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The European Union has invested some €3.4 million in the HAMLET project. In addition to Solmates, LioniX and Satrax, all from the region of Twente, other participating companies are the research institute Fraunhofer HHI (Germany), Linkra (Italy) and the Technical University of Athens (Greece). Oost NL has played an integral advisory role in helping the participating companies from Twente with various procedures regarding Horizon 2020.

### ***High-tech companies from Twente enabling the transition to 5G telecommunications networks***

The nanotechnology companies Solmates, LioniX and Satrax, along with their consortium partners, will be receiving funding from the European Union for the development of energy efficient micro switches for the communication sector. These switches, based on light-based data transmission, are necessary to make the transition from the currently developing 4G networks to the far more rapid 5G networks. The companies are spin-off companies from the University of Twente, and their work is expected to result in data transmission that is at least 1 million times more energy efficient and many times faster than current technology.

### ***New technology***

Current telecommunication technology limits the possibilities for development of mobile technology at the speeds the market demands. Telecommunication service providers have been exploring the possibilities of transforming the current infrastructure into one based on data transfer based on light, which gives enormous advantages both in volume in speed. This also applies to mobile networks, which can be converted from the current radio signal-based networks into light-based networks ? known as 5G. In the meantime, there are already various optical switches available, but these all have a limitation: the low speed and the heat generation that occurs on the current chip designs. In order to make the transfer to 5G it is also necessary to develop a new generation of switches, which will make possible an intelligent antenna system that increases both the network coverage area and capacity.

### ***One million times more energy efficient***

The HAMLET project was formed so that Solmates, LioniX and Satrax can work together on developing optical switches on chips that are a thousand times faster and a million times more energy efficient than the current technology. The lower energy use also results in lower heat generation, which is essential for robust systems for telecommunications providers. In addition to applications in the telecommunications sector, it is also relevant for medical diagnostic application.

### ***High-Tech ecosystem in Twente***

The companies involved in this important research name one of the success factors the high-tech ecosystem that exists at the University of Twente around the research institute MESA+ and the Kennispark Twente. ?The entire innovation chain is here, all within a radius of a couple of hundred meters,? says Paul van Dijk, CEO of Satrax. He is referring to the fundamental research of the University of Twente, the high-quality facilities (among which are the MESA+ Nanolab and the High-Tech Factory), countless high-tech companies that strengthen each other and, last but not least, the guidance they receive from the Kennispark Twente. ?The fact that successful high-tech companies not only start-up here, but also remain and become successful is evidence enough,? adds the CTO of Solmates Matthijn Dekkers.

### ***Solmates, LioniX and Satrax***

Solmates produces equipment that applies nano-layers that are used in the production of semiconductors, among other applications. The proprietary technology, developed by Solmates itself, uses pulsed laser deposits and is ideal for applying new layers of new materials that are necessary for future generations of computer chips.

LioniX develops and produces chips based on micro and nanotechnology for use in, among other applications, optical switches and fluid applications. The company, in addition to developing new products, facilitates together with clients chips that are used in third-party applications.

Satrax develops intelligent antenna systems intended for aircraft, satellites and broadcast towers. These systems have an automatic system that prevents signal loss. These systems play an integral and essential role in photonic circuits.



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