

Thomas Kraupe: Immersion Magician



Thomas Kraupe is a German astrophysicist who specialized in x-ray astronomy at the Max Planck Institute for Extraterrestrial Physics. He's managed a kind of magical situation by combining math and physics with his love of planetariums and music to create numerous interactive edutainment and art science crossover projects that have attracted artists such as Snap, Heaven 17 and Pink Floyd at several planetariums most recently as Director of Planetarium Hamburg, which he transformed into one of the most advanced planetariums in the world before retiring in late 2022. He continues to serve as a consultant for immersive theaters worldwide. I met Thomas in Colorado Springs, Colorado at one of the first immersive gatherings.

His invitation for me to join and chair the International Planetarium Society Committee for Immersive Sound has opened the door for many projects. We crossed paths at Imersa Montreal 2022. Thomas, it's great to have you on iMMERSE!

Thomas Kraupe: Hello, Charlie.

Charlie Morrow: Hello Thomas. I appreciate you're meeting me. I'm working on a book and a podcast and I'm making an interview with people I've collaborated with. You're one of the most important people for me because of your invitation for me to become part of the International Planetarium Society, which has been quite an experience.

In this project, I'm asking two questions. One is, how does immersivity figure into your practice? Obviously your work with planetarium experience, but Immersivity in particular, how does that work for you? And the other is a timeline. How did you get to where you are in this thinking and in this interest or in reverse, backwards from where you are? How do you think it happened?

Thomas Kraupe: Well, we'll simply start in trying to make sense of what I'm seeing.

Charlie Morrow: Well, when you were a kid, there must have been some magical experience that led to winding up in the planetarium world, for example. What do you think excited you in this direction because you have a magical theater in which you can present anything in sound and image to your audiences. And so, something must have started you out in this direction.

Thomas Kraupe: Well, I was always fascinated by nature and I was always outdoors and exploring. Then there was the influence from meeting friends at the Public Observatory, which had a diverse background, many were not students of science but studied music or were in other professions. We always gathered to experience a dark night sky around the Perseids.

I think that was critical. Like seeing the meteor show, ending the nights on the mountains in sleeping bags, and we were having fun and creating sounds ourselves, singing and being immersed by the beauty of the night sky and sort of attached to the earth. We felt like as if we are diving into the starry night, as if up is down and down is up below our feet, below our body.

So we tried to imagine this being part of that universe that rotates around us or us rotating through the universe in that night. And so it was a combination of people with their background in art and the love of music and sound. And my own love of music and the immenseness and immersivity of nature and the Milky Way stretching around us and the night sky with shooting stars.

So it was just these breathtaking impressions, this combination that we always had in mind to combine the arts with science. Writing poems, reciting poems under the night sky. So it was natural to me to go to the planetarium and there, listen to music, to Bruckner Symphonies or the Alpine Symphony by Richard Strauss for very big orchestras and all elements of nature and

even remote orchestras. Richard Strauss was a master in having separate groups of orchestras, placing them hundreds of meters away. And also Charles Ives at that time really influenced me, listening to his music and his marching brass bands from the distance. So that was fascinating for me as a young school kid and just about ready to go to the university.

And so I guess those influences really made me wish to put all this together. We always tried that at the Public Observatory, to do the ultimate symphony of combining imagery and the sound. And so it's like, as we say, Gesamtkunstwerk. I think it's even an English word now. A Germanism.

Charlie Morrow: Yeah, definitely. It definitely is a Germanism in English and probably many other languages because it says it all.

Thomas Kraupe: So, nature or all that surrounds me in sound and vision is like a gesamtkunstwerk. And it's something we reflect on and it goes in all directions. So, I love to experiment. And at that time, remember it was like the late sixties, and early seventies. What I'm just talking about is mid seventies. Even early eighties, then there was stereo sound, and then in the eighties, I remember where I bought the first 5.1 equipment for my living room and that was fascinating. It was something completely new. To have available sounds in a sort of surroundsound set up, and I always try to use the best sound equipment and so it seems I've never stopped doing that.

Charlie Morrow: Well, that sounds absolutely inspiring and I'm glad that you had those experiences because you've been able to now bring that to the work you do in Hamburg. It's not just in the planetarium, but also around and with the community and...

Thomas Kraupe: One thing also, certainly in the eighties, was the influence of IMAX, the big screen. That was totally overwhelming quality, especially of the sound. The image is one thing but the sound quality was something that really amazed me. I loved the planetarium and I started to experiment in the planetarium in like 1973 at the Public Observatory where we had a small planetarium. And we always combined music with cassette players at that time, but very poor sound quality.

But it upgraded as soon as we were involved in listening and seeing IMAX movies, and it was so amazing. And later in the planetarium to get that sound quality there. That was a good start.

Charlie Morrow: I hear you. That that's a very good story and I feel your excitement about it. It's brilliant to begin to understand things through those voices that you heard.

Thomas Kraupe: You know, at that time, there was experimental music starting. I loved Pink Floyd. I loved like those space sounds that were like all around you. The experiments that Pink Floyd did in concerts in the seventies, but I was already a fan of Pink Floyd in the late-sixties. And also the Beatles, with multitrack recordings. All that was fascinating. And I bought tape recorders and Ampex and the Revox and all those brands, which were very familiar at that time, and it was fascinating to use tapes and multitrack tapes. So the advances in technology, the space race, the film industry, all that left a deep impact. The storytelling, my real intention with my friends who inspired me to bring that all together. So, in a sense, to do something that people haven't done before, or at least experiment in bringing stuff together that was never brought together in that way. So, I feel very happy that I had this opportunity to meet all those wonderful friends there and they inspired me.

And later it was the US and my traveling to the United States. As soon as I started my planned career in 1983, 84 in Stuttgart. I went on my first vacation. I went to United States and saw New York Hayden Planetarium, Bill Gutsch, who inspired me a lot, who worked with big Hollywood actors and created soundtracks. And so it was my intention to do big things, to really do good quality stuff and not just do what everybody else had been doing in the past.

Charlie Morrow: Well, you certainly have done unique things and maybe you could speak a little about some of the things that you tried from that time forward. because you've always been a pioneer.

Thomas Kraupe: Well, thank you. But it was only other people who hired me and by what they were doing as pioneers. So, like I said, friends and colleagues in the United States, for example. And also, certainly, in Europe. Well, I started experimenting with artists and combining music and live action in a sense in Stuttgart in the eighties.

But it was, just a stereo sound system there in the dome, but then I had the chance to design the new Planetarium for Deutsches Museum on the Museum island in Munich and it was at that time, when it opened in 1993, the most advanced planetarium. And then I worked at that time with Steve Savage of SkyScan and we called it the *Fahrvergnugen* Planetarium because at that time Volkswagen had an ad about *Fahrvergnugen* and *Fahrvergnugen*, the German word [ed. driving pleasure], was used worldwide to market that. And we said, we want to have *Fahrvergnugen* – the joy of running a planetarium. We want to enjoy it and want people to enjoy it. So we thought, what is best? So we even put speakers under the seats because I wanted to create cricket sound, which needs to come from below, or water, or sound when you have poetry and you're talking about water. And that was a 5.1 sound system inspired by what at that time SkyScan had been doing in Concord, New Hampshire, which was at that time one of the most advanced, latest planetariums.

A spacious dome. So it was an enormous system at that time with moving video projectors or where you could program them, the tilt and so the image moves up on the dome. And we only had 5.1 plus the extra channel, the underseat channel.

But it was awesome because it attracted a lot of musicians, a lot of composers, and we even had the management of Pink Floyd come and we did a Pink Floyd show and they were really coming and saying: oh, it's stunning. You need to meet David Gilmore. Can we have that show for the launch of the album? What was it? Just after *Division Bell*. The live album. The double album. And we had this blinking LED in the cupboard. And so we did a lot of album releases. With Snap, for example, to the show, Welcome Tomorrow.

So there was a lot of excitement about sound there, but 5.1 and later when I was working for the New York Planetarium for the New Haven Planetarium, they wanted a better sound system, not just 5.1. So that was the multichannel theater, Meyer speakers and a Meyer sound system, but it was very difficult to operate at the time they opened in 2000.

And in 2000, I went to Hamburg after that consulting job in New York and had the chance to kind of refocus and rebuild or upgrade the Hamburg Planetarium. And it was fantastic because I could freely choose the technology. When we reopened shortly after I found out about the spacial sound wave system of the Fraunhofer Institute. And, so we installed that system with 64 speakers and we still use it and the interesting thing is that the planetarium is, I call it an infinity space because you don't have a lot of spaces where people can really talk about infinity or can reflect on huge spaces, and architecture is always associated and has to deal with acoustics and the dome is usually very bad in terms of acoustics and all the planetarium domes were very bad with their acoustics. Unfortunately, I learned from work with SkyScan from the work with Evans and Sutherland and others, namely, with those theaters they were designing, that you really have to dampen to really have almost a sound-dead room and then create the sound field with the speakers.

So, for the planetarium, as I said, there's an infinity room. You can create it if you close your eyes. Listen to the sound. You should be able to create a sound-dead room, which is sort of as you might say, infinite, because you don't hear a reflection. It's very difficult for us to digest as humans, but you need to be able to scale the universe to get the right scales.

So, you need a room where you can change the size of the room acoustically. And that was the ultimate dream. And I think we've set up like a, Sound wave or similar systems like the ones you designed, Charlie. It's fantastic now to create infinite rooms or the feeling of infinity and it's the grandest thing to do, to put people in the universe, in the middle of the universe and touch them emotionally, touch their heart and their minds, and that's most important for planetariums that you have to create stories. You have so many tools in the planetarium. Not just visual storytelling, but acoustic and sound is more than 50%. I would say. It's underrated in most theaters and it really drives me mad when I visit planetariums.

You enter it and you see the infinity of the universe, you see the stars and beautiful, quality, believable. It's, people think very realistic, authentic, but as soon as the voice or the music kicks in, it sounds like you are in the room the size of a bathroom. So it sounds terrible and it destroys the whole illusion. So we are magicians in a way, in the planetariums.

And in the planetarium it's critical that it's authentic. So you need to have believable acoustics. Meaning, no reverb, where it shouldn't be. So, and I love to have people in the room who really feel they are inside the story and the stories we try to expand. And use the space more than just a visual space, but as a space where you can dive into an audio story.

We came across the fact that we could have radio stories like *Hoerspiel*, as we say in Germany. And there's one called "The Three Detectives." Alfred Hitchcock had the idea to create those stories. And for 40 years now, they are so popular in Germany with a big following. They fill big arenas, just telling the stories, the three detectives sitting there on stage, so no visual effects.

And so, the idea was to do that in the planetarium, just gather people because it's a social space to gather people and put them inside a story and really no mobile phones interrupting, hopefully, and no environmental sounds from outside, so people jointly dive into a story, and it's a detective story, and we did this.

We started this. Nobody believed it would be successful, but with this sound system, with this immersiveness of sound, people paid like 15 or 18 Euro to listen for one and a half hour to the story they could hear with their headphones [at the planetarium] or at home. But the sound quality is so good with the immersive sound beyond 5.1 that people paid the money and they were also with friends.

It's like in the movie theater or in the theater. As any theater. It's a social venue. So people gather together to experience something they can discuss and debate afterwards, and it was very successful. The stories were selling out for one year or more than one year, three times a week, and it's amazing.

So this was kind of an innovation, as you might call it, these type of audio stories or radio stories in the planetarium, but also to create immersive sound effects and stories where sound is very important.

We do not use 5.1 most of the time. We use the, the 64 speakers and use also the depth of the sound field and the impact is much better. And also the transparency of the sound and the beauty of the experience, and that's ultimately what counts. People love it. So it became very successful.

Our theater, we were the first in the end now adding also 3D immersive images. So we became the first planetarium to offer immersive 3D sound and vision.

So, with classic, with shutter glasses, we could project an immersive 360-degree or fulldome visual and even in real time. And it will be the next step to experiment in real time to develop new art forms where we move objects, sound and visual objects in 3D space. Visuals, 3D space and in audio, and it's all in sync, and that's challenging. But more and more artists are coming

and trying to create artworks for the Hamburg Planetarium. And there are other theaters now who started a setup similar to ours, so we can even work in a sort of network.

Charlie Morrow: Well, that's a wonderful story. I appreciate so much that you have taken the time to tell me your story. I'm very pleased for what we've got.

Thomas Kraupe: For me, the influence of meeting people is the most important thing. And talking to artists. I mean, I'm so happy I met György Ligeti. His music was so inspiring in 2001 Space Odyssey; it was classical music, but it was modern classical, contemporary classical music and also Penderecki and others.

I'm not a musician and I can't even read a score, but I, I have a good hearing. I have good ears, I think. I love to learn about new music and what others are doing in sound and music, and it's fascinating to offer them a place or a stage where their music and their inspirational work can be presented.

And I think the planetarium is such a space. It's the infinity room. In space, in sound and vision, and that should be much more acknowledged. It goes beyond astronomy, way beyond astronomy, and we have done so many presentations way beyond just stars. It's about us. It's about a reflection of us with what's around us.

And the third dimension is most important for understanding the universe. Why would you show a two-dimensional image. Why do you want to listen to a two-dimensional or one-dimensional sound? If the world around us is three dimensional or even nine dimensional? Look at string theory. So, you have to open up the minds and the senses of people and where there are spaces, and the planetariums are the spaces where you can demonstrate and teach people, senses, young people, all the people, to look at nature, to listen carefully, look around, not just looking forward.

There's not just one direction. We can go forward, everybody is saying. Yeah, but you can also go sideways, left, right? You can go backwards. So there are many more directions you have to think about and you should sometimes also raise your head and look up and also look down and look sideways. And sound and the visuals make you turn your head and change maybe your opinion because it's about us; it's about us and our planet. We have to find new perspectives, and I think in three dimensions. It's the only way to change your perspective on our world. Chance to look at it, experience it visually and with your ears in three dimensions.

It's most important, I think, for the future of our civilization, that we learn that and use it carefully.

Charlie Morrow: Thank you for that good thought. Reminds that's the way it was when before technology, people would be walking around in the woods or in the mountains, no technology, but they'd be looking up and down and all around. And that world, except for some rare cases, is more or less lost on a lot of people.

Thomas Kraupe: People look at their smartphones, they look at one spot, one angle, a small angle of view, but there's something beyond your smartphone, and it you're in the theater, but you're outside what's happening while watching a play, which has just a stage where we look just in a forward direction. But if it's immersive, then you are part of the action. You're in the action and you have a responsibility for what's going on. Because you're an actor yourself in the cosmic landscape, in the environment we live in. So we have an obligation to use our senses not just in one direction.

Charlie Morrow: Brilliant. I'm very inspired by what you're saying and I thank you very much for this interview and more to come. So thank you so much, Thomas.

Charlie Morrow: I'd love to share with you the latest work we're doing with sound, which is quite interesting because we're putting sound into hospitals and workplaces and mixing it with various kinds of controlled noise in order to be able to create privacy or mood changes and so forth. Treating life as though it were a movie, so to speak, or a production. And then adding the science to it to measure the reactions of people. So these are the new directions, you know, that my work has gone in.

Thomas Kraupe: Wonderful. I have one more thought; I didn't mention this home aspect. People feel comfortable only if, well, they know where they are. And in the planetarium we tell the ultimate story – we are telling the story because people always, you know, when you, you meet somebody in a foreign location, they ask you for directions. Maybe no longer with smartphones, but people still want to know where they are and where home is.

So, the first thing people build is a house. As a kid, you build a house, you build home, you build your own house. So you feel uncomfortable if you don't know where you are, you feel uncomfortable if you don't know where your home is. If you relax and feel comfortable you say, I'm home. I'm here.

This is my home. Yeah. And through sound, not just vision. Sound gives you this comfort of feeling of I'm home, I'm here. This is my environment. It gives you some pleasure. So this feeling home is something. So in a sound environment the acoustics are so important to open up people so they listen to you and they look around because when they don't hear a comfortable sound environment, they will not listen to you. They will not look around and feel happy. So I think in the planetarium, you can only tell stories about home. Where are you in the universe, space and time. When you create that home feeling with the sound system, with immersive sound, it's always an immersion that creates that home feeling, not something that you hold in front of you.

Playlist immerse! Podcast 18 Thomas Kraupe

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Interview by Charlie Morrow, Incidental sound samples recycled

A Pillow of Winds • Pink Floyd
Soundscape Secret Track • Pink Floyd
TwoCharlies • Charlie Morrow
Birds Flying2 • Charlie Morrow
Temptation Instrumental • Heaven 17
Look Around • CM & The Rascals

other found sounds

Mixed & collaged by bart plantenga, mastered by Sean McCann

Charlie Morrow: It's amazing that you say that. I don't know if you've read Bachelard, but he's written very, very precisely about that sense of home and space and as a child even hiding in a closet in his parents or being in a little basement room with his grandfather, but that whole sense of being in a place that is home and he writes about it as a spiritual experience.

Thomas Kraupe: I think it's ultimately what people want to know in the planetarium. It's really there. Well what is this earth? And I mean, if you tell me it's only this tiny speck there and it's just somewhere at the edge of a galaxy, that doesn't help. That destroys that home feeling. So, you need to create it in a different way. But some relations, the human relationship is most important to put people in a sound environment where they feel comfortable.

There's only one home maybe, but ultimately planet earth is our home. So all those sound environments can be taught to be home. And I think it's a learning curve for people, like you said, maybe, a small container some people call home sometimes, or homeless people, some, some corner in the streets where they feel comfortable, at least to some extent. But everything comes together there. It's not just the visual impact of that corner, but it's also the sound environment, the way you need a sound environment to sleep, for example, sometimes people cannot sleep if it's too quiet.

It's very interesting. Some other people like to hear the sound of water, to feel calm and sleep. Others can't sleep with that. So the sound is very interesting, how our brain accommodates and how we combine, how our brain wires that over the place where we grew up. Probably not everybody has the same experience there ...

Charlie Morrow: But maybe some variation of it, if it's a formula. Home is someplace, there's a stabilizing part of your sensibility – yes – yhat needs to know where I am standing?

Thomas Kraupe: Well, what makes me feel it's important to immersive work is exactly creating those feelings of home and relationships. Let's say there needs to be a relationship between people and environments.

Charlie Morrow: I'm delighted with our conversation, which is part of our friendship, and we'll go on into the future I hope. It's just part of our endless conversation, which has gotten us through time. You know, we keep on finding ourselves in relationship to each other and sharing thoughts and deeper feelings.

I'm happy that you feel comfortable enough with me to share these kinds of thoughts. I certainly feel the same comfort with you to share those kind of deep thoughts and it's not everybody that you can have this conversation with, although one hopes that everyone will find their home and so forth. Well, thank you.

Thomas Kraupe: I feel comfortable and at home too, when I listen to your voice. You have a great voice, but you know that.

Charlie Morrow: Well, thank you so much. I will be in touch soon and take care, and all the best till soon.

Thomas Kraupe: Bye-bye.

Charlie Morrow: Bye, Thomas.