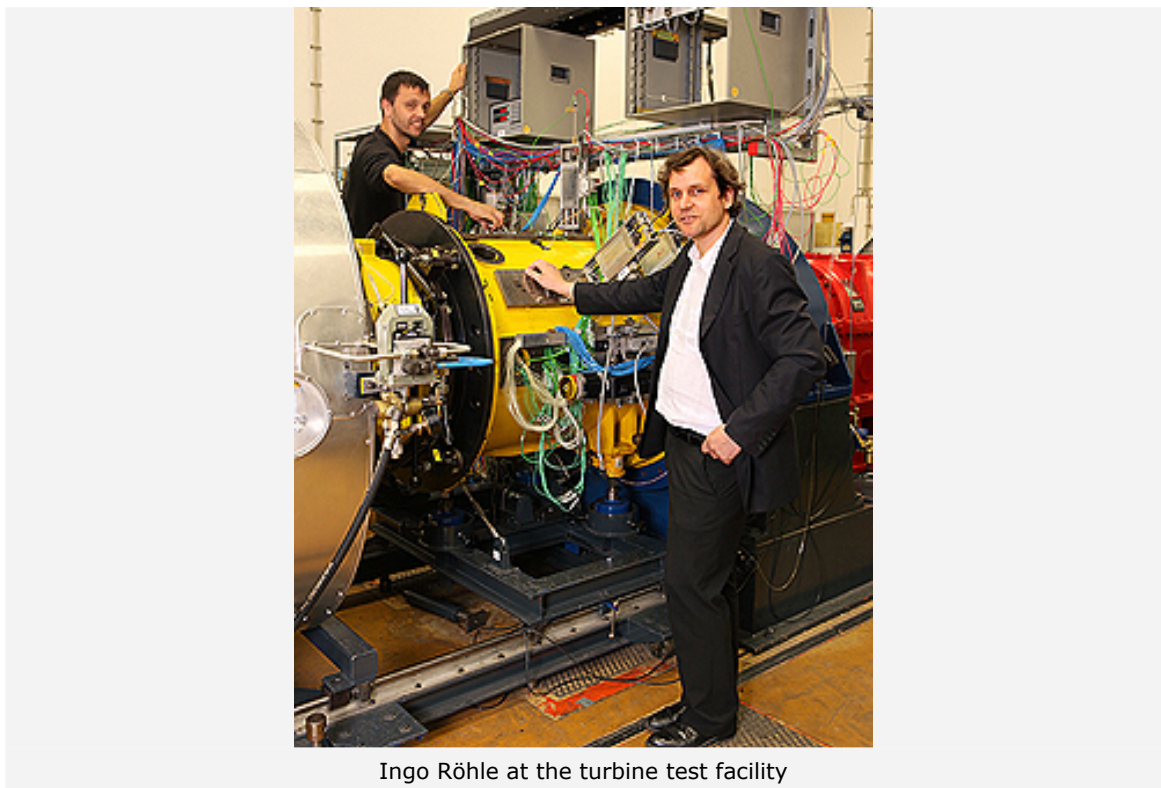


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A breath of fresh air in the Turbine Department at DLR Göttingen: Ingo Röhle

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Ingo Röhle at the turbine test facility

By Andrea Schaub

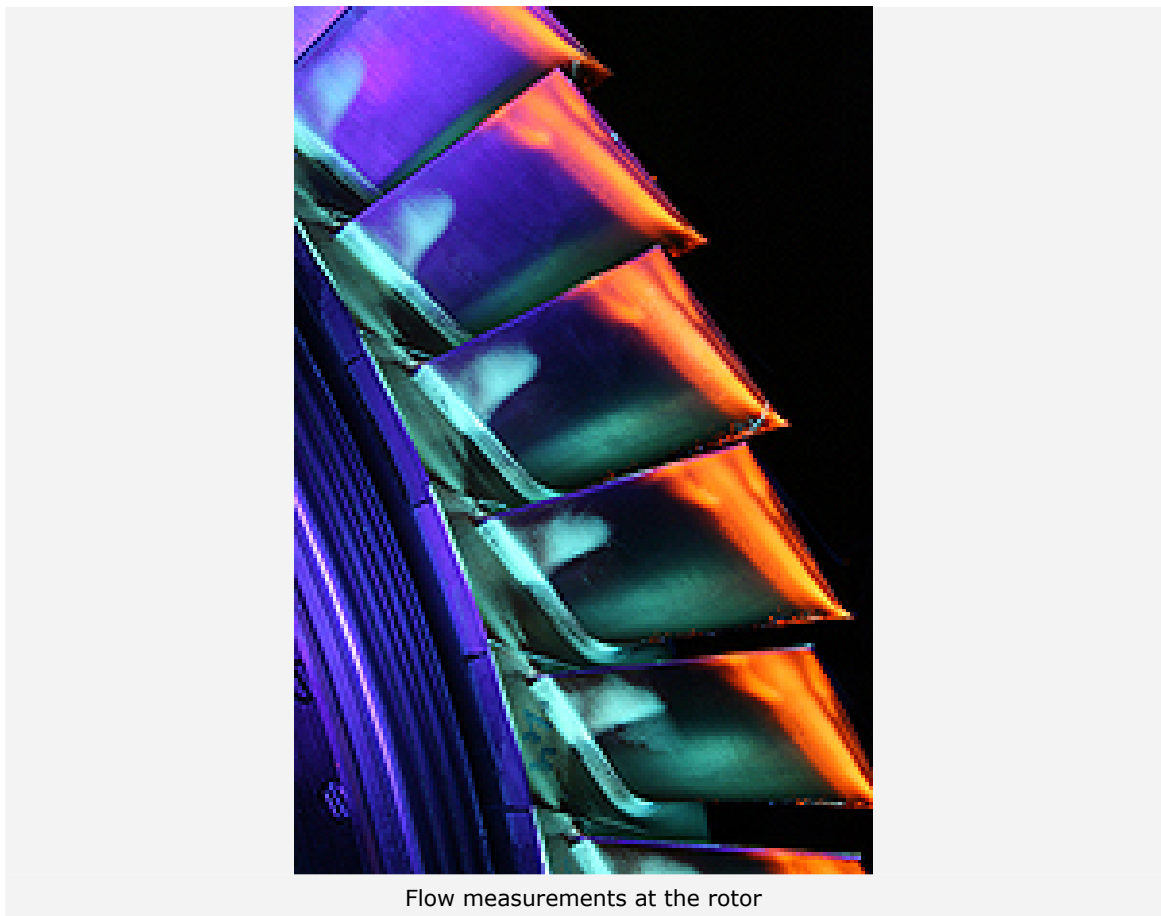
There has been a breath of fresh air in the Göttingen Institute of Propulsion Technology of the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt; DLR) since July 2008. That is when Ingo Röhle took over the Turbine Department at the oldest DLR site. In a year, the young professor has set a great many things in motion, both as regards staff and structurally – the team and order volume of the department has grown. Part eight of the DLR Web Portal portrait series presents the scientist Ingo Röhle.

The first encounter with Ingo Röhle comes as a surprise. For a university professor, he seems exceptionally relaxed. Röhle was born in 1968, wears a casual sports jacket and has his hair rather long at the back. This morning, the young engineering academic appears a little tired. Several times a week he commutes between the DLR site in Göttingen and Berlin, is frequently away on business trips and heads the Turbine Department of the Institute of Propulsion Technology with some success. And yet, his fellow staff members say, their chief copes with it all. Röhle, then, corresponds to the typical image of the scientist of today: he is a scientist and manager in one. Ask his staff about their boss and they come up with attributes such as competence, commitment and openness. Someone how knows exactly what he is doing, but who also recognises when he needs to involve his scientific colleagues.

With a friendly greeting, Ingo Röhle opens the big glass door on the ground floor of the huge Institute of Propulsion Technology building. "This way to the test facility," he says, pointing past the offices of the Turbine Department. It takes a bit of time and a good sense of direction to get to the wind tunnel. Having negotiated twisting corridors, glass doors and many steps, Röhle finally opens the door to the 'Rotating Cascade Tunnel' (Windkanal für Rotierende Gitter Göttingen; RGG). Alongside the RGG, the building also houses three further turbine test facilities: the 'Straight Cascade Tunnel' (Windkanal für Ebene Gitter Göttingen; EGG), the 'Low-speed Cascade Tunnel' (Niedergeschwindigkeits-Gittermessstrecke, Göttingen; NGG) and the 'Probe Calibration Facility' (Sondeneichkanal Göttingen; SEG).

DLR expertise in measuring techniques

At the wind tunnel, Röhle is in his element – his initial tiredness has suddenly fallen away. Enthusiastically, he describes what is hidden inside the individual cylindrical chambers of the yellow working section. With the skill of a teacher, Röhle explains the purpose of the individual sensors, motors and jets inside the measuring chamber. His staff carry out measurements on industrial gas turbines and aircraft turbines. The aim is to make aircraft turbines more fuel efficient, environmentally friendly and durable. "Engines are in continuous use, for a good thirty years on average. That is why it is important that they are thoroughly tested in advance," he explains, adding: "It is important for the customer that they can be confident that precise measurements are produced at DLR."



Flow measurements at the rotor

The DLR turbine test facility is a helpful and, above all, versatile instrument. It provides measurement results on flow processes, as they would occur in real turbine machinery. All relevant variables that are important for gas turbines and aircraft engines during use can be simulated in the test facility. High-pressure turbines can be tested at almost the original size under the same conditions that will subsequently prevail in the engine. "That's what makes the test facility of such interest to companies like Rolls Royce, who only yesterday undertook tests on a new experimental turbine," says Röhle.

DLR develops experimental turbine for Rolls Royce aircraft engines

Research and development require a great deal of perseverance from scientists. As long ago as 2007, Rolls Royce was testing a new kind of turbine in the RGG at Göttingen. Using sensors for pressure, temperature and other values, DLR scientists meticulously measured the aerodynamic characteristics of the turbine. They made 250,000 measurements per second. Huge quantities of data were generated, which DLR then analysed. The results contribute to determining the final design of the turbine. The Rolls Royce turbine will be used in an engine for passenger aircraft.

"Undertaking research means doing things which no one else has thought of yet. If one wants to achieve more – beyond the current state of technology and knowledge – a high degree of perseverance together with hard work and a certain willingness to suffer is required. That doesn't mean grimly pursuing a single line of enquiry, that tends to be counterproductive, but it means retaining one's ambition and searching for all kinds of solutions. In other words, persevering for as long as there is any possibility, until you've found the answer," Röhle says. And he adds: "That strength of purpose is something one should have," describing his view of the necessary qualities of a scientist.

Perseverance and strength of will are also among Röhle's strengths. In 1987 he began studying physics at the University of Bonn and in 1993 gained his doctorate at the University of Bochum, moving straight into a scientific job at the DLR Institute of Propulsion Technology in Cologne. In 2001 he received the US Pratt & Whitney Award, from the aerospace company of the same name, for his doctoral dissertation. In the same year, he moved into the 'Corporate Development and External Relations' department of DLR and was responsible, until 2003, for the programme to promote young talent and for relations with the French space agency, CNES (Centre National d'Etudes Spatiales). In the period to 2008 there was a stint at the French research institution ONERA (Office National d'Études et de Recherches Aérospatiales) in Paris and lectures at Berlin University of Technology, as well as heading a Helmholtz University Young Investigators Group. In 2008 he was appointed head of the Turbine Department in Göttingen and since April 2009 he has worked as a professor at Hanover University.

"I want to make space for creative work"



Head of Department Ingo Röhle

Under Röhle's leadership, two staff members have already been recruited in the current year. Speaking about his role, the 41-year-old scientist says: "I want to develop the department in such a way that there is space for creative work in research and development." And new structures in every sense of the word have already been started in the building of the DLR Institute of Propulsion Technology. New offices and meeting rooms are under construction on the top floor and, over the next three years, a new and globally unique turbine test facility is being built in the basement, which is likely to be in operation for the next 40 years.

"Networking is all-important"

Röhle is an open person, a character trait that he demonstrates not just inside the institute. In his new management function, he is away, on average, once a week on business related to turbine research. He gives lectures across Europe, procures new research commissions and establishes contacts with industry and other scientific institutions. "Almost all activities of the department involve partners, that is why networking is all-important," Röhle says.

DLR: bridge between academia and industry

That is why Röhle is looking forward to the start of term in April 2010. With his professorial colleagues from Hanover, he is currently in the middle of the final phase of an application for a special research field. "If that is successful, then there would be a super symbiosis between teaching and research, because DLR would have acquired a project for at least 12 years," says Röhle, adding: "In addition, DLR hopes that the publicity value of a good lecture will attract more students. In general, the cultivation of relations with academia is an important part of networking." Through his work as a professor, he keeps the relationship between DLR and the university going and skilfully contributes to ensuring that DLR continues to play a key interdisciplinary role as a bridge between academia and industry.

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