

# Shooting for the moon: the motivation and mindset of Marc Klein Wolt

***“I believe there is or must be an explanation to everything – we are able to understand everything”***

***“Once I set myself a goal, I’m very dedicated and will do everything in my abilities to achieve it.”*** Radboud University astronomer Marc Klein Wolt boasts an impressive track record of aerospace achievements: from putting a telescope behind the moon to his involvement with the first ever picture of a black hole. How does he do it? And why? What’s pulling him towards the limits of what we know, pushing him to make the most of his potential? Before he takes off to Namibia - where he’s working on a telescope for the Event Horizon Telescope - we meet Marc at his office in the astronomy department of Nijmegen’s Radboud University, where we get a glimpse inside the mind of a rockstar scientist.

***Why are you building a telescope in Namibia?***

“We’re working on another telescope for the Event Horizon Telescope, where astronomers and scientists are building and connecting telescopes from all over the world to take pictures of black holes. So far, we’ve been able to take pictures of not just one, but two black holes – one in our own galaxy, the Milky Way, and one in a more distant galaxy. This is awesome, because now we have tangible proof that black holes actually exist. Not only do we have a theory or a prediction, but we have actual

footage, we’ve got data: we have proven Einstein right. Now we want to learn more about them. In order to do so, we need more telescopes, one of which will be in Namibia.”

***What do you hope to learn?***

“What we’re especially interested in, and hoping to see, is how matter moves around a black hole. The images we currently have are comparable to pictures on a regular camera: they’re a snapshot, showing us what a black hole looks like at a certain point or moment in time. What we’re trying to do right now, can be compared to taking a picture with a longer shutter speed. New telescopes, like the one in Namibia, allow us to make longer observations and to integrate these pictures, maybe even into a movie. Can you imagine seeing a black hole move? These movies will help us understand the theory of black holes, better than ever before.

***And why’s that so important – understanding a black hole?***

“Because, the way I see it, black holes are ‘the place to be’ for physics and astronomy, maybe even for science in general. They’re one of the biggest mysteries in our universe, a place where the force of nature occurring on the largest of scales – like gravitational theory – is combined with that of the smallest – quantum mechanics. By studying black holes, we’re studying the fundamentals of our world. Through theories, like the string theory, we have an idea about the way nature works, and we can make assumptions and predictions. But





Night sky at Namibia, with clear sight of the Milky Way

we won't know if any of that is true until we have proof. We need these pictures and movies of a black hole to verify whether our theory is correct, which allows to get a better and clearer image of our world – and maybe understand ourselves a bit better, too."

**Do you think we'll eventually be able to understand everything?**

"Yes, I do. Some people believe in God. I believe that there must be a logical explanation to everything. Why should we accept a limit to what we can understand or know? I want to understand everything. I want to understand why we see things the way we see them, why they work the way they do. I want to understand more about nature, physics, and the world around us. I truly believe that, if we want to fully comprehend our universe, we need to keep pushing the boundaries of our knowledge and technology. That's what science is all about to me – it's an important reason for me to do what I do."

**How do you manage – trying to understand everything for a living?**

"It's all about dedication for me. I want to challenge myself, set a goal and then go for it. And once I do, I dedicate almost my life to it, and I'll do everything I can to achieve it. Achieving a goal is one of the most beautiful

things there is to me. I believe that's my sweet spot, where I feel like I'm making the most of myself and my abilities. And once I've achieved something, I'll remain involved in some way, but I also always feel like moving on to the next: to set a new goal and create something new. This way of working fulfills me with so much energy - and being able to share that energy with others is what makes it all worth to me."

**So, you're always on the go, moving from one milestone to the next, creating new things. Do you ever take a break?**

"A couple of years ago, I was pretty much forced to stop. I was working in a more corporate setting and not enjoying myself, so I set myself a goal: I wanted to get into aerospace engineering and work on a mission to the moon. And then that mission actually happened and we succeeded. Not just that, because shortly after, my team was also involved in taking the first ever picture of a black hole – which is like Nobel Prize level science. So I was checking a lot of my top boxes there. This had me wondering: what's next? I had to take a moment to stop and think, not just as a professional or innovator, but also as a person: who am I and where do I want to go next?"

**How did you figure that out?**

"I was asked to lead a couple of big projects at the Radboud University, such as setting up their Radboud Radio Lab together with Heino Falcke, where I also got the responsibility of managing and leading a group of people. This came with a set of new challenges, like maintaining my position in the academical hierarchy or learning how to present myself and fit into the role of director – which I didn't know how to do. I sat at the table with company boards and aerospace leaders worldwide, and they saw me as the director of an important research institute, but I didn't feel like I was. It suddenly hit me that the person I thought I was, no longer matched who I was becoming or the way I appeared to the outside world."

**Who did you feel like you were?**

"To be completely honest, I still felt a bit like 'Marc, the boy from Enschede.' I was always a bit of a dreamer, but never really the smartest kid in school. I had to put in a lot of work to pass my exams and make it to

the next grade. And although things started to get better in high school and I eventually developed an interest for astronomy, that mindset and some of the insecurity it came with – stayed on me. That's why it took me a while to understand and discover that I have something to bring to the table, too."

**So, what is it that Marc Klein Wolt brings to the table?**

"When I was studying astrophysics at the University of Amsterdam, I learned that I was never going to be 'the best scientist,' but that I do recognise what's needed to make something work, to realise it, and then actually go through with it. I believe this also has a lot to do with my social skills: I almost naturally know how to pick the people that seem fit for the job, bring them together, motivate them and spark that fire within. That's how I create, and I also think that is what I'm good at - and it certainly is what I love doing the most."

**What do you love about it so much?**

"I want to make people shine. By motivating people and empowering them to do the things they do best, you can make somebody shine. I've learned that, if you do so, things start to flow naturally, almost by themselves. As an example, I never have to remind anybody about any upcoming deadlines. My team is often done before we reach a deadline, because we all feel that we're doing this together and we all have the same goal in mind. And while doing so, everybody is recognised for who they are and for their skills, they own something and feel responsible. I believe that's where you can make the difference, and really make somebody shine."

**And what is making you shine?**

"Namibia. Something about that country just got under my skin. It's a combination of untouched, raw nature and warm-hearted and kind people – it's truly unique. And when I'm in Namibia I can talk to children in primary schools and high schools, university students and the vice president of the country - all in the same day! Being able to do so, and witnessing the impact and meaning of our work to their community means a lot to me. We're not just building a telescope there: we're also supporting them in their aerospace journey and to share our love for aerospace and science with them."

"This is truly one of the greatest gifts I've ever experienced, during both my career and my life. I can't wait to go over there again next week."

**How taking a picture of a black hole works – in a nutshell**



In the Event Horizon Telescope (EHT), scientists and astronomers from all over the world work together to learn more about black holes and the way they behave. From what we now know, a black hole is a position in space where the gravitational pull happens to be so strong that not even light can escape it – most likely when a star dies, it turns into a supernova and then collapses under its own gravity. Good luck taking a picture, you might say, since light is quite critical when taking a picture. However, theory predicted that a black hole should have an horizon beyond which we should be able to see the light which matter emits, just before it "falls" over the horizon and is lost forever. Through the Event Horizon Telescope, connecting multiple telescopes worldwide, scientists were already able to successfully take images of that matter for the very first time clearly showing the presence of the black hole horizon.

*Would you like to dive into this matter (pun intended) just a little deeper? Ask Einstein – who already predicted the existence of black holes with his theory of general relativity – or have a look at the EHT website:*

**[eventhorizontelescope.org](http://eventhorizontelescope.org)**