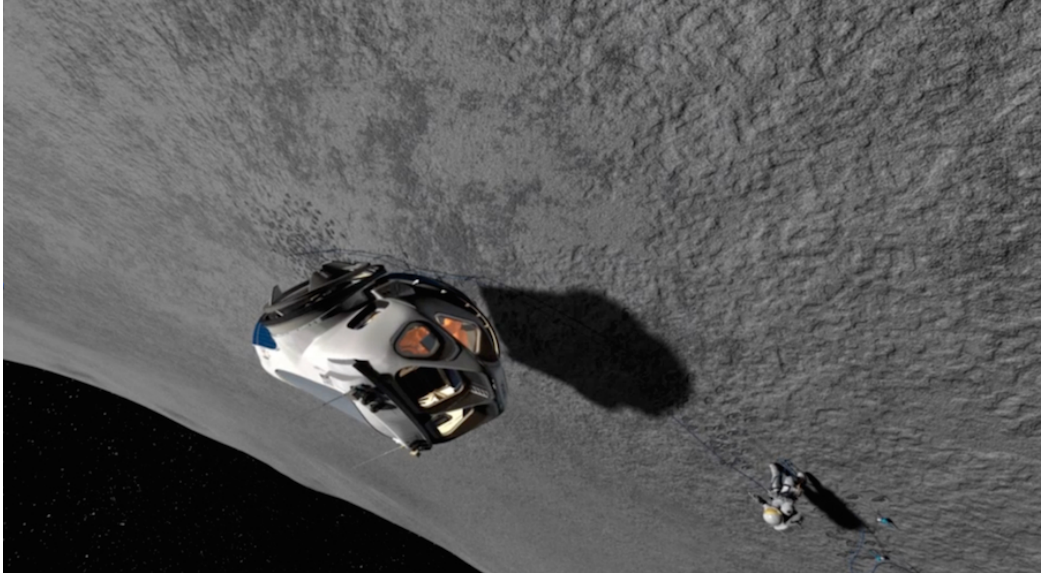


EROS MISSION FROM THE GREAT PLANET ADVENTURES

Here's a scene [below] from The Great Planet Adventures, a possible NASA mission to asteroid Eros 443. We use views inside our spacecraft and outside to create nice pacing and also to facilitate cuts between scenes... the audience has learned to accept this from watching motion pictures and it still works in the immersive fulldome views although some may disagree. Our spacecraft is accurately created from International Space Station modules, the audience has seen pictures of the ISS so it is a recognizable form... well except maybe for the windowed bridge area in the front which was found in a junk yard on a desert planet [Star Wars pun], but again a recognizable spacecraft concept. To take advantage of our immersive view we employ a long zoom for dramatic fulldome impact. Now this particular task was a good example of the creative types working together with the technical people since we had to create special scripting for ever-more-detailed textures to achieve this zoom. Our Space Exploration Vehicle [SEV] down close to Eros is a real NASA design, so again a known. So our scene is partly made up of things the audience probably has seen before and accepts quickly. And for some of that needed unexpected serendipity, our astronaut at the end just has some fun at the end of his "bungee" cord by leaping off the asteroid at the end of his spacewalk.

http://homerunpictures.com/2015/EROS/Eros_sequence_400.mov

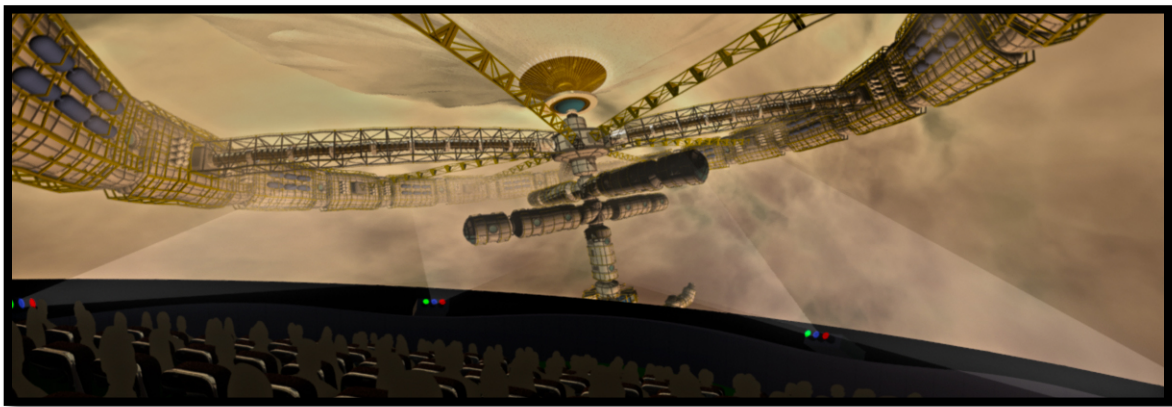




VENUS FLOATING SPACE STATION FROM THE GREAT PLANET ADVENTURES

So also from The Great Planet Adventures planetarium show, we have a visualization of a Venus floating space station, a real NASA concept [below]. Our station is a large circular ring, since space stations usually are rings, and in this case hanging from a recognizable weather balloon style rig. There is a long vertical strut like a kite's tail for stability. And what about our shuttle craft for exploration? That has to be able to withstand the great pressures and corrosive gases of Venus' atmosphere, so instead of looking like a space shuttle, it is more similar to a deep ocean submersible with portholes, like those submersibles that explore the Titanic wreck. So for this scene we have a lot of creative types working with engineers for future-like visualization, but still a lot of things similar to what the audience may have seen before.

http://homerunpictures.com/2015/VENUS/Venus_sequence_400.mov

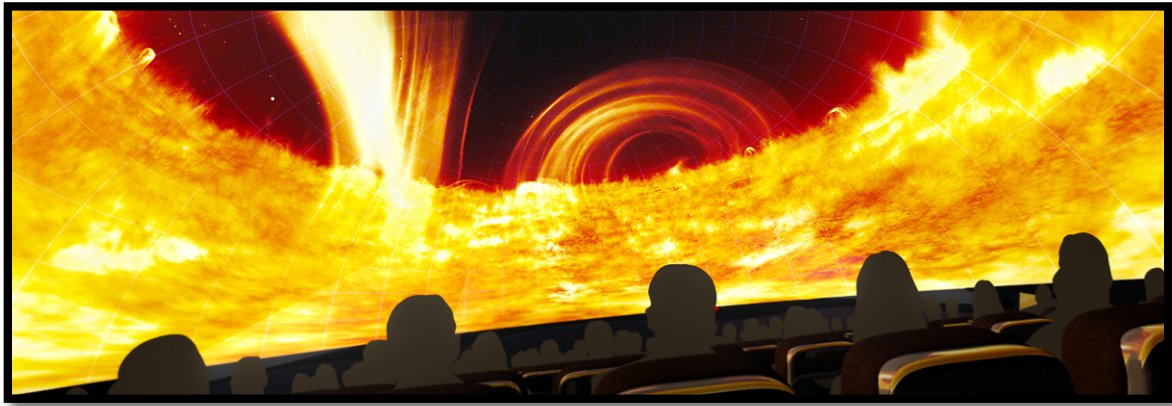


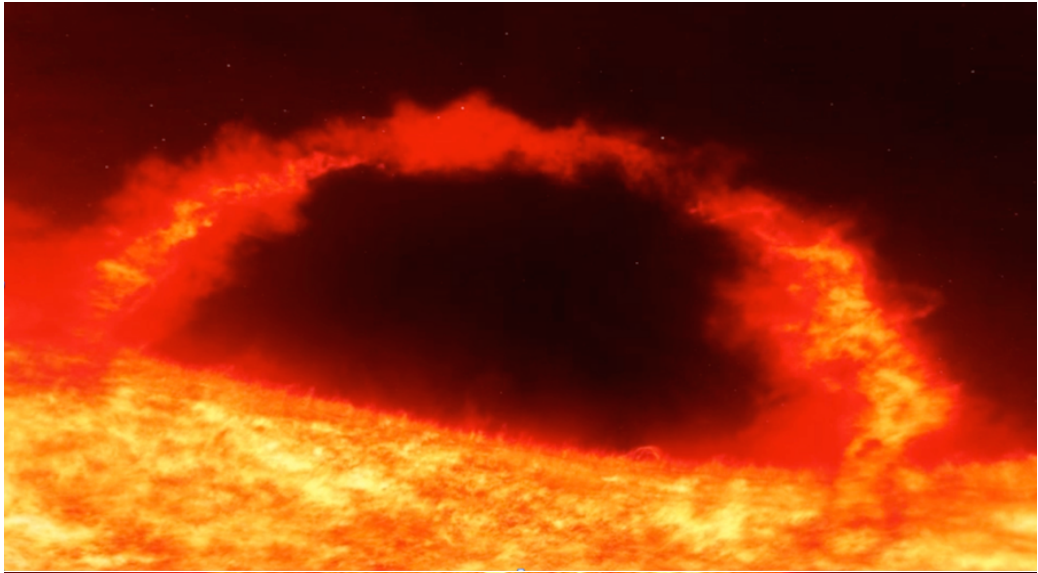


THE SUN FOR SOLAR QUEST

For the Buhl Planetarium's Solar Quest show, we needed to create a fulldome view of the surface of the Sun that worked effectively and believably along side the incredible images of solar activity being captured by the NASA Solar Dynamics Observatory [SDO]. This required five months of special technical scripting in Maya software using fluid dynamics for the effects and also creation of a special camera for rendering [so internally to the production, the technical married to the creative effort was very present]. Drama was added by having the audience pass under the various solar activity using the fulldome immersive view to its fullest effect. Pacing is obviously in time-lapse to make the activity most dramatic. And maybe this particular visualization is even something that's never been seen before as our title suggests.

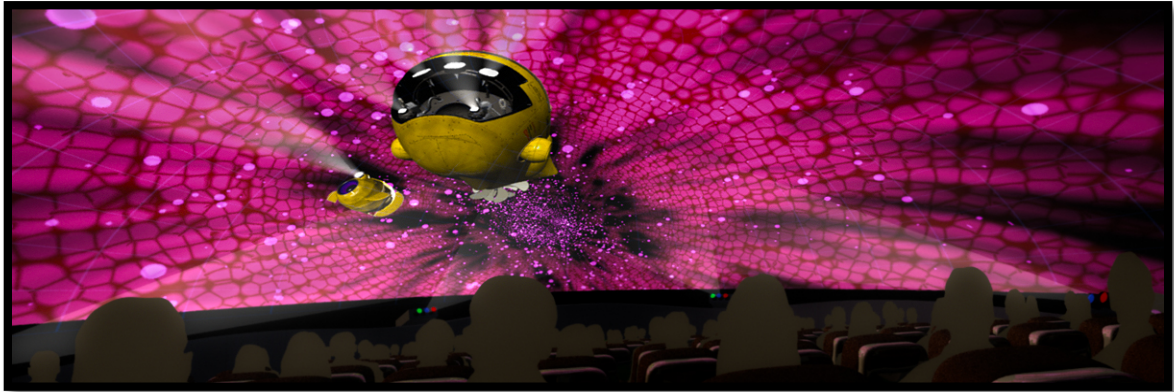
http://homerunpictures.com/2015/THESUN/SOLAR_QUEST_Sun.mov





And that's how we approach creating dramatic science visualizations at animation and visual effects studio, Home Run Pictures. You can see more of these concepts, the technical and creative working together, at the Fulldome @ Home Run Pictures web site if you are interested...

<http://www.homerunpictures.com/fulldome>



Microcosm – E&S

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