Mark Royce (01:15):
Hey, Jess. Hi, Melissa.

Melissa Girmscheid (01:17):
Hello

Jess Dykes (01:18):
Hey Mark, Melissa.

Mark Royce (01:19):
How's it going today? How are you both doing?

Jess Dykes (01:22):
Sun is shining on the East coast.

Mark Royce (01:25):
Yep. Melissa?

Melissa Girmscheid (01:27):
It's about to be 80 degrees here, so,

Mark Royce (01:29):
Oh my gosh.

Jess Dykes (01:30):
We might hit 50.

Mark Royce (01:32):
Wow.

Jess Dykes (01:32):
And it's going down to 30 tomorrow, so...

Mark Royce (01:34):
Oh my goodness. And you are in Philadelphia, Jess?

Jess Dykes (01:39):
I'm just outside. I'm in the suburbs just South.

Mark Royce (01:42):
Cool. Well, thanks for joining me today, you guys. I'm excited to talk about what you guys are doing in the modeling world. And I know our listeners are gonna enjoy this time too. I don't know how many of our listeners have heard of computational modeling before. What it is, what it means and, and, uh, how

you guys are involved in it. So can you start out by just kind of helping us understand? You posted in the notes that I got something called CMPF dash B. Can you describe what that is for those of us who don't know?

Melissa Girmscheid (02:23):

Yeah. It stands for computational modeling in physics first with bootstrap. In the modeling, there is a capital M so we could say computational modeling, all lower case. And that would be that we're using computers to model something, to create a model of whatever it might be. But if I'm saying Computational Modeling in Physics First with Bootstrap, all capital, it means that we're adding a computational piece to modeling instruction. And in this particular case, we've built upon the fabulous work of the Physics First curriculum developers and established another representation that students can use. And the reason the Bootstrap is attached is we're working with a project out of Brown University originally called Bootstrap. They developed a computational modeling piece that went along with, originally with algebra one, to teach students how to use functions in a very concrete way to interact with the computer. And so we are building upon that. And the reason it works so well with physics first is because algebra one physics first students tend to be taking those classes at the same time. So we are building upon their work. And they've been a part of this project since 2016.

Mark Royce (03:55):

Yeah, I was actually gonna ask you about bootstrap because I had not heard of that before either, so that's cool. So they promote the idea of physics first in the high school curriculum.

Jess Dykes (04:09):

Well, yeah, partnered with us. They also do computation with algebra in, I think the middle school is where they actually start.

Mark Royce (04:17):

Okay, sure. Yeah. So let me ask you guys each this: How did you get connected with the idea and the methodologies of modeling instruction? Melissa, we'll start with you.

Melissa Girmscheid (04:31):

Yeah, my first connection with modeling instruction, I actually have never known another way. My high school teacher, I was fortunate enough, was a modeler. Wow. So back in summer of 1993, my high school teacher had taken a modeling mechanics workshop at ASU. And so I was fortunate enough to learn from her and absolutely loved that I was doing things hands on and loved that I, we were always challenged to go one step deeper. So if we had questions, we'd get the lab equipment out right there. She didn't tell us what the answer was. We always had to seek the answer and I absolutely loved that. Didn't realize that that's what it was. And then when I was an undergrad at ASU modeling in mechanics was actually my teaching methods course. So I have never known any other way, either as a student or as a teacher. I've been part of modeling in physics. I think the only difference I've ever had was probably that first introduction to a lecture as a freshman at college,

Mark Royce (05:39):

Was that difficult?

Melissa Girmscheid (05:41):

Actually as someone who went through modeling instruction, I made quite a lot of money tutoring everyone else who was struggling with the lecture.

Mark Royce (05:51):

Interesting. That's really interesting. So your high school teacher was a early adopter of modeling.

Melissa Girmscheid (05:58):

She was.

Mark Royce (05:59):

That's interesting to me. Jess, how about you, where'd you get connected with the modeling world?

Jess Dykes (06:07):

Well, being on the East Coast, I had a circuitous route. I had the experience of traditional education in physics for my high school and college experience. And then I started teaching for about four years as a traditional teacher, but I was living in New Jersey and I wanted to come back home to Pennsylvania. And there was a school that was looking for a teacher and they wanted to do physics first and being a traditional physics teacher, I was only ever used to junior/senior level physics. And I'm like, well, how does one do that? And they're like, oh, well, we heard about this program called modeling. And we want you to get trained in that. So they brought me through a five day, nine to 10 hours a day, one week workshop, where they brought somebody who'd been doing it. And we just blasted through mechanics where I learned, I would, say literally the mechanics of modeling, but the theory was just completely bulldozed. The following summer, I went to ASU and I was trained by Jeff Hengesbach and Kelli Warble. And Melissa, I believe, was also trained by those same people, a different year.

Jess Dykes (07:25):

And that's where I was able to just soak in the theory because I had the mechanics of "this is what you do," but I never had the, "this is why you do it." And so I was probably annoying Jeff, pretty much the whole three weeks where I was just like, "look, I know what we're going to do. Why are we doing it this way?" And it was just a really explosive experience in my mind. And just all of the things that had been disconnected through my student experience that remained disconnected in my teaching experience in the first four years I was doing it. They all got connected and my brain just took it all in. And I was like, wow, this, this whole physics thing is way cooler than I thought it was. And I'd already thought it was really cool.

Mark Royce (08:13):

What year was this? When did you start teaching? And when did you do the modeling workshop? In 2000 you started teaching. And then the workshop...

Jess Dykes (08:22):

I started teaching in 2000, I got the whirlwind modeling tour in the summer of 2004, crashed and burned that first year teaching with that, "This is what to do, but not knowing why." And then I got the summer of 2005, I got the training at ASU.

Mark Royce (08:40):

Yeah. Cool. And it all came together at that point.

Jess Dykes (08:44):

Yeah. It was really an interesting experience. And I was just, I went back so energized, like I'd never been before, to teach and I was really excited to be a teacher too. So it's like, wow, this is really cool stuff.

Mark Royce (08:57):

So how did the two of you get connected? 'Cause I know you guys have done workshops together and you've collaborated on some developmental things for computational modeling. How did you guys get connected?

Melissa Girmscheid (09:11):

So, in 2017, AMTA and AAPT, along with stem teachers, New York City and Bootstrap put out a call for people to work on this project to basically develop a curriculum. 2016, they had done something locally in New York city and they were expanding and asking for teachers from across the country. And so, at the time I was only teaching juniors and seniors, but I loved the idea of physics first. And I thought, I'm gonna apply for that. 'Cuz you never know. I might get that. And, Jess had done the same thing. And so we actually ended up working there together and actually found that we worked really well together 'cuz when we had started developing the curriculum, we were placed in the same, working on the same unit and it seemed to fit really well. Like we had very similar goals as far as what we wanted students to be able to do when they got out of this instruction.

Mark Royce (10:20):

So tell me about some of the things that you guys have developed together, the curriculum, the methodologies that you guys have focused and helped bring to fruition and you're sharing with others. Talk to us about that stuff.

Jess Dykes (10:35):

Well, we basically, as Melissa mentioned, I guess in the opening, we took the Michigan physics first curriculum as our starting point. So if anybody's seen the stuff out of Michigan, which was actually developed based on the stuff that was developed by Rex Rice and his team in, I guess that's Illinois, I think it is. Or is it Missouri? Regardless. We took the Rex Rice stuff that got modified in Michigan. And then we re-modified that to kind of fit in the computational piece. And the goal was to make the computational piece step forward. So the traditional modeling method, when you start a unit with a paradigm lab, you get your data and you go straight to a graph and then you analyze the graph. We do it a different way. We turned away from the graph, which leads to a parametric way of solving problems. And we moved towards the differential method with the motion map from kinematics, really being the linchpin piece of where we build from. And so they get their data and then we take a side step that most modelers would probably be like, wait, we're not graphing this? And we do motion maps and we let the computer, or actually we teach the students how to get the computer to then model that motion and the discrete steps, just like their data is and then extend it. And then we work backwards from that to make it smaller and smaller and smaller steps. But the piece that we really worked on is all of the things that everybody's used to in modeling is still there. We just added this extra piece and we kind of put a little bit more of a spotlight on motion maps and what we call state diagrams to try to understand what's happening to our system in that instant. And how will that determine the next state?

Mark Royce (12:42):

And you're employing this in ninth grade... With ninth graders, right? Primarily

Jess Dykes (12:49):

That is the target audience.

Melissa Girmscheid (12:50):

Yeah.

Mark Royce (12:51):

Yeah. Wow. When you talk about physics and you talk about mechanics, explain to me what you mean by that word "mechanics" in the context of your physics classroom.

Melissa Girmscheid (13:05):

So yeah, mechanics. Basically the units that we have, that we've currently developed for Computational Modeling in Physics First with Bootstrap are qualitative energy, constant velocity, uniform acceleration, and then balanced and unbalanced forces. So everything around why things move, how they move is all included with that. That would be our mechanics portion.

Mark Royce (13:31):

Okay. So I saw Jess in your notes that you talked about something, but you talked about mechanics and then you mentioned CASTLE and E & M. And what is CASTLE and E & M?

Jess Dykes (13:48):

CASTLE is a product from Pasco that we have modelized. It stands for Capacitor-Aided Student and Teaching and Learning of Electricity. So CASTLE is really simple circuitry, but you can take it to a much deeper level through modeling instruction. And so that's the program that I was a part of training some folks. I didn't develop it. I don't want to make anyone think that I did. I don't know who the team was. I think Rich McNamara was a part of that, but, I don't know who else was a part of that as well, but that is something I've done with my students. I've done some trainings with it as well in Cleveland and then the E&M, that is electricity and magnetism again through the modeling lens where you're developing the model of charged particles and how the charged particles interact and the creation of fields by charged particles and all of that fun stuff. So yeah, it's something that is all of the physics stuff. So there's also waves and optics in the modeling instruction materials that I have never been trained in, but I've dabbled in, in my classroom. There's a lot. Modeling has a little something for everybody. Well, Melissa's one of the best trainers in the country, I think, on E&M as well. So if Melissa wanted to share a little bit more on E&M she's welcome to do so.

Melissa Girmscheid (15:24):

I would not deign to call myself one of the best trainers in the country on that one. I was fortunate enough to learn under Michael Crofton and then intern with him for E&M, for electricity and magnetism. And it's something that I, with my freshmen, I combine a little bit of the electrostatics with the CASTLE portion for them just because I'm a big fan of the electrostatics, of that E&M unit one. But electricity and magnetism is something I used for years with my AP physics one students when we had that as part of the curriculum. And then I've used it with physics 101 students at the community college

level. And I actually developed a course. I loved it so much that I developed a course in my last district where I got to use it. It became part of the curriculum. I made sure that it was included. But I love the electricity and magnetism portion we have because I think it lends itself so well to a great partnership with what students are learning in chemistry. So when they have a chemistry modeler, and they've learned E&M from a physics modeler, the depth that students are able to explore, with how particles interact, I think is, pretty powerful.

Mark Royce (16:40):

Especially as they go into the chemistry classroom and hopefully have a modeler in there, in the classroom they're going to. Yeah, that's really cool. So you guys, co-teach quite a few workshops and, online trainings and that kind of thing. What are you learning from those who attend those workshops? What are you discovering about the people who attend? What's the thing that they seem to most need or gravitate to, or, you know, you can take this any direction you want, but I'm really curious, as workshop leaders, what, what you guys are learning from those who attend.

Jess Dykes (17:30):

Well, I'll start, I guess. The interesting thing to me is how many people had actually taken the bull by the horns already and tried to do some sort of programming with their students before they come in. And to me that was, amazing to see people, because I'll be honest, I would not have had the confidence in myself to do that on my own. The only reason that this has happened is because I went to New York city in 2017 and got trained on the programming piece a little bit more and then had a chance to really dig deep, not working on my own, not working in isolation, but working with a team to develop some things and seeing people that are working on an island and are ready to take that plunge. That to me is the most amazing part of this is to see people who are just like, "I really want to do this and I don't know how to do it. So I'm just gonna do it and figure it out as I go." And then they come to us with the program that we have that we're able to give them more tools and a little bit more of a coherent storyline. I think that's the really cool part is just seeing people that are hungry to do this.

Mark Royce (18:49):

That's great. Melissa, you?

Melissa Girmscheid (18:52):

Yeah, I think we're gonna show exactly why we work so well together, 'cuz I was gonna say pretty much the same thing. I think a lot of the people we've had in our workshops have done that. They've either gravitated towards ...they're like me and they gravitated towards teaching their students how to use spreadsheets to do some problem-solving. I still do some of that because I've heard from students who have graduated and came back that the use of Excel was very popular in their college courses. And so I wanna make sure that they have that experience before they leave me or we have some people who went to different languages that they were using with their students and they wanted something that would marry those two components that would take a programming language and take a physics pedagogy and put the two together. And I think that's what we've been able to do. And one of the best things that we also learned from people that I think we kind of expected, but has been very helpful is that we get a lot of great feedback from our workshop participants. And so we've been working through these workshops. We'll actually work to improve what we do, our improve our resources and make changes on the fly based on what we see with them. 'Cuz one thing might work in our classrooms. But

when we see it implemented with 20 people at the same time, we can use their feedback just like any good teacher would, monitor and adjust and adjust the curriculum as we go.

Mark Royce (20:34):

Yeah. Talk to me a little bit about your process in your classroom and how you are connecting with your students. What tricks have you learned? What challenges do you find in your classrooms?

Jess Dykes (20:53):

This question a little bit. I've only been able to implement really one year and it wasn't a full implementation because my class didn't match up with what I had been spending the time developing. So I am primarily a developer of this. Melissa on the other hand is our, she's really the alpha tester and the beta tester as we go through this. So I think Melissa's definitely the one to talk to on this question.

Mark Royce (21:22):

So are you saying, are you not in the classroom right now? Teaching?

Jess Dykes (21:26):

I'm in the classroom. I am just not enabled to teach this particular curriculum to my students based on the teaching load the school district has decided is what I'm teaching.

Mark Royce (21:38):

But are you using modeling in your classroom?

Jess Dykes (21:41):

Oh, absolutely. Oh, I'm sorry. Yeah. I use modeling all the time. Yeah. I just don't get to use the CMPF piece.

Jess Dykes (21:48):

So modeling. Yeah. The students, you know, I love getting the juniors back because I don't have to train them. So it's just like, this is what modeling is and they understand it. The freshmen sit there and they look at you like, okay, you're gonna give us the answer now. You're gonna give us the answer now. And I give them the question and then there's a little hesitation, the blinking, and they're like, oh, he's serious. He's not actually gonna tell us. He wants us to figure this out. And so the questions kind of lead them to the point where they go, okay, he's not gonna tell us. So we have to actually figure this out a little bit. And then I just go, well, what have we talked about already? What do you already know? Use the tools that we have use the abilities that you have and take it one more step. And that's a lot of fun, honestly, to see the student reaction when they finally get it on their own beats them finally having that aha moment when I tell them and it's like, oh yeah, that makes sense. There's no visceral like aha. When you go, this is Newton's Second Law is, and here it is. They go, oh, I've seen that before. Whereas opposed to when they develop it themselves and they're like, wait a minute, I've seen this before. And, and I just did it myself. So that's, to me, that's the real payoff in modeling instruction.

Mark Royce (23:09):

Yeah. How long into the semester are you before the kids really start to engage in the modeling process, the method as you use that methodology, when is it that they're really connected to it and you start rolling?

Jess Dykes (23:24):

It takes a little while and every kid is gonna be a little bit different. So it takes a few weeks, you know, a couple students it'll take a month, sometimes a month and a half before they really kind of catch on and go, this is how it works here. And they're also transitioning to high school. So there's a lot of trepidation, especially in terms of just talking in the classroom. They're not used to that a lot of times. And so they're like, wait a minute, I have to speak? And I have to share my own thoughts on this topic before I get anybody else's ideas.

Mark Royce (23:58):

Okay, Melissa, we're gonna go back to the original question about, you know, your experience in the classroom with CMPF.

Melissa Girmscheid (24:05):

Sure. I love that Jess called me the alpha and the beta tester, because, well, I implemented this for three years, on a block schedule before moving to my current district. So I had six semesters where basically I was, because I'm in Arizona and we start in very early August, I was always ahead of everyone. So I'd be ahead in my first semester. And then I get to adjust for the second semester. So if we found issues, my students were really the ones helping us find the issues. And I would be very upfront with them and say, Hey, look, we've developed this. I want you to, we're gonna go through this together. Like scientists, if you see errors, if you see issues, you need to let me know. And they were really great about it. And I think it brought out a really good aspect of the process of just... The process of science for them to look and help me out with that. And they treated it like an experiment, but it worked really well with them. And so we were able to adjust and a couple years ago, I actually moved to a district where I switched and I teach only freshman, only physics first. And the district is very comitted. In fact, they have a connection with AMTA and so we're very committed to modeling instruction and it makes it so much better for me because when my students come in, yeah, just like Jess said, they're transitioning to high school, they're learning to be high school students at the same time, a lot of them are learning to be in a true science classroom for the first time. And they're coming from various experiences with science in middle school. Some have, maybe never, had really the chance to be in a lab environment before. And I also know that when I pass them along to the next teacher, they're gonna be passed along to a chemistry modeler. And so I have the ability to be a little more stubborn. I'm not gonna let them give up on the modeling process. They're not gonna give up on the cycle. And so we've reached the point in the year now, here in February, where, when I give a question, I'll hear students mimic me and they'll tell each other, well, can you elaborate on your thinking? Can you walk me through that process? And now ask each other those same questions that we as modelers kind of will do those generic sentence starters. They know those ones by now. And so with the computational piece, they approach it in the same way. And so we do a lot of whiteboarding where you would think they're working with a programming language. They're gonna put everything in the computer. No, our first step is to put things onto whiteboards, is to discuss what should be going on, is to represent in multiple, multiple ways, which is where the state diagrams come into play. They're drawing as many representations as they can. And that computational piece is another representation in their representational toolbox. And they actually use those words 'cuz I use them with them. They're like we gotta dig into our representational toolbox is the coolest thing as a modeler to hear my students say that, if I say you're gonna dig

something outta your representational toolbox they're like, oh, okay. I know what that means. I'm gonna draw state diagrams. I'm gonna draw a system schema. I'm gonna draw some force diagrams. I'm gonna draw a velocity versus time graph. And I'm going to put that into the programming language.

Mark Royce (27:40):

There are more and more schools that are adopting the physics first curriculum system. How many are employing the computational modeling stuff that you guys have developed? Do you know what the adoption rate is?

Jess Dykes (27:56):

That's a hard question. I don't think the number is very high. We've only done the training since '18. So, we trained one group in Chicago in '18. We did another group at ASU in '19. We took the summer of 2020 off thanks to COVID and we just did another kind of virtual training in '21. So we really only trained about a hundred people in totality.

Mark Royce (28:25):

Right.

Jess Dykes (28:26):

And of those hundred, I don't think we have a hundred percent implementation, especially considering the number that have followed through with the research piece. I'd say probably closer to 50 to 75. If I had to put a number on it.

Mark Royce (28:43):

So what would you say to our listeners who, and especially those who are in a physics first, but maybe not employing the, computational modeling aspect. What would you say to them to encourage them, to adopt it, to, you know, like what's your pitch to those to bring it into their school?

Melissa Girmscheid (29:06):

I think it's a lot like making the switch to modeling instruction. If a teacher's trying to move from a traditional method of instruction to a modeling pedagogy, it takes some administrative buy-in. The admin, the rest of the department, need to see the payoff for students. And so in my particular district, I'm the only one who's using computational modeling right now. But the district has seen it. So I had our science specialist, from our district come in the other day and they know I model. I mean, they knew I was gonna be a computational modeler 'cuz I made it very clear in my interview that if you don't want a computational modeler, then I'm not the person for you, but they knew what I was gonna do. So now they've seen what it does for students. And I think it just takes that buy-in, it's very different. You know, just like Jess said earlier, we're used to collecting data, going to the graph and analyzing the graph and we're switching that and flipping that around. And I think it just, it takes some buy-in of why exactly that's happening. And for my students, what I'm seeing, the buy-in that I'm getting is one, my students are really good at digging into data. They have multiple ways to look and analyze data. They're getting, I'm seeing better scores for my students in math class. So the reason I took my current position is I work as part of a team and my students, most of my students have the same algebra teacher, so I can see what they're doing. And she's giving me some qualitative data of noticing that the students are not struggling with functions with her as they have in the past. So I think people need to see that and they also need to see that my students genuinely enjoy it. I'm getting more students who are signing up for

computer science classes because they notice what they're doing in my class. And they find it interesting. And that's huge for our students. That's a growing field and encouraging them to study something new, that will actually be with them no matter what they do. No matter what our students do, computing is gonna be such a huge part of their lives. Showing both students and parents and administration that what we're doing is giving them another tool that's going to help them be successful in whatever they choose to do in life. Giving them another way of thinking, because it is really about teaching computational thinking and teaching our students to understand how a computer thinks, and understand how they can interact with a computer better. It's a big life skill that we're putting forth. And so anyone who's having difficulty with it and difficulty getting that buy-in I think they just need to be, need to be persistent. And I've always been a huge proponent of invite people in. Invite people into your classroom to see what you're doing, to talk with you more, to talk with students. And I think that that buy-in is gonna happen.

Mark Royce (32:16):

Jess, do you have anything to add to the pitch?

Jess Dykes (32:18):

Well, you can see why she's the AMTA president. So there's not a whole lot I can

Mark Royce (32:23):

Wait before you go on, I forgot to mention Melissa that you had, fairly recently become the president of the AMTA and congratulations on that.

Melissa Girmscheid (32:35):

Thank you.

Mark Royce (32:36):

It's great. Anyway, Jess, sorry to cut you off.

Jess Dykes (32:39):

Yeah. She gave such a complete answer. There's not a whole lot that I can add to it. Other than to say these two things: Number one, the one thing I would say is if you're going to implement it, you have to completely implement it. There's there's really no half measures when it comes to modeling instruction. And when it comes to the computational piece, you have to buy-in as a teacher and then you have to go and do it every day so that your students will buy-in. Because if you slip out of that methodology and if you move in a different direction to the quote unquote safe space for teachers where you know that they become the sage on the stage or whatever, then the students will expect that. So that's the first one. And the second one is there's something really cool about programming something into the computer and having it break the law of physics because you told it to, and then you go back and you get the computer to follow the laws of physics, which shows that you actually understand the laws of physics.

Mark Royce (33:47):

Fascinating. That's cool. I kind of want to go off track a little bit and ask Melissa, do you want to share anything about the exciting things going on at the AMTA?

Melissa Girmscheid (34:04):

Oh yeah. So I would love to talk about how excited I am about the recent AMTA ConnectEd. I think we're making a shift. So for years we did a big summer conference, we go everywhere. And I think one of the, you almost hate to say it's a benefit of having to go virtual, but a benefit of going virtual is we understand how to go virtual now. And so our amazing marketing and PR communications team, Carly Delo and Erica Posthuma have put together that AMTA ConnectEd and I think completely 100% rocked it and did this amazing just mini conference last month. And I think it went so well that this is gonna be something that we have on a routine basis. And so I'm actually really excited about that. Bill Thornberg and I have been talking about this. It's great.

Mark Royce (35:06):

I think my wife was a part of that.

Melissa Girmscheid (35:08):

Yes she was. Yes. She was. Brenda did an amazing job for us on questioning. Yeah.

Mark Royce (35:14):

Cool. Well,

Melissa Girmscheid (35:16):

It's just, I think what's, it's what's happening is we're getting more of a community feel going in the AMTA community 'cuz we are a community.

Mark Royce (35:25):

Yeah.

Melissa Girmscheid (35:26):

So I'm pretty excited about that.

Mark Royce (35:27):

Yeah. That's for sure. It is a community and being married to one of y'all, I'm a fan, even though I'm not into science stuff at all. Well, I wanted to ask you guys, this is getting back on track with our modeling discussion. Do you guys both teach at schools where the science department is invested in modeling beyond your class? Like other teachers that are using modeling methodologies in their class like chemistry or biology or

Jess Dykes (36:01):

We are, to a certain extent. We've had almost all of our science teachers that were hired five, six years ago or longer have all been trained in terms of the modeling. And one of our administrators is very interested and he's part of a group that's developing a modeling biology, whether or not all of the teachers at my district are as sold on modeling as myself, No. There's, there's a little bit of attention there. And so I'm a modeler. Some of my colleagues are modelers and some of my colleagues are not, but we've all had experience being trained in it up until the most recent hires and there's discussion of getting the most recent hires to be trained as well.

Mark Royce (36:50):

Cool.

Jess Dykes (36:51):

But I don't know if they're gonna be all modeling.

Mark Royce (36:54):

Right. Just curious. Melissa, how about your school?

Melissa Girmscheid (36:59):

Yeah. My district has an agreement with AMTA that we use modeling. However, I teach at a brand new school. And so we have seniors for the first time this year. And so we we've been hiring a bunch of new staff every year. And so some of our science department has been trained. Some have not, but we're working on that. I am really fortunate that actually there are two other workshop leaders who teach at my school. So Carol LaBond in chemistry and she's who my students have for chemistry. Following me. And then Stephanie Chow, who is a biology work workshop leader also works at my school. So I'm super fortunate. I get to work with a lot of very invested modelers and the rest who don't realize they're going to become very invested modelers because I am... I'm excited to make sure that we can make that it for our students.

Mark Royce (37:53):

Yeah, that's awesome. That's really great. Well, if somebody wanted to find out more about the CMPF-B, and get information about it or find out how to get involved, what would you suggest? How, how would you suggest that happen?

Jess Dykes (38:13):

Well, there will be a training this summer, assuming that we have the participants interested in the program, but we'll be in Cleveland this summer in July. July 11 through Melissa can confirm this. I believe it's 29th of July. So it'll be full three weeks. And it will be hosted at Baldwin Wallace University in Berea, Ohio, which is a small suburb town of Cleveland. I believe that that information is available on both the modeling instruction website as well as the AAPT website.

Mark Royce (38:52):

Okay. So this would be mostly for physics first teachers, right?

Jess Dykes (38:56):

Yes.

Melissa Girmscheid (38:57):

Correct. And you know what we have, we have plenty of modelers who have come to workshops who don't necessarily teach freshmen, but they've implemented it with juniors and seniors. And there's nothing wrong with that. They've used the same curricular resources.

Mark Royce (39:17):

But always in the physics setting, right. It doesn't apply in chemistry or

Jess Dykes (39:22):

No, this is all physics.

Melissa Girmscheid (39:23):

Correct. This has been a conversation with, with Bootstrap and with the project of where do we go next? And we've come back to it time and time again. And where do we go next? And it's always something that comes up in a conversation at summer workshops. Like what do we wanna do? And let me tell you, there are a lot of things that we would like to, we would like to do that have come up. And I don't even dare say what those things are because it's kind of exciting just thinking about what the possibilities are.

Mark Royce (39:52):

Well, when they, those things start to evolve and we're ready to share it, you will make sure we connect again and do another episode on that.

Jess Dykes (40:01):

Sounds great.

Mark Royce (40:03):

So before we wrap, are you guys gonna watch the Super Bowl?

Jess Dykes (40:09):

I am. I will not have a huge vested interest.

Mark Royce (40:12):

Okay. So you don't have a team that you're rooting for.

Melissa Girmscheid (40:17):

I was really hoping my cards were gonna play.

Jess Dykes (40:21):

So I'll be watching I'm actually for this year, I'm gonna be pulling for the Bengals because I don't think that that fan base has ever got to experience the thrill of that. So I'm hoping that they get that.

Mark Royce (40:34):

Yeah.

Jess Dykes (40:35):

And I have a few friends that live in Ohio that might actually be Bengals fans. Although most of my friends in Ohio are Browns fans. So maybe that would be worse for them.

Melissa Girmscheid (40:43):

There. There's a pretty big tradition in Phoenix of wearing things that say "Beat LA" and it comes from the Suns-Lakers rivalry. So I'm gonna go say Beat LA on this one and go with Jess.

Mark Royce (40:55):

That's fun. Phoenix and LA rivalry. Now the Olympics are happening and Jess, I know you're a fan of curling.

Jess Dykes (41:06):

Major fan of curling. I can't tell you how big a fan of curling I am, but I've never played because there's no curling clubs around here.

Mark Royce (41:14):

I was gonna ask you, is it a popular thing in Philadelphia?

Jess Dykes (41:18):

No. And most of my friends think I'm nuts, but it's amazing. There's the strategy, there's the physics, it's just an amazing sport. And the best part is they mic up the players so that you can hear their strategy and you can learn so much about the game just by listening to them talk about it.

Mark Royce (41:37):

While the teams are strategizing and yeah. Wow, absolutely. Interesting. I have never, I mean, I know what curling is. I've seen pictures of it, but never followed it or understood it. Well, Hey, you guys, it has been a real joy talking with the two of you and, I'm really grateful to you for the work that you guys do in the modeling community and especially around this computational modeling stuff. And I really appreciate you taking the time to share with us a little bit about it and about what you're doing with it. And I hope that more people become aware of it and hopefully through this podcast a few more will. So I just wanna say thank you so much for joining me today and it's been great.

Jess Dykes (42:30):

Thank you for the invite. It's been fun.

Mark Royce (42:32):

Yeah. Thanks Jess. Melissa.

Melissa Girmscheid (42:33):

Absolutely. Thank you.

Mark Royce (42:35):

And you know, Melissa, we'll probably get together sometime and talk more about AMTA with you as president, maybe have you and Carly or Erica, and, you know, we could do something and catch everybody up on what's going on behind the scenes.

Melissa Girmscheid (42:49):

That would be great. I could talk your you're off for hours.

Jess Dykes (42:52):

and she could.

Mark Royce (42:53):

So that would be a great episode for us to do. Okay. You guys take care of yourselves. I will see you soon.

Jess Dykes (43:01):

Take care.

Melissa Girmscheid (43:01):

Bye.