

PRESS RELEASE

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“Multi-color Vision” for Drone Flight, Vertical Farming and Autonomous Driving

European Research Project “HyperImage” Launched with Twelve Partners from Industry and Science

(Zwickau/Dresden, 01/29/2024) High-resolution hyperspectral images are set to take quality assurance and increased efficiency in industry, agriculture, and autonomous driving to a new level. The Fraunhofer Institute for Material and Beam Technology IWS in Dresden heads a European consortium of twelve companies and research institutes tackling this objective in the project “HyperImage – A universal spectral image sensor platform for industry, agriculture, and autonomous driving”. The European Union is funding the project with a total of 5.6 million EUR over a period of 3.5 years.

Under the leadership of Fraunhofer IWS, a European consortium of industry and science is developing a modular, cloud-based platform for the semi-automated evaluation of spectrally high-resolution images. “With innovative photonic components and the use of AI algorithms, we strive to translate image data into relevant functional product properties,” explains Alexander Kabardiadi-Virkovski, who acts as head of the HyperImage project at Fraunhofer IWS. “This will enable us to classify products and make decisions more easily and quickly, as well as monitor processes better.” The research partners also want to develop and test algorithms to harmonize and standardize hyperspectral data from European camera and cloud infrastructure manufacturers. This standard should unify the variety of existing image formats and enable the transferability of image information between different camera manufacturers.

Increasing Quality and Efficiency in Four Industries

The project results will be used for quality control in high-performance electronics production, monitoring automated vertical plant cultivation, integrating spectral image-based vision and navigation functions in autonomous vehicles, and developing a high-resolution hyperspectral vision system for unmanned geo-surveillance drones. These use cases serve to position HyperImage as a universal solution for object recognition, detailed product and material analysis, and reliable quality control in various industries. The automated platform will increase yields and reduce production costs in vertical

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farming, save fuel, increase operating speeds for autonomous off-road driving, reduce weight, and increase flight time for drones.

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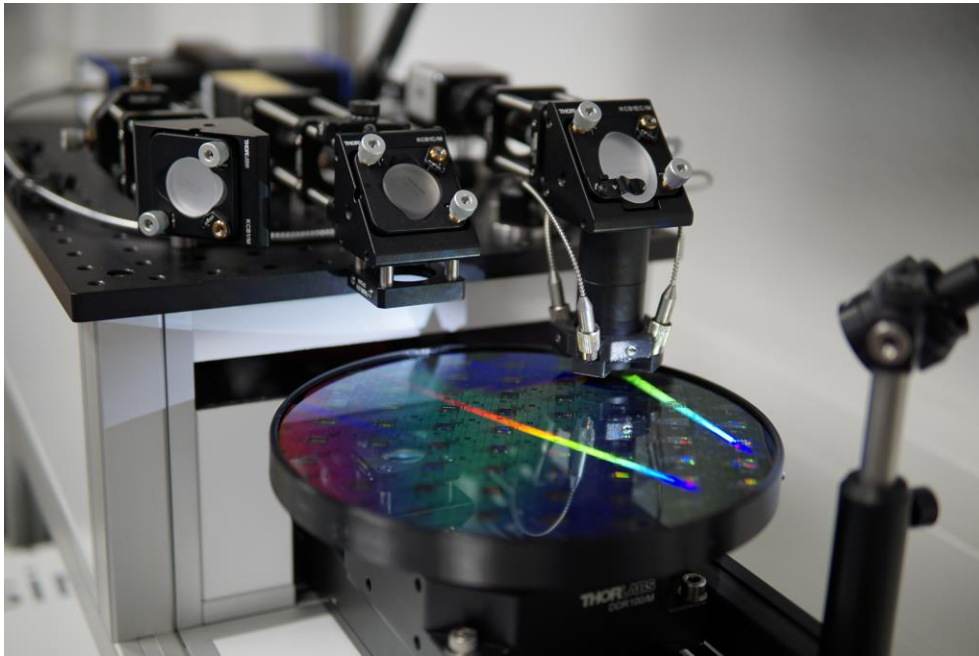
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Info Box**HyperImage Project Partners**

The project started on December 1, 2023, and the participating companies met in Dresden for the official kick-off meeting on January 16 and 17:

- *4K-MEMS* (CH): Optimization of novel SWIR light sources and their integration in customized IR line illumination modules for high-quality hyperspectral imaging
- *AMIRES* (CZ): Management support, dissemination, and communication
- *DIVE imaging systems* (DE): Novel hyperspectral vision device for semiconductor quality control and platform utilization for spectral image analysis
- *Fraunhofer IWS* (DE): Project management and coordination, machine learning, normalization algorithms for spectral imaging data, and technical assessment of spectral imaging systems
- *Growy Labs* (NL): Growth analysis and health status of plant crops using spectral imaging solutions
- *Infineon Technologies Bipolar* (DE): Quality control in the soldering of bipolar thyristors using spectral imaging
- *KETMarket* (DE): Vorbereitung der kommerziellen Verwertung von Projektergebnissen und Vernetzung mit dem offenen europäischen Innovationsökosystem
- *Netcompany-Intrasoft* (LU): Design and development of the cloud-based digital imaging data analysis platform and the platform's user interface
- *Norsk Elektro Optikk* (NO): Production of hyperspectral camera demonstrators based on novel components in the project
- *Optotune Switzerland* (CH): Provision of electrically adjustable liquid lenses, 2D mirrors and pixel shifters
- *Robotnik Automation* (ES): Autonomous off-road driving based on spectral image data
- *SILIOS Technologies* (FR): Design, manufacture and characterization of multispectral sensors for the different applications
- *Stichting Wageningen Research* (NL): Spectral imaging for agriculture, including data analysis and demonstrator development



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The measurement setup serves to analyze the surface quality of structured semiconductor wafers. It features specialized hyperspectral measuring devices. The Fraunhofer Application Center for Optical Metrology and Surface Engineering (AZOM) at Fraunhofer IWS focuses on the investigation and evaluation of complex surfaces.

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FRAUNHOFER INSTITUTE FOR MATERIAL AND BEAM TECHNOLOGY IWS



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The HyperImage project partners met on January 16 and 17, 2024, for the kick-off event at Fraunhofer IWS in Dresden, Germany.

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