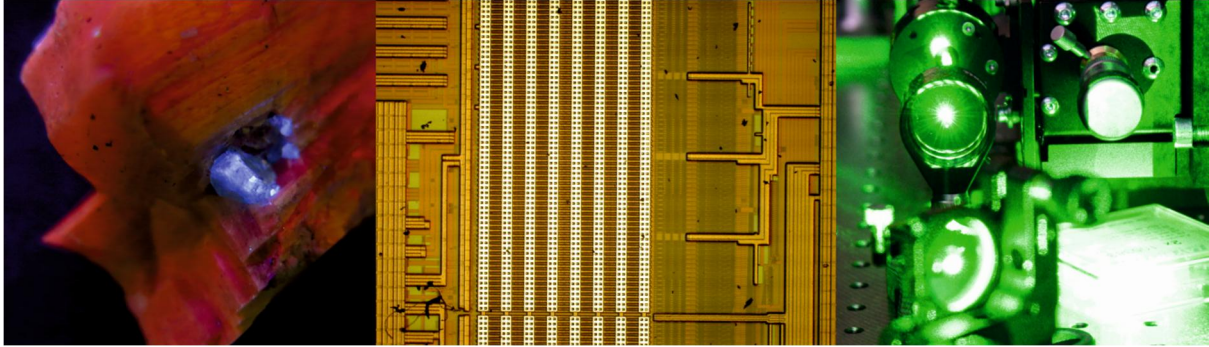




Development of laser spectroscopy for the rapid analysis of minerals containing rare earth elements - LaseREE



A number of modern technologies, such as electronics and photonics, are currently dependent on the production of the rare earth elements (REE), which consist of the fifteen elements of the lanthanoid group and Yttrium and Scandium. European commission has in the year 2014 enlisted these “high tech elements” as critical raw materials, as simultaneously both the economic importance and the supply risk are high. There are REE deposits in Finnish bedrock but the bottleneck in the cost-effective exploitation is the complex and time-consuming extraction process of REE from the host minerals. It would be a significant benefit, if the REE contents and the mineral composition could be determined on-site and on-time.

LaseREE consortium is developing a method for mineralogical and chemical analysis for the fast and optimized detection of REE. The research is based on versatile laser spectroscopic techniques using time-gated spectroscopical methods and short-pulse laser excitation. Teams from Nanoscience Center of University of Jyväskylä, Optoelectronic Research Centre of Tampere University of Technology and Electronics laboratory of University of Oulu fluently combine knowledge in the fields of geochemistry, optoelectronics, laser spectroscopy and electronics in this multidisciplinary project. Evaluation of the optimal measurement parameters together with the development of novel instrumentation will create unique setup and measurement solution.

The published scientific results from the LaseREE project will be a proof of concept for tailored REE analysis. In the future for prototype commercialization of an building blocks for the wellbeing originate a severe need for more. The developed concepts implemented to the quantification tasks also compositions.



the results may form a base development and analytical instrument. As the economics and human from mining industry, there is efficient use of the resources. and the platform can be identification and for other metals and mineral

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