

Within the last decade, computational techniques have become increasingly relevant in areas such as biomedicine, engineering, etc. Often, complex models covering interacting phenomena from multiple fields of physics have to be studied and the need for multiphysics simulation tools arises. The IT'IS Foundation employs more than 20 electrical engineers, physicists and computer engineers and is active in the fields of modeling, electromagnetic exposure as well as dosimetric measurements and is extending its current activities in the field of biomedicine. Together with the ETH and its spin-off SPEAG it has developed one of the most advanced TCAD platforms for the numerical simulation of electrodynamic and thermal physics. IT'IS has experience in studying tumor growth and treatments as well as blood flow related phenomena.

## **Simulation of FUS Induced Blood-Brain-Barrier Opening (PhD)**

### **Job Profile:**

In this context we are offering an interesting and socially relevant PhD. It will focus on simulating high intensity focused ultrasound (HIFU) induced opening of the blood-brain barrier and targeted drug delivery - a relatively novel medical technique. A simulation environment will be developed capable of computing ultrasound propagation, micro-bubble cavitation, pressure induced flow and transport variations as well as the resulting biological consequences and effects. Interaction with medical and biological experts will be possible and close contacts to other research groups in the field will have to be maintained throughout the project. Novel numerical techniques and mathematical models will have to be developed and implemented.

The PhD will be embedded in a highly motivated and dynamic team working in various related research areas. Furthermore, we work together with prominent research laboratories as well as worldwide leading companies in telecommunications and biomedicine. The work is expected to have a direct impact on the medical application of HIFU in partner hospitals.

### **Education:**

We are looking for talented candidates interested in the modeling of physical and biomedical phenomena with a strong theoretical background in numerics and a university degree in (medical) physics, mathematics, computer science, material science, electrical/communications engineering or in a similar field. Enhanced knowledge and skills in programming (C/C++/vtk/python) and corresponding tools (Windows and Linux/UNIX based platforms) are recommended.

Are you interested? We look forward to receiving your application (complete resume materials including references, as a pdf file). For further information or to discuss the scope of this position please contact Dr. Esra Neufeld ([greatjobs@itis.ethz.ch](mailto:greatjobs@itis.ethz.ch) or phone +41 44 245 9696).

Please send your application to:

IT'IS Foundation, Martin Daellenbach, Zeughausstrasse 43, 8004 Zurich, Switzerland  
+41-44-245 96 96, [greatjobs@itis.ethz.ch](mailto:greatjobs@itis.ethz.ch), [www.itis.ethz.ch](http://www.itis.ethz.ch)