Project title: Development of "green" hybrid Si/organic heterojunction IR photodetectors

Project summary: The research will be done within an industrial research environment. The project sponsor is ELMAT, a leading developer and manufacturer of fiber optic telecommunication systems. The company will coordinate the work, provide feedback regarding the requirements of the device parameters, and perform industrial tests of the developed devices. The project aims at developing a novel photodetector based on a hybrid heterojunction forming between the Si/organic materials (the organic part is perylene derivatives and/or others) and developing the technology with potential for a commercial use, which may in the future allow integrating the photodetectors with silicon integrated circuits. Utilization of the sub-bandgap absorption phenomena in hybrid heterojunctions allows for fabrication of Si-based IR photodetectors by passivation of the Si surface with an appropriate organic material. The proposed solution circumvents the inherent disadvantage of silicon, namely the transparency for photon energies lower than 1.12 eV, at the same time providing compatibility with the well-established CMOS process. Subsequently, the use of low-cost, non-toxic, biodegradable ubiquitous organic materials allows reducing energy input, toxicity, and complexity, all of them plaguing the conventional detectors sensitive in the telecom-wavelength region, which are mostly based on the compound inorganic semiconductors.

There are currently two open positions:

Position 1	**Position 2**
The successful candidate will be involved in the design, fabrication, electrical and photoelectrical measurements of hybrid Si/organic photodetectors. As well as design, the project features fabrication and analysis of photodetectors integrated into Si optoelectronic integrated circuit and Si-based sensor matrices.	The successful candidate will be involved in the design, fabrication, electrical and photoelectrical measurements of hybrid Si/organic photodetectors. The main focus of the project will be designing and carrying out spectroscopic experiments to understand the fundamental physical phenomena occurring in organic materials, as well as in the complete solid state devices.
Requirements for candidate: - **strong background in one or a few of the following fields: semiconductor physics, integrated optoelectronics, microelectronics fabrication technics, and related** - **work experience in laboratory/clean room environment preferred** - **knowledge of scientific English required** - **experience with organic electronics preferred (but not necessary)** - **strong attitude towards experimental physics and interest in technological work**	Requirements for candidate: - **strong background in one or a few of the following fields: physical chemistry, nanotechnology, material science, semiconductor physics, and related** - **experience with infrared and optical spectroscopy techniques preferred** - **knowledge of scientific English required** - **experience with organic electronics preferred (but not necessary)** - **strong attitude towards experimental physics and interest in technological work**

Oferujemy zatrudnienie w pełnym etacie. Miejsce pracy: Rzeszów

Aplikacje prosimy przesyłać na adres: m.bednorz@elmat.pl

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