Doctoral Position
in the Simulation of the Gas Flow in Combustion Engines

The research project falls into the area of combustion engines. Aim is the numerical simulation of the three-dimensional gas flow in the piston rings under consideration of the ring dynamics. The compression results in the so-called blow-by, where combustion gases pass by the piston rings and reach the crankcase. The blow-by as well as the possibly occurring reverse blow-by pose a major influence on both the sealing and lubrication properties of the piston rings. In addition, the flow is influenced by the steep heat gradient between the combustion chamber and the crankcase; an effect which should be accounted for via thermo-coupled fluid-structure-interaction models. The simulation will be based on a finite element method with moving meshes, which will first be applied to pure air and later also to contaminated combustion gases and the oil transport. Your work will be conducted in cooperation with an industrial partner with the intention of improving the understanding of the blow-by effect.

Your profile: Requirement for this position is a diploma or master’s degree in CES, engineering, applied mathematics, physics or a similar subject with a superior academic record. Practical programming experience in Fortran or C as well as with parallelization (MPI or OpenMP) are of advantage. Familiarity with UNIX operating system would be ideal. We expect you to contribute to general tasks at the institute, such as teaching and advising master or project theses.

Our offer: The candidate will be employed as a regular employee and must meet required personal qualifications. This is a full-time position with salary according to civil service pay scale TV-L E 13 (www.cats.rwth-aachen.de/jobs/bat). The expected appointment period is up to five years, with an initial appointment for one year. Applications are being reviewed now.