SMART SPACE SOLUTIONS

YOU ARE

an industrial business manufacturing space system components. Your environment is becoming increasingly competitive. To stay in the race, you need to be more innovative than your competitors while maintaining benchmark standards and ensuring optimal quality and safety for your products.

YOU ARE

a **business,** an **authority** (national, regional, local) or an **organisation** (national or international) for which **space data** holds huge potential for crisis, flood or transport management, land and forest monitoring, etc.

WE OFFER

skills, know-how and cutting-edge infrastructure to:

- **Improve the performance of materials** used in space
- **Develop new services based on satellite data** for a series of applications such as precision agriculture, natural resources and natural risk management

Located in Luxembourg, which houses many companies in the space industry, we work with many Luxembourgish and international companies and organisations: ESA, ITS, Airbus Defence and Space, CNES, HITEC Luxembourg, LuxSpace, Cybercultus, Geoville, GVSELux, Convis, Terrasphere, Aerovision BV, Aurea Imaging, GreenVision, TELOPS-Canadian, Thales Alenia Space, etc.

We are also a member of the Luxembourg Space Cluster.

LUXEMBOURG INSTITUTE OF SCIENCE AND TECHNOLOGY

LIST

The Luxembourg Institute of Science and Technology (LIST) is a mission-driven Research and Technology Organisation (RTO) that develops advanced technologies and delivers innovative products and services to industry and society. As a major engine of the diversification and growth of Luxembourg's economy through innovation, LIST supports the deployment of a number of solutions to a wide range of sectors, including energy, mobility, finance, logistics, space, construction, agriculture and advanced manufacturing at national and European level. More info on **www.list.lu**

NEW SERVICES BASED ON SATELLITE DATA

LIST offers products and services using remote sensing for the monitoring and management of the environment, agriculture, communications, transport and natural hazards.

Those are developed in application domains such as:

- Flood management
- Precision farming
- Big data analytics and visualisation
- Intelligent transport systems
- Safety and protection (people and critical infrastructures)

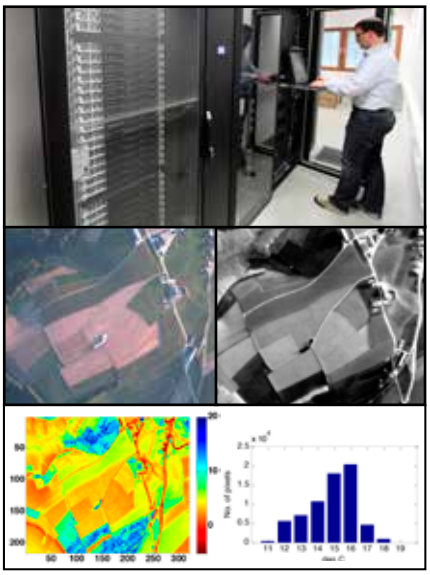
Our main activities

Thanks to geoinformatics (image analysis, (geo) statistics, etc.), visual analytics and environmental modelling, LIST develops new tools and methods for environmental, agricultural, transport and communication engineering, and civil security applications.

- Development of retrieval algorithms for biochemical and structural parameters from vegetation, soils, aerosols and water
- Development of retrieval algorithms and processing chains for hydrology-related variables such as soil moisture and flooded areas
- Integration/assimilation of remote sensing data into environmental models (hydrological, hydrodynamic, biosphere)
- Thermal remote sensing, temperature mapping and evapotranspiration modelling
- Integration of satellite, airborne and ground remote sensing data with global navigation satellite systems and telecommunications
- Development of algorithms and methods to deal with large dynamic and uncertain data
- Development of transparent, reliable multichannel communications for mobile applications
- Data protection and security frameworks for satellite communications

What we can do for and with our partners

- Biomass estimation with satellite and unmanned aerial vehicle (UAV) data
- Mapping land surface temperature and evapotranspiration
- Global spatial annual ET
- Percent ET anomaly
- Monitoring of surface and subsurface water from space
- Integration of remotely sensed information with prediction models
- Software integration platform for GIS
- Data analytics and machine learning platform
- Data visualisation tools
- Airborne survey with TELOPS Hyper-Cam hyperspectral thermal imager: lab, field and airborne measurement capabilities in the 8 µm – 12 µm spectral region
- Integrated GSM and satellite communication platform
- Software monitoring and simulation platform for communications, transport and logistics
- Crisis management, including geofencing, alert generation, safety management
- Satellite tracker based on real time data sensing



YOUR CONTACT

Prof. Dr Lucien Hoffmann

Director of the Environmental Research & Innovation (ERIN) department

lucien.hoffmann@list.lu

IMPROVING THE PERFORMANCE OF MATERIALS USED IN SPACE

At LIST, we pool our skills in nanomaterials, nanotechnology and composite materials for many research projects with the space industry with the aim of improving materials used in space.

Our main activities

DEVELOPMENT OF INNOVATIVE MATERIALS

We develop innovative solutions for industrial applications. The aim is to improve materials used in space in terms of (multi) functionality, lightness or durability.

DEVELOPMENT OF SCIENTIFIC INSTRUMENTS

We develop scientific instruments in relevant fields.

- Development of miniaturised high-performance mass spectrometers, for applications including isotopic measurements in hydrology, tracking of particles in the atmosphere, homeland security and space exploration.
- Correlative Microscopy: nanoanalytics combining high-lateral resolution and high-sensitivity chemical analysis
- Development of high-performance SIMS add-on systems
- Development of ion sources

MODELLING AND DESIGN OF STRUCTURES AND MULTIFUNCTIONAL COMPOSITES

Through the use and development of mathematical and numerical modelling, we assist with design, research new features and optimise materials, processes and structures

CHARACTERISATION AND TESTING OF MATERIALS

We provide analytical services and effective support for root cause analysis, materials expertise, applied and fundamental research in materials and surface science, materials and surface engineering, technological development, etc.

Examples of achievements

- the EASIMECA project: assessment of an innovative microtensile test for the characterisation of freestanding nanostructured thin films
- the NANOSENSE project: development of a real-time, qualitative and quantitative miniaturised chemical sensor, enabling the monitoring of molecular contamination on payload surfaces
- the BLACKCOAT project: development of a coating technology for manufacturing «black» surfaces in the visible and infrared spectral range. This technology is used on the baffles of high-performance optical instruments in order to meet the expectations of stakeholders in the space industry
- the COSMIC project: development of an anti-static ETFE-based nanocomposite
- the COSSMAS project: development of software for the digital analysis of composite space structures
- the ConductivEpoxy project: improving the thermal conductivity of epoxy resin

YOUR CONTACT

Prof. Dr Jens Kreisel

Director of the Materials Research & Technology (MRT) department

jens.kreisel@list.lu

Headquarters

Luxembourg Institute of Science and Technology (LIST)
5, avenue des Hauts-Fourneaux
L-4362 Esch/Alzette
Phone: (+352) 275 888 - 1 | Fax: (+352) 275 885

info@list.lu

LIST.lu

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