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PROGRAM NAME: WOMANITY – WOMEN IN UNITY

GUEST NAME: PROFESSOR LESLEY CORNISH – SCHOOL OF CHEMICAL & METALLURGICAL ENGINEERING – UNIVERSITY OF THE WITWATERSRAND

SPEAKER	TRANSCRIPTION
DR. MALKA	Hello, I'm Dr. Amaleya Goneos-Malka, welcome to 'Womanity– Women in Unity'. The show that celebrates prominent and ordinary African Women's milestone achievements in their struggles for liberation, self-emancipation, human rights, democracy, racism, socio-economic class division and gender based violence.
DR. MALKA	Joining us on the line today for our series covering women in science is Professor Lesley Cornish from the School of Chemical and Metallurgical Engineering at the University of the Witwatersrand. She is also the director of the DCI/NRF Centre of Excellence in Strong Materials and the African Research Universities Alliance Centre of Excellence in Materials, Energy and Nanotechnology. Science is an important aspect and if we consider that part of the African Union's agenda for their 2024 focus, is on the wings of innovation, the African Union's Science Technology and Innovation Strategy for Africa, which aims to respond to the demand for science, technology and innovation to impact across critical sectors such as agriculture, energy, the environment, health, infrastructure development, mining, security and water, amongst others. Welcome to the show Prof Cornish!
PROFESSOR CORNISH	**Thank you very much, I'm very happy to be here.**
DR. MALKA	You wear several caps that have a significant impact on material developments, both within South Africa as well as across the continent, one that I'd like to focus on is the DSI/NRF Centre of Excellence in Strong Materials, so as the director of this centre, can you please tell us more about it?
PROFESSOR CORNISH	**This centre has been running since halfway through 2004, basically as the director my job is to, if you like, oversee it, make sure that we're kept on track for the overall mission and what the overall mission is, is to build people, build the expertise, build the infrastructure, increase collaboration and networking and then use that usefully in trying to solve problems for industry and then of course the other centre of excellence is wider than that and goes into Africa and also it does come with a lot of administration and we have to report to the NRF and that is becoming more and more onerous I think as the government is looking for more and more from its money, so obviously its asking the NRF to report and of course they give it to us, but mostly it's a lot of fun, it's a lot of encouraging people. I have my own students as well, so it's very, very varied and also I have to keep things on track with the university because obviously the university has got it's way of doing things and we have to be audited and it's very tight on that.**
DR. MALKA	Well you're dealing with expansive budgets; I'm sure, looking at the different types of innovations and the research aspects that are undertaken. In the conversation you mentioned the fact that you are looking to solve problems for industry; what types of real-world problems are you planning on solving, if you can give us a few highlights?
PROFESSOR CORNISH	**Basically we're trying to make materials better, so we're trying to make materials more efficient so that they last longer, so that they become safer if they last longer, we're also looking at trying to improve specific materials, trying to do things like improve corrosion resistance, we've got**

	a group looking at modelling, what they try and do is, and they've done it very successfully, is model possible materials and then either in that group or another group other people try and make those materials and obviously it's materials with a certain use, it's not just materials for the sake of it, it's a wide range. We've had several patents accepted and a lot of them are with various industries, like Element Six.
DR. MALKA	The science discipline is renowned for making new life-changing discoveries and like you've mentioned you've had successful patents put through, which all speak towards the factor of innovation. The Centre of Excellence does focus on challenges as well as opportunities in the continent, can you expand on some of the more significant collaborations or research projects that your teams are working on that have got more of a continental footprint?
PROFESSOR CORNISH	**Thanks, yeah, that's where the ARUA Centre of Excellence comes in, that was sort of based on something we called AMSEN, which was African Material Science and Engineering Network, in that we were looking at making better nickel-based alloys for higher temperatures, there was also a whole load of work, not directly done by me, but we were looking at better materials for batteries, now what one group is doing is looking at materials to help alleviate pollution and also materials to help, we want to really get this one bigger, it's starting, materials that will help for water purification. There's also a lot to do with energy and trying to get different ways, more, bigger, better energy resources and also to try and remove waste and at the same time as you're removing waste, you're actually creating energy; those are just some of the projects.**
DR. MALKA	I would imagine that some of these aspects and the work that you're doing really taps into the United Nations Sustainable Development Plans.
PROFESSOR CORNISH	**Oh definitely, if I have those to hand, I could reel them off and it's not just materials, it's not just the better life, it's the education part and hopefully heading towards better equality. So yes, there's a lot of the stuff that we're doing has got that as underlying, I mean you can see a lot of the things we're trying to do is almost as if we're using materials to do the things that materials do, but the spinoff of that is actually to improve our society and make it a better place. In fact, in our ARUA Centre of Excellence there's two sort of overlying themes, one is to make materials more effective and the other is the social impact of materials and we've got somebody looking at sort of the life-cycle of a particular building material, which is quite complex and if you were sitting outside you wouldn't necessarily think about that.**
DR. MALKA	It's an important responsibility that we need to confront as a society and understand the impact that we have on our world long-term, which is actually going to endure long after we leave the planet. In the ARUA initiative, which represents Africa Research Universities Alliance, you work with a host of different institutions, so obviously it's hosted by the University of the Witwatersrand but other institutions include universities in Pretoria, in Nairobi as well as Ghana. Given that you work across a breadth of different institutions in different countries, I wanted to ask you, what is your view on the responsibilities that universities have towards shaping the thinking of students as the continent's future socio-political and economic players, especially women?
PROFESSOR CORNISH	**Yes we have a huge role there and a huge responsibility there and I think it goes deeper than just the academic subject, which of course is very important. Both centres, they deal with a wide range of disciplines in science and engineering and we've got specialists there and no-one really fits across the two, that's why we have to have this collaboration.**

	Virtually all of our students are research students, there are some post-docs there as well, so they will all be experts in their fields, but on top of that, we are training the students to think and I think that starts at a very early level. We're encouraging them and we're empowering them and by showing an example we can show them there's places to go to, whether they want to be an academic or whether they want to go into industry, some have gone into government, some have gone into banking. One of the things that I think is really important and maybe we're not so good at it at the moment, but I think we're getting better, is this whole idea of citizenship, what is a citizen of Africa or a citizen of the world, what should they be like. So they should be honest and fair, they should be maybe not necessarily an expert in everything, but have enough knowledge and experience that they can be useful and this citizenship is really important because with it comes the whole thing of not just being greedy and getting what's good for you, but trying to care for the environment as well as humanity, all parts of it, not just the males if you're male and not just the females if you're a female, but all parts of it and I think we're getting better at this but we need a bit more work on this and the other thing of course that happens is you end up being quite competitive with other universities and I hate that and also even with industry sometimes and even with things like the science councils and we shouldn't really be competitive, we should be more collaborative, but unfortunately you get this competitive thing coming in and that's because all institutions like to show that they're successful and they do that by counting things and as soon as you start counting things you want to have more than the other entity and that can count against us, when really we can share and if we collaborate we can share the papers because we've shared the workload and I think not everybody has got that yet. A lot of people have and it's great, but not everybody.
DR. MALKA	It is a different way of thinking and if I'm not mistaken I think Aristotle said "The whole is greater than the sum of the parts" so if we have this philosophy that we're all contributing to this greater whole, then we will stand to benefit and not just think of ourselves in our own little fiefdoms.
PROFESSOR CORNISH	**Oh definitely and this whole thing about looking after the environment, I mean there's been so much greed that that's actually got us in the mess we're in today and if we can get better energy supplies, especially if we can use up waste to make energy, we kill two birds with one stone, I hate saying that 'cause I'm a birder, but never mind, so we've got to be more thoughtful on how we do things and I think if we can just pull together and there are some good signs that things are happening, then everybody benefits. Maybe some people won't benefit as much as they would have done, but hey, they've had a big part of the cake anyway and maybe it's time to think of a fairer way of doing it.**
	AD BREAK
DR. MALKA	Today we're talking to Professor Lesley Cornish from the School of Chemical and Metallurgical Engineering at the University of the Witwatersrand. She is also the director of the DCI/NRF Centre of Excellence in Strong Materials and the African Research Universities Alliance Centre of Excellence in Materials, Energy and Nanotechnology. We would love to receive your comments on Twitter:@WomanityTalk.
DR. MALKA	We've spoken about some of the research aspects that your teams have undertaken and it is firmly sitting in the STEM environment, which covers science, technology, technology, engineering and mathematics and these subjects have been cited as being pivotal for jobs of the future, yet various

	reports indicate that women are often under-represented in these types of disciplines, which obviously creates a gap and will be at a disadvantage when they're looking for work or job opportunities as our world evolves. You are a professor of physical metallurgy, which in simple terms is the science of making useful products out of metals; please tell us what sparked your interest in this field?
PROFESSOR CORNISH	**It goes back years, I think I'm one of these lucky people, I knew what I wanted to do when I was fourteen, I didn't quite know the name of it, but I knew what I wanted to do and yes it hasn't been an easy trajectory, it hasn't been a trajectory in a straight line. I was always interested in science, I was always interested in how things work or didn't work and going through senior school, look I had some very good teachers I must admit, very, very supportive, they weren't quite supportive when I said I wanted to do metallurgy because they didn't know what it was and they thought I was putting myself into a dead-end, but then they did become more supportive later on, but I realised that I was going to have to go into science because that was my interest, but having said that, I was also interested in a whole load of things but I decided that I was going to go into science also because not only was it interesting, it was somewhere and I realised that that would give me a career where I could be self-supporting. I didn't necessarily want to be rich, I wanted to be fulfilled and I wanted to have enough money and then I started looking at what could I do and I came across metals and in a cupboard under the stairs at my school in the UK we had various university prospectuses and I just used to sit in there, with the door open so I didn't suffocate, and go through and look at what I could do and look at where I could do it and I made up my mind and that was where I was going and I did.**
DR. MALKA	And what types of career opportunities are there for metallurgists?
PROFESSOR CORNISH	**There's quite a few, I mean if you stay into metallurgy, which really overlaps with materials, engineering and material science, we don't just deal with metals, there's a lot you can do. You could stay in a research environment at a university and do what I've done, but I haven't always been there, you could go and join some sort of science outfit, here it would be science councils and carry on doing research, you can teach, you can go into manufacturing; there's still a lot of manufacturing where they do their own research in-house and then there's what's becoming increasingly important these days and will be more important in the future, is you can head out on your own as an entrepreneur, you might need other people as well to help you with some of the stuff. We're trying to get people to think around like that and put them in contact with people who have been entrepreneurs and sort of say help set up their own business. Now obviously before that they've got to have a really good understanding of what they're trying to do and how to do it and how not to do it and that's why it's interesting and effective to put different people together. One of the things that I've lost several of my students to once they've graduated is going into banking and the reason for this is that the banks offer people money, okay, to do things and obviously they want it to be a successful investment so that before they lend money for something they need engineers and scientists to look at what's being asked for, is it feasible, is it safe, is it doable, is it likely to succeed or is it just a waste of time, so that is actually really, really important and also people going into government because the more scientists you have there, the more they'll understand what we need to do. The thing about universities which I love is that you have lots of different people there with all different expertise**

	and everybody has got a different way of thinking this is how we ought to change the world, it's actually quite a lot of overlap between what the scientists and engineers are trying to do and what the social scientists are trying to do. So there's a lot you could do and even if you don't stay in your discipline, I don't think it's a waste because you've been educated in that, you've thought about that and you can still, if you like fly the flag and get people to think about proper and sensible things, there's so much you can do.
DR. MALKA	I really like the way you've expressed and stressed the flexibility and agility that comes with pursuing scientific subjects, the logic that it gives you, the critical thinking skills which can be reapplied to almost any sphere. Going back slightly towards the origins of this question; what do you think industries, schools and universities can do to encourage more women to pursue careers in stem subjects?
PROFESSOR CORNISH	**I think one of the problems with women is it starts much earlier. I'm always really saddened when I hear that girls miss school because they, you know, they can't cope with their period because they don't have the right things at hand, they don't have the pads or whatever and I think that is so sad because although I didn't really enjoy that stage of my life at that time, we were old fashioned and used to call it the curse, it's just something that you get on with it. If the girls don't have the right equipment, you know, they're going to miss out on so much and I think that is vitally important, I don't think this is the place to discuss it 'cause I'm not a medic, but I think it is really important and I think any initiative to help girls get through that, I think is really important. The other thing you're up against is I mean I still have it in my own family, is you know just oh girls don't do that and I just think if you really want to do it you've just got to carry on and do it and there's no reason why a woman can't do anything, yes it's probably easier to, say if you're running a facility, oh we don't want females here because we have to have another set of toilets, I mean really, can't you put a lock on the door? There's just so many excuses but women can do things and we just need the opportunity. When I first came to South Africa women weren't allowed in a bar and I didn't realise that and got thrown out and look at it now, so we just need the opportunity and just to try and get round that mindset and one of the ways of getting round the mindset is not to get upset, is just keep trying, just carry on, you know, successful, show people what can be done by women and just keep trying. This is where role models are really important because, you know, the school girls or the students can say oh, there's a woman doing that, I could do that, so I think that's really, really important. I get a bit worried about saying we need more bursaries for women, we do but we need more bursaries for everyone. One of my students right when I first started at Wits got a bursary for being a female and it was almost like an insult, but luckily she was clever enough to think well I don't care what they call it, I've got my bursary and I'm going to get on with it and she did and she did her undergraduate and she her master's, then she went overseas unfortunately and did a PhD and never came back. So we just need opportunities for women and we just need people maybe to realise that there are underlying problems and the other thing of course that happens is people expect that women should be more the caregivers in the house and they tend to get lumbered with more things, looking after the other children and that is really difficult, so we just need to take in mind that that's what might be happening; it's a very wide question.**

DR. MALKA	It is a wide question and you've certainly addressed some of the challenges, but also emphasised the point of opportunities and being able to take those opportunities and make them work for you and at the same time you've highlighted some of the things which I find to be, quite frankly, dumb, I mean why should a woman be prevented from walking into a bar. About six months ago I was doing something on women in the law and came across various pieces of legislation that have been put in place to address, as I call it, these dumb sentiments which make absolutely no sense on preventing us from moving ahead.
	AD BREAK
DR. MALKA	Today we're talking to Professor Lesley Cornish from the School of Chemical and Metallurgical Engineering at the University of the Witwatersrand. She is also the director of the DCI/NRF Centre of Excellence in Strong Materials and the African Research Universities Alliance Centre of Excellence in Materials, Energy and Nanotechnology. We would love to receive your comments on Twitter:@WomanityTalk.
DR. MALKA	We certainly do have a ways to go and the fact by having women accounting for half of our population, having them participate in the labour force obviously has macro-economic contribution consequences, but we still have these persisting inequalities between men and women where women tend to be coming off second-best, whether it is about unequal pay, working in lower ranking roles, under-representation in management. Given your experiences throughout your career, what types of interventions do you think can realistically help remedy inequality in the workplace?
PROFESSOR CORNISH	**That's really tricky because you start doing things and then the old guard comes in and sort of blocks it again and it isn't just women, it's almost everywhere that's a big organisation, you can see there's an old guard, they try and keep out the people that aren't like us type thing, it is so wrong and it's crazy and one of the things that I think is so special about South Africa is that we're so diverse and we've got people from so many different walks of life that there's so many different contributions that the people could give. I mean I like it when my students come up with things and you begin to see something in a different light and we need everybody to get involved. As you said, women is half the workforce or half the potential workforce and you're throwing away, potentially, that number of people, not only as just sort of bums on seats, but also their capability, there's a lot of capable women there, I know there's a lot of capable men, but there are some really bright women out there who just need to be given the chance and I've, you know, I've helped both men and women, give them a space to give them a chance and sort of get them going much further than they could have done otherwise, because they weren't seen by people above me as having potential and it's just crazy.**
DR. MALKA	But that's the role of being a good teacher, that's the role of being a role model and the role of being a mentor, to be able to recognise the potential and the opportunity that lies within someone and give them that nurturing push to succeed rather than holding them back and that speaks to the earlier aspect of our conversation on the contributions that we can all make collaboratively to improve the lives of everybody.
PROFESSOR CORNISH	**Exactly and some people, they just need a chance, you know, they've actually got everything but they just need an opening and so several times I've created a space for them and they've, you know, they've blossomed and that's what we've got to keep trying to do. I like people to try and think where they'd like to go themselves rather than being pushed the whole time, but sometimes it's good to give somebody a little nudge and a**

	little bit of encouragement and also what happens is some people, they don't see where they could go, they just see what's round them and you need to try and show them that there's something more apart from the environment that they're stuck in, but if they could only get through this, then they would have much wider horizons and I think at the moment we're all suffering from that because we're just, most of us are stuck working from home. We've got to try and get out of that and we've got to try see beyond that and we must just keep pushing and trying to expose people to a wider environment, but this is where it's good for people to attend webinars and stuff because they can see what's happening in the world and not just from the news, which can be depressing, not just from social media which can be incorrect, but see what is going on out there and get involved.
DR. MALKA	I imagine it must be so rewarding to see people get out of their comfort zones and realise that they have this spark that can propel them forward into the future. A question that I'd like to ask you now is about your personal journey; can you please tell us about some of the factors that you feel have contributed to your success and shaped you?
PROFESSOR CORNISH	**I can do, I was actually born in Uganda, so I had some little bit of growing up to do in Africa. My mother died early, I was only eleven and I think I learned to become independent and I learned to rely on myself and I was lucky enough to get a scholarship to a good school. With the support from that good school, although not everything was totally wonderful, it was a good school and from there I could go to university and I went with the right sort of attitude, which came from the school, certainly the work ethic and also a realistic thing with what I could do. When I first came to South Africa to work at Wits, quite a lot of our students had really unrealistic expectations and it used to cause quite a problem because they would sort of clash with the companies because they wanted a car and a directorship, the company would think well gee, you're just a wet behind the ears graduate, you know, you've got some growing up to do, but I was very lucky in that, that things fell into place and I could see what was good, what was bad. The other thing that I was really lucky with is along the way I came across some very good men and some very good women and I was able to think that even though my family are very male chauvinists, you know, women just don't do these things, I could see beyond that, although it hurt at times that my family weren't interested. I mean I remember once telling my father, phoning him up and he was in the UK and saying I'm going in, you know, I'm presenting at a conference in Japan, I'm presenting my work and his comment was, don't they have anybody who's better and that was just such a putdown and I thought he just doesn't understand the system, you know, it's my work, nobody else can present it, it's my work, it's what I did and I just had to sort ignore the stuff with the family.**
DR. MALKA	But Prof Cornish, that's so hurtful, coming from a family member, how...
PROFESSOR CORNISH	**Oh it gets worse than that.**
DR. MALKA	How did you overcome this, because other women are in your shoes and you're dedicated to your work, it is important, it's making a difference, it's impacting on the world and you've still got to contend with family who don't appreciate what you're doing; please just talk us through how you've navigated that point.
PROFESSOR CORNISH	**I sort of learned to ignore what the family said because I had enough science coming out from outside that I was actually doing the right thing**

	and I've actually given up telling my family what I'm doing, because they just don't get it and if I tell them, you know, they're just going to rubbish it, so I just ignore it. It was quite hurtful but that's the way my family were, because I was only a female, but you see losing my mother so early I had nobody to stand up for me and I was just left in a very male orientated household. My grandparents helped initially and even after my father remarried it was still a very male orientated household and I just learned to ignore it, because luckily that school that I got a scholarship to was an all girls school and I think that helped, at the time I was worried about it because boys didn't faze me because I had three elder brothers, they you know, I had good vibes coming from them and it was a very academic and sporty school, I wasn't very good on the sporty side there 'cause it wasn't my sort of sport, but it was great from the academic side.
DR. MALKA	I also went to an all girl's school and I have to say in that environment it was actually quite empowering because we could, well we were told we could be anything that we wanted to be and there wasn't anyone telling us anything different.
PROFESSOR CORNISH	**Exactly and I think that's what's so good about all girls schools. I think sometimes that you can, the pupils there can sort of lose out how to cope with males, but I was lucky because as I said, I had three elder brothers, so I didn't really miss out on that but certainly as an environment, yeah, you know, the best in the class is a girl, the bottom in the class is a girl as well, but there's nobody sort of saying oh girls are lousy at science, there's nothing like that. I mean I even had a little bit of that at my primary school, which was an excellent primary school, and I just said rubbish, I can do anything better and they said well show us and I did, but I think maybe you need that sort of personality that you've got to believe in yourself a bit, you are going to take knocks, there are times when you think am I doing the right thing, you know, I'm finding this so difficult, but you've just got to think no actually, there are going to be times when I don't want to say fail, but you don't succeed, and you've just got to take a breather and look at it, why didn't you succeed and try again. You're not always going to succeed in everything you do, but as long as you succeed in most of them, that's fine.**
DR. MALKA	Well said, and lastly, as we close our conversation today, can you please share a few words of inspiration or wisdom that you'd like to pass onto girls and women who are listening to the show?
PROFESSOR CORNISH	**Thanks. You're not going to get anywhere, no matter how bright you are, you're not going to get anywhere just on that, so there's hard work, there's hanging in there, I used to be a marathon runner until I messed up my hips and I couldn't sprint to save my life, but I could do marathon running 'cause I could just hang in there and the other thing is honesty; you have to be honest. Dishonesty might get you there in the short-term but it won't in the long-term and another thing is you will never please everyone, but if you're true to yourself and you try and do what's good, then you should succeed and you must also be prepared to disagree with people. I get so upset with certain people that if you don't agree with them, you know, it's sort of if you're not with us you're against us, and I think that's a load of rubbish because I'll disagree with anybody but you don't have to come to blows, you know, you can just say well actually I don't see it that way, I see it this way because, you know, and stand your ground. Sometimes you'll have to admit and so oh, yeah okay, you've got a point there and go away and think about it, but that's part of the**

	honesty and being true to yourself and another thing I'd say is that whatever you do, do your very best to enjoy it, you might not enjoy it all the time, I mean I hate marking with a passion, but that's the downside of my position because I still have to do teaching, even as a director, but that's a small downside to all the other stuff I do. So, overall, enjoy it and if there's something you don't like, try and change it, don't necessarily throw the towel in but try and change it and if you can't change it, do the bit you don't like and get rid of it and do it well enough it doesn't come back, but mainly, you know, be honest to yourself, because if you're not honest to yourself you can't be honest outside.
DR. MALKA	Thank you for sharing those powerful words, I particularly like the view of endurance, being in things for the long run and focusing on your trajectory, being true to yourself and standing your ground when you need to but at the same time practicing aspects or let's say practicing virtues of tolerance and acceptance, that we can have multiple viewpoints in circulation and that there's nothing wrong with that. So thanks once again for joining us.
PROFESSOR CORNISH	**Thank you, I've thoroughly enjoyed it. What I wanted to say was the respect for the other people. I mean respect other people even if they don't agree with you.**
DR. MALKA	I completely agree with that sentiment as well, everybody comes from a different context, a different background and our lives are shaped by that and that means that we will have different views, but again, there's nothing wrong with that.
	PROGRAMME END