

*Oklahoma Innovations* Radio Show

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Guests: Mike Callaway and Chad Dainty, **CalTech Global**; Trevor Snyder, **VADovations**;  
Kenneth Oglesby and Michelle Witt, **Impact Technologies**; Rich Helfrich, **Amethyst Research**

[ Music ]

>> From the OCAST Radio Network, this is *Oklahoma Innovations*, a weekly science and technology radio magazine brought to you as a service of OCAST, the Oklahoma Center for the Advancement of Science and Technology. OCAST is the state's only agency whose focus is technology – its development, transfer and commercialization. OCAST's mission is to locate and fund promising technologies and allow Oklahoma to compete in a global market economy from our own backyard. This program features some of the state's most gifted and talented scientists and inventors, entrepreneurs, manufacturers and business leaders who all have one common goal: developing technology-based economic growth for all Oklahomans. Now here are your hosts Gary Owen and Steve Paris.

[ Music ]

>> Gary Owen: Welcome to this week's edition of *Oklahoma Innovations*. We're coming to you from an event with a lot of people in the background which means obviously we're not in studio this week. We're on remote at the Oklahoma Technology Showcase. Now by the time you hear this program it would have happened last week and what that means is that we're in a circle of entrepreneurs who're involved in technology and innovation. Part of this showcase features CEOs from the ten of the fastest growing small businesses in Oklahoma. The presenters were allowed ten minutes to give a high energy talk about the highlights of their innovative product services and their life lessons learned as they pursued their ambitions. Right now we have two people, Steve, at the microphone. We're going to talk to the company called CalTech Global and if you know anything about the oil and gas industry, this is an interview you're going to want to hear.

>> Steve Paris: That's exactly right, Gary, and we're going to let them explain what CalTech Global means, how they came up with that name. We have with us Mike Callaway who is President and CEO of the company and Chad Dainty who's Director of Operations and both of these gentlemen hail from Sapulpa, is that right?

>> That's correct.

>> Steve Paris: Mike we'll start with you first. Give us a little bit of background of your company, how did you come up with the name CalTech Global? Being in Oklahoma, has nothing to do with California, right?

>> Mike Callaway: That's correct. It used to be called CalTech but they confused that with California, so, we went to CalTech Global. CalTech stands for Callaway Technologies which is really kind of a R and D research company.

>> Steve Paris: Very good. You're headquartered in Sapulpa and you're a research company but you have a specific focus on some remedial work, do you not? Is that the way it works?

>> Mike Callaway: Our product we're working on now is, is called Sulfabate and it's a granular filter media for removing hydrogen sulfide from natural gas or other gases like landfill gas, sewer gas and biogas applications.

>> Steve Paris: So I, I kind of want hydrogen sulfide in the gas that I buy don't I or do I not?

>> Mike Callaway: Well, if you want to smell bad or be corrosive, poisonous, okay.

>> Steve Paris: Okay.

>> Mike Callaway: Most people don't.

>> Steve Paris: You convinced me. I don't want that, all right?

>> Gary Owen: Let's, let's do this for the audience that isn't familiar with the gas.

>> Mike Callaway: Okay.

>> Gary Owen: Let's describe what hydrogen sulfide is and let's talk about the dangers of why what you're doing is so important to the gas industry.

>> Mike Callaway: Okay, hydrogen sulfide can be a natural occurring, it's a corrosive and poisonous gas, you've probably all smelled it or know it as rotten egg smell. You drive by the sewer plant and you smell that and because it is poisonous it's a big problem for people that work around it. So there's work limits or exposure limits of around 10 to 15 parts per million that's acceptable. Over that it's, it's a severe hazard.

>> Gary Owen: Now, so what you're doing is?

>> Mike Callaway: So in the oil and gas industry they have a limit of 4 parts per million of H<sub>2</sub>S concentration allowed in their gas that they sell so anything over that you have to remove the hydrogen sulfide until it gets down to the 4 parts per million. Of course the level could be high, it could be several hundred, several thousand parts per million which is a deadly concentration.

>> Steve Paris: Have, have we had any cases around the world where hydrogen sulfide has gotten out of hand and killed a lot of people?

>> Mike Callaway: Oh, there's a few cases recently about where a worker will be working on a sewer line and he gets overcome and they'll pass out and they'll, if someone doesn't get him out it'll be deadly.

>> Steve Paris: Right.

>> Mike Callaway: Usually it happens two at a time because someone goes in after him.

>> Steve Paris: Yeah. Then they're in trouble then.

>> Mike Callaway: It's deadly. And then there's also the flammability issue. It is flammable so it's also a problem there.

>> Gary Owen: So would you say you deal more in the drilling aspect of the business?

>> Mike Callaway: Actually we're more into the production area.

>> Gary Owen: Oh yeah?

>> Mike Callaway: And, because once they drill the well and put it on production they want to sell the gas so we provide a very economical method for treating that gas so they can make it commercial.

>> Steve Paris: Is it a trade secret what you do?

>> Mike Callaway: It's not a trade secret what I do but it's a trade secret how I do it.

>> Steve Paris: How you do it. Okay.

>> Gary Owen: Let's get Chad Dainty on, he's the Director of Operations. Chad tell us about your job with CalTech and maybe you could give us a little more explanation of what the company does.

>> Chad Dainty: Well, no doubt, small start-up company. It's the two of us, so we each do everything.

>> Gary Owen: Oh my.

>> Chad Dainty: We wear many different hats. Production, research, development, IT, Accounting, Payroll.

>> Gary Owen: Oh boy, so you.

>> Chad Dainty: Marketing.

>> Gary Owen: You guys don't have a life, is what you're telling us.

>> Chad Dainty: We do this 24 hours a day.

>> Gary Owen: Yeah. What got you into this?

>> Chad Dainty: You mean personally?

>> Gary Owen: Yeah, I mean both of you. What got you to start this company? What was your background to create this company?

>> Mike Callaway: Well, I was working in an industry that was doing a similar system for treating hydrogen sulfide.

>> Gary Owen: I see.

>> Mike Callaway: Went to work one day and they decided they didn't need my services anymore and I thought, well.

>> Gary Owen: [Inaudible]

>> Mike Callaway: So I thought I could, I could maybe improve on this a little bit.

>> Gary Owen: Interesting.

>> Mike Callaway: So we did.

>> Steve Paris: Let's talk about your research. I mean, how did you come up with the process or is the process basically simple?

>> Mike Callaway: Well the, the process is based on iron oxide chemistry which has been around for over a hundred years for this application, okay. But through our research and

development we've been able to figure out how to make it at a nanometer size particles, makes it very effective and we're about 300 percent more effective than anything else on the market.

>> Steve Paris: Okay. Mike, tell me something. Are you a native of Sapulpa?

>> Mike Callaway: For about 30 years.

>> Steve Paris: Okay.

>> Mike Callaway: Grew up in Oklahoma though.

>> Steve Paris: Okay. So you're, so you're from here and you came along, came up with this idea, I guess there was a need that had to be filled but by virtue of the fact you weren't working somewhere any longer so you came up with this, this scheme. Had you been thinking about it before you left your former employer?

>> Mike Callaway: Well, I'd worked in that industry and in that industry we were working on a liquid scavenger method

>> Steve Paris: Hmm, hmm.

>> Mike Callaway: And so that was where I, you know, gained a lot of experience.

>> Steve Paris: Sure.

>> Mike Callaway: And then once I got laid off I also knew about the solid treatment method and they had a lot more room for improvement, I felt, so I started working on that.

>> Steve Paris: So you made an existing product better by changing the process, right?

>> Mike Callaway: It's a little, it's more than just changing the process. It's a different approach and a different chemistry.

>> Steve Paris: Improving the process, would that be a better way of saying it?

>> Mike Callaway: We've actually raised the bar for the industry.

>> Steve Paris: That's what I mean, yes, yes.

>> Mike Callaway: You could say new state of the art.

>> Steve Paris: That's what I mean.

>> Mike Callaway: For the industry.

>> Steve Paris: Sure, sure. Obviously. So let's talk about some of your growing pains. Obviously marketing is a key factor in keeping your company going and the reason I bring that question up is because that's a key to any successful business is marketing, public relations, all of that. How did you guys, how're you guys getting the word out about what you do? Obviously you've got connections in the industry for some.

>> Mike Callaway: Well, we started with, our target customer is the small to medium size oil and gas producer that deals with sour gas and that's because they, the decision makers usually on site and they're involved in the process daily and they know how painful it is.

>> Steve Paris: Sure.

>> Mike Callaway: With the old system and so they're very excited to get a new system that works well and saves them a lot of money. So really the sales are kind of word of mouth and we're basically sold out right now and.

>> Steve Paris: So you're sold out and your, and production is all caught up at this point. Now, how do you go about, you said word of mouth but do you have any actual outreach?

>> Mike Callaway: Well, we're actually going to be at the Oil and Gas Trade Show next week.

>> Steve Paris: Okay.

>> Mike Callaway: In Oklahoma City.

>> Gary Owen: That should help you a lot. Yeah

>> Very good.

>> Steve Paris: Okay. Let's talk about your company. I mean, that's pretty personal, but let's, we'll try not to get that personal but you two guys are there, you have any other staff members?

>> Mike Callaway: We have, my wife is part time and she does secretarial, office, everything that we can't get around to. She picks up the slack.

>> Steve Paris: So you.

>> Gary Owen: Primarily a family-based.

>> Mike Callaway: Yes.

>> Steve Paris: You're actually producing a product.

>> Mike Callaway: We have a product. We're selling the product. We have customers. We're cash flow positive and trying to grow.

>> Steve Paris: I, I have no concept of how much volume we're talking about here. Do you have a warehouse where you keep this product or anything like that?

>> Mike Callaway: Well, it goes out pretty quick.

>> Steve Paris: Okay.

>> Mike Callaway: We make it and it's shipped out usually.

>> Steve Paris: So you make it, you two guys actually are the ones, I guess, I guess Chad, you're the one who does most of it?

>> Chad Dainty: Well, we equally share, to be sure, you know, really, really Mike's background is in chemistry background so he, he handles the majority of the R and D on that side so some, most of it falls to me on the production side but we always step in when we can help each other out.

>> Steve Paris: We've come to the part of our interview where we normally ask our guests, yeah, we normally ask, we've got one minute, we ask our guest where do you see your company and yourself five, ten years down the road?

>> Mike Callaway: That's a great question and we had a large opportunity to grow where, like I said, we're basically sold out, so we're getting, we're trying to scale up, make where we get

more product out and we have customers queued up and waiting on us and so really the sky's the limit.

>> Gary Owen: That's, that's a good problem to have, man. That's.

>> Steve Paris: Are you looking for investment.

>> Mike Callaway: We'll take your money anytime. [Laughter]

>> Steve Paris: Very blunt. Very good. So you, if, if you want more information about CalTech Global how do we find out, how do we find out about?

>> Gary Owen: And the product is called Sulfabate, is that right?

>> Mike Callaway: The product is called Sulfabate. It's manufactured by CalTech Global in Sapulpa. We have a website.

>> Steve Paris: And what is that website?

>> Chad Dainty: You can go to [www.sulfabate.com](http://www.sulfabate.com).

>> Steve Paris: Sulfabate.com.

>> Chad Dainty: S-U-L-F-A-B-A-T-E. Steve Paris: And you also have [www.caltechglobal.com](http://www.caltechglobal.com), right, so you get more information. I'm going to look you guys up when we get back to the office.

>> Chad Dainty: Thank you.

>> Mike Callaway: Very good fun.

>> Steve Paris: Thank you for being on our program.

>> Gary Owen: This is an example of some of the entrepreneurs here at the Oklahoma Technology Showcase at the Reed Center in Midwest City. We have a lot more to come. Fascinating stuff, heck, you know what, this show's so good we ought to do two of these back to back this week. We can probably do that. All right, we'll take a break. We'll be back on *Oklahoma Innovations*.

[ Music ]

>> We've all heard the old adage when life gives you lemons make lemonade. Well, when life gives you eastern red cedar trees make mulch. These invasive trees are not a welcome site for Oklahoma farmers and ranchers because they displace plants, can accelerate a spark into a catastrophic wildfire and are expensive to remove but a new market for these red cedars could turn them from dangerous nuisance to profitable resource. With the support of the Oklahoma Center for the Advancement of Science and Technology one company is researching how to transform these invasive trees into productive, aesthetically pleasing garden mulch that pays for the cost of its own removal. Creating solutions supporting innovation, that's what OCAST is all about. OCAST is looking for small business owners serious about investigating new products, services and processes. For more information call OCAST toll free at 866-265-2215 or visit our website at [OCAST.ok.gov](http://OCAST.ok.gov).

>> It's all about Oklahoma technologies, research, science and commercialization. This is *Oklahoma Innovations* on the OCAST Radio Network.

[ Music ]

>> Gary Owen: This week's program is coming to you from the Oklahoma Technology Showcase at the Reed Center in Midwest City and again, those of you just tuning in, if you didn't know about it, it's already happened, so we're taping this program obviously, but basically the purpose of this technology showcase is to expose technology-based innovative Oklahoma companies throughout the state and we now have our next guest, and this gentleman has been on our show before. His name is Doctor Trevor Snyder and he's now with a company called VADovations and it's a revolution in heart failure, is their subtitle or their slogan line and boy, I tell you what, I wish this was television, Steve.

>> Steve Paris: Don't you know, Gary. VADovations founded in 2009, they seek to develop and commercialize revolutionary ultra-miniature heart assist devices and of course Doctor Snyder is Vice President of Research and Development for VADovations Incorporated and we're going to turn it over to you because we don't have a lot of time but I want to hear what you have to say. Tell us about, about your company.

>> Trevor Snyder: Well first of all, thank you all very much for having us on again. When we last joined you I was on with our Cardio Thoracic Surgeon, Jim Long, and talking about some heart assist devices that we're implanting in INTEGRIS Medical Center. We continued to do that to this day. We've actually implanted over a hundred people, not just from Oklahoma but Kansas, Arkansas, Missouri, they're all coming to Oklahoma City to receive the most advanced therapies in the world. But there're still limitations in the technology we're using and I can describe that in a bit. So INTEGRIS allowed us to create a spin-off company to try to create even better heart assist devices so we can reach the huge population of people who're developing heart failure in America. So I brought some toys with me today.

>> Gary Owen: You did at that.

>> Trevor Snyder: Like I said, you said, it would be interesting if we could show this on TV.

>> Gary Owen: It would.

>> Trevor Snyder: Well, the first device I have is called the Heart-mate. It weights several pounds and is the size of a small coffee can or maybe a small canteen and it would be implanted in your stomach and connects to the heart with some rather large tubes.

>> Gary Owen: You know, some people might say, boy those like, kind of like a small alternator out of a car. [Laughter] You know, it's got these big tubes coming out.

>> Trevor Snyder: It's definitely a good size and has a wire that also has to run across to your stomach and come out to an external controller and then batteries or we have a little box that you can plug into, to plug into the wall.

>> Steve Paris: And that's the old technology, right?

>> Trevor Snyder: Well, this was state of the art, believe it, until, the best technology that's replacing it was a FDA approved in 2009.

>> Gary Owen: And that weighed how much? Seven pounds?

>> Trevor Snyder: Seven pounds.

>> Gary Owen: Can you imagine having seven pounds of that in your . . .

>> Trevor Snyder: Well, the other thing that was interesting about this, it got approved as a permanent therapy for heart failure. So.

>> Gary Owen: Grief.

>> Trevor Snyder: You would think, well, you should get several years with that and it turns out it only lasts a year and a half.

>> Gary Owen: Oh my.

>> Trevor Snyder: So.

>> Gary Owen: [Inaudible]

>> Trevor Snyder: I guess definition of permanent is, is variable depending on how it.

>> Steve Paris: The next advancement is?

>> Trevor Snyder: It's called the Heart-mate 2. I actually.

>> Gary Owen: Heart-mate 2.

>> Trevor Snyder: I actually worked on this device when I was getting my PhD in Bio Engineering at the University of Pittsburg. It's been in, used in humans for almost 10 years now but was not FDA approved until 2009. It's, the big difference that makes it smaller is there's a turbine rotor inside that's spinning at about 8 to 10 thousand of revolutions per minute, RPM, to push the blood through the body. So it's about the size of a D cell battery and again it has several big tubes and a wire that goes across.

>> Gary Owen: Hmm. Someone, someone we know has one of these, right?

>> Trevor Snyder: Yes. This is the device that was implanted in Dick Cheney and one of the things I want people to understand is Dick Cheney was a heartbeat away from the Presidency.

>> Gary Owen: Wow.

>> Trevor Snyder: So you'd think he has the, access to the best medical therapies available. Well he had to fail every single heart failure therapy available before he could receive this device and that's because, in spite of continual progress, there're so many complications associated with this device that the risk is just not worth it until you've run out of all other options. So.

>> Steve Paris: Now let's go to the new device. I don't mean to rush you here but we got, our time's running out. The new device, this is very cool.

>> Trevor Snyder: So our device is the size of a triple A battery.

>> Gary Owen: Wow.

>> Trevor Snyder: And instead of requiring open heart surgery, basically cutting you open from your neck to your belly button, we can put this in through a small incision in the groin, just like they would with a stent or they do angioplasty.

>> Gary Owen: Hmm.

>> Trevor Snyder: It is, it's intended to reach a much wider population so you don't have to get so almost mortally ill before you receive this therapy and we think, based on making these smaller technologies, that 50 to 100 thousand people a year.

- >> Gary Owen: Wow.
- >> Trevor Snyder: Could benefit from this technology.
- >> Gary Owen: More affordable as far as the [inaudible]
- >> Trevor Snyder: Oh a dramatic [inaudible]
- >> Gary Owen: The technology.
- >> Trevor Snyder: It's interesting, we have our, our customers aren't just patients. It's clinicians in hospitals and we can reduce the cost for improved quality of life for all those people so this is lower cost to Medicare especially, this is a new technology that actually reduce cost, which actually.
- >> Gary Owen: And management, and maintenance and management of a device like this.
- >> Trevor Snyder: Absolutely. We currently have a team of about 20 people total at INTEGRIS to manage patients on these existing devices. In the future this would be much more like a pacemaker where you go see your doctor once every six months, maybe call him on his phone and.
- >> Gary Owen: And adjust it.
- >> Trevor Snyder: Yeah and be done.
- >> Steve Paris: How long do you think, or do we know yet, how long this will last?
- >> Trevor Snyder: There is no part that we construct in this that will wear out.
- >> Steve Paris: Okay.
- >> Trevor Snyder: So eventually the internal motor would eventually wear out so we're talking maybe 10, 15, 20 years.
- >> Gary Owen: But to change it out would not be that difficult, right?
- >> Trevor Snyder: Correct. We're actually designing it to be removable.
- >> Gary Owen: That's amazing.
- >> Steve Paris: Wow.
- >> Gary Owen: And do you, on your, with your company, do you have a, information on this on your website?
- >> Trevor Snyder: Actually, we don't have a website yet.
- >> Gary Owen: Oh. [Laughter]
- >> Trevor Snyder: We're just, we're just.
- >> Gary Owen: It's brand new then.
- >> Trevor Snyder: Yeah. We're just
- >> Gary Owen: Wow.
- >> Trevor Snyder: We're just coming public with this information. The other thing that I wanted to, to indicate is a techno log, technology like this, I mean we hear about great things about drugs and stem cells, gene therapy. If, if somebody gets into trouble with heart failure you can put one

of these in and then apply one of these great up and coming technologies when they're ready. And so.

>> Steve Paris: Keep them alive until they [inaudible]

>> Trevor Snyder: Correct. So we don't think this is just a replacement device but maybe a bridge to some kind of regeneration or recovery as well.

>> Gary Owen: Hey listen, we are out of time. Doctor Trevor, Trevor Snyder with VADovations and you want to be listening for that name again, VADovations, cause I'm sure you're going to be hearing a lot more of this, maybe in the national media cause I just, this is a 60 Minutes story here. I just see that coming. We got to take a break. We'll be back with more on *Oklahoma Innovations*.

[ Music ]

>> It's about new advancement in technology, science and research. This is *Oklahoma Innovations* on the OCAST Radio Network.

>> Hearing loss is not just a problem for the aging population. Soldiers involved in explosions and weapons training are victims of noise-induced hearing loss. Facing mounting disability expenses, the Office of Naval Research provided funding to an Oklahoma researcher to help identify a treatment for noise-induced hearing loss. The solution, a pill that could reverse damage to your hearing. With the support of the Oklahoma Center for the Advancement of Science and Technology, Oklahoma researchers had been testing combinations of chemicals in an effort to create a treatment that is as easy as swallowing a pill. OCAST is looking for Oklahoma researchers serious about investigating new products, services and processes that improve the quality of life and the autonomy for Oklahomans. For more information call OCAST toll free at 866-265-2215 or visit our website at [OCAST.ok.gov](http://OCAST.ok.gov).

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>> Research and development, technology transfer and commercialization, creating high paying jobs in Oklahoma is what OCAST is all about. This is *Oklahoma Innovations* on the OCAST Radio network.

[ Music ]

>> Gary Owen: Thank you for joining us on this week's edition of *Oklahoma Innovations*. We are at the Oklahoma Technology Showcase doing our show this week and they've got a great line up of sponsors. EPSCoR, the Greater Oklahoma City Chamber of Commerce, Oklahoma Center for the Advancement of Science and Technology, i2E, the Oklahoma State Regents for Higher Education and the University of Central Oklahoma and MidFirst Bank. The Oklahoma

Technology Showcase is for the intellectually curious and forward thinking individual who wants to experience the ideas of some of Oklahoma's best entrepreneurs. This segment we're going to talk to a young lady and her boss.

>> Steve Paris: Yes we are.

>> Gary Owen: Who was the founder of Impact Technologies.

>> Steve Paris: We're talking about the owner and the Director of Business Development for Impact Technologies LLC. We're going to get that divided and figure out who does what here in just a minute.

>> Gary Owen: Well Michelle Witt was on our show, what, about a year

>> Steve Paris: Back in the spring.

>> Gary Owen: Was that soon? Really?

>> Steve Paris: It had to do with the Governor's Cup competition.

>> Gary Owen: Oh, that's right.

>> Steve Paris: Yeah.

>> Gary Owen: Yeah, that's right.

>> Steve Paris: And she was there and you, I think her team came in second.

>> Michelle Witt: They won second place and ten thousand dollars.

>> Steve Paris: Ten thousand dollars? You can go a long ways on ten thousand dollars these days.

>> Gary Owen: Okay.

>> Steve Paris: Impact Technologies. Let's visit with Kenneth Oglesby who is the owner and I'm looking at his business card. He's the President of Impact Technologies LLC and he has on his card "Thinking small in a big way". What's that mean Kenneth?

>> Kenneth Oglesby: Well, actually that idea came from Michelle.

>> Steve Paris: Oh.

>> Kenneth Oglesby: But it does show that we're trying to invent ways to do things on a smaller scale and actually do them better than what's done now.

>> Steve Paris: Very good. Now I heard you say early on before we, we were on the air that you all have, you have about 20 projects going under Impact Technologies, is that -- did I hear that correctly?

>> Kenneth Oglesby: That's 20 technologies.

>> Steve Paris: 20 technologies, okay, and we're going to let you explain that. Talk to us about a few of those if you would.

>> Kenneth Oglesby: Well we have roughly 27 patents, I think one came through, another one came through the other day, so we're at 28 right now. The, it deals primarily with these SPI gel systems which are useful in the oil and gas business to divert the flow of unwanted fluids such as

water and, and the fluids that you do want such as the oil and gas and the CO<sub>2</sub> that you inject to be able to utilize that and recover that effectively.

>> Steve Paris: Okay.

>> Kenneth Oglesby: So, and then it has a lot of other applications in drilling and in basement repairs and a whole lot of other things but our primary focus right now and which we had a DOE grant is the use of SPI gels for CO<sub>2</sub> floods.

>> Steve Paris: CO<sub>2</sub> floods. Now you are a Petroleum Engineer and you have your Master of Science in Engineering and you're a product of the University of Tulsa, kind of a local guy.

>> Kenneth Oglesby: That's right.

>> Steve Paris: Okay and so you came up with some of these ideas, you developed them. Now at some point you brought in your Director of Business Development, that's Michelle Witt, and I'm sure you can explain the process that you went through that convinced you that you needed somebody like Michelle, right?

>> Kenneth Oglesby: Right. I'd been working with I2E for a while and they said you got to meet this lady. She is really good and so after a period of time I said yes, we need someone to grow and so, they said she came from Chicago, she's been down here, she went to the University of Tulsa, my alma mater, and then so I said, oh this is great, so we had a chance to meet and she came on board and has been doing an outstanding job for us.

>> Steve Paris: Well, and I believe that. She's an excellent spokesperson and does a lot more than that I know, but let's talk just a little bit to Michelle. She is a BS in mechanical engineering, Master of Science in Engineering Management from the Rose-Hulman Institute of Technology and an MBA from the University of Tulsa.

>> Michelle Witt: [Inaudible]

>> Steve Paris: Yeah, you been going.

>> Michelle Witt: I like school.

>> Steve Paris: You must like school, yeah, and tell us what you do as the Director of Business Development, what you do for Impact Technologies.

>> Michelle Witt: Well Ken mentioned, you know, our SPI gel systems, but another big basic technology that a lot of our technologies revolve around is a drilling system that is a different way of drilling. It's kind of a green drilling system and so all of these technologies together are the drilling system but there's also applications for each of the technologies and so there's so much going on and so many technologies and the idea was to bring me on to look at some of the markets that these applications, that these technologies could be used in and figure out, you know, what's the quickest path to market and what are the most viable technologies and then kind of prioritize how we're commercializing them. So.

>> Steve Paris: Hmmm. Heard you mention I2E a while ago and we kind of went through that very quickly. I2E stands for Innovation To Enterprise and that is a non-profit organization that works, we actually fund them through OCAST. They work with, with Oklahoma technology-based companies and try to help them bring their product to commercialization and I'm, I'm sure that they've probably played a role, obviously helped you find Michelle and I'm sure they done

something, done some other things as far as helping you figure out just exactly where you are in the process.

>> Kenneth Oglesby: Right. They helped us on our first business plan, on our slurry pumps and those are good for abrasive systems and for biomass systems.

>> Steve Paris: Okay.

>> Kenneth Oglesby: And they helped us on that and then they've helped us in the other business plans for the other technology and yes, we found Michelle through I2E and they're the ones that got us into looking at OCAST grants.

>> Steve Paris: Yeah.

>> Kenneth Oglesby: And all, some of the technologies.

>> Steve Paris: You brought money up, you just talked about money when you said OCAST grants and awards. I'm going back to Michelle for just a minute because I'm reading here that you were responsible, are responsible for helping raise four and a half million dollars. Wow.

>> Michelle Witt: Make that five and a half million.

>> [Inaudible. Many people speak at the same time]

>> Steve Paris: You've added some more money.

>> Michelle Witt: Yeah.

>> Steve Paris: Okay. For product development with Impact Technologies, now, we all know that money is the life blood of companies.

>> Kenneth Oglesby: [Inaudible]

>> Steve Paris: Yes. You have to have it and it's, it's, it helps you do what you have to do to be successful. Talk to us about where you found the money.

>> Michelle Witt: Well, our approach is, kind of, you know, you're not going to go out and find the grant that is exactly what you want to do and specifically written for what you need to do and so it's kind of an art to go out and find where are the dollars and then how can you, kind of, spin your application to where you're, you're doing something with the dollars that they're looking for you to do but you're also accomplishing what you need to accomplish and so it's not always the most direct path but it's a good way to get non-dilutive money and also to attract the other outside money that.

>> Steve Paris: Sure.

>> Michelle Witt: Keeps you be focused.

>> Steve Paris: And yeah, and let's be, I assume most of the money you have, if not all the money that you've been able, the five and a half million that represents investors who expect to get something out of this someday?

>> Michelle Witt: Well no, that five and a half million is actually grant dollars.

>> Steve Paris: Grant dollars?

>> Michelle Witt: That's all non-dilutive. [Laughter]

>> Steve Paris: My goodness, your stock just went up. You know that, don't you?

[ Laughter ]

>> Kenneth Oglesby: Yes, we know that. Total, I think we've raised just under 10 million dollars.

>> Gary Owen: Wow.

>> Kenneth Oglesby: In private funding, founder money and government grants.

>> Gary Owen: That's remarkable. That's amazing.

>> Kenneth Oglesby: And it really takes that, industrial systems, these aren't small pet rock type innovations. These are, you know, very complex systems that have a lot of parts that come together.

>> Steve Paris: Yeah, let's talk about your customers, I think we mentioned them earlier, the oil patch, the gas patch, where do most of your customers come from?

>> Kenneth Oglesby: Right, our targets for the SPI gel right now are companies like Kinder Morgan, Devon, Chesapeake, Chaparral.

>> Steve Paris: Hmm.

>> Kenneth Oglesby: Oxy, those are the ones that are operating CO2 floods that they need ways of keep, from re, just recycling the CO2 which is real expensive and to get more oil out.

>> Steve Paris: Right.

>> Kenneth Oglesby: And we all want more oil out because it goes to refineries and makes our gas, heating oils and things like that.

>> Steve Paris: And, and anything we get here means it doesn't come from the Middle East, right?

>> Kenneth Oglesby: Absolutely right. On our drilling systems the markets there are, anytime you're drilling in the earth or materials you're look at oil and gas drilling, ground source heat pumps, the heat bores for that which is a really great and wonderful technology and then really deep geothermal which is for electrical generation and so we have a project on that which is a very exciting technology.

>> Steve Paris: Don't want to get into proprietary information so, if you say I can't tell you that, we understand. But let's talk about the size of your company from the standpoint of how many people you have working with you on these projects because I'm sure it provides some employment opportunities in the Tulsa area, right?

>> Kenneth Oglesby: Right. We're, we are a small company.

>> Steve Paris: Yeah.

>> Kenneth Oglesby: We're eight people.

>> Steve Paris: Okay.

>> Kenneth Oglesby: And, and it goes up and down from there but we're trying to grow. We, on top of that though, we have tremendous number of contractors we use. Universities that do work for us in Oklahoma and across the nation.

>> Steve Paris: You're kind of spreading that money around a little bit as far as investing more in your own products.

>> Kenneth Oglesby: Absolutely right.

>> Steve Paris: You bet.

>> Kenneth Oglesby: We're trying to find the best people for a given development that can really bring something forward.

>> Steve Paris: Okay, we, we're at the point where we always ask this question for up and running companies. I'll go to Michelle first cause you're in the business development side. Let's look five, ten years down the road. Where do you see Impact Technologies and the technology we're talking about here today?

>> Michelle Witt: Well, hopefully we're selling rigs to two different markets and SPI gels, I'm hoping, in the next year we're going to do the field trials with our DOE grant and I think that's the point where they'll be proving up and within the next two or three years we should have a commercial product that's out there being used.

>> Steve Paris: Wow, a lot quicker than five years, then.

>> Michelle Witt: Oh, I would hope so. [Laughter]

>> Steve Paris: We can't wait that long.

>> Michelle Witt: We'll be rich.

>> Steve Paris: Well, and that's, that's part of the goal, isn't it? Yeah, Kenneth, you buy into that? That where you want to be?

>> Kenneth Oglesby: Oh absolutely. I mean, I think they're very wonderful products going into very dynamic markets so I think looks very good.

>> Gary Owen: And if you want more information their website is basically [www.impact2u.com](http://www.impact2u.com), right. Okay, we're at the Oklahoma Technology Showcase. More to come when we return on your science radio magazine, *Oklahoma Innovations*.

[ Music ]

>> This is *Oklahoma Innovations* on the OCAST Radio Network.

>> One man's trash is another man's treasure. That's the motto that led one Oklahoma company to take waste from oil and gas and turn it into a commercially viable product that's pumped over 2.4 million dollars back into the local economy. The company has developed a process to extract iodine from the waste that is created when oil and gas are pumped from the earth. Iodine has many uses including in electronics such as plasma screens and in your daily diet in the form of salt. Because OCAST provided seed funding to test the technology, an international company chose to build their iodine extraction plant in rural Oklahoma instead of their original plan of building in a foreign country. OCAST is looking for Oklahoma researchers serious about investigating new products, services and processes that improve the quality of life and the economy for Oklahomans. For more information call OCAST toll free at 866-265-2215 or visit our website at [OCAST.ok.gov](http://OCAST.ok.gov).

[ Music ]

>> Gary Owen: Thank you for joining us on this week's edition of *Oklahoma Innovations* coming to you from the Oklahoma Technology Showcase and as we mentioned before, this is featuring a lot of innovative companies here and the purpose of the showcase is to expose technology-based innovative Oklahoma companies to the state. The Technology Showcase is just a glimpse into the future of Oklahoma innovation, provoke inspiring insight into technology and spark new ideas and enthusiasm throughout the program. Steve, we've got our last guest of this hour and he's with, he's representing a company in Ardmore.

>> Steve Paris: He absolutely is. We're talking about Richard Helfrich who is, he lives in California, little town called, town called Pleasanton, is that right?

>> Richard Helfrich: That is correct.

>> Steve Paris: And he is representing Amethyst Research Incorporated. We've talked about Amethyst a lot on this program out of Ardmore, Oklahoma, but you're tied to their program called MIDS and that involves MEMS. Now we're going to let you explain all those, all those words and tell us what they mean but before we do, Richard, we'd like to know a little bit about you. Tell us a little bit about what brings you to this table.

>> Richard Helfrich: Well I've been involved in infrared areas for many years in the past. Actually, I wanted to go into biomedical fields when I got out of school. I had my first degree in Physics but it was Particle Physics and there wasn't much going on in the fusion energy field back then so I went back and got a Masters in EE and I thought, gee, you know, medicine activities sound really interesting for EE so I went back again and did Chemistry and Biochemistry medical training and tried to get into Biomedical Engineering but that field didn't exist back in the seventies and so [laughter] I ended up in the aerospace business and ended up in the infrared activities in the aerospace industry starting at Hughes Aircraft.

>> Steve Paris: Very good. Hughes Aircraft, and, and that brings up the question, I've been hearing a lot about MEMS, what that means but you're going to tell us.

>> Richard Helfrich: Well MEMS are actually a subset of the semiconductor world. It was determined that using the tech, the same technology to make your microchips in your computers and your cell phones, they could make all kinds of exotic three-dimensional structures and these structures are actually miniaturized versions of a lot of mechanical devices you use every day, actuators, pumps, valves, whatever and they're now showing up in, in really neat devices used in, in various fields. I think you'll probably first hear about them in commercial products used in the medical field. Really innovative things for making diagnostic tests but even for implanting in, in, inside of people. Some of these MEMS are going to be soon on the market where you can implant a year's worth of insulin for a diabetic in your arm and you, and it will measure and control your sugar content for years.

>> Gary Owen: Wow.

>> Richard Helfrich: So great things are happening in this MEMS world.

>> Steve Paris: Wow. So you don't have to worry about that on a daily basis like a lot of diabetics do.

>> Richard Helfrich: Yes. So wonderful things are happening and it's really an outgrowth of the semiconductor field.

>> Steve Paris: Yeah.

>> Gary Owen: Hmmm.

>> Steve Paris: MIDS. Now that involves MEMS but tell us what MID means.

>> Richard Helfrich: MID is an acronym we came up for a device that uses MEMS as a structure to capture energy from out in the world just like a camera uses various detectors to capture pictures in the world and infrared is, is a far, infrared area that we are specialized in

>> Steve Paris: Sure.

>> Richard Helfrich: Has very long wave lengths compared to visible and regular silicon detectors used in TV cameras can't see that.

>> Gary Owen: Hmmm.

>> Richard Helfrich: So, but the military has used it for decades because it, it really works at night.

>> Steve Paris: Sure.

>> Richard Helfrich: In total darkness the US Military has such an advantage that it saves a lot of our soldiers' lives. It really does wonderful things.

>> Steve Paris: Absolutely. Yeah, it gives the war fighters an advantage that they've not had in the past. One of the pictures I remember from Amethyst Research is kind of a green colored picture of a soldier, you know, in the battlefield situation. I've seen that picture a lot when it comes to Amethyst. Let's get down to talking about, you know, as much as you can, exactly what does this technology do and how does it benefit Amethyst in its, in its effort to make these products available.

>> Richard Helfrich: Well what's, what's Amethyst got involved with years ago was a technology called mercury cadmium telluride. This is a.

>> Gary Owen: Well that's a mouthful.

>> Steve Paris: Say that again.

>> Richard Helfrich: Mercury cadmium telluride. Three elements in the periodic table, when you put them together, make the best infrared sensors you can possibly get.

>> Gary Owen: Yeah, okay.

>> Richard Helfrich: People have tried everything else but nothing over the last 30 years has ever been able to beat mercury cadmium telluride. MCT for short.

>> Gary Owen: Sure. Yeah. [Laughter]

>> Steve Paris: Very good.

>> Richard Helfrich: But it's very expensive. Systems are made by basically just a few companies like Boeing, Lockheed, Raytheon and British Aerospace and they are really expensive. They are like a million dollars is a typical price. When I was at Hughes we built some very, really high performance ones that are tens of millions of dollars up in satellites. Now what's happening, what's changed over the last few years is the defense budget is getting told it's going to get cut big time.

>> Steve Paris: Yeah, we're hearing that.

>> Richard Helfrich: Yeah, I mean.

>> Steve Paris: It's all, it's been all over the news.

>> Richard Helfrich: Yes, on the other hand, the Army guys want to give the soldier, every single soldier, an infrared system. Well, with a million soldiers out there at a million dollars apiece, that's a trillion dollars. There's no way.

>> Gary Owen: No.

>> Richard Helfrich: No way that's going to happen.

>> Gary Owen: That's not going to happen. No.

>> Richard Helfrich: So what I've been thinking of all, for many a year is a way to make cheaper systems.

>> Steve Paris: Yeah.

>> Richard Helfrich: And what, what, this actually was an idea first initiated at OS [inaudible] and it really, it's not an invention, per se, in the fact that it's actually using MEMS technology that was invented in the eighties. It's using a medical polymer technology invented in the eighties. It uses narrow wires that were invented in the nineties and it puts it all together into a detector.

>> Gary Owen: Wow.

>> Richard Helfrich: So it's a very clever combination of technologies from a lot of different fields into a single detector and what really makes it work so much better than everything else that was done prior is these narrow wires. Turns out, you know, thermoelectric is a technology that's been around for decades. You might have first seen it in these little coolers they sell for your cars you plug in your cigarette lighter, it keeps your drinks cold. Very low efficiency but in the last 15 years it's been a highly researched field for energy and, and there's dozens of companies that have received a lot of funding to make these devices much more efficient and it's really come a long ways in the last few years and the newest devices are using a whole lot of new chemical compounds that have efficiencies that were phenomenally better than was available five ten years ago and the Department of Energy has been very generous in funding this because the idea is, in the very near future you'll stick, you'll stick these things on your car exhaust, take that heat and generate all the electricity you need for your automobile, lights, radios, all the electronic devices.

>> Steve Paris: And you heard it first right here on *Oklahoma Innovations* here.

>> Richard Helfrich: And so this is going to really revolutionize the energy field.

>> Gary Owen: Wow.

>> Richard Helfrich: We're taking this same exact technology and applying it to sensors.

>> Steve Paris: [Inaudible]

>> Richard Helfrich: So it's a really, you know.

>> Steve Paris: [Inaudible]

>> Richard Helfrich: A side area, it's not as big as the energy world but it's still a good sized opportunity.

>> Steve Paris: Yeah, but the sensor technology again back to the war fighter, improves or enhances their ability to be effective and to see what, what normally they could not see, right?

>> Richard Helfrich: Right, now, we're going after the war fighter because the Defense Department is willing to pay the development cost.

>> Steve Paris: Right.

>> Richard Helfrich: They will put up the money up front. Once we know we're expecting to get a contract starting about Tuesday to build a very small scale prototype which, if it meets their performance spec, specifications, they're promising to pay pretty much the full-blown development cost to make a production-ready prototype.

>> Gary Owen: Oh wow, nice.

>> Richard Helfrich: That's great, and, and, and, you know, the military actually would like to buy one for every war fighter at a very nominally low price.

>> Gary Owen: Sure.

>> Richard Helfrich: Which I think could still make us a very good profit but really the big market for these things is commercial and that's because right now, if you look out there, the biggest buyers of these things are, are people who need security.

>> Hmm-hmm.

>> Richard Helfrich: And that's right now, first of all, every nuclear plant is buying these kinds of things. They don't want terrorists or any other hostiles to come up to the front door and.

>> Steve Paris: Sure, sure.

>> Richard Helfrich: In the night and set a bomb off and on the second, second issue is even, even coal and natural gas power plants don't want that. Refineries.

>> Steve Paris: Yeah.

>> Richard Helfrich: I mean, and then the other side of it, I've been, done business in about 60 countries and worked with local offices of the US Embassies in those. Every one of those guys want more security and.

>> Gary Owen: Absolutely. I tell you what, this is fascinating stuff. I wish we had an hour with this guy.

>> Steve Paris: You bet.

>> Gary Owen: He's got some interesting technology. Unfortunately we're running out of time, Richard, but we, we thank you so much for sharing this and glad to know that Amethyst Research is on the move for something exciting.

>> Steve Paris: Absolutely. We'll have to get a hold of you again and talk about this more in depth.

>> Richard Helfrich: Yes, yes. Actually, my, my interest in it is to the tertiary application in medical.

>> Gary Owen: Guys, we're out of time, got to go. Talk to you next week on *Oklahoma Innovations*. Have a good week.

[ Music ]

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