

Ep.2.28 - Dr. Thomas Glasmacher

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SPEAKERS

Announcer, Ed Clemente, Dr. Glasmacher

A Announcer 00:01

Welcome to The Michigan Opportunity, an economic development podcast featuring candid conversations with business leaders across Michigan. You'll hear firsthand accounts from Michigan business leaders and innovators about how the state is driving job growth and business investment, supporting a thriving entrepreneurial ecosystem, building vibrant communities and helping to attract and retain one of the most diverse and significant workforces in the nation.

E Ed Clemente 00:28

Hello, I'm your host, Ed Clemente and it's a pleasure to have Thomas Glasmacher, he is the FRIB Laboratory Director, which means Facility for Rare Isotope Beams at Michigan State University and welcome to the show, Thomas.

D Dr. Glasmacher 00:43

Well I'm glad to be here.

E Ed Clemente 00:45

And just so you know, any of you people look up his background. He said, I can call him Thomas, I know he has a Doctorate. But I think he's much more comfortable with Thomas, right. [Yeah] Yeah, and I don't know, we might have met in the past. But I know that way back when I was in the legislature, one of the last things we kind of worked on was with MSU, we were trying to get you funding through the state appropriations, and I did a committee hearing there. And it was so long ago, I don't think you would remember it, but I know you were working there at the time. So, I'm just so excited about this whole project, even though it's beyond my mental

capacity to know everything that's going on there. We do appreciate everything you've been doing and what Michigan State's been doing. And what do you kind of tell people Thomas when they first meet him at a party and they don't know anything you do?

D

Dr. Glasmacher 01:36

Well, it's, I mean, the facility for rare isotope beams, it's really a Team Michigan project, Team MSU, and Team Michigan, it's a Department of Energy funded user facility for scientists from all over the country, all over the world, come to get science opportunities that don't exist elsewhere. And what we do we make rare isotopes, those atomic nuclei that once existed on Earth, they have long since decayed, and we make them available for study. And to enable scientists to make discoveries with these rare isotopes, we make them in a big linear accelerator, we built the world's most powerful, heavy ion linear accelerator here in Mid-Michigan. And it's been going on for 14 years, and we started in 2008. In May 2022, President Stanley, the President of MSU, and the Energy Secretary Jennifer Granholm former Governor that together cut the ribbon. It's a joint activity between the Energy Department and MSU, but it couldn't have happened without the support we receive through multiple administrations. And you know, over a decade and a half from the State of Michigan. So I appreciate you being there in the beginning, and those who came after you who have since supported us.

E

Ed Clemente 03:04

Well, it's kind of like a thesis, you lay the foundation, but the next person probably carries the torch after you pass on. And a lot of people obviously, there's, there's a lot of probably parents involved in making this project go. And I know that you know, from being in the legislature, it's really never you, it does everything. But I also know that, why don't you just touched on it a little bit, but when you say people come here, you got some really big numbers of people that do come there. I don't think people realize, and as a former alumni of Michigan State, and someone who remembered when cyclotron was on the campus, and we they said, you know, people scientists were coming for that. But what you're doing is way, like more advanced even is that?

D

Dr. Glasmacher 03:57

YEah, the FRIB really builds on the tradition and history and accomplishments of the MSU Cyclotron Lab that in the 80s became the National Superconducting Cyclotron Lab. And I joined MSU as a postdoc at the Cyclotron Lab, the NSCL. The FRIB accelerator is 1000 times more powerful than the cyclotrons. And after, you know, 50 years of science, the cyclotron's shut down and last fall, and we're gonna have a celebration of the cyclotron science accomplishments here in August of 2022. Now for effort, 1600 users from, mainly from the US, but some from abroad, have registered to do experiments here. They represent 124 universities, 13 national labs, US national labs, and these users come from 52 countries. So those are nuclear scientists who wants to do basic science here, that's the kind of science that industry doesn't fund, but that eventually can lead to economic opportunity. And part of the, while FRIB is funded to be a basic science machine, you know, we will afford economic opportunity for State of Michigan through spin-offs and discoveries and IP that gets generated, that then, you know, can can elevate the state forever. Because, you know, we feel strongly I

mean, the State gave us this opportunity, Michigan State gave us this opportunity and so you have assets, you leverage these assets into more assets. That's the story of NSCL being leveraged into FRIB and something will build on the shoulders of FRIB.

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Ed Clemente 05:48

And you actually stimulated a little bit of another point that one of our previous guests was the Director of the Midwest Patent Office, which is, if anyone wants to listened to that episode, it was way back. But you know, Michigan is such an innovative state, and we have so many patent lawyers. So you mentioned intellectual property, you know, I think you and I, in our discussion ahead of time, was that you use a lot of Michigan innovation too and manufacturing opportunities for the creation of the FRIB, right?

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Dr. Glasmacher 06:26

Yeah, Michigan is, so over the last 15 years, we spent a billion and a half and we spend 75% of that in Michigan, and 94% in the nation. But Michigan is ideal to build this one-of-a kind facility. So it's one-of-a kind, there is not a blueprint. We have to design it and then we have to find suppliers who can build us the parrots and sometimes I think of ourselves as a system integrator for one-of-a kind systems. So the best suppliers, we have companies 50 to 150, people often they're family owned, quite often actually second and third generation. And we can work with them well, because the volume we buy appeals to them, we can be meaningful business for them. They put up with us, you know, scientists, sometimes we change our minds and stuff. So it's a good size and it's a good partnership. We can work with them, they work with us and this is why Michigan was really good to build FRIB, because there is a lot of supply base available and the Midwest in general, it's not all Michigan, but we have you know, we have suppliers from all over the state. But like I mentioned, three quarters of the things we bought with spent three quarters of the money in Michigan.

E

Ed Clemente 07:46

Yeah, I mean, you know, just from all my years, even running a chamber of commerce, that it's amazing how many small businesses actually diversify what they do and they can transpose it, I mean, go all the way back, you know, when Michigan's always managed to switch to war times to peace times, you know, it's, but it's always the people that sort of, I'm just finishing a book on Henry Ford, but like, you know, he was, he was electrical kind of guy and then he was this and that. And I think a lot of people are like that in Michigan. And I think we should also mention one other thing, too, is you mainly do basic research versus applied. Can you just give a quick definition for folks, what are the differences between the two?

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Dr. Glasmacher 08:29

Yeah, we do basic research, we're funded by the US Department of Energy of Office of Science, the largest funder of the physical sciences in the nation for basic research. We cannot, we're not allowed to compete with industry, we don't want to compete with industry, but we do the kind of research that in 20, 30, 40 years pays back. And actually, we enable scientists to do

this. You know, we really enable other people who come here, do the discoveries, and they can then translate into economic opportunities through then becoming applied research or they create IP, somebody licenses it. And so we do the kinds of things they're too risky, there is no ROI yet, for industry, but eventually, there may be. And so that's what we enable them to do here.

E Ed Clemente 09:19

Well, yeah, you know, it's funny, because return on investments is always a challenging thing for folks. But the reality is, if you look at almost all of history and innovation and invention, really only, like maybe 5% really ever sort of comes to market. But if you didn't have all that other 95%, you wouldn't be able to get to the 5%.

D Dr. Glasmacher 09:40

I completely agree, and you don't know upfront what the 5% is.

E Ed Clemente 09:48

You don't. You know what it's like sort of, it's a mix of both good deductive and inductive reasoning, right? Because some stuff you have to eliminate, other stuff you have to go where you don't have really that many clues if that's the right path, right?

D Dr. Glasmacher 09:53

No, I agree, you don't know what's a good idea, what's a bad idea? It's an idea, you learn more about it and pretty soon you figure out that one was a bad idea. But some other things stick around longer and they go in, in cycles. I mean, the story of the MSU Lab is that MSU President Hanna hired somebody from Oak Ridge, Tennessee, Henry Blosser, to build a cyclotron, he did. Then he built a superconducting magnet, because superconducting wire came out, he put radiofrequency in it and we had the world's first Superconducting Cyclotron. Then the largest Superconducting Cyclotron, then we use that to do heavy ion science, which hadn't been done with superconducting cyclotrons. We use that to make the first radioactive beams here in Michigan and we use that to become leaders in the science that was needed for FRIB. And we use the leadership in science to convince the federal government that they should invest \$700 million here. So this is how things in a serendipitous manner are built on top of each other. And what I'm not talking about is the lines of inquiry, not pursuit. It's not that we jumped from cyclotrons to FRIB, there were other things in between, we didn't do, because we went down the path a little bit turned out to be a bad idea. And when you look back, it looks so well thought out. The moment I came here in '92. I remember we had meetings and you know, first little bit depressing, because that wasn't working and that wasn't working. So you got to stick with it. And judge which path in the road to take.

E Ed Clemente 11:43

I mean, you know, if anyone studies any history, you know, things like the Renaissance and the

I mean, you know, if anyone studies any history, you know, things like the Renaissance and the Scottish Enlightenment and all these things, they all happen not because anyone thought about doing it. It's just sort of like you said, serendipitous, but serendipity happens because there's a lot of sort of spontaneous combustion going on, among people who just sort of, you know, you have like an ecosystem that allowed you to do the FRIB. Yeah, had you not had that ecosystem, it probably wouldn't have turned out the way it did, it might have gone a different way or whatever.

D

Dr. Glasmacher 12:16

No, you're right. You need a bunch of smart people, you need opportunity and then when you combine the two, new things can happen.

E

Ed Clemente 12:25

I should also let our listeners know that you have a slight Florida accent. You are from northern Florida, so people just want to know, I'm just teasing you. But you did go to Florida State University. And it's I have a lot of connections with there. But you really came from Germany originally and you are Fulbright Scholar you said, right?

D

Dr. Glasmacher 12:45

Yeah. So, I don't know that that's a Florida accent, I think. Yeah, I ended up at Florida State as a Fulbright Scholar. I went to school for two years in Germany college wanted to go abroad and this was the time before the internet. And I looked on a map and I thought Tallahassee was close to the beach. Now, it's relatively close to the beach, but either way, I ended up at Florida State, got my PhD, had a good time, and then came to MSU as a postdoc.

E

Ed Clemente 13:14

Yeah, we're fortunate for that and we appreciate all the good work you've done there. Is there any partners or other stakeholders you wanted to mention? Besides, I know, you've mentioned MSU, and the state?

D

Dr. Glasmacher 13:25

Well, yeah, MEDC. Well, we appreciate I mean, the Michigan congressional delegation in a bipartisan, bicameral manner has been wonderful. We, we really appreciate the support we've gotten from Republicans, from Democrats in the House in the Senate, and also then from the, you know, State of Michigan. And it just goes to show when people work together, and you know, that good things can happen for the state. And I really appreciate that when we had the ribbon cutting. You know, it's just like Central Michigan, it's a mixed thing. But, you know, our workforce is the same way, we all work together to further this cause and we put our differences aside and we just built a thing and now it's running.

A

Announcer 14:16

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E

Ed Clemente 14:32

What other trends and disruptors do you see that might be affected by your basic research? You see a leap frogging or taking different turns.

D

Dr. Glasmacher 14:40

Yeah, it's interesting. So within the basic research, we're gonna, with effort, scientists will figure out what number of protons and neutrons stick together. There's really not a comprehensive predictive theory. You know, what, what numbers of protons neutrons stick to it when we figure that out, that's basically research. We'll figure out how the heavy elements on earth were made because you know, when hydrogen fuses to helium, and things keep on fusing, you end up with iron, which is the most tightly bound atom, But yet we find gold and other heavy, heavy elements on Earth. So we'll figure that out. But then at the same time, we're doing that by making rare isotopes. These rare isotopes, which we use for basic nuclear physics research have also applications in themselves. So we now have started talking to medical folks, because we can make any isotope you want in research quantities. These can then be used to help humankind, be that in medicine, or in other kinds of research. So if I had to guess, you know, in 20, 30 years, yeah, I hope Michigan State FRIB will be known for having solved some fundamental questions in nuclear physics. But the thing that's gonna take us in the future, I guess, I don't want to say I'm sure, but I guess, we'll be more on the isotopes side, because we really can be an isotope maker. Now, that enables research in itself, and it's not very economical, this place is expensive to run but once folks have figured out what particular isotope is efficacious for something, you know, then you can find more economical ways to distribute them to once people have figured out what isotope is efficacious for some medical purpose, you can find economical ways to make them and distribute the supply chain over the country. So we're really gonna be, I think, the research center on the application of isotopes for society, and that can mushroom and really grow then.

E

Ed Clemente 16:52

Well, you know, it's, I always tell people this, even when I was in my committees, is that you just need to look at NASA, for example. And all the spin off things that came out of that, that you couldn't have predicted before, and how it really, you know, I know it was a space race, but it was actually more beneficial for humankind I think. All the other stuff they did that you couldn't have anticipated, because we were just sort of fighting with the Russians in order to get to the moon. And all the other huge benefits to this day. And I imagine the same thing, like right now you're talking about, you know, whatever it is, but could lead to sustainability issues, could be electric vehicles, could be wearables for medicine, you know, as you said, like you don't know where it's gonna end up communications. But it's very exciting.

D

Dr. Glasmacher 17:42

Yeah, we kinda need to be a little bit two minded that we got to keep the eye on the ball, focus on our mission. But with 10% of the brain, we need to be open to these other opportunities that come along. And that's, that's what makes it really interesting. So you know, everyday what you need to do, but you keep an open mind of what's possible with the things you find out?

E

Ed Clemente 18:05

Yeah, no, no, no, it's very, that's why I was excited about doing this podcast anyway, because I just think, I'm always excited about basic and applied research and how they both do different things. But basic is usually really what moves the gears applied, use ease and necessity sometimes, right? And so it's just sort of interesting how they work together in a way. So this is your chance to go back and talk to your 17 year old self when you're over there in Germany and you're debating where to go for your career? And what would you tell yourself again, what would you tell your high school self, if you were sort of like doing a mini commencement speech? What would you what would you tell your self to go back into now with what you know nowadays?

D

Dr. Glasmacher 18:53

Well, it's interesting when I was 17, I had no idea what I wanted to do. I like I like the physics teacher I had, so I thought maybe I should study that. That's about it. And so I think this whole path has been quite serendipitous and lucky. And, you know, I feel fortunate about it. So maybe I would say I should be a better planner. But on the other hand, I think just the pursuit of knowledge and the pursuit of, you know, curiosity and thinking about things. I think maybe that's really the message. If you do something that you like doing and you're serious about it, it'll turn out okay. I don't really know that one can plan all this out. Certainly, it didn't work that way for me, and turned out okay.

E

Ed Clemente 19:42

Yeah, there's what I'm gonna paraphrase the old saying that people that spend all their time planning never do anything. So you, you kind of got to react sometimes. And like you said, you need the other part of your brain, sometimes not the most, like the serious part of your brain sometimes. It's good to follow your impulse too once in a while.

D

Dr. Glasmacher 20:02

Right, right. [Yeah.] And then some, you know, showed up in the US with a suitcase. Maybe that was a little crazy in retrospect, that was crazy. But I don't think that it was.

E

Ed Clemente 20:12

Well, you're still going to Florida. So the beaches aren't that far. But plus, one thing we I think

well, you're still going to Florida. So the beaches aren't that far. But plus, one thing we I think we did forget to mention that you've got 630 employees, right? It's pretty big. You've got a lot of people working their too. It's, it's got to be I think, even in your press release, you're almost like a separate college, right? Or a unit, like within the university.

D Dr. Glasmacher 20:34

Yeah, but since we don't give degrees, we don't call ourselves a college. We are a major administrative unit, it's akin to a colle. We have 40 faculty and our students get degrees in natural science and in engineering.

E Ed Clemente 20:46

But they do work in your lab as part of their other degrees in other schools.

D Dr. Glasmacher 20:50

Yeah, they work here and then you know, one other thing that may be not known we educate a quarter, so 10% of the nuclear science PhDs in the US come from MSU. And we're also the top ranked graduate program. We surpassed MIT some years ago. But we also educate about 25% to 30% of the nation's nuclear science PhDs, They come to MSU from different schools to take data, and then go home, analyze them and write papers and make discoveries and get degrees.

E Ed Clemente 21:22

It's pretty exciting. I didn't know all that either and I did go to school. I should have known more. Well. I had other things on my mind. I was playing rugby, too. So yeah, [Yeah, I read that about you.] I don't know how I'm pretty serendipitous too, I don't know how I got here. The last question we usually ask and because you're sort of a transplant, but not really, you've been here a long time now, but what's your favorite thing to do in Michigan, either a festival are a place to go?

D Dr. Glasmacher 21:49

Well, I like the I like the outdoors and I like the I like the summer. I like the winter when it snows. I'm not such a big fan of I don't know, January, February. That's a time to go to Florida. No, but Michigan is a good place. I mean, we have a lot of water. We have beautiful resources and incredible people.

E Ed Clemente 22:10

Yeah, no, it is I love the state too Well, anyway, I once again want to thank the Director of the FRIB, Thomas Glasmacher. And I want to also thank you for taking time, I know you got a really busv schedule. And we appreciate this at the state and evervthina you're doina for the

...university as well as for Michigan. So thanks again for coming on the show today, Thomas.

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Dr. Glasmacher 22:30

Well thank you Ed, and I do appreciate what MEDC does for Michigan too. So we all got to work together elevate the state. Thank you.

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Ed Clemente 22:38

Join us next week where our guest will be our Awenate Cobbina, he's the CEO of Bedrock Group, and he's also the Chair of the MEDC Executive Committee.

A

Announcer 22:48

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