

## Monica Bolles - Immersed in the Brain



Monica Bolles already wears many hats. She's an artist, music producer, audio engineer, and composer who is very involved in three-dimensional environments and the creation of immersive experiences, especially in full-dome setting. She loves exploring the fusion of multimedia arts, science, sound, and immersive environments that submerge the audience in multi-sensory sonic, visual, and tactile sensations.

**Charlie Morrow:** Back in 2003, when we first perfected our sound Cube idea, at the place here called the Kitchen and another one called Harvestworks commissioned a dozen artists to do pieces for it. And we just presented them again last night at Harvestworks and then we'll go out to an art location called Governor's Island

today through Sunday. So it's kind of a reunion. It's been nice because the engineer who, from the Harvestworks side, worked on it has since written a book on immersive sound with his partner, he teaches at NYU.

**Monica Bolles:** Oh yea, Agnieszka [Roginska].

**Charlie Morrow:** Yea, exactly. So the two ... this is Paul Geluso. Do you know him?

**Monica Bolles:** No, I haven't met him. I met Agnieszka and talking with her I put together a final pitch for South by Southwest and with her and some other women in spatial audio.

**Charlie Morrow:** Is that for this coming year or last year?

**Monica Bolles:** For the coming year. So we'll have to see if we get accepted, but you can get the strong panel.

**Charlie Morrow:** Sounds great. I wish you well. He's going to be the head of the AES (*Audio Engineering Society*) here.

**Monica Bolles:** Yea and I have that book (*Immersive Sound: The Art and Science of Binaural and Multi-Channel Audio*). When I saw that come out I said I need that book (laughter).

**Charlie Morrow:** My original collaborator with all of this is a guy named Brian Katz (immerse! podcast 6: <https://immersesoundlightspace.podbean.com/e/brian-katz/>) who heads the Spatial Audio Department in Paris at the Sorbonne. He turned me on to this book.

**Monica Bolles:** Well, that sounds like a lot of fun.

**Charlie Morrow:** Well, it was a good gathering. We talked about what spatial sound meant then and how people think of it now and so forth. It was a great panel.

**Monica Bolles:** Yea, the idea of it is that it's changed over the years?

**Charlie Morrow:** Substantially, especially Paul's idea is quite interesting compared to where it was. It's interesting to see the evolution

**Monica Bolles:** Yea, it sounds like it would've been an interesting panel. You'll have to send me the video.

**Charlie Morrow:** I certainly will. Well, what I wanted to discuss with you is immersivity itself. I'm writing a book and doing a podcast called *Immerse!* and I had two questions: One is just your current work with immersivity and your understanding of it. And the other question, since I'm working with a timeline in the book, is to talk about how you got to your current thoughts about immersivity or going backwards from where you are and stepping back and deconstructing it.

**Monica Bolles:** Should I start with my work currently?

**Charlie Morrow:** Oh definitely, start with now.

**Monica Bolles:** In a week I'm about to head up to the Cube at Virginia Tech. They have their 139-channel speaker. I'm presenting two pieces actually: One is a piece I've been working on with Charles Veasey, Ben Efram and Michael Sperandio; they're all from the Imerse community and then working with artist Janet Feder – she's a musical artist from Boulder, but she plays prepared guitar so using different objects to create different sounds and tones. So we've been working on that piece currently. The first presentation was at the Conference of World Affairs in Boulder and then we presented it at the c and then we'll be presenting it at the Q and then I've also been working with a group of ladies on a project for sonifying and visualizing astronomical data. I built a kind of an instrument for being able to use astronomical data to create different tones and different sounds that I can then improvise on. It's multichannel and I just did a performance with a 16-channel speaker array and using gestural control to be able to manipulate some of the parameters and exploring sound, exploring the orbits of Venus and earth around the sun and not just through tonality, but also through space and kind of giving people an opportunity to actually experience what that sounds like spatially and how to sonify the spatial elements of space. Also kind of how that affects the tone and the sounds. So, you're kind of getting this same data sonification through a couple of different means and it provided a really interesting system that allows you to kind of improvise with the data that gives me as a performer an opportunity to actually find things in the data just interesting patterns in the data that aren't necessarily apparent if you're just kind of looking at the data. But when you can kind of experiment with it and try different ways of experiencing it you can get a chance to see and hear and experience the data in these different ways. I think everybody that saw the show on Friday came out of it with a lot of really interesting insights. And were very interested in their own interpretation of that data.

So, I'm presenting that as well at the Q – a much shorter version of it. So I've got to work through that. Those are my biggest projects that I'm working on right now. And really diving into the full dome planetarium and the combination of the visuals and the live performance and the spatial audio and the kind of 360 visual experience. It was a very interesting platform and medium to explore different concepts. I mean, the piece that we're doing there is called "Entopia" and its around exploring the duality of dystopia and utopia and our different human interpretations of those. And artistically, we were discussing how utopia, like there's a certain vision of utopia and there's a certain vision of dystopia that some people have.

We were finding that in a utopia, a lot of times nature is very controlled and in dystopia, the human has kind of lost that control to nature. So, we were saying that there's different versions of looking at some of these images of dystopia, which is pretty much of nature overgrown and has pretty much taken over humanity – we're recognizing that that was actually beautiful to us. There's subtlety in wanting to accept this kind of a new lack of control to nature, kind of exploring our

peace and chaos and geometry and form and non-form and the juxtaposition of some of those elements. I find immersive experiences and immersive spaces to be really interesting spaces to be able to contemplate and question some of our human relationships to some of these concepts and ask: is our view of duality and that there's these connecting points in the middle that are important and that sometimes things that seem like they're on opposite ends of the spectrum but are actually very connected and are integral to creating a whole picture and, I guess, an overview of my work currently.

**Charlie Morrow:** Thanks, that's a great overview. I wanted to ask you specifically: what is immersivity when you use the word and you describe your pieces as being immersive. What do you mean?

**Monica Bolles:** So I've actually been thinking a lot about this lately. I don't know if you read my dome tour posts that I wrote about the overuse of the term immersive and I think there's two different ways that we approach the term immersive. I guess the Latin connotation of it is it's initial definition. It was very much about submersion and merging something in a fluid and so there's, to me, this very 360-degree experience of submersion. Like if you're submerged in water, you're immersed in a fluid. Like you have a 360-degree sensory experience that's happening. Then we also use immersion and immerse when we're talking about getting lost in a field of study or lost in a book, or like we get immersed in a story, we get immersed in this experience. And it doesn't necessarily have to have this 360-degree connotation. It's more our mind disconnecting from our present reality and just find it and moving beyond that, being in a different space than what our current reality is. Most of my work focuses on attempting to get people to disconnect from whatever their reality is. But I think it focuses mostly on the 360-degree nature of it. You know, with the spatial audio, with the 360-degree projections. Either putting someone in a space that there's things going on all around them and there's this full 360-degree experience happening around them. I don't work as much with VR or AR, which I think are some of the more current. You were talking about how this idea of spatialness has evolved over time. You know the current conversations around immersion are very much in the fields of AR, VR, XR, and most of my experience with the full-dome world and the spatial audio world. And so, for me, it's a combination of a physical 360-degree experience and having things completely surround the audience member. So for me and my work, a lot of the immersion comes from the 360-degree element and submerging someone in an experience.

**Charlie Morrow:** Would you now walk back your earliest immersive experience leading them to where you are now or a timeline from now and sort of walking back step by step.

**Monica Bolles:** I'll start at the beginning. Again, I've spent a lot of time thinking about why I'm so connected to creating these immersive experiences and why that's kind of what I've been drawn to artistically. I realized the way that I sense and experience the world is very immersive. I mean, the way I imagine, I just have a very adept visual and auditory imagination and also just this body kind of sensation. So, when I imagine something, I feel it and I see it and I hear it and it's almost like I'm in that experience.

For me, whenever I come up with this idea or this thing that I want to be able to put out in the world, I'm trying to create this experience that I'm having myself for everybody else. So, for me, the immersivity comes from my own experience of the thing that I'm imagining. I'm trying to

communicate that as best as I can, which, for me, has become through these immersive technologies in the world. That's just from a very young standpoint.

When I was little, I always loved having parties and to create a party, have parties at my parents' house and having these themes and decorating the whole house to this theme and having different stories that were happening in that space. When I was probably 10 or 11 – i used to have these Halloween parties at my parents' house and my brother would help and I'd come up with these entire narratives and we'd have these scavenger hunts on my parents' property and we'd have all these little clues that you'd get someone from one place to another. And it was actually terrifying. And I amazed parents let their kids come to these things because my brother would have some of his friends and he buried them in the ground and they'd be popping up out of the ground randomly.

I remember one experience: we have a bomb shelter at my parents' house. So you'd have to go down into this bomb shelter and there was this kind of scary looking clown guy with an axe standing in the corner of this bomb shelter. And right next to his foot is this little scavenger hunt thing that you have to grab.

And so you're so focused on him and "oh my God, what was he going to do?" And then you go and pick up the thing and nothing happens. And the whole time you've been focused on him, you don't notice this row of boxes by the side and all of a sudden somebody jumps out from there. And it was just very frightening. One of my friends would drop out of trees on people. I just loved designing these stories and trying to build this experience for people coming over and going through this Halloween kind of experience.

When I was in high school, I took a digital media class and we had to design something and I ended up designing this immersive theater; it was a cube, it wasn't a dome. But I had this whole design for this theater with projections on all sides and the holographic projections and the seats would move in different ways. And it's always funny to see how things kind of come full circle and a few years down the line, I find myself hanging out in these domes all the time.

So that happened when I was just finishing up my undergraduate degree at Colorado University, Denver for audio engineering and music production and one of my teachers, wanted found this group for being able to experiment with new multimedia technology. And I was very interested in that kind of stuff.

And so Dan Neafus over at Gates Planetarium opened up the planetarium for us to come in every Tuesday night and have this arts collective group and so we started going there and they have a 15.1-channel speaker array and this was 2012 and so it was like what do you do with that. There's no digital audio workstation, it's just outputs to 15.1, We had to figure out our own list, work with that. So we started using ambisonics and kind of diving into exploring what it was like to work in that kind of space. And then Dan invited us to volunteer at Imersa. My first Imersa was a somewhat nostalgic experience. It was like suddenly a meeting of all of these people in the full-dome community. We had the guys from SAT were there and they shipped out their server, plugged it into the dome we call that hijacking the dome. And, they were putting on a bodysuit and flying through space and moving objects around in real time.

And you had Charles Veasey and Jane DaPain from IAIA and they were presenting V-Dome, which was their new mapping software that they've come up with. Then our group is presenting this audio stuff that we've been working on and working with the VJ to do these kinds of visuals. We had three live performances in the Dome. I think we were running four or five different systems in the dome and having to switch to feed these systems – and it was just absolute chaos. But it was really magical. I didn't sleep the whole week, but it was this really magical experience connecting with all these people. I'm just like, wow, this is a really cool community that I had no idea existed but there's these amazing things that are happening in this space and I was feeling like I wanted to be a part of it in some way. And it's been one year after another and I moved to Nashville and was doing more traditional audio engineering and music production and I kept missing the more immersive stuff and so, I went back to grad school at CU Boulder for creative technology and design. And my thesis was building a 360-degree multimedia performance piece for the Black Box Theater that explored resonance through the lens of physics, psychology, art, and music and I created a space with people. The first part was more like an art installation and people come in; they can interact with things in the space and could walk around and they could have conversations. They could just sit, look and listen. And then I created the second movement. I created a composition based on the room modes and the resonant frequencies of the space. It's a very visceral experience that people had to kind of walk through because the sound changed in a three-dimensional plane and so depending on where you were standing in the space, would create a different experience. And then the third movement is based on sympathetic resonance. I worked with another composer and we recorded a bunch of sounds that were created in different ways through sympathetic resonance and had some of the instruments that we were using in the space. And so they were playing with those in a live improvisational way, but then people from the audience were also able to pluck those instruments and play them as well. So they're adding to the soundscape. And the last movement was an exploration of resonance from a more artistic and psychological standpoint, a human standpoint.

**Immerse! Podcast 12: Monica Bolles Playlist**

artist, music producer, audio engineer, and composer

Interview by Charlie Morrow  
Incidental sound samples used

Atlantis Orbits Remix • Morrow, Bolles & b/art  
Orbits: An exploration • Monica Bolles  
The Playground Ensemble • Monica Bolles  
Metropolis Atlantis • Charlie Morrow

Mixed & collaged by bart plantenga, mastered by Sean McCann

I worked with some dancers to do a dance choreography. It was a love affair between humanity, art, and science. I had a piano composition that I had written and I had a dress that I had made that took my brainwaves and translated them into different light and color. So, depending on how active certain brain waves were, my dress would change colors. It was a combination of dance, visual experience, and

sensors. This is really the first time I felt like taking that initial experience of stepping into my brain. And here's my brain. So, the dress is symbolic of me just trying to communicate my brain. That's kind of where it all started (laughter).

From Back to forward is feeling like my brain is this crazy place and I imagine these things are just very immersive and very experiential. And so, I feel like I just want to communicate my brain because I think it's a magic place and it's beautiful. I mean, I've always been fascinated by my brain

and the things that it can do and how it creates these experiences and these, for me, imaginative experiences.

And so, yea, that was my thesis and since then I've just diving into that world and starting to create more and more productions in these spaces and starting to figure out how to tour them and make them financially sustainable and how to continue to build and grow on these concepts and finally be able to share them more and more with people.

**Charlie Morrow:** Thank you, that was very beautiful to hear your stories. wonderful to be with you – virtually (laughter). You seem very happy and it was wonderful to experience to work recently as I had through your website. So I'm glad that you'll be part of this project and I say thank you.

**Monica Bolles:** Yea, well, thank you. I feel honored that you thought of me and it was great to connect with you and we'll talk soon.

**Charlie Morrow:** Bye bye.