

Specialty optical fibers for mid-IR photonics

Description

The last years were marked by increased interest of science and industry towards eye-safe mid-infrared spectral range (2-20 μm) due to a bunch of potential applications ranging from non-contact non-destructive medical diagnostics to such important applications as oil and gas sensing. This wavelength (λ) range is also aptly known as molecular fingerprint wavelength range of various organic/inorganic molecules, enabling a wealth of new applications such as fine material processing (on the micro- and nano-scale) of novel composite and semiconductor materials in electronic and telecommunications industries. At NTNU, Department of Physics, we recently built a state-of-the-art fiber tower facility for drawing optical fibers, including specialty micro-structured fibers based on novel glasses and materials transparent in the mid-IR.

The project task will be designing and manufacturing on the NTNU fiber tower (in close collaboration with the top specialists in materials and drawing such fibers) of the highest quality novel optical fiber solutions in a broad spectral range (from 200nm to 20 μm) for advanced ultrafast lasers developed in our group at NTNU. The work will include design, manufacturing and optical analysis of the developed passive and active (including nanocrystalline doped) fibers. The fibers will be further used for such applications as oil and gas sensing in collaboration with the Norwegian industry, including Statoil.

- No pre-knowledge requirements
- Supervisor's name and e-mail
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- Use of both, fiber tower and NTNU Nanolab will be necessary.