

[UPBEAT MUSIC]

**MIKE LIVERMORE:** Welcome to the *Free Range* podcast. I'm your host, Mike Livermore. This episode is sponsored by the program on law, communities, and the environment at the University of Virginia School of Law. With me today is Matthew Burtner, a professor of compositions and computer technologies in the Music Department at UVA.

His work explores ecology and the aesthetic link between human expression and environmental systems. His new album, *Icefield*, was recently released by Ravello Records. Matthew, thanks for joining me today.

**MATTHEW BURTNER:** Hi, Mike. Thanks for having me on your show.

**MIKE LIVERMORE:** So in the publicity materials for *Icefield*, I saw this question and struck me as an interesting point of departure. The question was, if glaciers could speak, what would they tell us? And I guess my question for you is, do you see your compositions or the compositions on this particular collection of works anyway as playing this kind of translational role between humans and the natural world?

**MATTHEW BURTNER:** Well, I think that the music in that it embeds systems of change from the natural world as musical forms. I think that it challenges listeners to think outside of our conventional ways of understanding music. That's part of my hope with this kind of work because I feel like part of our challenge as humans is to really consider the other inhabitants of this world as valuable, as living, as even sentient.

And so I've extended that past the other animals and even plants and start imagining if the river has a kind of sentience or being, what is it thinking? Does the glacier have-- is it an Earth animal in some sense? And so the music is really trying to decenter humans in order to understand these other types of complex systems that make up our environment.

**MIKE LIVERMORE:** Yeah, it's really interesting. So on the title track, just to give an example, it's this kind of haunting, beautiful composition. And my understanding again, just looking at some of the notes is that the way that was constructed was you out into the middle of this huge field of ice basically. I mean, huge being like 1,000 square miles, so really big, with the saxophone and some recording equipment, microphones, and the like. So let's give that a listen.

[MUSIC PLAYING]

So how do you create this composition just from a physical perspective? What we're hearing includes sounds from the natural environment wind and that kind of thing, you can imagine. But also the saxophone itself. How is that-- just kind of as a practical matter, how do you how do you make that happen?

**MATTHEW BURTNER:** Well, yeah, it's super interesting just as a practical matter because in this work, I'm really imagining the icefield itself, which is the headwater for hundreds of glaciers in the region. So it's a kind of proto glacier system. I'm imagining that as a musical instrument. And so I brought the bass saxophone out, because it's like the biggest saxophone that I have. And the saxophone is the instrument that I play. So it's like I wanted to bring my best to the icefield. The best thing I could bring. And so I took the bass out.

And the bass saxophone is this little tiny speck of gold out in the middle of this vast system of ice. And then I put microphones in the saxophone but also inside the icefield. So I dug down, put microphones down in the snow, put them around near the instrument but also far away from the instrument so you would pick up the environment. And then made this multichannel recording where we are hearing the saxophone played as an acoustic instrument, but we're also listening to the saxophone filtered through the icefield itself.

So the sound of my playing is resonating down through the snow and being picked up by the microphones down there, and then that's providing a kind of filter to the saxophone sound. And then the wind is in there and the sounds of the snow itself. I played the snow, so I moved my hands around on it and recorded that. All that's in this piece, and it's really trying to create this kind of-- I mean, there's a couple of ways of thinking about it. I guess it'd be one would be like a duet between the sax and the icefield. But the other is maybe a kind of hybrid human nature instrument, that's like a kind of collaboration between this massive environmental system and this massive quote, instrument.

If you watch the video on YouTube, there's a music video for this track. And it's basically a real time film of me playing that out there. So you can kind of get a sense of what we're talking about.

**MIKE LIVERMORE:** Yeah, and the scale is really-- the juxtaposition of scales is really fun there, because right there, the bass sax is huge in a sense but not compared to 1,000 mile square icefield.

**MATTHEW BURTNER:** Yeah, so I hired a pilot to fly me out there with the bass sax, and it uses a kind of ski plane so they can land on that icefield. And the bass sax and I and my recording equipments, pretty much all that could fit in that plane. And they dropped me off and they said, well, I had to have survival gear for several days because the weather conditions are such that they might-- not they don't when they can come get you, so you have to be ready to stay out there.

So I had to decouple everything from the snow because it's so cold, and the sun's just beating down so I had to have everything also protected from overheating and just from the sun itself. So it's a really weird kind of working environment. Really interesting place to work. And of course, the batteries are dying, so you have to have power. So I'm using a solar. I have a solar charging system.

And then I had to arrange it all because I was shooting it as a-- I was recording and recording a video, everything had to be kind of positioned so that it didn't look messy or obstruct the idea of the piece or make sound itself in the environment. So it was fascinating project. It's definitely one of the coolest projects I've ever been involved in.

**MIKE LIVERMORE:** Yeah, that is so much fun. And then when you were out there, this is, I mean, just kind of more of a process question but again, just interested. Is the balance between improvisation on the spot and kind of composition that you had done ahead of time? Because it seems like, I could imagine kind of going both ways into something like that. So was this a piece that you had largely composed ahead of time entirely ahead of time or was there improvisation that was happening as well in that environment?

**MATTHEW BURTNER:** It's definitely improvisation, because I did compose a lot before and also prepare a lot before. I wrote melodies and certain kinds of materials and played the saxophone imagining what I might do out there. And then I prepared by planning both the kind of practical survival necessities but then also the microphone and how that was going to work.

And so I went into it with this idea but also not knowing really at all what was going to happen. Because it's super unpredictable, right? The weather first of all, it's just very unpredictable. This was my third attempt. I got dropped off on the third attempt. The first times, the flights were canceled because of weather. And it was a good thing too because they got five feet of snow. So imagine being out there and five feet of snow on top of you, I mean, it's really very dangerous. But when I went, it was beautiful weather.

And so I had prepared all this and then I got there, and it was just kind of like, OK, now it's time to start. And the first thing I did was make coffee because that's a good place to start.

**MIKE** Right? You warm up your lungs a little bit, right?

**LIVERMORE:**

**MATTHEW** Yeah. And then just started trudging around, planning out the session, and working on it. And I had my materials,  
**BURTNER:** so I started with those elements and then improvised with the icefield itself and recorded, recorded, recorded. And then I took all that material back to the studio. And then I think composed the piece by edits.

So I'd edit what I did. Take out a good part, find a part of the icefield sound that was really interesting and layer that. And so there's layers in the recording. It's not like a single take real time recording, it's a creative mixing of a real time recording session.

**MIKE** Right, wow.

**LIVERMORE:**

**MATTHEW** So there's a lot of improvisation. And in general, I think of it as like an approach to the natural world because in  
**BURTNER:** composition and in human music, we often try to fix things. Like, fix them in frequency. So we want to be able to play a C on the instrument, needs to sound like a C every time. And then D needs to be tuned perfectly, a major second above that.

But in the environment, it doesn't follow our interest in sound, there are different properties, different organizational systems of sound in the environment. And so part of this whole endeavor with environmental music is discovering what those systems are and learning to appreciate the beauty of what they are already. Not necessarily try to make it conform to what we think of as beautiful music.

**MIKE** Yeah, this is really cool and interesting stuff. I mean, one question that just comes out of that for me is, when I  
**LIVERMORE:** think of playing music, you authentic people can play music by themselves but you're also playing with other people in a group of some kind. You think of improvisation, canonically jazz improvisation where people are kind of riffing off of each other.

And so I guess one question for you is when you're out there in that environment and especially it's a challenging environment, you're doing improvisation in that way, you're improvising with the physical materials and your set up, and it's all kind of spontaneous and in the moment. How much of that once you actually get into playing and you're kind of in the flow of playing along but you're responding to what's happening in the environment? To what degree does that feel, just the physicality of it or the kind of just musically, does it feel similar to when you're playing with other people, where they're making changes, especially again in an improv kind of situation and you're responding and they're responding?

Does it have that same kind of feel to it when you're say in this situation where you were by yourself but you're interacting with this whole complex environment?

**MATTHEW  
BURTNER:**

Well, I would say that it does not feel like that at all pretty much because the natural world doesn't care about us. It's not responding to us, it's not even speaking-- I mean, we're so far from speaking the same language of the natural world that we certainly can't play music with these systems yet in a way that they could respond. That has to be earned. That's something even improvisers who play together, human improvisers are studying that kind of human-human interaction. So to translate that into human environment interaction, that's a far leap. For example, what I think feels the most alien in improvising with the natural world is the sense of temporality. Because this icefield or the forest or a river or the ocean, no matter what system it is, these places have vast senses of temporality. And we're kind of fixated on the mesa level three-second events and 10-second melodies, and maybe a piece lasts 5 to 10 minutes. Well, the environment's not like-- I mean yeah, there's stuff happening on that level. But the grand cycles of the place and the systems of change can far exceed that.

And so if the icefield is interested in playing with me, I'm just a blip. I'm just a small blip in that scale of temporality. Like a glitch in the electroacoustic system. It's like a clip or something that happens. That's my whole experience, it's just a little clip inside the icefield.

So that's really weird because when you put all this energy and your instrument, you're blowing, you play your best melody that you've composed, and you play it and you expand it and you do all this stuff. And you think you've done a good job and then you just stop. And there's just like, the icefield's still there, still persisting, doing what it was doing before you started. You're like, OK, so what can I do here?

So part of it is I mean, there's two things that could happen. You could turn away from it. You could say, OK, the icefield is not sentient, it does not care, it does not listen to me, there's no kind of interaction here, I'm not part of it. But then another way to do is like, well, I haven't discovered the mode of communication yet, I need to play more with it, I need to get used to this feeling of vast temporality.

And even if I can't understand it, I have to familiarize myself with that feeling that I can just stop in the middle of a phrase, get up, walk over, drink some coffee, go back. The icefield doesn't care. And then pick up where I left off, and that was like, OK, that would not really work in a jazz context. If one of the musicians just kind of stopped playing, got up, walked away, came back like 15 minutes later, well, the song would be over. It's over. But the icefield, it's not over. It's in a different scale of time.

I don't know, that's a strange way to think. But I'm really committed to understanding the temporality and the resonance of these natural systems as forms of aesthetics that we can engage with partly as a way of decentering ourselves as a kind of politics of decentering the human will as the only thing that we are focused on. And I think that music can teach us about how to appreciate these systems in the natural world, even very strange ones like the icefield.

**MIKE LIVERMORE:** Yeah, wow. And so I mean, one of the-- just as we're talking about time scales, this puts me in mind of some of your other work that I've come across, where you're doing something different with time scales. So I'm talking about is where you take data that you collect or that is collected from the environment, and then you translate that data into sounds basically, as a way of-- and in a way, that is also working with different time scales because you're taking a process like sea ice extent or something like that that we could collect data on, and that's happening over very long time scales.

In a way, that's the planet talking to us in its own time scale language. But it's hard for us to see that or it's hard for us to understand that language at that time scales. And so you're translating that into a different time scale that maybe is a little bit more comprehensible for a human being.

**MATTHEW BURTNER:** Right, so yeah. This is two of the benefits of sonification. One is being able to listen to things that we can't otherwise listen to, that listen to data that doesn't itself make sound. So like the waves on the beach make sound and we can record them and we can use that sound file to understand the energy of the movement of the water. But the light that's reflecting off the waves doesn't make sound, and we can't hear that.

But with sonification, we can take some sort of light data and turn it into sound so that we could couple that with the sound of the waves. We could a computer sonification of the light on the waves and have a different understanding of that system through sound. That's one of the interesting things about sonification. The other is that it does allow us to transpose the temporality to take something that's 40 years of data and bring it down to the level of a phrase, a musical phrase or a musical movement.

And so you can hear these changes that are obviously outside of the realm of our perception, except over a lifespan. But they could easily exceed our lifespans. And you could listen to them in a minute or two and get a sense of what's happening. So that is a really wonderful thing about sonification.

And I have done this with the work ice prints that's on the *Icefield* album, uses ice extent data from the Arctic mapped into piano music. And then there's another piece on there called Sonification of an Arctic Lagoon that takes different layers of data and creates musical instruments and plays that out over a full year. So in the five minutes of the piece-- well, it's four minutes actually. The four minutes of the piece, you hear one year of data mapped into that musical form. And it's dramatic, it's amazing in four minutes.

It's so dynamic, this environment in the Arctic where things are frozen all winter and then they just explode with productivity in the summer months, and then they freeze again. And it's just this incredibly dynamic environment. And the sonification lets us hear that a musical form.

**MIKE LIVERMORE:** Great. Well, maybe this would be a nice time that we could hear a little bit of a sonification that you put together. Either one from *Icefield* or from another context.

**MATTHEW BURTNER:** Yeah let's listen to a little bit of the Sonification of an Arctic Lagoon, and let's listen to perhaps like the late winter months in the Arctic. This would be March, starting in about March, and then through the summer months. And you can hear that great explosion of harmonic spectral energy as the summer comes into sounding.

**MIKE LIVERMORE:**

[SHRILL SOUND]

So it's really, really interesting. And one of the things that this puts me just in mind of is the use of recording instruments and electronics and computers and how that's different from kind of the old days when we would use more classical instruments, just standard instruments. And I guess what I'm thinking here is in at least some music in the past, you have, I think, some attempts to portray the changing seasons or that's in the background, that there's something about the natural environment that has inspired a musical composition. But here, you're actually taking data that's collected about the world and translating that into-- directly translating that rather than being inspired by that.

And I wonder if that's an interesting worthwhile distinction, just kind of almost like the history of music or the history of Western music.

**MATTHEW  
BURTNER:**

Yeah, I think that's right. There's a lot of music that involves the kind of impression of the natural world. And I think certainly for as long as people have been making music, they've been making music about the natural world. So in many ways, this ecoacoustic approach is perfectly in line with what people have been doing since-- musicians have been doing forever.

On the other hand, there's some new dimensions to it specifically because the tools that we have are different. The computer, the personal computer that allows you to apply sophisticated computation onto data and run things at a sample rate level so that you can turn that data into sound, that's a very recent development relatively in music. We can conjecture that. If Debussy had had access to this kind of technology or Mendelssohn or anyone of the musicians of any different tradition that was inspired by the natural world, that they might have used this as well, and the music might have taken on different forms.

I think that one of the things that excites me about the sonification and more than impressionism is that the data doesn't always sound like want it to sound. And this is a big problem with it. It's like, you turn the data into sound and it's like, well, that's ugly or that's malformed. It's not satisfying. It's like, why doesn't it change very much? Or why is it going down when I feel like it should be going up? Well, that's because it's the data. That's the way the world's working.

Then you have a choice. It's you can either change the sound, change the data, but then you're not really representing the system anymore. You've moved into that impressionistic approach. Or you can listen to it and try to understand it for what it is and maybe find beauty in that or learn about the beauty that's in there. That's the part that really excites me about the sonification.

I mean, I can tell you that for every one successful sonification-- I think that Arctic lagoon sonification is successful. For every one of those, there's probably 30 that are not successful as music. And so you listen to them, you learn about them, and then you have a choice. You can well, either just throw them away or maybe you can use them in a way that's not in the foreground.

So I've used for example, annual cycles of thawing and refreezing, these kind of oscillations of warming on an annual cycle, I've used that as beats. So I've taken that yearlong cycle and compressed it down to 200 milliseconds so that it just goes broop. But that little broop contains a whole year of data. So where it wasn't very interesting to listen to the year kind of cycle. I found it quite exciting that there was a beat in the music that was like, broop, broop, broop, broop, broop. That represented the actual data from the natural world.

So at that point, there's no listener that's going to hear that and say, oh, I think that sounds like 1986, like the thawing and freezing. But that's OK because this is also conceptual art. It's OK that you can't hear everything that's in music. It's about what's there and about your mind like being excited about what's there as much as it is about the actual notes that are there.

**MIKE**  
**LIVERMORE:** Yeah, so that's a whole fascinating line to explore too is-- and maybe we could get back to it, because I really do think that's a fascinating element of a lot of your work is that there's the kind of conceptual piece of it. And that really matters. But one thing that I thought we'd just get on the table too is strikes me-- and this is probably an incomplete, so let's add to it appropriate. That there are kind of a couple of different ways that your music incorporates this interaction with the natural world.

So there's the sonification that we were kind of describing, where you have basically data that's been collected through some kind of data collection measurement, kind of instrument that you can then translate over into sound basically. And that's the sonification. Then there are using the natural world or some part of the natural world as an instrument. And that's what we were kind of talking about with *Icefield*, where you're playing the saxophone, but you're also swishing around the snow and the saxophone's being played through the ice. And so the world kind of becomes this instrument that you're interacting with to create sounds.

And then there's a-- again, correct me if I'm wrong here. This seems like a third category as well, which is in some sense quote unquote, passively recording sounds that are happening in the natural world without necessarily your intervention, and then using those kinds of sounds in compositions and so on. Is that also part of your work as well?

**MATTHEW**  
**BURTNER:** Yeah, I mean I think you've basically done about as good a job as I've ever done in describing ecoacoustics methods. When I talk about it, I talk about those three approaches. And when I teach ecoacoustic music, I teach those three approaches. We learn each one of those things is like a kind of field of study.

And you can make pieces that are to recast them into the music language. We call the recording the natural world soundscape or field recording. And it's a creative action, because you have to choose where to put the microphones and what microphones to use and all that. But the idea is that you're recording some phenomena that's happening and then listening to it and understanding it and using it kind of as is.

And then the sonification, which you described beautifully. And then the third would be the human nature interaction, which involves that kind of performance and performative element of interacting with these systems, which can be so wonderful as musical instruments to bring the sensitivity of a musician who's spent-- imagine a violinist spends 10 hours a day practicing for years and years and years and has this kind of amazing, amazing ear, hand, coordination with this machine, the violin, to bring that level, that sophisticated training to the snow.

I mean, it's like the snow is in the music instrument instead of the violin, there's so much. And/or the water or the sand, whatever it is. There's as much detail and sensitivity in that environmental material as there is in the violin. We just don't tend to think about it as an expressive instrument. So those three things definitely are all at play and to varying degrees in any composition.

**MIKE**  
**LIVERMORE:** Yeah, and it's interesting as we're talking about that last category, the using or interacting with the natural world in such a way as to-- in this kind of instrument way. You've got to figure that those were the earliest musical instruments was kind of simple drums and flutes that you could kind of-- that maybe were just already-- someone found or that required a very little amount of manipulation to create. So in a sense, it's very interesting because that approach is very-- presumably has a very long history even if it's been a little lost for the last couple of hundred years at least in the West.

Whereas something like sonification or recordings, those really rely on advanced technologies that we've only had in the case of recording, I don't know, 100 years or so, 150 years. And then sonification is using data analytic techniques that are decades old.

**MATTHEW**  
**BURTNER:** Absolutely, that's such a good point. That's not something that I've really articulated like that. I love that idea that these three things are not the same. There's one that's actually very, very fundamental. Because you're totally right, of course, it's about the human body and generating sound with external resonant sources. So like, you can sing, you can move your hands, and you can touch things, and you can dance. And that's our first music for sure. And then you pick up a stick, you pick up a rock, that becomes another tool. And then it just goes from there.

But absolutely, that's as old as music. And then these other things, I mean, we might be able to with our academic sensibilities to discover a history of sonification that predates computation in the sense of computers that we think of now. Like, there are ways that data was mapped into sound before the computer. Actual data. It was done by hand computing, and there's probably notions of recording that predate the field recorder, which was invented in World War two and came into use in the late 50s when the Nazi Germans left Paris and left their field recorders and was taken up by artists and used to make art.

But before that, you have Messiaen in the forest with his music paper listening to birds and transcribing them in real time on the paper. So Messiaen with his amazing ear was a kind of recorder himself. So we could probably keep going and find examples of that, but absolutely there's one of those three approaches that's really, really fundamental to music. Ironically, it's the one that's probably the least recognized in my field.

So there's lots of discussion of sonification, there's lots of discussion of soundscape and field recording, but there's very little research and discussion into human nature interaction and that kind of performance of natural materials relatively to those other two.

**MIKE**  
**LIVERMORE:** Yeah, that's really, really interesting. And it seems that just thinking about a violin, there's a whole history of those types of instruments. And at some point, it just flows back into something that was people walking around and just engaging with things that they found in the natural world. Now thinking about the soundscape field recording, you spend a lot of time out in nature doing these types of field recordings. I'm wondering if we could hear perhaps some examples, if you have any favorites that you think tell kind of a particular interesting story or evocative of a particular place.

**MATTHEW**  
**BURTNER:** Oh yeah, that's interesting. Yes, of course, I mean every recording, of course, is telling that story. So I have three just come to mind right now, but let me focus on just one because it's so unusual and so marvelous.



When I visited Guatemala, and there was an erupting volcano in Guatemala. And so I hired some guides to take me up the Mount Pacaya, where this volcano was erupting. And these people live in the shadow of this volcano, so they understand how to navigate the lava flows safely. Whereas of course, I didn't. And the guides took me up there to record the sounds of the lava coming out of the Earth.

And this was such an amazing system because you've got the force of the lava pushing out of the volcano and then quickly cooling at the surface when it hits the air. It cools on the surface of the lava, but it stays molten underneath. And so as these kind of crusts form on the surface, they're breaking off as the lava cracks its own forming skin. And they fall down, and they make this kind of clicking, tinkling, breaking, shattering sound.

But it happens in a way that's perpetual. It's like glass breaking perpetually. So I mean, that's one that I think is really incredible. We could listen to that.

**MIKE** Great, that sounds wonderful. Let's give that a listen.

**LIVERMORE:**

[SHATTERING SOUND]

**MATTHEW** Another one is on the Virginia coast. You have these little crabs that create tunnels in the mud banks. And these  
**BURTNER:** are their little homes, they call them flutes. And when we're out there on those mudflats, I love to put the-- I have these little tiny microphones, and I'll thread them down inside the crab flute into its little hole, its little home, and just kind of eavesdrop on the domestic life of a crab in the mud.

And it's so beautiful because the flute actually-- the crab flute actually it's a closed tube. So it has a resonant characteristic that's unique for that crab. So the crab made this flute, the hole, then the wind blows across the surface of it, the sounds from the outside world filter down into the tube, and it resonates at a particular frequency. So this these crab flutes are actually kind of flutes, like musical instrument flutes. They have a pitch.

And so down inside this hole, you hear the whole world filtered through the crab's ambient resonant home, and then you hear the movement of the crab as it kind of probably wonders what the heck is this microphone down here? I got to get this thing out of here. So that's also a really interesting recording. And I can play that for you too.

**MIKE** Yeah, wonderful. Let's give that a listen.

**LIVERMORE:**

[SHRILL SOUND]

So I love that it's called the crab flute. So you didn't come up with it, you don't call that the crab flute. That's what the scientists or folks in the area call it.

**MATTHEW** That's right, and they're all different. So if you move the mic over to another one, it has a different pitch, a  
**BURTNER:** different sound. And then the mud banks are just absolutely packed with these things. Thousands of them. And there's just crabs everywhere. And so this is like a giant orchestra of flutes.

**MIKE** Wow, and you can actually hear it. If you're standing there, you'll hear the sound, wow.

**LIVERMORE:**

**MATTHEW BURTNER:** No, you can't hear it. You can't hear it at the surface, you have to really amplify it turn. Go in close. It's like a microscope, you have to zoom in and then you can hear that resonance. But if you're just standing on the mud banks, of course, you don't hear the world of the crab.

So this, again, is like about transposing our listening out of our human-centered perception into the way a crab might hear the world. I mean, there's definitely a post-humanism that runs through all of this environmental listening. And it extends beyond animals. Animal hearing and animal vocalization to plants but also to things like the forests and the glaciers.

**MIKE LIVERMORE:** Yes. It's one of the things I-- it's just such an incredible feature of our world that when this magnification point, right? That you could take something like an insect that's very small or something you couldn't even perceive like bacteria or something that's happening at a very small scale. And when you magnify it, it's just this beautiful thing. And it's just the world is full of these things like that. We're just at the wrong scale to perceive, but it just nevertheless exists out there.

And that now we have some tools that allow us to peer into these different scales. Like looking at the planet for that matter, from outer space, it's not something that you could ever do without a tremendous amount of technology, but it's this beautiful thing that's just kind of sitting there waiting. I don't if it's waiting for us exactly, but it's there, and we can see it, and we can experience it.

**MATTHEW BURTNER:** Totally. Yeah, so much of this, the joy of this kind of environmental music is participatory, it's about being able to actually listen yourself. So the microphone and the headphones allow you to augment your morality so that you can now perceive things you couldn't before perceive. And those things are wonderful, and that participatory aspect of it is really-- it never stops being surprising. And I constantly underestimate how powerful that is.

When I'm teaching ecoacoustics, the first time that the students put on their headphones and they have their field recorders and they start going around listening to things, it's the best day of the semester because they're lost. I mean, I've lost the class. As soon as they put on their headphones, they're gone. It's so interesting and so consuming that I always underestimate how interesting it is. So I'll be like, OK, everybody, time to regroup. And that wasn't nearly long enough. I didn't give them nearly long enough to listen because it's so fascinating.

And then that just becomes like part of the way they hear, and I think of that as part of expanding our understanding of the world and really thinking outside. Thinking that there are things that we don't perceive. Our phenomenology is limited and that's good to know but also it's OK. It's OK that there's many things that we don't know about the world. But it just sort of reminds us that we have to be extra conscientious and careful and respectful and appreciative.

**MIKE LIVERMORE:** Of all this, yes, it's really something. And one question I have for you as we've been talking this over is kind of like the aesthetic theory of some of the stuff or maybe even kind of how this has influenced your own way of thinking about aesthetics or appreciating beauty or music more generally.

So on the one hand, you're obviously a highly trained musician, you're a professor and music department. And as you were mentioning with respect to the violinist who's playing with a different kind of instrument in the natural world, there's value-- or this is the question I think is kind of the value of learning and sophistication that's happening in a particular intellectual, cultural tradition.

But then that trains us to hear certain things or to listen for certain things in a particular way. Like, just even operating within a specific scale and if something's off the scale, it sounds off or we have certain expectations around what music is going to look like or we're going to return back to these themes or whatever else. There's just kind of certain structures that we can train to listen for.

And so there's this kind of tradition. And then when you're in the context of the sonification or when you're recording things in the natural world or operating playing the kind of these unpredictable instruments, you're going to get sounds, you're going to get patterns, you're going to get sequences that are not going to fit with those traditions. And so I guess the question is, how do you see these things fitting together? Like in a way, are we trying to undo the work that the traditions have done and training us? Do the traditions make us kind of unable to hear certain things and then we're trying to unlearn those or is there something else happening?

So anyway, it's a pretty broad question, but I just invite you to reflect on that relationship between the deep tradition that we inherit and the work that you're doing that is really interacting with things that are very outside of that tradition.

**MATTHEW  
BURTNER:**

Right, I think that's so interesting. I really feel that it's always about a process of opening. So in my own experience the knowledge of music and the ability to listen more closely to understand what I'm hearing, to parse out voices, this is all about opening up new dimensions of listening and being able to appreciate levels of sound that I wasn't able to appreciate before. So I definitely think of it in that the knowledge really helps open up the world to just different dimensions of aesthetics and that that's just been a continually rewarding experience.

I also recognize that sometimes, people who study music then, maybe they don't find themselves appreciating something. It's like, too simple because it doesn't use it. But my feeling on that is that it never gets more simple, it just gets more and more rich. And you just kind of find your way so that things that you would have thought of as being simple, you just haven't figured out how to listen to them yet. So they're complex, but you just don't it yet. And then if you keep listening, you keep discovering, you find the complexity that's already there. Or if something sounds chaotic, it just means you haven't listened to it enough to understand it's order, it's beauty.

And so this has been my process of discovery, both learning traditional music, which I was trained in traditional music theory and analysis. But then moving past that into computer music and beyond that into ecoacoustic music, for me, it's just been every new kind of technology and new theory has just opened up new worlds of sound. Sound that was always there. I mean, I've been listening to the glaciers for as long as I've been alive because I grew up around glaciers. But now, I listen to the glaciers and I hear an incredible symphony and a kind of intelligence and a real beauty that was invisible or inaudible to me before.

**MIKE  
LIVERMORE:**

Yeah, maybe we could-- just thinking about where we grew up and place, that's importance for us. And also obviously, climate change. And we haven't even gotten into the kind of environmental politics. So there's a way in which the music that you're creating kind of operates on an aesthetic level that is kind of-- I don't if it's independent for politics, but it has it's own status, let's just say. But then there is anything about the environment has a political values too, especially if we're talking about ice and the Arctic and climate change.

And so I guess one question for you generally is how much of that political reality, political context do you see as informing your work or are these things kind of independent in your mind? And obviously, your own kind of personal history and growing up in Alaska and how that's informed your choice of subjects, I guess.

**MATTHEW  
BURTNER:**

Well, I think of the work a little bit because of my biography I guess, I think of it as kind of accidentally political in that I started off working in this way because I loved the natural world and I loved the sounds of it. And I thought human music was cool but not nearly as powerful as some of the things I heard in the natural world. And so I wanted to kind of discover how that could become part of music.

And then it was because of living in Alaska and studying music at a time of rapid global warming when we were experiencing the dramatic effects of climate change early on in Alaska, then that work took on kind of later a political dimension. I don't mind that at all. I think that if there's a way that the music could intersect with discourse around issues that matter to people, that's just fantastic. And I certainly have ideas about-- political ideas.

And I feel like the music is a little bit separate from my political ideas, in that what I try to do is create a space for contemplating these topics. And I'll let other people frame the message and address that in the way that they think it fits the context. So in my own way, that's not to create the message but rather just to let people learn by listening and feel emotionally connected to these ideas and celebrate them through melody and rhythm and just concept. And just that process of listening to the world will open up in them a similar kind of feeling of empathy for the world.

So it's a kind of a politics of not persuasion but rather just presentation. And I'm happy with that. And that I think also helped the music find its place in these discourse, like the music being used. Like when the State Department asked me to create music for their event. They wanted ambient music that would be based on the subject of their gathering but not something with a lot of fight song or anything like that. It's just like a different kind of music that's really celebrating the natural world opening up as an aesthetic space so that Obama could put a message in there.

And then his message was about addressing climate change at the Paris Accord that was coming up. And then that happens but that's another person's field. That's for the politicians as far as I'm concerned, and they know how best to address those things. Meanwhile, I love it that the music can be a part of that discourse.

**MIKE  
LIVERMORE:**

Yeah, one related discourse I guess or related reality that we face and the Anthropocene and just the political moment that we're in is there's a lot of folks that are-- Let's just say there's an inevitable amount of climate change that's on the horizon. And it's obviously going to have tremendous consequences for the Arctic. And the question that we have is really how much and how bad not whether.

And I just wonder again, this is kind of with your own personal history and then the recent album and the work that you've been doing in the Arctic, is there a coming to terms with these changes or is there a mourning that's happening or is it a celebration or are these things kind of entangled? I guess that's the question is you're capturing a moment in time and a place that's always changing of course, over millennia but now, we're entering into a time of more profound change.

And I guess the question is, is that partially what motivated this work at this time? And yeah, your own feelings about that if there's sadness involved or if it's something that we can just focus on what we have now and celebrate it.

**MATTHEW  
BURTNER:**

Well, art has always given us a place to deal with tragedy. I mean, we can dance to the song about death, we can sing along with the melody about a lost love. And these kind of love songs and these kind of dancing to destruction, topics of destruction, this is part of what music's been doing for a long time. In many ways, I think that the method's the same if there's mourning involved. Music's going to give us a way to mourn, it's going to give us a space to allow our emotions to express.

And maybe the songs are not about breakups, maybe they're about the loss of the polar ice or the loss of the glaciers or the loss of a coast or the acidification of the ocean or the arid of forests. They're going to be about topics of the environment because we feel deeply about these things. People feel deeply about them, and we are already kind of mourning them.

I mean, I just think that it's kind of like a love song. It's like another way of expressing art as a place for mourning. That's been a way that art's dealt with these things, these topics. And then, of course, there's also the active part of it that's not accepting necessarily that these are inevitable outcomes but that there may be ways to repair certain aspects of the environment, to restore things.

So right now, I'm working on a project called soundscapes of restoration. And it's about listening to restoration projects. So we're out at the Virginia coast, and we're listening to the sound of seagrass beds. These seagrass beds were nearly extinct, and they were brought back and they thrived again. And so here's an example of a restoration project that is having a large positive effect on the ecosystem.

Another one is the oysters. We're doing oyster reef restoration. The scientists are doing oyster reefs restoration, and I'm listening to that. So recording those sounds of the oyster reefs, counting the number of oysters. This is another huge success story. So inside all these tragedies, there's also modes of sustainability and restoration.

And we can lean into those things as well and think about how we can do that in a way that's conscientious and ethically sound and economically viable. And then I'm going to make music out of those things. So those are more hopeful kinds of subjects. It doesn't all have to be about loss necessarily, it can be about restoration.

**MIKE  
LIVERMORE:**

Yeah, that makes perfect sense. So maybe my last line of questions for you today would be actually to return to a subject that you mentioned earlier, which is the notion of conceptual art and this kind of-- when you have layers. I mean, in the music that you make, there's layers. There's a lot of layers. And people can kind of approach these songs in different ways.

So someone could be a casual listener, and it could just play in the background, right? Folks can read more about the underlying music and the theory behind it or get into understanding for example what the sonification is. If you've got like a bloop, that where the bloop is compressed sound over a year's worth of extent data or kind of whatever you have there.

And so I guess the question is almost like a recommendation or how you think listeners can approach these conceptual pieces at different layers. And how should they interact with these things? Is it intended to operate at different levels? And then if folks are interested in getting more into the kind of meaning behind what's happening, what are your thoughts on how to best do that?

**MATTHEW  
BURTNER:**

I mean, yes, I think they're operating on different levels. So I work really hard to try to find music as an expression of-- a kind of sonorous expression that's purely in the material domain. That is it has notes and rhythms, organized sound that is satisfying to listen to. That it is interesting to listen to, that it unfolds in a way that leads you along, that doesn't send you off, turn you off. And so there's this kind of like it draws you in. I'm trying to make something that draws me in as a listener. And I guess I would like that to also then work for other people to draw them in.

So on one level, the music's designed completely to be understood on its own. Like, if it came on the radio and you didn't what it was, you might just hear that and go whoa, what is this? This is interesting. I'm curious. I'm enjoying it. And then on another level, it's conceptual art. So the complete reverse of that would be you just read about it in a program and it's like, oh, wow, that idea for a piece is really interesting. Like, that's actually a really compelling idea. And then that needs to also be worked out in the piece so that there's this conceptual unfolding that's just as interesting as the material unfolding of the sound itself.

So when you put those things together, hopefully, the experience can be multifaceted. It can be kind of engaging your curiosity in your mind but also making you feel things with your body and your ears. And like, that could be all working together. That's the kind of ideal situation. But it usually doesn't happen like that, it's usually more or less one or the other and different ways of listening. But I work really hard to put all that in there.

So the pieces should be able to be approached just as sound, as melodies, on their surface, what's there. But then it's like the sonification of an Arctic lagoon. It's a pretty nice electronic track. You can listen to it, not anything about what it's doing, not even the title and be like, oh, yeah, that's a really nice piece of sound work.

But then if you start understanding that every single sound in that piece is correlated to a data, specific data in the environment like light and velocity and the water and temperature, and that everything is actually of a real place that's unfolding in a year, then it's kind of an incredible experience. Because it's like, that thing that you thought was just an interesting sound object takes on another meaning, connects to another field. And then it's a rich space for discovery. That's my ideal.

So I'm always working on the conceptual side and on the material side.

**MIKE  
LIVERMORE:**

Yeah, it's absolutely wonderful work. Thanks so much for sharing some of it with us today and your thoughts. It's been a real pleasure to chat with you.

**MATTHEW  
BURTNER:**

Mike, thanks so much for having me on your show. I just I just love talking to you.

[MUSIC PLAYING]