

As part of the Horizon 2020 project and more specifically Gateone, GreenTropism and the Fraunhofer Institute join forces to create an innovative solution in near infra-red spectroscopy

Paris – October 1st - Fraunhofer Institute for Photonic Microsystems (IPMS) has joined forces with French IT company GreenTropism as part of the European Commission-sponsored Horizon 2020 Gateone project to optimize and coordinate both metrology and analysis tools for compact near-infrared spectrometers. This cooperation may enable companies to access customized hardware and software solutions for the on-site measurement and assessment of gaseous, liquid and solid substances from a single source.

Under the Gateone project, Dr. Meyer and his team developed a demonstrator for near-infrared spectroscopy based on established Fraunhofer IPMS scanning-grating technology. GreenTropism then conducted extensive testing on the demonstrator - based on its GT-Index protocol - to determine the accuracy of the system. GreenTropism CEO Dr. Anthony Boulanger states “We want to provide our customers with reliable, meaningful, easy-to-process data. Our expertise includes specialized know-how in the areas of spectral data acquisition and evaluation throughout the entire wavelength spectrum. In the Gateone project, we were able to support Fraunhofer IPMS in the further development of the demonstrator with the help of several hundred reference spectra and subsequent data processing.”

Dr. Sebastian Meyer, Head of Environmental Sensing Fraunhofer IPMS explains “Our near-infrared *Spectrocube* spectrometer is extremely compact and robust, allowing measurements in the 950 nm to 1900 nm wavelength range with a spectral resolution of 10 nm. What we have lacked in terms of marketing until now, was the know-how needed to process and evaluate measured values to provide information about a wide variety of organic compounds. The partnership with GreenTropism, launched within the Gateone project, completes our offering and helps us to better tailor our technology to customer needs.”

Spectrocube is based on a scanner mirror with an applied diffraction grating manufactured with MEMS technology. The spectrometer detects the intensity of the reflected light for a large number of wavelength intervals by using bending and interference to split radiance over the diffraction grating. A special time-discreet measurement principle is implemented allowing a single, highly sensitive detector to scan a spectrum with only the rotation of the integrated MEMS grid. Unlike conventional instruments, the spectrometer does not require an expensive NIR diode line, thereby opening many new applications for spectroscopy in the wavelengths of up to 1900 nm. Scientists at Fraunhofer IPMS place the MEMS scanner, the individual grating and the diffraction columns directly on silicon wafers to facilitate the cost-effective, batch production of large numbers of spectrometers.

DeepGreen software by GreenTropism allows users to build spectral database or to access already-built databases by the company, to manage spectral data and to apply chemometrics tools designed for spectral data. *DeepGreen* is fully interconnected and user-friendly, allowing any user to promptly deal with a spectrometer and the interpretation of spectra for immediate application and communication. GreenTropism establishes its expertise in the handling of miniaturized spectrometers, bringing large perspectives for field and portable measurements.

Spectroscopy, which uses contactless electromagnetic radiation to illuminate compounds and analyzes the intensity and wavelength of reflected light, is of particular interest for countless applications providing fast, accurate and easy concentration measurement and type determination of organic compounds. Compact formats such as portable measuring instruments used in the food and beverage industry, mobile medical and pharmacological analysis devices, industrial in situ quality testing, or early-warning and monitoring systems for security and building management applications are in great demand. In order for this measurement principle to work, measured values must be both accurately recorded in a broad spectral range for varying scenarios as well as promptly processed and analyzed according to application specifics.

About Gateone: The gateone project is an innovation action under Horizon 2020 and part of the Smart Anything Everywhere initiative. The mission of gateone project is to offer Innovation as a Service to encourage and facilitate the adoption of smart technologies and smart systems by European SMEs. The goal of the action is to initiate the relationship between Research and Technology Organisations (RTOs) and SMEs to facilitate innovation access and to accelerate smart systems adoption by European SMEs. The Innovation action aims to engage SMEs in a first evaluation of smart solution while reducing their innovation risk. In providing a demonstrator selected by SME for evaluation, the goal is to generate enough confidence in the technology and the market to move towards a more ambitious development of innovative and smart solutions. Gateone has received funding as part of the European Union Horizon 2020 research and innovation program under grant agreement number 644856.

About Fraunhofer IPMS: The Fraunhofer IPMS with its more than 300 employees is dedicated to top-level applied research and development in the fields of photonic systems, microsystems technologies, nanoelectronic technologies and wireless microsystems. Innovative processes and products which are based upon our various technologies can be found in all large markets – such as information and communication technologies, consumer products, automobile technology, semi-conductor technology, measurement and medical technology. More than 50 percent of our annual operating expense of 39 million euros is financed by direct commissions from industry.

About GreenTropism:

GreenTropism embraces the challenges of Smart Industries and supplies software solutions for non destructive monitoring.

Combining expertise of our spectroscopists, data scientists and developer, GreenTropism solution is a all-in-one connected tool to enable real time monitoring and reactive decision-making process.

The company relies on partnerships with research centers like IRSTEA (Institut National de Recherche en Sciences et Technologies pour l'Environnement et l'Agriculture) and deploy ist solution in environment, agroindustry, textile, petrochemical industries. www.greentropism.com

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