



**CG GARAGE PODCAST #276
JIM LAMMERS
PRESIDENT, TRINITY3D AND TRINITY ANIMATION**

When industry legend Jim Lammers isn't creating 3D content, including "Archer" sets, he's purveying the latest VFX software. He tells Chris and Lon his story.

Since 1994, Jim Lammers' company, Trinity3D, has been vending 3D content and software. At the same time, his studio, Trinity Animation, has created content for technical and medical projects as well as visual effects for the movie Starship Troopers and backdrops for animated sitcom Archer. In this podcast, Jim joins Chris and Lon to reminisce about SIGGRAPHs past and long-lost data storage media, as well as the shifts that have taken place in the 3D industry since the mid-90s – and how new technology is throwing up familiar problems.

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Chris Nichols ... Should note that I'm recording in my son's room because it's got the most soundproofing because of all the heavy bunk bed furniture, but Lon liked the background of the Nerf wall.

Lon Grohs I love that Nerf arsenal. It's just like...

Chris Nichols See?

Jim Lammers Oh my.

Lon Grohs That's an impressive...

Chris Nichols Yeah, and it goes on for quite a while.

Jim Lammers Wanted: Dead or alive.

Chris Nichols Yeah. Yeah, yeah. So how you been?

Jim Lammers Me? I'm doing well, thank you. Sticking up with it, keeping up with things.

Chris Nichols That's good. That's good. Hanging in there. We're all adjusting to the new normal but this is... I'm looking at these sort of things as opportunities to find out new ways of working and what we can learn from this process because I think that there's a lot of people that have learned, for example in animation, that they can do a lot of stuff from home if they really had the choice.

Jim Lammers We had a few pioneers here. They were saying they could be more efficient and focused at home, and we set it months ago, years ago, for those guys and it was working pretty well so they pioneered it for our animation team.

Chris Nichols Right.

Lon Grohs Oh, that's good, so then when it came time to make a switch you had everything, at least a system in place, that you could switch to.

Jim Lammers Yeah, we found one hitch. We didn't realize we had a VPN limit because we'd never had that many people on at once.

Lon Grohs Yeah.

Chris Nichols Oh, right.

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Jim Lammers So they can submit right to our render farm just as though they're connected here at the office. They're working in scenes, saving and sending jobs to the farm, and all that.

Chris Nichols Well, that's pretty amazing. So let's actually talk about that a little bit. How big is Trinity now?

Jim Lammers Well, ten people work here.

Chris Nichols Right.

Jim Lammers Myself focused on everything, Debbie Fulk and Misty Wayne handling our products division where we sell V-Ray as you know, and 3ds Max going back to the 90s, and all these kinds of products, and then we have Tracy Spainhour as manager, and then we have five artists that work on the projects that come in that she manages.

Chris Nichols Wow, that's actually pretty small considering how influential your company is. I've got to say, I remember Trinity for almost as long as I've been working in 3D. It was the biggest thing, especially when I was doing Max, right?

Jim Lammers Yeah.

Chris Nichols Because when I was doing Max, Trinity was the place to go to get all the cool plugins that you wanted, right?

Jim Lammers Yeah. Anything Max related, that's exactly where you went.

Chris Nichols Anything Max related, it's a very, very important place to go and an important part of the community, so how did that start?

Jim Lammers Thanks.

Chris Nichols Yeah, how did that start?

Jim Lammers I had a passion for animation when I realized how much fun it was compared to... I always like photorealism starting with watercolor and then later with airbrush, and you guys might have dabbled in art too-

Chris Nichols Yeah.

Lon Grohs Little bit, yeah.

Jim Lammers Starting playing with POV-Ray, started playing with Vivid and said, "This is great. I don't have to breathe paint fumes all day," and just loved it. This is pre-internet so there was a BBS community that sprang up to support all the interest in 3D and it

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just flowed naturally from there, first as a hobbyist and then as a freelancer plus the BBS. It was called a rendering plant and that was selling plugins for 3D Studio DOS off of there, and became an Autodesk dealer in 96, and then just both divisions just grew naturally from there and we continued to be really active as a software dealer, and supporter, and trainer in addition to applying those tools. They're both fun, I hate to leave either one behind. It's exciting to do both.

Chris Nichols Yeah. Lon, what was your first experience with Trinity? Obviously it was a destination, it was a resource for us for that time, right?

Lon Grohs Yeah, I'm trying to think of what exact plugins but I'm sure it was a place where we looked for plugins or content materials. Remember there used to be all those different... You could get different texture CDs back when everything was actually on a CD, and our production library used to have those... Remember it used to keep your CDs in these little pouches and then you'd take that over to your friend's house or whatever, we had those with all of our software in it. In fact, we had those with all of our backups in it too when backup finally moved to CDs, and that was the worst system ever because man, you had like 27 CDs of whatever project it was and it was like, "Which one is it on?" It hurt.

Jim Lammers Max 6 and this plugin version 2, and trying to keep it all straight.

Chris Nichols Yeah, and the worst thing is when you had those old projects you had back in the 3ds Max DOS days, and you'd keep them on CDs or whatever you had, and then you burn them on CDs and then you didn't realize that after seven years those CDs would stop reading.

Lon Grohs Or they get scratched or something because somebody... Yeah.

Chris Nichols No, because the burned CDs are actually burned into the dye as opposed to being glass laminate, which is the traditional CD.

Jim Lammers Yeah, with aluminum.

Chris Nichols So after about seven years you can't read the CDs anymore and they become obsolete and they're like, "Oh no, that was the last piece of data that I had of my crappy chess piece modeling that I did in college."

Jim Lammers Like thermal paper. I had all this Turtle Wax car wax to try to get the CDs back alive.

Chris Nichols Oh, really?

Lon Grohs Oh, wow.

Jim Lammers Sometimes it worked.

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Lon Grohs Wow.

Chris Nichols I didn't know that.

Lon Grohs I like it.

Chris Nichols A nice hack, that's a nice hack.

Jim Lammers If they were a little scratched, yeah.

Chris Nichols Yeah.

Jim Lammers It's pretty funny.

Lon Grohs For whatever reason that reminds me of the... So a million years ago I worked at the computer lab in architecture school and everybody was working in 3ds Max DOS, and there was a notorious zip drive problem that would happen. You would get the zip click of death and sure enough, that would happen, so a drive would go bad and then it would destroy everybody's disks, and people would call me over and be like, "Hey, I'm having a problem in here. Click, click. Click, click. Click, click." And you're like, "Oh no. The zip click."

Jim Lammers Yeah. 100 megabytes.

Chris Nichols Yeah.

Jim Lammers They were like floppies, and they're twice as thick, and they had 100 megs instead of 1.4 megabytes so yeah, everybody started using... "These are the answer." And then about a year later, "These are all garbage."

Chris Nichols Yeah.

Lon Grohs Yeah.

Chris Nichols I switched to the SyQuest drives at that point.

Lon Grohs Of course you did. Yeah, Chris is always like... Whatever was mainstream, Chris is going to go the opposite direction.

Chris Nichols Yes.

Jim Lammers A contrarian.

Lon Grohs Mm-hmm (affirmative).

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Chris Nichols I have to be. It's like, "You know what? You guys are using this, I'm going to use something slightly different and it's slightly better."

Lon Grohs Right.

Jim Lammers I like that.

Chris Nichols And then the only downfall is that no one else is using it. Look, I was the guy who was using OGG audio compression instead of MP3.

Jim Lammers I know it. Yeah, that's funny.

Chris Nichols Yeah. All right, so let's talk about that. So basically you've created a resource, you've created a community, you were selling software through it but you're also doing animation stuff, right?

Jim Lammers Correct.

Chris Nichols So let's talk a little bit about that animation. What kind of stuff are you looking at in terms of animation?

Jim Lammers Currently, what we're active with?

Chris Nichols Mm-hmm (affirmative).

Jim Lammers Right now?

Chris Nichols Back then actually, even.

Jim Lammers Oh, yeah. In the early days as a freelancer my first projects were for a local agency. I was working on Caterpillar engines for a company that's now called The Frank Agency and trying to learn how to model with the very primitive tools in the DOS versions, things like engine blocks and stuff like that. I got lucky. On the products side I had been working for a fellow in California who had these explosion collections. You've seen them all a million times. They use them on The Discovery Channel and all of the television...

Jim Lammers They have space explosions, and it was a company called VCE and the guy who ran it was Peter Kuran. He was all Mac based and I knew we needed something like that for the PC, and I lobbied him to just for the payment of CDs, let me do a conversion. And Mac to PC was a big, complex deal back then. So I got to be friends with him, and he called me up when he needed some effects for a film he was starting called *Starship Troopers*. Just totally serendipitous and just a great person to work for, yeah. Really lucky.

Chris Nichols So what did you do on *Starship Troopers*?

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Jim Lammers Mr. Kuran had his own film compositing tools. This is film compositing with an actual projector so he could handle all the animation-type things, but some elements they needed to do more as a 3D approach and so that's where they were coming to us. We were on Max 1.0. we did those shots where they run up to a transport and the doors close, and the transport shoots down the tunnel. That was probably the more complicated shot. It was all synthetic, the tunnels and all that. It was all at the LA Convention Center which you guys have been to many times.

Lon Grohs Yeah.

Chris Nichols Yeah.

Jim Lammers That was where they had the Union Station of *Starship Troopers*, if you've seen the film.

Chris Nichols Yeah, I do remember. Yeah, basically they made it look like a train station or a space station of some kind, right?

Jim Lammers Yeah. And you know what? We told them not to dolly back the camera and they dollied back the camera to get the impression, because we wanted to just take that as a plate and just make it recede down the tunnel.

Chris Nichols Right. Right, right, right.

Jim Lammers But we could correct it later.

Chris Nichols Yeah. Yeah, I remember seeing that shot and I was like, "Wait, did they go to SIGGRAPH?"

Jim Lammers Yeah. You get to know that show hall so well.

Chris Nichols Yeah, it's pretty funny. But yeah, that's true. I completely forgot about that. Well, that was pretty exciting.

Jim Lammers It was.

Chris Nichols That was pretty early in your career.

Jim Lammers Yeah, and we were in Kansas City. We're not a showbiz town so it was pretty unheard of in those days to get much if you weren't a little more in the mainstream of California.

Chris Nichols Right.

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Jim Lammers I had lived out there when I first got out of college. My degree was in electrical engineering and I worked at Rockwell in Anaheim so I got a couple years of living in the Los Angeles greater area and I liked it a lot.

Founding Trinity

Chris Nichols Yeah. It's nice if you're not stuck in your house all day, every day. My house is fine but yeah, it's a nice place to be, for sure. Well, that's great. You've been in Kansas City, I guess, the whole time, right?

Jim Lammers Yeah, yeah. I moved back here in 89 and founded the company in 94 as a full-time real entity, so 26 years now.

Chris Nichols Yeah, and I think I remember going to Trinity back in probably year one, so it is definitely...

Jim Lammers I'm honored. I had no idea. We've always been big fans of yours. We didn't know you were here, so that's great.

Chris Nichols Yeah. Oh, yeah. Yeah.

Jim Lammers We got your first-

Chris Nichols Back in grad school, yeah. It was great.

Jim Lammers We got your Gnomon training that you did that helped us learn V-Ray and a lot of the techniques so we were disciples of yours here in our studio.

Lon Grohs So Jim, Chris and I went down to visit Blizzard, this is a few months ago, and-

Chris Nichols That's in...

Jim Lammers Irvine.

Chris Nichols Yeah.

Lon Grohs Yeah, down in Irvine, and they have a library of all this material that you can check out to learn whatever you want.

Chris Nichols Big library out there.

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Lon Grohs It's a pretty nice library. It's exactly what you would expect from Blizzard, there's swords and game tables, and all kinds of stuff, and we found in the library Chris' DVDs that you just mentioned that you could check out, so we took a picture of him in whatever it is, the smoking chair or whatever in the library to prove that these relics still exist.

Jim Lammers It's fantastic.

Chris Nichols A little out of date these days.

Jim Lammers One of our first employees here at Trinity ended up at Blizzard. Harley Huggins was their Cinematics Director there for many years.

Chris Nichols Oh, wow.

Jim Lammers He helped me on *Starship Troopers* and then he went out and he was lead cinematics for a good long while.

Lon Grohs Oh, cool.

Chris Nichols Wow. That's pretty awesome. That's pretty awesome.

Jim Lammers So he let me come visit him. I got to see that studio as well a few times.

Chris Nichols Yeah.

Jim Lammers Yeah.

Lon Grohs Nice. Yeah, it's a great campus.

Jim Lammers It is. It's impressive.

Chris Nichols And by the way, thank you for sending me the reel of your stuff, which I think is pretty amazing because it just shows the amount of different kinds of animation that you guys do. You guys do a ton of different kinds of animation. Obviously it's not... You guys are doing *Archer* as well which is on the entertainment side of things, and I definitely want to talk about that process and what you guys do, but there's also just a ton of informational animations that just are being made by you guys. What's all that stuff about? Can you explain that?

Jim Lammers Maybe it's a little bit about being in Kansas City and maybe it's a little bit about me just enjoying different vertical markets, but we haven't specialized the way other studios just do medical, or just legal, or just architectural, and you see that in our reel. It's true, we go out there and we find people who need visuals, and we solve problems. I take that engineering mindset to what they need to do. And we help them with marketing, or just visualization, or whatever we can do.

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Chris Nichols Yeah, because like you said, you guys do a lot of medical videos, you guys do a lot of... There was some stuff I saw like geological videos about showing how certain digging is happening. I guess it seems like explaining videos, because of course someone has to do an animation that explains that because it's too complicated to do it verbally or written down or just through a series of pictures. The animation is so much clearer to explain that stuff, right?

Jim Lammers It's a great solution, and if there's just some compelling need that drives the budget and somebody taking the time to put the project together, it's a perfect fit for us, so we love explaining things. Again, you go back to The Discovery Channel and just making something so clear when you can with animation.

Chris Nichols Right. And I guess it's really cool, especially when you're animating something complex like a complex piece of machinery or something like that, you get to learn how that thing works and from an engineering point of view that's got to be pretty exciting, right?

Jim Lammers It's fun. It's like I mentioned, just having the variety of clients means there's something new all the time and it's always fun. We did one recently for a company that does flour sifting and learned all about industrial flour sifters for a few weeks.

Chris Nichols What is that?

Jim Lammers Well, when the truck comes up with all the flour to the bakery, they need to run it through a sifter first to make sure there's not any paint chips, or bugs, or anything in it.

Chris Nichols Right, right, right.

Jim Lammers And it's this convoluted machine that drives it all through really, really fast. So I drove out and took pictures and video, and just learned all about sifters for a few weeks. It's just kind of fun.

Chris Nichols Yeah. Yeah. I think that is kind of fun. It's interesting that all the different kinds of animation... One of the things, have you guys ever done legal stuff?

Jim Lammers Yeah, a fair amount.

Chris Nichols You do.

Jim Lammers My wife's a lawyer so she advised me a little on some of that.

Chris Nichols Yeah, because that's actually a big thing. There's a lot of people that do legal animations.

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Jim Lammers She was like, "Don't do it. It's awful."

Chris Nichols Yeah. It's not very exciting, right?

Jim Lammers Right. It's prejudicial if you make it pretty. You can't make it pretty.

Lon Grohs Yeah. Yeah.

Chris Nichols Right, it has to be as boring as possible so that no one thinks that you're trying to sell them on something.

Jim Lammers They'll kick it out of court and then the lawyer that hired you is upset because-

Chris Nichols It looks too good.

Jim Lammers ... The judge said it looked too much like that guy's face firing the gun.

Lon Grohs Oh, wow.

Chris Nichols Yeah.

Jim Lammers We did a few of them, though. We've had a few. Usually something very bad has happened, also. Every one of them's a tragedy.

Chris Nichols Right.

Jim Lammers A roof fell in, somebody's been shot, we've had one of those. It's things like that.

Chris Nichols Yeah. So one of my good friends who ended up winning the Oscar for *Benjamin Button*, he was the animation director on *Benjamin Button*, one of his early jobs, he was doing legal animation stuff, and he ended up doing the animation for... What's his name? OJ's case, and apparently they were upset and said, "Don't make him black." He was like, "Well, what should I..." So they made him a blue person for some reason just so they would be... Because the whole point was to see how far he could go in a certain amount of time or whatever it was.

Jim Lammers Yeah.

Chris Nichols Yeah, you have to be really careful about that.

Jim Lammers One of our employees left and took a job at a legal firm in Los Angeles, and their demo reel was just one atrocity after another. Somebody getting run over by a car, somebody run over by a bus, somebody falling off a boat into the lake, and it was just sadness.

Lon Grohs Yeah.

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Chris Nichols Yeah.

Lon Grohs I don't think I could do it. I couldn't stomach it.

Chris Nichols Yeah, especially considering the fact that this is not for some big Hollywood movie starring the Rock. This is reality, things that really happened.

Jim Lammers Yeah, and a lot of them settle out of court when they see all of the facts. 10 minutes before showtime it's all canceled.

Chris Nichols Oh, they never actually see it because once the video comes up they're like, "Well, this is going to ruin it," right? Yeah.

Jim Lammers It may, but for us nobody sees the work. We've done all the work and now the show never happens. A lot of times with legal animation they just wrap it up.

Chris Nichols Yeah, that's tough. That's tough. Okay, so you guys do also... Obviously architectural visualization is another big part of what you guys do which is great, and I saw some of your arc-viz stuff, and that's an interesting field. Is there anything that you feel that each different vertical that you mentioned can learn from the other vertical? Is there stuff that you've been able to cross from one to the next?

Jim Lammers Oh, totally. That's really one of the great things about working in all these industries, and also selling the software, and talking to artists, is how each vertical market informs the other, or inspires it, or if we're supporting people who have bought V-Ray from us knowing that we've been there a little bit and seen that same kind of challenge. The work we do that is more beauty-oriented can inform some of the work that's a little more technical or just simple technical shots in adding a little bit of beauty to those to make them better looking.

Jim Lammers Sometimes clients, especially on the technical and explanatory side, they'll be happy with something that just is workaday solution animation, but if you can show them, "Look, what if we did this? What if we added this bright light coming from back there?" You can add some sparkle, and think that's part of what you bring to it. I remember the same thing came up in one of the CG Garages with Tim Miller talking about Blur in Venice, and how it's our obligation to not just do what the client tells us but to listen to the client and think about what we can do that takes them one step further.

Chris Nichols Right. You're right, he did say that. That's a really good point. I think it's interesting to think about what that means in terms of animation, but one thing that I also felt was fascinating, especially when I was looking at your reel is the medical stuff always looks very different. The medical stuff is the one that stood out as something a little bit different. What can you tell me a little bit about the medical animation and where did that come? And how has that changed a little bit in

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time? Because I don't know much about medical animation or that whole field at all.

Jim Lammers Medical animation's one of the best vertical markets right now for animators because it's really hard. The wireframes are unworkable, it's just a mess. Everything's organic, everything's curvy.

Lon Grohs Everything's organic, yeah.

Jim Lammers Yeah. And so it's not the sort of thing that just an amateur can just pick up, sketch up and make an anatomical animation real quick. So we love it for that reason. We looked at the industry and what other people were doing. We feel like we brought our own aesthetic to those animations. We did about 200 of them, almost all for Elsevier, a publisher out of Amsterdam that does a lot of medical books and nursing books, and this was supporting material so it was healthy tissue, sick tissue and solutions, and nursing skills. Yeah, I think we brought a really neat lifelike, visceral feel to those ones that we did. They were different.

Chris Nichols Yeah, it is very different and I think it's... I always find it really cool to see animations that illustrate something that's going to make it clear to you. We are in the age of people that learn things through YouTube, right?

Jim Lammers Yeah.

Chris Nichols They don't learn things through pictures anymore so they need a moving picture to illustrate something and make it make much more sense. I think that those types of animations are going to be helping people understand how something works, and how things work really seems to be something that's really what you guys seem to be really good at. If I'm going to put everything into all of the different verticals that you do, it's like, "what they really do is they make animations that show people how things work."

Jim Lammers Thanks.

Chris Nichols I think that's a really cool idea in general. But one thing that you guys did, obviously, is these *Archer* animations and that's a really cool thing. Let's explain to people because *Archer* is a really great thing and it's slightly niche in the United States, some people don't necessarily know about it. I'm sure outside the United States not many people know about it, but it's a really great animation. And how many seasons do we have now, 11?

Jim Lammers 11, yeah. We're finishing up the last two episodes of season 11.

Chris Nichols Wow.

Lon Grohs I can't wait to see it. I've seen everything.

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Jim Lammers Archer's back in the spy game with this season which is going to make it a little bit fun.

Lon Grohs Good.

Jim Lammers Yeah.

Lon Grohs Yeah.

Jim Lammers After three dream seasons.

Lon Grohs I can't wait.

Chris Nichols Well, let's explain a little bit about what Archer is and what you guys are doing for it.

Building "Archer's" sets

Jim Lammers Well, *Archer* is a 007 James Bond spoof merged with the bickering and infighting of *Arrested Development*. That's the high concept that starts *Archer* off, and I'd been a fan of the show whether we touched it or not. We were just really lucky. In the early days they were going to use the same kind of watercolor and illustration backgrounds as they had used in the past, and then also they had used photography on *Frisky Dingo* if you've seen that series and then just heavily Photoshopped it to look more painterly, and quickly realized they had a production bottleneck there.

Jim Lammers That's when their art director, Neal Holman took his LightWave skills and said, "Can we do backgrounds for a 2D show with 3D and make it look okay?" That was when they were on their pilot, their pilot episode back in 2009, season one. And then they needed somebody who could handle the 3D, and they are out of Atlanta. They went around Atlanta and they spread their net farther, and eventually they gave us a chance to audition. We passed the test and got to work heavily on seasons one through five, so it was great.

Chris Nichols How does it work? Explain the style because obviously we'll show a little bit of it, but how does it get that look that looks so cool to it?

Jim Lammers It's a really great process because it gives a lot of creative freedom for a cartoon. Since they have 3D sets they can be like Scorsese and they can put the camera in the place that tells the story. Well, you guys know that from V-Ray in real life.

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What a great bunch of camera angles you used on that. Great, great short film. So on *Archer* they'll send us reference photos of things like, let's say it's a police station. Well, what style is it? Modernist or 1940s? So they'll sketch it out with their own hand as well as provide reference photography, and that's our chance to just go start blocking in the basics of the shapes.

Jim Lammers We worked pretty hand-in-hand with their scene directors in Atlanta, and each phase they're seeing the sets being built up. By then the storyboard artists have camera angles for the shot, so there's a scene and they know they're going to want to portray it from different shots. And we go ahead and we put bipeds from Character Studio. We go ahead and use bipeds and pose them, at least roughly.

Chris Nichols As stand-ins for the characters?

Jim Lammers Yeah, so they know the green one is Archer and the red one is Pam, and they can use that, especially if the shot is extreme perspective or a lot of foreshortening, it really helps guide the 2D work that they're doing. At that point there's the complex challenge of creating everything in layers. They're going to get a Photoshop with 72 layers, so every table and chair, sometimes every layer of glass.

Jim Lammers Everything's on separate layers so the characters can go behind it and so they can painterize it in different ways. All of that's delivered to them as a gigantic Photoshop usually, and then they can go in and apply their watercolor style, you know the *Archer* look. It's a bit painterly and it has to match and mesh well with the cel-shaded style. And they do all that with Illustrator, not with Flash. That's why *Archer* looks so rich, is it's a lot more laborious.

Chris Nichols So what they get from you guys is a background where everything is broken out into tiny little pieces, right?

Jim Lammers And still looks fairly realistic, yeah.

Chris Nichols So it's still rendered as a normal render at this point, I'm assuming, right?

Jim Lammers Yeah, we let the light bounce around and we do reflections. We really don't get too far from reality at that point. And luckily *Archer's* not a real crazy quilt show, like *SpongeBob* or something, where verticals are vertical, and people are generally five to six feet tall, and all that.

Chris Nichols Okay, so that's pretty interesting and so obviously you may have some textures here and there but you're keeping... Most of the thing that you're focusing on is the perspective, the lighting, and the objects, and the composition of the scene, et cetera, right?

Jim Lammers Just trying to serve the story and the humor, especially.

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Chris Nichols Yeah. Yeah. And so then I guess they must have a pretty robust system to convert that to some kind of a vector process in Illustrator though, right?

Jim Lammers Well, when I said Illustrator I was referring to the foreground characters.

Chris Nichols Oh, really?

Jim Lammers All the actors and stuff.

Lon Grohs Yeah.

Jim Lammers Those are all Illustrator and then the backgrounds are bitmaps provided by us.

Chris Nichols Okay.

Jim Lammers Yeah.

Chris Nichols Wow, so it's really just... Okay, that's pretty amazing. But it still has a little bit of a look to it that matches both worlds pretty well so it's pretty amazing.

Jim Lammers It's a neat look.

Lon Grohs Yeah, I love the look. That's one of the things that drew me in beyond the sense of humor is awesome. Jon H. Benjamin is... I love him as a voice artist but I was so puzzled by the look because I didn't understand it when I first saw it. I was like, "How is this being done? This is magic." And then of course when I learned that Jim and team had been working on the environments I was like, "Oh. Okay, so that makes perfect sense that there's this 3D element," because it has this beautiful... Like you said, it's got bounced light and the reality of it but then there's this wash on top of it that makes it blend with the characters. Man, it's cool. It is a really cool look. You said season 11's coming out soon?

Jim Lammers Well, they had stated May the sixth but that has now slipped. It's been in Entertainment Weekly and Variety as a date that is TBD.

Lon Grohs Got it. Yeah, that makes sense.

Jim Lammers I don't know how far out they're going to push.

Lon Grohs How far out it'll be.

Jim Lammers Crossing our fingers.

Chris Nichols Well, we'll put this podcast out sometime probably close to May or around May, and so people should just keep an eye out for the new season coming out. And if

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you haven't seen *Archer* you still have 10 seasons to catch up on before you get to season 11.

Lon Grohs Good time to catch up.

Chris Nichols So it's a good time to catch up, and I would definitely recommend doing that because it is a really hilarious show. And I think James, that was really cool. So you guys have been doing *Archer* for a long time, I guess, right?

Jim Lammers Since 09, although we mostly worked on the first five seasons. I think season six and seven we just got a few pickup shots and then season 11 we're back pretty well full-time. They have an internal team too that's handling stuff. I believe Floyd County has some other productions that are also taking the resources too so it's been good to be a part of it.

Chris Nichols How many episodes in a season?

Jim Lammers When they started out it was 10s and then 13s but for the last four or five seasons it's been eight episode seasons, so there's only eight episodes for this season.

Chris Nichols I noticed that that's actually kind of interesting... A lot of shows now have actually reduced the amount of shows they do per season but they're giving higher quality content at the same time, so I'm not so disappointed. Because it used to be back in the days when *Cheers* and whatever on was like 26 episodes in a season, right?

Jim Lammers Yeah. *Andy Griffith* would be like 32.

Chris Nichols Yeah.

Jim Lammers They just get the summer off.

Chris Nichols Yeah, exactly. Exactly.

Jim Lammers And I believe they pushed Adam Reed to go to 16 episodes when the show started really gaining in popularity around season three, and they just felt that the quality would suffer and they stayed with 13.

Chris Nichols Yeah. That's a lot to ask for an animation, especially if you're trying to push the boundaries of how it looks for a season.

Jim Lammers Yeah. The pressure they're under in the Floyd County production studio is higher than anything we experience so my hat's off to them.

Changes in the VFX industry

Chris Nichols Wow. That's pretty amazing. So we mentioned that you're obviously part of the community back in the late 90s or mid 90s til now, what have you noticed in the community that has changed a lot? Or what are some of the things that have been adapted or changed and grown in that time? Especially from someone from the vendor point of view where you're dealing with customers and dealing with different things as well as somebody who's actually using the stuff and creating content at the same time. That's two great perspectives to have on the industry.

Jim Lammers I think the big watershed moment for animators was global illumination. Previous to practical global illumination with V-Ray in particular we were really illustrators. It was nice looking but nobody was fooled. And then around, what was it, 05? 06? 07? We started to see Detroit, all the car companies starting to do their literature with renderings, we started seeing some other product shots, so suddenly instead of this little animation niche we have product photography 1,000 times bigger and animators are starting to get a pretty good chunk of that starting in those years. So that was where things, I think, really changed for the applicability of our skills to a much broader world. That was a really big moment.

Chris Nichols Yeah. You were part of the Max community, so aside from the Lightscape community you're probably one of the first groups really in the CG that was really focusing on global illumination a lot more. There were a lot of architects that were living in the Max community, a lot of those people, so global illumination was a big part of that group that was actually beyond even the Maya guys or any of those guys.

Jim Lammers We were using scan line rendering in Max and thought it was good, thought it was good enough, and I saw what some people were managing to do and I realized it was a moment where we really had to make a choice. So I had to buy a lot of hardware, a lot of computers, the fastest I could get, and then we were at the edge where we could a minute of HD animation flying through a globally illuminated environment even with things that are moving. When that became possible that was an exciting time, yeah.

Chris Nichols Yeah. It must have changed everything, right?

Jim Lammers Yeah.

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Chris Nichols From all the different verticals.

Jim Lammers At first, like you said, with Lightscape and finalRender from cebas, you could do stills but animation still seemed a bridge too far. It was just too much to ask and so when that slowly started becoming possible, that really took our architectural animations up just to a whole new level of realism, and excitement, and believability.

Chris Nichols Yeah. It's true, it's true. Lon, you've been in the GI world for a long time.

Lon Grohs Oh yeah, definitely. In fact, I was one of those poor souls that was rendering Lightscape animation and rendering it through batch files that you would take and you would manually input it onto a machine and say, "You render these 10 frames," then you go on to the other machine, "You render these 10 frames." And then I'll never forget a job where we cooked out the solution, we rendered all the frames, and then we had to put in RPC people that were walking through the frames and so that scene was obviously all built in Max and then rendered out so that you could composite it into the Lightscape frames, but there was no motion blur so we ended up taking the motion blue of the scene, and it was the fake motion blur that you got in Max that was smeary-

Chris Nichols The 2D one?

Lon Grohs Yeah, the 2D motion blur, and we rendered that as a map pass and put that over the Lightscape pass so that it would smudge it enough that it was like the motion blur pass, and something it all came together and worked, and you're like... But my god, I wouldn't do it again.

Jim Lammers Yeah, that's called character building.

Chris Nichols Yeah.

Lon Grohs Yeah, exactly. Yeah.

Chris Nichols It is interesting how so many people have always... During that transition time when something new is happening, you didn't quite want to fully commit to it but you would basically go, "Okay, I want GI but I can't really do real GI so I'm going to use another pass like ambient occlusion and I'm going to touch that in a little bit, but still use mostly rasterized scan line rendering or whatever it was."

Chris Nichols I just remember, "Oh, it looks pretty good but the reflections are never going to look good so I'm going to just retrace that separately in a different render and try to blend that in." When people just gave up using multiple renderers to get the thing to look right and finally just committed to a single renderer, that became a big change because you're just fooling yourself.

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Jim Lammers Yeah. A lot of people are cobbling together mixed solutions like that. I'd say from around the early 2000s to maybe 2010. What can we do? We need more computers or we need to try this just for this one part of the video, and it would be a bit of a... We'd just sort of nailed it all together. It was a lot more elegant when you could just say, "Okay, we're just going to put it through the render pipeline and get a good result at the other end."

Lon Grohs Yeah.

Chris Nichols And then you end up sacrificing so much when you do that, too, because the process, I'm sure what Lon described, was not very creative.

Jim Lammers A lot of human hours, and I can see the clock turning in the time lapse video of Lon working on that.

Lon Grohs It's also so much to keep track of and so many things that can go wrong so you're introducing all these points of failure that you shouldn't have to deal with. Chris and I joke, we see a little bit of the same sort of thing with some of the realtime stuff.

Chris Nichols Yeah. That's what I was just going to get at, yeah.

Lon Grohs Where it's like we're still trying to hack our way through, or maybe we could turn on a reflection here, or maybe we could turn on a little one pass of GI over there. And don't get me wrong, I'm very excited that there's progress and we're getting to that point that we can do that stuff in real time, but just... It gives me nightmares back to, "We need something that can just go and work."

Chris Nichols Right.

Jim Lammers It's funny, in Unreal I'm making spherical reflection maps again as though it were 1994 all over again. I'm seeing all the same early tools from the DOS versions of 3D Studio as they work through smartphones and the smartphones get better, and real time.

Lon Grohs We were joking too when VR came back into the mainstream and was taking off, and the most popular was the stereoscopic still image, and we're like, "This is really just a QTVR everybody. We've been doing this for a long time."

Jim Lammers Yeah.

Chris Nichols I remember doing this in probably 94, 95.

Lon Grohs Yeah. So okay, it's a stereo QTVR which means you've got two images now.

Chris Nichols Yeah.

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Jim Lammers Yeah.

Lon Grohs Cool.

Chris Nichols Yeah.

Jim Lammers Yeah. I guess it was immersive when you put it in your headset and you can look around, yeah.

Lon Grohs But it works. It was effective.

Chris Nichols You guys remember-

Jim Lammers When I was a kid I had the View-Master too.

Lon Grohs Oh, yeah.

Chris Nichols Oh, yeah, yeah.

Jim Lammers With Fred Flintstone.

Chris Nichols Yeah. Do you guys remember the QTVR that you'd basically have on and then you'd put the hotspots that would take you to the next spot?

Jim Lammers Yeah.

Lon Grohs Yeah.

Chris Nichols Basically it was... I don't know why it never took off but it was really cool.

Lon Grohs There was another one that would do an animated one so you could go from one spot to another along a path, you had to choose a path and it would basically do a QTVR at every frame so you could go in, you could look around all along the path which was pretty much VR.

Chris Nichols Yeah.

Jim Lammers Yeah, it worked okay. We did some VR tours using the same approach so yeah, you could click the hotspot in the QuickTime and then you would rush up to it or play an interstitial animation and get to that spot and now you can look 360 again within that spot.

Chris Nichols Yeah. Yeah, it was kind of like a Zoom warp to the next spot, right?

Jim Lammers Indeed, a little like street view on Google.

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Chris Nichols Yeah, yeah. Exactly, that's a perfect analogy of it. Yeah, it was exactly like that. Yeah, I thought it was pretty interesting. And you're right, the real time world is suddenly having these same things. I remember when I was at Sony and I was working on *Ghost Rider*, and basically it was the last show on *Ghost Rider* to ever use their legacy system, which was a system called BIRP for lighting and it was the old RenderMan. I said, "I am never rendering a shadow map ever, ever again," and now I'm realizing if you're going to be doing real time you probably need to think about shadow maps again.

Jim Lammers But the earliest devices are like, "Well, you've got eight kilobytes for all of your shadow maps, another eight kilobytes for your geometry," and suddenly you're back to *Quake 1*, you know?

Chris Nichols Yeah. Yeah, yeah, yeah. It was interesting, so there's a friend of mine named Josh Scherr, he's actually a director and writer over at Naughty Dog, I think he's one of the main guys behind *The Last of Us Part II* which means he's very busy these days, but he was giving a talk apparently to some young kids about video games, and he said, "Back when I was a kid..." He says, "Open your computer," and he says, "You see that icon that's telling you Google Chrome or whatever that's on your thing? That icon takes up 32k. We had to write an entire video game in 8k for Atari." That just gives you an idea. The icon itself is four times the size of what a video game used to take in terms of memory.

Jim Lammers You're wasting all this space.

Lon Grohs Right? Yeah.

Chris Nichols Yeah. I haven't been following it but I used to love going to the demo scene stuff. You know the demo scene, guys?

Jim Lammers No.

Chris Nichols They're the guys who... They're supposed to create some kind of a graphic experience or a demo, right? And it's supposed to be an executable, and they're supposed to see how much stuff they can fit into a minimum amount of space so they write it all in machine language so it's super, super, super efficient, but they'll do these very trippy visual experiences and it's like 64k. I was like, "What did I just see?" So it's a combination of super nerdy tech people and then very visual content as well. It includes all the music that has to be synthesized through the process and everything else.

Jim Lammers I know a little bit about it. I had one of those Timex Sinclair ZX81 little memory-

Chris Nichols That's what I had. Yeah.

Jim Lammers Yeah. Did you learn a little machine code with that for ZX?

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Chris Nichols You had to.

Lon Grohs Chris finally found somebody that had the same equipment as him. We have to remember this moment forever.

Chris Nichols Not true. I have had a couple other ones but yeah, the Sinclair ZX81. You could write it on a cassette tape to put your programs on.

Jim Lammers It was good discipline. It was a little like animation, you had to do everything right and in the right order, and nothing worked.

Chris Nichols Nope. Yeah.

Jim Lammers Yeah. And we learned a little bit of machine language. It's pretty good. It was a good starter for me.

Chris Nichols Yeah, absolutely. And I think it had 1k of memory on it. I was always jealous of my friend who had a Commodore 64 because that had 64 times the memory and he had a game called *Flight Simulator* on it, and I did not have *Flight Simulator* on my 1k machine so I decided I was going to try to write my own *Flight Simulator* which was instrument-only. The only thing I could do was land and I didn't know anything about aerodynamics so I just made it up as I went along. It was like, "What's your altitude and speed?" And so if you accelerated it would go up and you would just see the numbers go up and down. Whether it came down too fast or not, I'd crash and it was really just basically just a bunch of numbers going up and down.

Jim Lammers That's seriously impressive. That's really good.

Lon Grohs Yeah.

Jim Lammers How old were you? Five, 15, or 25?

Chris Nichols No, no, no. I must have been 13 or 14, something like that.

Jim Lammers Yeah, exactly. That's what I thought. Yeah, that is impressive. That's great. Did you go to engineering?

Chris Nichols No, I went to architecture.

Jim Lammers Architecture, yeah.

Lon Grohs Yeah.

Chris Nichols Yeah, yeah.

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Lon Grohs There's a mathematical mind in there as well, too.

Chris Nichols Yeah, I did a little bit of... I did some math. It's interesting, I was really into computers and I loved doing that stuff but then when I went to actually study computer science in college I just didn't like the faculty and I didn't like the subject matter, and it was mostly about timing. Literally timing how efficient your code is, and then after a while I was like, "This isn't creative at all," so I gave up my... I was doing math and I was doing computer science, and I gave up the computer science part to just do art instead and it was much better that way.

Jim Lammers Wow. We're all technicians that love art, I guess.

Chris Nichols Yeah.

Lon Grohs Yeah.

Jim Lammers There's a lot of musicians in the field too.

Chris Nichols Yeah. I think music, mathematics, and art, and architecture, they all seem to do really well together as a combination.

Jim Lammers We used to see at SIGGRAPH a lot of guys that used to be in bands and now they're all working in 3D in different ways. Just, I guess, comfortable with applying computers and technology to creative endeavors. Seemed like Gary Yost and the original Yost gang that built 3D Studio, a lot of them were musicians if I recall.

Chris Nichols Probably. Do you play music?

Jim Lammers Yeah. I used to play guitar mainly.

Chris Nichols Oh, okay. So yeah, you're part of the band.

Jim Lammers Yeah. Taught guitar through college.

Chris Nichols Yeah. You did teach guitar, actually?

Jim Lammers Yeah, through college. Yeah.

Chris Nichols Wow, okay.

Jim Lammers So it was peak hair metal. I was teaching a lot of Motley Crue songs.

Chris Nichols There you go. There you go.

Lon Grohs Nice.

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Jim Lammers Yeah. Every kid wants to know them.

Chris Nichols Yeah. Actually, my kid wants to know how to play guitar. He's actually been interested in guitar and so I'm trying to think about how I'm going to make that happen for him at some point. And I think he's got a big math brain as well so I think there's something about the logic of how music works in terms of progression and stuff, and chords, that blends really well with a mathematic mind, I think sometimes.

Jim Lammers Yeah, I agree, and also it's really good to just physically master something once in your life, just where your body meets the world, and getting really comfortable with playing an instrument is a great way to just... It's motor skills, and your mind, and living in the moment. It's a different thing than other disciplines and I think it informs a certain kind of thinking. It's good to have done that at least once. Some people do skiing or baseball, that sounds too.

Chris Nichols Yeah. He's got some pretty good muscle memory on a game controller, I can tell you that.

Jim Lammers Excellent.

Chris Nichols But yeah, I think you're right. I think it's good to have that discipline, that something you can do, and something you can always come back to. And the cool thing, especially about music, and I'm sure you can agree to this, is you can always pick up a guitar, right?

Jim Lammers Yeah.

Chris Nichols And it doesn't always have to be plugged in, you can have it completely unplugged and that's something you can always do. And that's something I've actually always envied about people who play musical instruments because I don't always have that freedom.

Jim Lammers It's a delight, man. It's worth it, yeah.

Chris Nichols Yeah. Going back to your animation, obviously you were mentioning the fact that you learn all this stuff about these new things, and your engineering background also was an influence from you, so figuring things out and understanding that, did that influence your music as well?

Jim Lammers The math and engineering mindset?

Chris Nichols Well, the figuring things out. Obviously you learn music as you learn music but there's also something like how you learn the music and how you try to get it accomplished. Is there something about your engineering mind that influenced your music mind or was that always two separate things?

Jim Lammers The really hard part in music is usually pre-college. Usually it's when you're 10 to 18 years old. You've got a lot of time, you don't mind that you're terrible, and especially pre-YouTube you had to just play the record and figure it out yourself. There was no useful tablature in that era that you could figure songs out with, usually. So that was a good discipline, just like you're talking about Lon with Lightscape and you with your aircraft landing tool. You just pound through it and it really informs a lot of your skills that you just keep trying and trying.

How to teach and learn

Jim Lammers When I was a teacher I had a lot of kids and a lot of adults, and everybody always said the kids were faster learners and better students, but what I found was adults couldn't tolerate being terrible, because you're always terrible. If I picked up the violin, I'm going to be a terrible violin player, and you're going to hear yourself being terrible, and adults were too quick to just say, "I'm terrible," or to say that someone's a natural. And kids don't mind, they've got all the time in the world and they just try, try, try, and eventually the positive feedback comes and it drives them to even more practice or more joy with the instrument, and it's a positive feedback loop.

Chris Nichols Yeah, and I noticed that with skiing. Adults who are learning how to ski, they never want to learn how to ski because they don't want to look uncomfortable on skis, but kids are like, "I don't care, I just want to barrel down the mountain."

Jim Lammers Yeah.

Lon Grohs There is also the fact that kids are a little bit more bendy so when you fall as a kid you're lower to the ground, it doesn't hurt as much. As you get older, skiing is like, "Well, I could break my arm."

Chris Nichols Yeah. Okay, but let's bring up that idea. Back in the 90s and stuff there was no YouTube or things of that nature. These days when people are learning things, especially in 3D animation, there is a ton of resources for people to do. Do you think there's something lost in just having instant access to know everything? Or do you think that's just a blessing?

Jim Lammers It's pretty much I veer towards pure blessing. The only thing is is just the perseverance that you gain some skills at, the willingness to just keep pounding at something that's a problem. If you lose some of that because if you can't find a quick solution you just give up, that would be the only possible downside. When I started in the early days of 3ds DOS there were one or two books out.

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Jim Lammers I recall Michele Bousquet wrote one of the first books on 3D Studio DOS and I bought it the first day and just pored through it. It was the first person who took time to translate the tools to art and just translate some ideas about how that's being done. Later I wrote the Maya Fundamentals series for Pearson. That was a pretty popular set of books for people learning Maya and same thing, you just are trying to work through those challenges.

Chris Nichols Yeah. I think it was interesting because those were those, "I've got *the* book." That was it. You only had that one book and Maya Fundamentals was a perfect example. That was a very, very important book. Anyone who was going to learn Maya, you started with that, right? And that's the resource you had. But now you can go and just go on YouTube and say, "Starting Maya," and you'll get like 25 different points of view about it. And actually, honestly speaking, sometimes I find it very frustrating because I'll see some guy's teaching you how to use V-Ray in something and I'm like, "Oh no, that's the wrong way to do it," right?

Jim Lammers Yeah.

Chris Nichols Or worse, and I'm actually at fault here as well, you brought it up that the Gnomon DVDs... People still talk about the method that I was talking about. Those DVDs are 13 years old, 14 years old and people say, "No, this is the way you do it." It's like, "That is a very, very long time ago."

Lon Grohs Don't need it. Use the defaults please.

Chris Nichols The problem is that it's hard to bless the true way of doing things. When you wrote Maya Fundamentals, Autodesk, or actually it wasn't, it was Alias Wayfinder probably at the time, they basically like, "No, this is correct. This is how it should be." It was blessed by them, they knew that you had a relationship with them, et cetera. But nowadays if you look up, "How I use Maya," you've got some guy somewhere who's using a cracked version of Maya saying, "This is what you do." And no, not exactly.

Jim Lammers Well, YouTube is in a way everybody can post their work, and always it's a blessing and a tragedy because there's a lot of wrong solutions or partially correct. Usually when people ask me I'll send them more to linda.com or digitaltutors.com which is now a portal site, I think.

Lon Grohs Portal site, yeah.

Jim Lammers Because there's a little more care taken in what they're presenting and making sure they have somebody who's an authority. It's a little better, yeah.

Chris Nichols Yeah, but you know.

Jim Lammers You've got to have some barriers to entry or you just get everything.

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Chris Nichols Yeah, yeah. But no, I think it's a really good thing also because if you decide you're going to pick up a new skill no matter how old you are, I decided because I'm stuck at home now I'm going to start picking up fly tying because I'm doing some fly fishing, so that's great. Suddenly I go on YouTube and it's like, "There's a lot of resources on tying flies."

Chris Nichols And I'll actually advise this to people, especially if you're dealing with anxiety which a lot of people are dealing with anxiety right now, watch someone tying a fly. It is one of the most meditative experiences of just seeing this little thread wrapping around a feather, and it's like, "That's going to help relax a lot more." But there's a lot of resources for anything that you want to learn, which I think is great, but it is hard to know what's correct and what's not. And I think you're right, finding resources that you're going to be able to trust.

Jim Lammers Yeah, the internet deals with that over and over, and Wikipedia, early TurboSquid, a lot of these everybody can post and some people, they don't know that they don't know yet.

Chris Nichols Right.

Lon Grohs Right. True.

Jim Lammers Nothing against them. I appreciate their contribution but they don't know that they need a little more knowledge before they start standing up on the milk carton and telling us all.

Chris Nichols Yeah. Yeah, yeah, yeah. It's true, it's true. So listen, we're rounding the corner here and I'd like to know a little bit more but obviously you were going to be able to come to Total Chaos which it's unfortunate that it's no longer happening, so I'm really glad you were able to at least be part of the podcast.

Jim Lammers Thank you.

Chris Nichols But tell us a little bit, were you going to be able to talk about anything at Total Chaos or were you just going to come to hang out in Sofia?

Jim Lammers Do you mean the one that was going to happen in 2020?

Lon Grohs Yeah.

Chris Nichols Mm-hmm (affirmative).

Jim Lammers Well yeah, they invited me to come talk about *Archer* so I was excited to come show off our techniques, and answer questions, and show off some of the elements of background creation. I went to Total Chaos 2018 and just loved seeing Sofia, and the gang at Chaos Group, and the city, and everything. Both my

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wife and I just really fell in love with Bulgaria and the experience of seeing this great city and touring it. So I was really excited to be coming back in 2020 and not just being an attendee but having a little bit of participation this time.

Chris Nichols Yeah.

Lon Grohs Yeah, and that was one that I was really looking forward to as well, so let's all hope that it happens 2021 and hopefully that gives the world enough time to recover. We've definitely got to have you there. Maybe we'll be talking about season 12.

Jim Lammers Yeah, I hope so.

Lon Grohs Right?

Jim Lammers Yeah.

Lon Grohs And the other thing that I was thinking in the back of my mind, Chris, is the *Archer* environments are kind of an interesting case for Lavina.

Chris Nichols Oh, possibly. Yeah.

Lon Grohs Because they're sort of an outdoor environment, you could be rendering that stuff, retraced in real time so maybe we've even got a little bit of an experiment we can do on that. The only trick being there's a lot of layers and things that you've got to render out so maybe you have to kick it back over to render it out final out of V-Ray, but there might be some interesting stuff we could do with Lavina. So we'll have to reconnect on that front in the meantime and see what we can do there.

Jim Lammers We'd love to explore that, absolutely.

Chris Nichols Yeah. Yeah. Well, I'm excited at all the stuff you're doing.

Jim Lammers Thanks.

Chris Nichols And I'm really excited at the fact that you've been around for a long time and Trinity's been around for a long time, and I've always used them as a resource and so your name... I've known your name forever. I've known of your name long before I met you, so when I met you it was, "Oh my god, it's Jim Lammers," so I was really excited. I think the first time we met in person, I believe... I don't think you know this but I remember it. You were at New Orleans in 2000, am I right? At SIGGRAPH?

Jim Lammers Yes.

Chris Nichols Yeah. I think that's the first time I met you in person.

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Jim Lammers Oh, fantastic. Yeah.

Chris Nichols Yeah.

Jim Lammers I remember that was when TurboSquid had their huge party celebrating their beginning.

Chris Nichols Yeah, exactly. And I was there, I think, so I think that's where I met you, at one of those big events over there.

Jim Lammers It's great, SIGGRAPH.

Chris Nichols It was because they were based in-

Jim Lammers That was 2000 or 96? 2000.

Chris Nichols It was in 2000.

Jim Lammers Yeah.

Chris Nichols It was in 2000. I think they had-

Jim Lammers It was the biggest SIGGRAPH ever. Remember, it was before the dot-com crash?

Chris Nichols Yeah.

Jim Lammers It was like a city. There was environment fog, it was so big. From one end of the show to the other it was like a city where the booths got taller as they got farther from your view. And then the next year was like a Peanuts Thanksgiving, there were just three card tables.

Chris Nichols You nailed it. I think the one thing I remembered the most about that SIGGRAPH that had me cracking up was, I guess, I think it was Sun Microsystems back when Sun was still around. This is when people had booths... The booths were two stories with dancers everywhere. It was crazy. And sometimes you had people like, "Why is Sun here?" And they would show something that had nothing to do with their product, it was just to get people to go to their booth.

Chris Nichols They had a very large aquarium there, and inside the aquarium, barely contained inside the aquarium was an animatronic dolphin. There was probably maybe two feet on each side of the Dolphin, that's how big the aquarium was, but it was a full-size dolphin animatronic that had an umbilical cord with a cord coming out and he would go like, "Woo," and he was moving up and down. It looked pretty real for a while and then you came close and realized, "Oh, it's animatronic." Well then, at one point I guess I came by one of the days and I saw a big SPCA truck outside of...

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Jim Lammers They thought they were abusing a real dolphin.

Chris Nichols They thought they had a real dolphin inside this aquarium inside the convention center, and I was like, "Nope." Yeah, it was pretty funny.

Jim Lammers I recall they were selling AOL disks and domains. They had the island of Tuvalu there selling the .tv domain and all of these very peripheral elements of animation were at this incredibly big SIGGRAPH show. I think I was exhibiting at SIGGRAPH 2000 so I was just busy as could be.

Chris Nichols You might have been, yeah.

Jim Lammers I think I was working with cebas in those days and we had finalRender 1.0, I believe, at SIGGRAPH 2000.

Chris Nichols Right, right.

Jim Lammers Yeah.

Lon Grohs Yeah.

Jim Lammers That would have been about the time.

Chris Nichols I think my wife tells me this story because it was her first SIGGRAPH she ever went to and so she was just walking around with a bag just collecting schwag like crazy. We had a competition in the morning to see how many T-shirts you could get, that's when those people were just throwing them at you for free. But she was exhausted because, as you said, you could see the environment fog in the convention center.

Jim Lammers It was huge.

Chris Nichols And so she was really tired and she ended up... One booth had these giant BarcaLounger chairs that you could unfold and they were playing the pod races from Star Wars on the big screen, and she was just sitting down, she was like, "I can finally relax and sit down and just watch the pod races. She looked at the guy next to her and the guy looks and says, "Do you know what they're selling here?" And she goes, "No, I think it's hard drives." They had no idea, they were just sitting down.

Jim Lammers Yeah.

Chris Nichols Those days are gone.

Jim Lammers When you're an exhibitor they come and they go, "What is this whole rendering thing?"

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Chris Nichols Yeah.

Jim Lammers Well, do I have to explain it from the ground up at my booth in the middle of the day? Yeah.

Chris Nichols Yeah.

Lon Grohs Yeah.

Chris Nichols Yeah. Okay, I'll tell this joke about Zaha Hadid, she was giving a talk at Rice University because she's a big name architect there were a bunch of people that had come that wanted to see Zaha Hadid talk about architecture that are not necessarily in the university but they just want to go see an architecture lecture, but she's talking to mainly students and people that know their stuff in terms of what it takes to do architecture. And so some guy who was probably in his 60s or 70s says, "I notice you use a lot of computers for your design. Do you use the Adobes?"

Jim Lammers Yeah.

Chris Nichols Like, "Yeah, okay." Little bit harder question to answer.

Jim Lammers It's pretty funny.

Chris Nichols Like you said, like, "What is rendering?"

Lon Grohs Yeah. No, that's a question I've had to answer many times myself, Jim. I appreciate it. And I usually start with, "You know dragons aren't real, right?"

Jim Lammers That's really funny.

Chris Nichols Good way to put it.

Lon Grohs That's the barometer of where we have to start this conversation.

Chris Nichols Yeah.

Jim Lammers When you're on the show floor you're already... Your voice is getting tired and you're trying to interact with people. You have about one minute per person so getting hit with a really broad question is like, "Talk to my competitor over there."

Chris Nichols Right. Yeah. That's true. All right, well Jim, thanks so much for being on. I really appreciate it. This is going to be great.

Jim Lammers Thank you. It's been an honor to be a part of the CG Garage Podcast. I really appreciate it.

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Lon Grohs Awesome.

Chris Nichols Yeah.

Lon Grohs Thanks, Jim. It's good to see you, and like I said, we'll circle back with you about hopefully Total Chaos 2021.

Jim Lammers Can't wait. I'll be there.

Lon Grohs Awesome.

Jim Lammers Yeah. Excellent, thanks guys.