



Visions of beating gravity

Jacob Mulder is driven by great questions and great challenges. One of his personal challenges is to alleviate the current and future pain in his back, which is the result of scoliosis (an abnormal curvature of the spine). The source of his problem is gravity. The solution - Space. Jacob plans to take up residence in a space colony within 15 years so that he can continue to work and live a 'normal' life. Time will tell whether his plans are a naïve dream or a life-changing possibility.



Jacob Mulder
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Like many people, I have a full and busy life, and I appreciate the opportunities and challenges all the different elements of my life bring. I work as a Security & Enterprise Architect for CGI, I volunteer and I'm an Asgardia Member of Parliament (AMP). I also run a private consultancy firm, Mulder Advies en Dienstverlening (Mulder Advice and Consulting), abbreviated as 'MAD'.

But beyond this I have always been driven by bigger questions. Questions like how did the universe start? What are space, time and energy? Is gravity an emerging phenomenon? How do clusters of galaxies evolve? Does a black hole have an edge? Questions like these led me to study astronomy and computer science at

Groningen University in the Netherlands some 35 years ago.

I joined Logica, now CGI, which offers business consulting and IT services for enterprises on a national and international level, delivering on projects such as large automation systems for international gas companies with their worldwide pipelines, hospitals where nothing can be allowed to go wrong in the automation, and ATM systems processing 1000 transactions per second. As someone who loves a challenge, I felt right at home with these grand projects.

As my choice of company acronym illustrates, I believe challenge should always be a bit crazy – a bit 'MAD'. Preferably also a bit against the flow. Only then can life shine.

Physical challenges

When I was eleven my body grew too fast. The result: a curvature in my spine of some 45 degrees. At the time, the options were fixation with a metal rod or a wheelchair. I refused to accept either, so I went looking for a third solution. I discovered that a new kind of orthopaedic corset had just been invented. That helped and my situation improved, but as the years passed my back got worse and in 2014, I got a second spinal disc hernia. It was fixed, but after that I could no longer walk properly. After two minutes of walking, I can't use my left leg anymore, because the nerves to it get squeezed in my spine. I have the same problem when I sit up straight.

So I'm now in a very advanced wheelchair, leaning far backwards, almost lying, but the seat is curved in such a way that I can still look straight ahead. I also drive my own 'Star Trek'-style car and that combination allows me to continue to work at CGI and to do my volunteer work.

Overcoming gravity

The problems in my back are actually caused by gravity. When I sit or walk upright, the nerves in my back are squeezed by gravity. Not only is it painful, but pretty quickly my legs stop working. Together with the Groningen University Hospital and students from the Hanze University of Applied Sciences, I developed a chair with a sort of lifting facility in the backrest, on which a corset could be hooked up.

The idea of hanging from your chest instead of sitting seemed a good one – for the first 20 seconds. Then I discovered that my lungs were so compressed that I couldn't breathe anymore. Oops! Another option to get rid of gravity is swimming. When floating in water, you experience a certain degree of weightlessness. However, this solution is not very convenient for my work, because a laptop and water don't mix very well. And this is how the weightlessness of space comes into the picture.

Conveniently, CGI has an aerospace branch, so I'm now trying to convince management to initiate partnerships with the major commercial



▲ The author at work in his specially adapted wheelchair.

space companies like SpaceX, Virgin Galactic and Blue Origin. A weightless environment would be perfect for me to live and work in, and before too long it will become a necessity because the situation with my back will slowly degrade in the coming 15 years.

What I envision are large space colonies in enormous revolving cylinders containing an entire infrastructure of apartments, hotels, logistics and so on (this general idea, first proposed in the 1970s, is known as an O'Neill cylinder). There is no gravity at the axis of such a giant cylinder.

▼ Presenting at Asgardia's first Space Science and Investment Congress in Darmstadt, Germany in October 2019.



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So that is where my 'office' will be, so that I can work without being bothered by my disability. My bed, on the other hand, will be against the wall of the rotating cylinder, where the artificial gravity created by the centrifugal force prevents insomnia and weakening of muscles and bones.

Mission

My mission is clear. I want to bring people, organisations and companies into contact with each other to continue working on my dream – creating space colonies with both weightlessness and artificial gravity – that will create the environment where I (and others with gravity-affecting conditions) can continue to do the things I like to do, that is, actively investigate things that intrigue me.

In October 2019, I attended Asgardia's first Space Science and Investment Congress in Darmstadt, Germany. That conference was about paving the way to living in space. During the last afternoon of the conference, I gave a presentation entitled 'Sustainable Space Colony Swarm Architecture' (see: MADmelange.Space/Asgardia). At the end I

explained to the audience that I have a problem with gravity. I challenged the audience to help me to 'emigrate' to space in 15 years.

At that moment it became quiet and I could see them thinking: "Excuse me?" But after that first reaction, people started mumbling and reacting – well, yes, it could possibly happen, given the speed of developments and, eventually, I received a big round of applause. From that conference I've obtained many contacts and now I am trying to link the space branch of CGI to commercial space organisations and, in parallel, I'm active in Asgardia's Parliament to make my dream come true and inspire others to join me.

See you in space?

My current home is a 100-year-old farmhouse in Niebert, a tiny village near Groningen in the Netherlands. In some 15 years, I plan to live and work in a high-tech space colony. One thing is certain, the future is uncertain. But another thing is also certain: the sky is absolutely no limit! ■

About the author

Jacob Mulder is an IT Security & Enterprise Architect at CGI and he also runs a private consultancy firm, MADmelange. Jacob has an MSc in Astronomy with Information Technology from the University of Groningen, the Netherlands. He is chair of a partnership of some 70 independent small-scale healthcare companies and related service providers in Northern Netherlands, and a Member of Parliament for Asgardia.

► Working in a weightless environment has benefits if your disability is compounded by gravity.

