GenHET newsletter

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High Energy Theory on the African Continent

This issue of the genHET newsletter highlights physics research, academia and education on the African continent. It presents the African Institute for Mathematical Sciences (AIMS) through an interview with Eunice Gandote, an alumna and now teacher at the programme, and features a second interview with Prof. Jeff Murugan on academic structures and research in South Africa.

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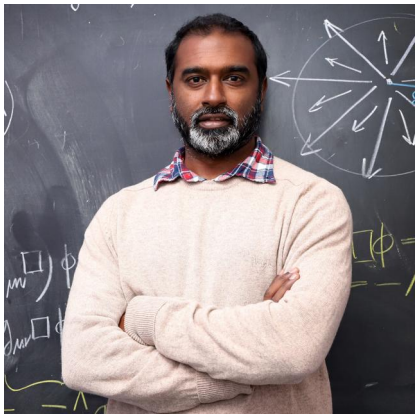
An interview with Prof. Jeff Murugan



To begin, could you briefly introduce yourself and describe your role at the University of Cape Town? I am a professor of mathematical physics at the University of Cape Town. I'm also the acting deputy vice-chancellor for research and internationalization at the University of Cape Town. In this role, I oversee the University's entire research portfolio. We have 6 faculties and 39 research institutes, and I oversee all of that research. So, it's a fairly substantial portfolio at the moment, which leaves very little time for research.

Strings 2020: successes and challenges

You organized the Strings 2020 conference in Cape Town. Unfortunately, it ended up being an online conference, but it was a huge success. Can you tell us more about it? In some sense it was good that it was online, and in some sense it was bad. It was bad because obviously it would have been nice to get everybody to visit, and everyone had put a lot of work into it. When we had to switch to an online format, in March of 2020, by that stage we had gotten all the invitations out, booked accommodation for everybody. We were at the point of booking flights, and then, all of a sudden, the whole World was in lock-down and nobody was going anywhere. However, on the other hand, I think it was a good opportunity. It was good because everybody was feeling kind of despondent at that point, so the online format provided a scientific outlet that nobody was counting on happening at all. There was a point where we thought there would not be any Strings meeting that year; in the end, us managing to pull it off was an effort that was highly appreciated by the whole community.

Strings 2020 featured daily panel discussions, which were well received. Was this the first time such extensive discussions were integrated into the conference format? It was the first time. We arranged it so that the meeting started around midday Cape Town time, and all the initial participants were from the Eastern time zones. Then, we slowly moved to include the West Coast of the US – at that point for me it was around 11 p.m., but people there were just getting going. So, it worked out quite nicely with that choice. We also organized, as part of Strings 2020, a special session for EDI aspects.

Do you think this conference gave good visibility to South Africa physics despite being online? I think it gave some visibility. Obviously, an in-person conference would have given us more visibility because of the many satellite events organized around Strings, that would have really showcased the good research work that we're doing in various groups around the country. In fact, one of the biggest issues that we have is our geographical disadvantage; people really have to travel quite far to get here. So, when people visit, while they are around the area, we try and organize as many things as possible. We said to people: while you're here, stay for an additional week and you can go to String Math at Stellenbosch University, as well. Or, come a week earlier and go to another meeting that was going to be held in Johannesburg. That would have really helped with the visibility, to be honest. It would have profiled more than just the University of Cape Town. The online event didn't really showcase much of South African science. The in-person event would have done a lot more.

> **One of the biggest issues we face is our geographical disadvantage—getting to South Africa takes time and effort.**

That said, there's usually a fair number of activities that happen in South Africa. Nothing of the scale of Strings, at least in our field, but certainly in adjacent fields. There's been some substantial QCD conferences, and quite a lot of particle physics conferences that have

helped. Those have showcased South African science a lot more, I think. At some point in the future, I would still like to host an in-person Strings meeting in Cape Town.

Research strengths in South Africa

South African research institutions collaborate closely. What drives this, and how does it impact the research? Yes; we're a relatively small community, so collaboration is more practical than competition. Given the geographical challenges, we rely on strong institutional ties to keep things connected.

For example, my group has close links with colleagues at Wits University in Johannesburg. It's common for researchers visiting one city to reach out and say, "I'm in the neighbourhood"—even if that "neighbourhood" is a two-hour flight away. We're always happy to facilitate those visits, and the same happens in reverse. This kind of informal but consistent collaboration helps strengthen our research network across the country.

> We're a relatively small community, so collaboration is more practical than competition.

What is peculiar to South Africa research that you're seeing in your position now? South Africa is exceptionally strong in medical research as well as astronomy and in climate research. And all for good reasons: we're strong in astronomy because we have some of the cleanest skies in the world. Just three hours away from Cape Town, in Sutherland, is some of the (radio) cleanest skies in the world. There, several years ago, the scientists involved were able to ensure that it remained a radio quiet area, essentially by convincing the government to buy into the importance of radio astronomy to the South African knowledge economy. So, the farmers in the area are not allowed to have cell phones, but the government has supplied them with satellite phones, which stay out of the frequency bands required for astronomy. It really takes some doing to get a government of a developing country to take an active role in that area, so we're very strong in radio astronomy, in particular. We also have some of the world's leading HIV-AIDS researchers. Just last December in fact, we celebrated some groundbreaking HIV-AIDS drug discoveries that were made right here at UCT.

> We have the cleanest skies in the world for astronomy.

The leaders of these fields that are now in South Africa, are they themselves from South Africa? It's a combination. For example, the head of the Neuroscience Institute, who is one of the world's foremost authorities in brain pathologies, is from South Africa. Our leading health scientist is neuropsychologist who is also from South Africa, but many of our radio astronomers are from abroad. They've moved to South Africa because if you want to do radio astronomy, you go where the clearest skies are.

Geography, race and inclusion

Do you think postdoc openings in South Africa are adequately promoted within the global scientific community? If not, what could be improved? It would be good if they had more visibility, but I'm also quite pragmatic: we're on a Southern Hemisphere academic cycle, so our academic cycle starts in January and by the time that we're posting our adverts, the postdocs in the Global North are already receiving answers from their applications elsewhere. So, unless we have somebody that very specifically wants to work with us on a particular piece of research that we're doing, if we have a general advert for somebody doing high energy theory, we're likely going to get postdocs who by January or February haven't got a job offer yet. Personally, I've been quite fortunate in that I have gotten some really, really exceptional postdocs because they wanted to do the research that we're doing. And that's where I was going with this; the geography is both good and bad. On one side of the coin; people that come to work on, for example, the neuroscience that we work on, and the people that come to work on the radio astronomy that we work on; they're coming here because it's the best place to do that research. But, since we are far away from other parts of the world, we may lack attraction for other fields. It is true,

though, that in the last few years, we've absorbed a lot of the really talented students coming out of India, for example, especially over the COVID years. We've taken them on as PhD students or postdocs, in part because the competition elsewhere is so high so they are considering more institutions where to apply. I'm hopeful that we can grow this particular network going forward.

Do South Africa's racial dynamics influence access to and participation in the research community, and if so, how? Yes, significantly so. One of the key pillars of government-mandated hiring policy here is redress—essentially affirmative action—to address historical imbalances and increase representation in underrepresented fields. South Africa's social landscape is very different from the rest of the world, and many don't fully grasp its complexities. I'd say it's impossible to really grasp it unless you've lived here for a while.

For example, we have exceptionally talented Black students coming through the system. In the past three years, three of my undergraduates have gone on to Oxford to pursue high-energy physics and mathematical physics. However, many of these students come from low-income, first-generation-University backgrounds. For them, higher education is not just about personal ambition; it's often seen as a path to lifting their families out of economic hardship.

That creates real tension when it comes to postgraduate studies. A brilliant student might earn a BSc in mathematics and physics, and ideally, I'd love to keep them as a graduate student. However, pursuing something as abstract as mathematical physics comes with financial uncertainty—academia isn't known for its lucrative career prospects. Their families, understandably, want financial stability, which often leads them to pivot into fields like actuarial science, engineering, or data science. As a result, recruiting and retaining top talent in theoretical physics in South Africa is particularly challenging.

> **Pursuing something as abstract as mathematical physics comes with financial uncertainty—academia isn't known for its lucrative career prospects.**

That is an aspect that has to do with social privilege, right? And probably in Europe, it is more spread, so if we want to pursue a career in fundamental science now our parents, our families, are happy with that. That's right. You can go into academia and pursue knowledge for knowledge's sake all you want if you have that kind of social privilege. I, for example, didn't. The pressure on me would have been too much had it not been for the fact that my sister wanted to become a doctor, so my parents were happy with one successful child. My mother was adamant that I should go into medicine. Thankfully, my father was much more open-minded and, even though he never really understood what physics was about - he was an accountant - he appreciated that it was something that made me happy. In the end, we compromised, and I would get a doctorate and that'd be fine. I think my mother is still waiting for me to get a real job. But anyway, the point is that these societal pressures are a lot more pronounced in the developing world than they are in Europe and America.

Do students also have difficulties with having to afford University? How do you see this issue evolving in the coming years? Absolutely, they do. In fact, we're currently dealing with student protests over this issue. Access to University is difficult, partly because South Africa lacks the kind of social safety net that exists in much of Europe. Our government also has not made the long-term investment in higher education that's really needed. Its promises often prove unsustainable. Every year, we brace for protests—it's almost a perennial cycle.

> **We don't have the kind of social safety net that Europe does.**

Part of the problem is historical. When apartheid ended, University was positioned as the gateway to a better future. Higher education was seen as the key to economic mobility, and many people believed that success depended on following that path. But the reality is that University isn't the only way to a successful career. There are jobs that University doesn't prepare you for, and I think more people are starting to realize that University education should be about intellectual and personal development and not as just a ticket to employment. Over time, South African universities,

like most of the world really has adopted a more corporate, transactional model. Universities now operate as service providers, with students as paying clients who expect a degree at the end of three years. In my opinion, that's not what University should be. Universities are meant to shape a knowledge economy—but knowledge isn't the only economy.

This shift in thinking has roots in how the education system evolved after apartheid. Under the previous system, trade schools played a significant role, especially for the white Afrikaner minority. If you wanted to be a doctor or scientist, you went to University, but if you wanted a hands-on, practical career in engineering or skilled trades, you went to a trade school, and a job was virtually guaranteed. When apartheid ended, trade schools were devalued — University became the only respected path, and those institutions were hastily converted into universities of technology.

There's a deeply ingrained idea that if you don't have a degree, you don't have value. That's a problem. We need to rethink how we define success—especially in an era shaped by AI and evolving job markets. Society should re-evaluate where and how it attributes worth.

> **One of the key pillars of government-mandated hiring policy is redress—essentially affirmative action—to address historical imbalances and increase representation in underrepresented fields.**

As a founding member of the South African Young Academy of Science (SAYAS), what inspired you to help establish it, and what is its mission? SAYAS is part of a global network of young academics, open to scientists under 42. I "graduated" to the Academy of Science of South Africa two years ago, but during my time in SAYAS, a lot of effort went into defining its mission. The "senior" academy primarily advises the government on policy, whereas SAYAS focused on connecting science with society—what you might call science diplomacy.

One initiative I tried to launch was Breakfast with a Scientist, inspired by a similar Canadian program. In Canada, when parliament was in session, they would bring policymakers together for informal discussions with scientists—not to lobby for funding, but simply to explain the science behind important issues. This had a real impact; for instance, Canada was ahead of many other nations in recognising the seriousness of climate change because their politicians had been engaging with scientists on the subject since the 1990s.

We wanted to replicate this in South Africa. Since parliament is based in Cape Town, it would have been easy to gather key decision-makers for discussions on critical scientific topics. One of our first planned speakers was Professor Valerie Mizrahi, one of the world's foremost experts on tuberculosis, with the idea of broadening the conversation to infectious diseases and pandemics. Unfortunately, in 2010, just as we were about to launch, our main funder pulled out at the last minute, so the project never got off the ground. That said, together with UCT's Director of Research, Dr Linda Mtwisha, I am now working to revive the idea in a different form. The need for better science communication in policymaking hasn't changed; if anything, since COVID, it is more critical than ever.

> **SAYAS focused on connecting science with society—what you might call science diplomacy [···]**

Gender and diversity in research

Do you think there is a fair access to research in the full University, both for men and women, and for other minorities? Yes, I think there is. I think we've made huge strides in the last 10 years. But in terms of gender equality, some fields are further down the line than others, obviously. As you well know, physics is one of the least balanced.

And it's not because one set of people are more smart than another set of people. I think that it's that people just feel differently about it; there are many variables that come into play. Sometimes, you feel that you can contribute much more in an area than another. If I'm honest, if I could go back, I would probably go into systems biology... it's like the wild west of science. The set of interesting questions that you can ask just seems endless. You can ask everyday questions, and you realise that on a fundamental level, we don't even know the answers to things like "If plants are optimised to capture light from the sun, why are leaves green

and not black?!". Everybody will say photosynthesis, but the actual physical mechanisms underlying photosynthesis, we've only started to unpack in the last five years or so. So that's really something! And it's not an issue of how smart someone is–it comes with experience and maturity that you realise you can make yourself happier and be more fulfilled in a slightly different field. Maybe I don't need to quantise gravity anymore.

But unfortunately, it takes a career spent asking fundamental questions about the universe to understand that there are fundamental questions everywhere around us. Yes, I agree. I think that what motivates you is really important. In fact, when students come to me and say that they want to do String Theory, I first ask them to read Peter Woit's book or Lee Smolin's book first. If they still want to do String Theory after they've read these counter narratives, then fine. But my view is that whatever you go into, you should go into with eyes wide open. We're living through a remarkable time where the nature of science is changing completely. I think the old ideas of what science is and what scientists are, are no longer valid.

You mentioned that the University had these huge strides in terms of diversity and gender. Do you know which kind of measures worked in making such progress? Yes, I think brute force, actually. By law and policy, we are required to consider demographics in hiring decisions. In a way, it's something we are compelled to do.

Were people unhappy about these quotas? Yes and no. The point is that the government is trying to get the microcosm of the University to reflect the society that it finds itself in, in terms of the numbers. But of course, like I said, in some fields, the pool is bigger than others. My wife is an astrophysicist at UCT as well. She does a lot of outreach and mentoring of young women that want to go into mathematics or physics, and for example one of the young women high school students that applied to the University this year and got really good grades was not successful, initially. This was a young, black woman who wants to study physics, with something like 90% for math in high school and with the full support of her family! To say that she is rare is an understatement. It's so competitive to get into the University that only after lots of appeals, she eventually did get in, but to engineering, her second choice. So, there's a lot of work to be done still.

We're living through a remarkable time where the nature of science is changing completely. I think the old ideas of what science is and what scientists are, are no longer valid.

Do you think that the choice of these affirmative actions can be done solely by the University? Or is government involvement essential for meaningful change? I don't honestly know. I think you're not going to be able to implement those kinds of constraints unless they come from the government. If you let the Universities to evolve by themselves, they would tend to evolve "meritocratically". There are pressures from inside the University, and there are people that feel like change is needed from within the University. The compromise that comes out is often to implement specific hirings, provided they're the best in the field. The societal demands are really quite non-trivial.

Meritocracy requires fair access to resources, right? Otherwise, it's still a privileged meritocracy. Correct, getting that equal access is the difficult aspect to it. And going back to my previous point, a University is an environment that requires a specific attitude, which is not granted upon access to it. Everybody should have equal access to jobs that they want to do in the world.

Building a happy research group

Earlier, you mentioned the importance of cultivating a positive research environment. How do you approach this challenge? When I returned from the U.S. and started building my own research group, I wanted to be deliberate about the kind of environment I created. In academia, we often advise students based on our own experiences—either replicating what we went through or the polar opposite. So, unless you consciously decide to do things differently, there is a danger of falling into patterns. On the whole,

I believe academia does a poor job preparing students for the realities of an academic career, where if you're lucky, research is just about one third of the job. Young faculty often reach senior positions without fully understanding how Universities function—how decisions are made, how funding works, or the role of different committees. I didn't fully grasp this either until COVID, when as the then Deputy Dean of the Science Faculty, I was involved in shutting down and then reopening the University. Suddenly, I saw the sheer number of moving parts required to make the system work.

My own experiences as a student have definitely shaped my approach to my own students. My master's supervision was difficult—I didn't really get along with my advisor which made for a difficult few years. In contrast, my PhD was an amazing experience. I had two advisors, George Ellis (UCT) and Philip Candelas (Oxford), who recognised that I worked best independently. They gave me freedom, stepping in only when needed, which worked well for me. That was the model I wanted to follow when building my group. To me, the key to a good research group is fostering a happy, collaborative environment. Of course, you can't make everyone happy all the time, but you can create a structure that supports them. In my lab, offices are arranged around a central open space, and the rule is that doors stay open when people are around. This encourages spontaneous discussions—one of my students might walk in, write something on the board, and we'd quickly brainstorm ideas. The lab itself is self-sufficient, with our own coffee machine, printer, and blackboards, ensuring we have everything we need without being overly dependent on the department. I also insist on weekly group meetings, where everyone gives a five-minute update on their work. This has been invaluable, especially over the past year as my administrative load has mushroomed in the University leadership—someone struggling with a problem might find that another student has already tackled something similar. These small interactions build a strong research culture.

I also insist on weekly group meetings, where everyone gives a five-minute update on their work. [· · ·] These small interactions build a strong research culture.

A lot of my thinking on this has been shaped by Michael Nielsen's book *Reinventing Discovery*, which discusses how science is moving away from the lone-genius model to more networked collaboration. That's the kind of group I want to create—one where students not only do good research but also learn from each other and develop as scientists.

Some data about AIMS

3497

total alumni

46

African countries

35%

of alumni are women

Alumni work sectors in 2022:

37%	23%	2%
academia	industry	government

Teaching staff at AIMS Rwanda in 2022:

23	from	17
lecturers		countries
13	with	30%
tutors		women

Data compiled from: nexteinstein.org and aims.ac.rw.

AIMS
African Institute for Mathematical Sciences

The African Institute for Mathematical Sciences (AIMS) is a pan-African network of research and education. With centers in South Africa (Cape Town), Rwanda (Kigali), Ghana (Accra), Cameroon (Limbe) and Senegal (Mbour-Thies), it attracts students from all over Africa. AIMS delivers Master degrees in Mathematical Sciences. The tuition, study materials and housing are fully funded through scholarships. With blocks of two different courses every three weeks, accompanied by weekly exams and homework assignments, it is a very intensive and high-level program. The teaching staff is made of visiting lecturers from all over the world, who typically stay for one block of lectures, and teaching assistants (tutors) who stay all year. With over 70% of the alumni staying on the African continent, AIMS centers enable Africa's students to become innovators driving the continent's scientific, educational and economic self-sufficiency.

An interview with Dr. Eunice Gandote

Could you present yourself and your journey as a physicist? My name is Eunice Gandote, I'm from Benin. I did my undergraduate studies at the University of Abomey-Calavi in Benin where I started with physics and chemistry and got my bachelor's degree in physics. Right after that, I did two years of teaching in high school in Benin. During that time I heard about AIMS (African Institute of Mathematical Sciences[1]) and applied. I got selected in the AIMS center in Ghana to do a master's degree in mathematical sciences. I followed the electromagnetism lectures of Prof. Robert de Mello Koch from the University of the Witwatersrand (South-Africa). He was very impressed by how I performed in his course and he offered me the opportunity to continue in high energy physics in his university.

> **[When I realised there were so few women lecturers in Benin], I just decided that I have to become a doctor and come back and teach in my country.**

So, right after AIMS Ghana, I went to South Africa to do another one-year research master's program in his field. I did my master thesis with Prof. de Mello Koch and then started a PhD with him. We used resurgence theory and AdS/CFT to study non-perturbative aspects of string theory. I also worked on quantum error correction in holography and scrambling in Yang-Mills theory. Just after I completed my PhD in 2022, I came to AIMS Rwanda as a teaching assistant. I've been working here since then.

What were your motivations to study science and become a lecturer? When I chose physics and mathematics at the university, people were telling me "you are not going to pass, you will just fail every year". I got scared, and I would have gone into geography if my Dad had not convinced me that, with a baccalauréat [*high school diploma, ed.*] in science, I should study science. When I started university in Benin, I noticed that almost all lecturers were men, less than 1% of the lecturers were ladies. I asked the university why there are so few ladies in science, and they told me that mathematics and physics are very hard fields and people are running away from them. At that time I just decided that if it is like that, I have to become a doctor and come back and teach in my country.

About AIMS

Could you introduce AIMS and its mission? AIMS consists out of five centers, in Ghana, Rwanda, South Africa, Cameroon and Senegal. It offers 10 months long master programs in various mathematical sciences and welcomes students from different backgrounds: physics, mathematics, economy, actuarial sciences, computer sciences... This year in Rwanda we have three programs. One regular program, one specialized on Malaria Modeling (MaMod) and one on Mathematical Epidemiology (MathEpi). We have 75 students, among which 45 follow the regular program. All students receive a scholarship that covers everything: AIMS takes care of food and accommodation, they pay for every fees. AIMS is also supporting the teaching assistants, that we call tutors: the institute pays for their accommodation, they are all living together in a house.

The program is made of three phases: *skill phase* (three months) during which students have to attend all the courses, *review phase* (six months) where the

[1] https://nexteinstein.org/

students choose the courses they want to follow, and the last phase is what we call *essay phase*, where students have to write a dissertation on a topic of their choices with a supervisor. The skill and review phases are made of lecture blocks of three weeks. The students have to submit an assignment for each lecture every week on Saturday midnight, in addition to two small quizzes during the first two weeks and one long exam at the end each block. The lecturers come from across the world, and we tutors are here to help them to organize the tutorials and mark students quizzes and assignments. The curriculum here is very different compared to other countries. The particularity at AIMS is that students have to learn how to work under pressure. The program is over a very short time. They learn how to collaborate to solve the assignment, which have to submit in LaTeX. They also have opportunities to collaborate with many different lecturers. That's how they can get jobs and PhD everywhere. There is also something called AIMS chat, where alumni from AIMS share job opportunities.

How are the students selected and what are their background? Since the center is in Rwanda, we have 50% of Rwandans, and the other 50% are from other countries in Africa. This year, we have students from 18 different countries in Africa, like Mozambique, Benin, Madagascar... AIMS also considers gender equality and gender inclusion. We have to select 50% of ladies if they are enough candidates. This year we have 40% of female students at AIMS Rwanda. We tutors are the ones who interview the candidates. They have to apply around March with their CV and bachelor degree certificate. We review those things, we then interview them by asking some questions. At the beginning of the interview, we ask them what is their background, if they say it is physics, we ask physics questions, when it's math, we ask math questions. We are in groups of three people at least, to have different backgrounds and be able to ask questions related to the students backgrounds.

How do students choose which center they apply to? There is no specialization, they choose their center according to their preferences. For example, as a student I chose AIMS Ghana, because I wanted to learn English. I studied in French in Benin and did not know any English before AIMS. That's why I didn't choose Senegal or Cameroon, where they teach in French and English.

> **This year we have 40% of female students at AIMS Rwanda.**

Would you say it's easier to study abroad after completing a Master's degree at AIMS? It's a lot easier for AIMS students to study outside Africa because they are collaborating with lecturers from across the world. They have opportunities to discuss with them and when they have opportunities, the lecturer can offer them a position. That's exactly what happened to me.

Do you know of any other initiatives like AIMS that try to give more opportunities to african students? There is an ICTP programme in Rwanda, which is similar to the one at AIMS, maybe more physics focused. There is also in Rwanda a campus of the Carnegie Mellon University, mostly about AI and machine learning.

Women and science in Africa

How would you compare the gender balance in the different countries and universities that you studied and worked in? In Benin we were very few women at university. In the first year in mathematics and physics, we were about 400 students, but only eight ladies. Eight, we knew each other, whereas male students could not. Then in third year, we were three in physics and four in chemistry. It was also bad in South-Africa, though not as bad as in Benin. We were for example six male students and two ladies working with my supervisor. The other woman was from Sudan. The imbalance was worse in physics than in engineering for example, and there are a lot of ladies in medical sciences. That's maybe because when you choose math or physics, you're being told that you will become a lecturer, and there is no money in teaching. So students prefer to do medical sciences as there is more money there. At AIMS there are few women lecturer. This year there will be only one. Among tutors, we are two women and seven men, but it fluctuates a lot. Last year we were six female tutors.

> **In the first year in mathematics and physics, we were about 400 students, but only eight ladies.**

What were the main difficulties you faced as a female scientist? Their are too many barriers for women. Ladies have to combine many things together: research, family issues, pressure from society. I don't know about outside Africa, but in Africa when you are a lady and study till you get a PhD, men run away from you because they say you are so smart you won't respect them. Ladies are scared to continue in their study, and to do research. Especially in a field like theoretical high energy physics, which needs lots of time and concentration. As a mother it's very difficult to concentrate more on your research while having to deal with your kids and family issues. I succeeded in my master's and doctoral studies thanks to the support I received. Without this support, I could not have continued my studies, because I wanted to combine marriage and studies. This was not easy at all. In research you have to go from one country to the other, you have to move your child from different schools in different countries. It is very hard, but I did not have any choice as a researcher. It is a lot easier for men to travel in different countries while the children stay home. As a women it is harder, because you are in charge of the education.

> **In Africa when you are a lady and study till you get a PhD, men run away from you because they say you are so smart you won't respect them.**

At AIMS, they understand that as a mother, you have other issues. They allow me to leave the office earlier than my colleagues who don't have kids. It's better compared to my time during the PhD. I've been freer since I started working as a teaching assistant. AIMS was also supporting with the accommodation. I could not live with the other tutors since I came with my family, so they rent a house for us. The tutors are also supportive, we divide the work depending on each others duties and availability. AIMS allowed me to stay for three years, whereas tutor positions are typically restricted to two years to give the opportunity to teach at AIMS to everyone.

What do you think would help in making the field of science on the African continent more gender diverse? I think mentoring programs are very useful. I think it's a great idea to promote the inclusion of women in science, because there are many many smart female students who can contribute to the development of science, so why not motivating them to continue in their study? As I mentioned, lots of people demotivate girls to study sciences by telling them it's too hard and that it leads to very few opportunities other than lecturer. Girls give up because of these people. Programs in high schools to educate about science and motivate the girls are very useful. When I was studying in Benin, there was a female lecturer who had such a program. She selected female students in the math and physics departments and we were going to high schools to meet the girls, tell them about science, explain the advantages and disadvantages to them, and motivate them. They have a similar mentoring program at AIMS Ghana that they call "Girls in Mathematical Sciences Program."[2] They are mentoring girls in high schools to motivate them to pursue STEM careers and they offer the mentees to join AIMS at the end of their bachelor's degree. I took part in that program: I used to meet my mentee regularly online, and motivate her to continue in science and tell her about opportunities for women in science. I think those initiatives really help.

[2] https://aims.edu.gh/event/girls-in-mathematical-sciences-program-cohort-3-residential-session/

Rubrique

In Memoriam Senamile Masango (1987–2025)

Senamile Masango, a pioneering South African nuclear physicist and advocate for women in STEM, passed away earlier this year. Founder of the Senamile Masango Foundation and committed to the UN Sustainable Development Goals, she dedicated her career to making science a force for inclusion and opportunity in Africa.

In 2017, she was the only woman in an African-led team conducting an experiment at CERN's ISOLDE facility, and later earned her MSc cum laude in nuclear physics from the University of the Western Cape. She was named one of the 50 Global Inspirational Women of 2020, a finalist for the Women in Tech Global Awards in 2021, and received the International Women in Science Award in 2022.

As the founder of the Senamile Masango Foundation, she worked to expand access to science, education, and opportunity across Africa, with a particular focus on empowering women and girls through STEM engagement and community-based initiatives. She also served as a mentor and public speaker, consistently advocating for greater visibility of African women in science and encouraging young girls to pursue careers in research, technology, and leadership.

Tribute from CERN Alumni: link.

In Memoriam Mary K. Gaillard (1938–2025)

Mary K. Gaillard, pioneering theoretical physicist and Professor Emeritus at UC Berkeley, passed away on 23 May 2025 at the age of 86. In 1981, she became the first woman appointed to the Physics faculty at Berkeley, while also serving as a senior staff member at Lawrence Berkeley National Laboratory, where she later led the Particle Theory Group.

Her work played a foundational role in the development of the Standard Model, with landmark contributions including predictions of the charm quark mass, three-jet events, and the bottom quark mass. She received the E.O. Lawrence Award and the J.J. Sakurai Prize, and was elected to the American Academy of Arts and Sciences, the National Academy of Sciences, and the American Philosophical Society.

Gaillard also contributed to advancing the presence of women in theoretical physics, both through her scientific visibility and her engagement with the structural barriers faced by women in the field. She told her own story in a memoir, "A Singularly Unfeminine Profession" (2015), which reflects on her scientific career and the institutional challenges she faced.

A dedicated article on her work and her contributions to gender equity in theoretical physics will appear in the next issue of this newsletter.

Memorial tribute from UC Berkeley: link.

ENS de Lyon introduces menstrual leave for students and staff

ENS de Lyon has announced the introduction of menstrual leave for all female students and employees, becoming one of the first higher education institutions in France to adopt such a policy. This initiative recognizes menstruation as a legitimate health concern and aims to reduce the stigma and inequality often associated with it in academic and professional settings. The new policy is part of a broader institutional effort to improve gender equity, alongside recent measures such as the launch of the Cécile DeWitt-Morette scholarships to support women in Mathematics and Computer Science.

More details (in French) here.

France launches national 'Girls and Maths' plan

The French government has unveiled a new national initiative, 'Filles et Maths', aimed at ensuring young girls take their rightful place in STEM careers. The plan rests on three pillars: (1) training and awareness for education professionals, including sessions on gender bias for primary and secondary mathematics teachers; (2) increased female participation in academic pathways leading to STEM, with targets such as 30% female students in 'classes préparatoires' by 2030, and similar targets for newly recruited lecturers; and (3) inspiring vocations through school visits by female role models in STEM.

Full plan (in French): link.

Webinar mentoring program 'Harassment in academia'

On May 19th 2025, the String mentoring program held a webinar titled "Harassment in Academia: How It Is Handled at the Institutional Level" as part of ongoing efforts to support awareness and action around equity, diversity, and inclusion in the HEP–TH community.

The session opened with practical guidance on how mentors can respond when a mentee raises concerns about harassment or inappropriate behavior. This was followed by a focused presentation on institutional procedures, using CERN as a case study. Speakers Marie-Luce Falipou (CERN Ombudsperson) and Myriam Ayass (CERN HSE, legal advisor on the harassment investigation panel) shared insights into CERN's internal mechanisms and legal frameworks for handling such cases.

For more information on the Diversity & Inclusion Programme at CERN link.

New scholarship program at ENS de Lyon to support equity in STEM

ENS de Lyon has launched the Cécile DeWitt-Morette scholarship programme to support gender equity in its Mathematics and Computer Science departments. The programme offers 12,000 EUR per year for four years to all female students entering the first year of these disciplines via academic application. This funding helps bridge the gap between trainee civil servants, who receive a stipend, and traditional students, who do not, thereby removing a financial barrier that may deter women from pursuing advanced scientific training.

More information: here.

The Newsletter Team

This issue of the GenHET Newsletter has been produced and edited by Saskia Demulder, Camille Eloy, Alessandra Gnecchi and Valdo Tatitscheff. We took over after the amazing work of Alejandra Castro and Elli Pomoni, who curated the first issues in 2020. We aim at publishing three issues per year.
We welcome suggestions for articles, interviews or announcements at genhet.newsletter@gmail.com. Don't hesitate to get in touch if you would like to become an editor.