The **French-German Research Institute of Saint-Louis (ISL)** situated in the border triangle of Germany, France and Switzerland is an internationally renowned research institute belonging to a global industrial and economic network.
The spectrum of our core activities comprises a variety of topics: aerodynamics, energetic and advanced materials, lasers and electromagnetic technologies, protection, security and situational awareness. Our activities are related to both basic and applied research.

ISL is offering a **PhD Position**

Research field: Laser and electromagnetic technologies

Investigation on mid-IR supercontinuum generation

The development of high-brightness broadband sources in the mid-infrared (MIR) atmospheric windows is subject of intense research due to its wide range of applications for spectroscopy and metrology as well as defense purposes. An attractive and very promising way to generate MIR emission is the generation of supercontinuum (SC) radiation in soft-glass fibers. ISL has proven to be capable of producing watt-level output power SC sources using a fluoride fiber with an output spectrum up to 4.2 µm.

The pump source used to stimulate the non-linear effects is a Q-switched mode-locked high-average-power 2 µm fiber laser. The ISL is currently world leader regarding average output and peak power generated by this single-oscillator pump source.

The task of the thesis is to further investigate high average-power SC generation in mid-infrared (MIR) atmospheric windows using nonlinear fibers (fluoride, chalcogenide) pumped by a 2 µm pulsed fiber laser, as well as the optimization of the 2 µm pump laser. The candidate will work in collaboration with scientists and other PhD students to "Improve the stability and characterize the pump laser".

Enhance the output power and spectral coverage of the generated SC. The possibility of covering the band II in the atmospheric transmission by using fluorindate and/or cascaded fluoride/fluorindate fibers will be investigated, as well as the techniques needed to efficiently couple the radiation through the different fibers.

Investigate SC generation or Raman processes in chalcogenide fibers for high-power broadband output radiation towards and above 5 µm. Methods for splicing different fibers for cascaded SC generation may also be part of this study.

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