

## News Archive Space 2009

### From apprentice with a distinctive profile to mechanical technician: Stefan Ratke

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This is part seven of the DLR Web Portal portrait series.

By Marco Trovatiello



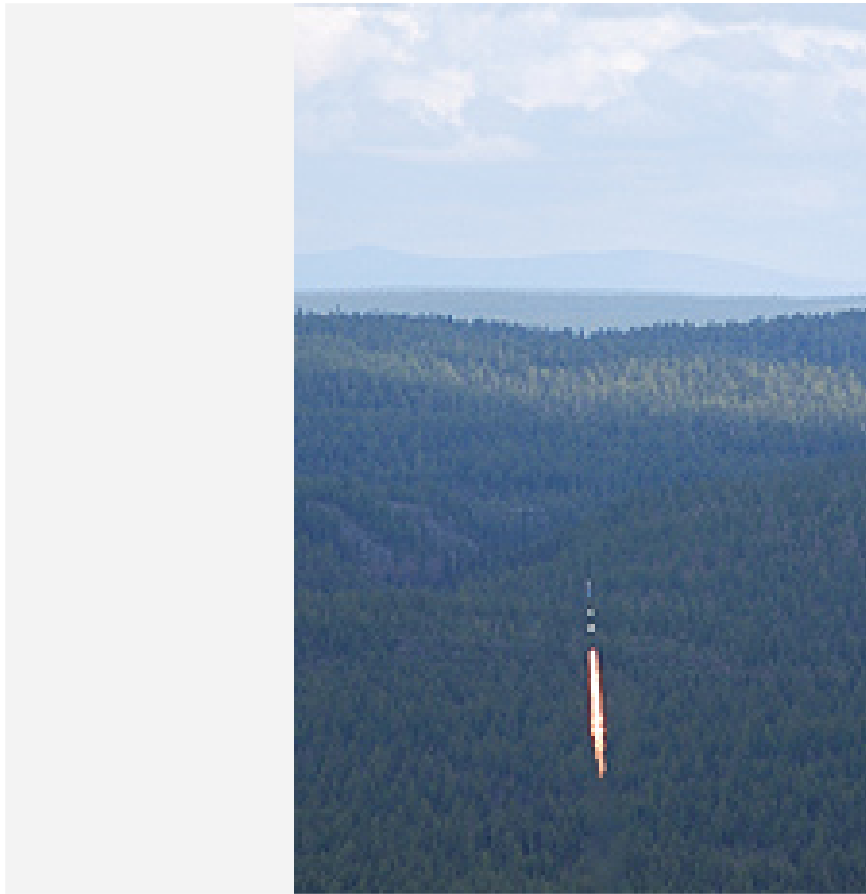
Stefan Ratke

I find myself sitting opposite a nice guy: Stefan Ratke and I are meeting for our first discussion on a sunny day in April in the brand-new training centre at the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) in Cologne. Stefan is 25 years old and a third (and final) year apprentice mechanical technician, specialising in precision toolmaking.

One would expect Stefan to be quite nervous with his final examination fast approaching – manufacturing of a final test item and swotting-up on theory are both pending. In spite of this, he appears very relaxed and patiently answers my questions. What brought him to DLR, and to his apprenticeship at DLR? He became aware of the wide range of training courses on offer at DLR by way of a newspaper advertisement. "In the first instance, it was important to me to succeed in getting a training position", says Stefan and adds, "The fact that I managed to get one at DLR was, of course, fantastic."

#### **Mechanical technician at DLR: "That is really something special"**

Apparently, what is special about a mechanical technician apprenticeship at DLR, compared to one in industry, is that you can develop yourself and try things out. "We are left alone at first and not placed in full-time production the moment we have learnt how to make the first simple items", observes Stefan and adds, "Of course, we also spend time in production, but only after one and a half years, by which time we have some experience." This is clearly an added benefit of the apprenticeships at DLR, as trainer Jörg Hofmann, who has just joined us, also confirms. "With our three trainers, we create a solid basis here in one and a half years for the apprentices' future work in production. Of course they also produce their first parts, for example for our fabrication operations in DLR's Engineering Systems House, during this time", he says.



DLR's Mapheus research rocket

Midway through the second year of training, the training plan provides for what is known as the 'Institute tour'. The apprentices are rotated through the workshops and test benches at the various DLR institutes and they take part in real projects for ten weeks each, often with a direct connection to space missions. "It is really something special. You're not just producing any old pump, but possibly a component that will actually fly into space aboard a rocket", says Stefan. And it is exactly this sense of achievement that Stefan has experienced. During his assignment at DLR's Institute of Materials Physics in Space, he worked on the complete experimental set-up of a prototype for a zero gravity experiment to study the solidification of molten aluminium. Many of the parts he produced flew into space in May 2009 aboard DLR's research rocket, Mapheus-01.

#### **Mars rover wheels and planet drills**

"Our advantage here at DLR is that we have no series production and therefore you are not standing at a machine pressing buttons for a run of one or two thousand pieces – here, we only build prototypes", observes trainer Jörg Hofmann. There is no end of interesting orders – from Mars rover wheels and planet drills to satellite components. "It is actually very hard to say which part of the institute tour is the most interesting. For example, at the Institute of Aerospace Medicine, you are heavily involved in design work, which is pretty exciting. On the other hand, working with special materials such as graphite or aerogel, for example, at the Institute of Materials Physics in Space, has its appeal", says Stefan.

From the topic of space we return to Earthly facts. I want to know how one survives as an apprentice and whether the apprentice wage is OK. After all, Stefan has a family, is married with a young son and, at 25 years of age, is certainly not the youngest of the apprentices – who are, on average, 17 to 19 years old. "Since our collective wage agreement, the TVöD (**T**arif**v**er**t**rag für den **ö**ffent**l**ichen **D**ienst – wage agreement for public service), came into effect, we are now paid on a par with the apprentices outside in industry and it has become more attractive again", says Stefan, who knows what he is talking about – previously he was also chief youth representative. In this responsible role, Stefan became involved with DLR's joint works council and with the working group for job provision for apprentices, working in the interests of the approximately 250 trainees at DLR. In addition to mechanical technicians, DLR trains a total of 21 career fields such as electricians, technical draftsman, photographers and office communication clerks. Many of them know each other, they are well organised and they communicate in regular meetings and committees.



Stefan Ratke and Jörg Hofmann

Our lively discussion now revolves around the question of what happens when the apprenticeship is successfully completed. Stefan grins and his eyes are twinkling. "After the apprenticeship, I of course aim to be taken on as a permanent employee", he says without a moment's hesitation. This chutzpa elicits a smile from trainer Hofmann, who otherwise frowns sternly. "Anything is possible", he says, and adds, "With the right level of performance, an apprentice can become a foreman, or get an additional qualification to become a master technician – everything is covered, from professional training programmes to tertiary study. I did my master technician apprenticeship at DLR, for example, and I then became a trainer."

An average of around 50 per cent of the mechanical technicians who have completed their apprenticeship choose the path of further education and training or switch to private industry. The other 50 per cent are offered positions at DLR and then generally join one of the workshops in DLR's institutes, for example the Institute of Propulsion Technology, the Institute of Materials Physics in Space or the production department of DLR's Engineering Systems House. "Other companies are happy to take on our people", says Jörg Hofmann and alludes to the fact that the quality of the DLR apprenticeship is also highly regarded by others. Therefore, some (ex-) apprentices also find good positions in commerce and industry. However, Hofmann adds, "Based on its current requirements, DLR is clearly training more people than it needs and therefore cannot provide any guarantee in terms of a job offer."

#### **The 'everyday work' of a mechanical technician at DLR: high-precision computer-controlled machines**

The typical workday of a mechanical technician apprentice at DLR is characterised by its obvious real-life relevance. "With up to two days vocational training school per week, the theory is actually only like a supplement", says trainer Hofmann and adds, "We definitely place special emphasis on the practical training, which in many ways is not sufficiently covered these days." But to make sure that no-one is missing out on theory, there is not only the first-class seminar room in the new light-flooded training centre, whose new equipment includes personal computers and a modern presentation system, there is also Hofmann himself: "Of course we also teach theory, work with the apprentices through training material and discuss and solve problems from the vocational training school." In the first training block, a lot is still produced by hand in order to learn the fundamentals, and the training course becomes increasingly technical as it progresses. "These days, not much is still produced by hand, it is all done – accurate to hundredth of a millimetre – by machines", says Stefan. Among other things, the apprentices are thoroughly trained in the use of CNC machines. CNC stands for computerised numerical control; these machines are computer-controlled, working to a high level of precision, and these days have

become indispensable in the everyday work of a mechanical technician. In addition, work in the training centre is quite structured. With 39 hours per week, the day starts at 07:15 and finishes at 16:10; unlike the institutes' workshops, flexitime is no longer used here. There are fixed times for commencing and finishing work as well as fixed break times. "Any other way and it would not be possible for us to make a sensible training plan", says Hofmann.



DLR training centre in Cologne

#### **In retrospect: "apprentices at DLR have more advantages" – and are anything but a cheap source of labour**

Time to look back: Stefan Ratke has now completed three years of training. "How do you feel? Have you found your niche, would you decide to do this apprenticeship again?" I want to know. "Overall I am very satisfied. My father works in the industry, so I was pretty sure of what awaited me", answers Stefan. "I really enjoyed it and I would do it over again the same way", he continues, "Even if, to be honest, you get to know and appreciate the real benefits of the apprenticeship only in the second year of the course. After the first examination was when I clearly realised from the good results obtained by DLR's apprentices that we have real advantages here", says Stefan, with a little bit of pride. His trainer Jörg Hofmann adds, "We take the apprenticeship very seriously here. To us, apprentices are anything but a cheap source of labour."

#### **DLR's new training centre in Cologne**

What's more, the working conditions in the new training workshop are superb. Since August 2008, trainers and apprentices have been working on a variety of extremely modern machines in a bright modern building with high ceilings. "The relocation here was certainly a highlight. Being able to look through this huge bank of windows at all the greenery outside now and again while working is really wonderful", agree Stefan Ratke and Jörg Hofmann. If, previously, the ceilings were low and there were not a lot of machines, today it is exactly the opposite. The newly procured machines in the training workshop are the same ones that the apprentices are tested on.

#### **Later on ...**

I meet Stefan Ratke two months later - satisfied and happy. He has passed his apprenticeship with a good mark and now works as a mechanical technician in the central workshop of DLR's Engineering Systems House in Cologne. An interesting future awaits him – his career has only just begun.

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