

# Research stay at Leibniz Universität Hannover (LUH), Institut für Kraftwerkstechnik und Wärmeübertragung (IKW)

Aleksandr Sebelev, postgraduate student of St.-Petersburg State Polytechnical  
University (SPbSPU)



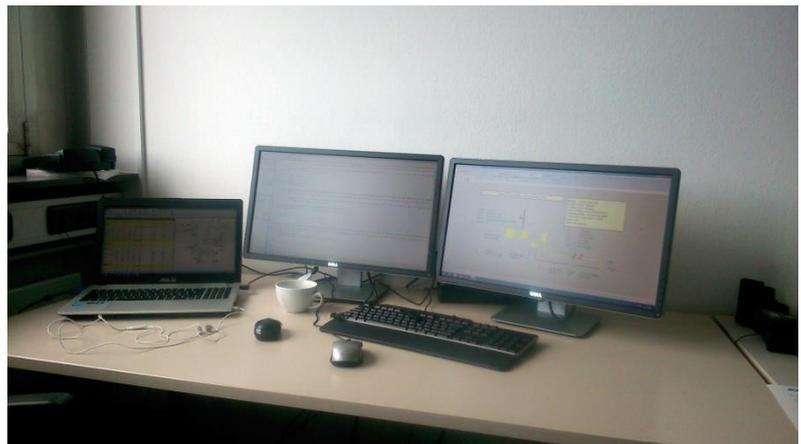
## **Introduction**

First of all, I need to say, that I don't want to concentrate on transport, accommodation and other formal moments. There have been said a lot of kind words to the whole organization of studying process at LUH by another students from St. Petersburg. But I have to highline the great support which was given to me by my institutional coordinator, Nataliya Butych, my supervisor, Martin Günzel, my professor, Roland Scharf, and my friends. At this report I want to focus on the scientific part of LUH and SPbSPU joint research work and my own cultural impressions.

## **Joint research work**

I had a four month research stay at LUH, IKW with research topic "Design and off-design modeling of ORC cycles". The first variant of the research topic, related to thermodynamic modeling of ORC cycles, was changed to consider the different aspects of ORC cycles behavior related to its off-design operating conditions. My research topic was adopted by myself and my supervisor in order to match my PhD thesis theme. I should outline that my working place at University was perfect. I had a new computer with two monitors, so I was able to connect one monitor to my laptop and work in parallel with two computers. It was really comfortable because at my laptop I worked with my program and at stationary computer I had all needed licensed software.

The aim of my research stay was creating and validating of computer program for ORC design and off-design modeling in collaboration with LUH professors and engineers. The REFPROP databases and REFPROP MS Excel



spreadsheets were taken as a basis of this program because I already had an experience in using of these models. At the first stage the different models of turbine efficiency and mass-flow rate calculation were analyzed to establish correct approach of off-design microturbine behavior modeling. The large number of experimental data was analyzed. The Stodola equation was accepted



positive impressions of German architecture and atmosphere of German towns. Every town, which I have visited, has its own specific atmosphere and I really like it. Unfortunately, I had a real lack of free time, because I tried to learn German language together with my scientific work and improving English language skills. However, I had a chance to see the beauty and uniqueness of Hannover itself. The Old and New Rathaus, Masch See, Herenhäuser Gärten and another sightsees are amazing and very atmospheric.



My hobby is sport (powerlifting). So it was impossible for me not to go to the gym all these four months. I tried to get an appointment to go to the LUH's gym, but I was not a student exactly and it would be too expensive for me. Fortunately, I've found cheaper gym and I'd been

going there for all the period of my staying in Hannover.

To say about my learning German language I have to say that Nataliya Butych gave me a great support in finding of an appropriate Deutsch courses. In parallel with Deutsch courses I learnt German language by myself. As a result, I have A2 language level to the end of my research period. Another thing that I have to highline is a communication with other people at the dormitory and at the University. At the first time it was a real assay for me to communicate with other people in English. It doesn't mean that I had real difficulties with the language, but after living all my life in Russia it was really hard for me to speak in English, think in English and so on. But I have to say that it was a great experience and great opportunity for improving of my language skills which I've realized.

## **Conclusion**

To sum up, my research was very productive and useful for developing of LUH and SPbSPU joint research activity. Two joint scientific publications were accepted to be published in international conferences proceedings. The facilities for further joint research were established. Also it was very useful for me to improve my language skills and learn more about Germany and studying abroad.