



## **The Instituto de Microelectrónica de Sevilla, IMSE-CNM, seeks potential MSCA IF Fellows**

### **Name and surname of Contact Person / Scientist in Charge**

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### **Name of Department / Centre / Institute**

Instituto de Microelectrónica de Sevilla (IMSE-CNM)

### **Brief description of the Host Group**

The host group is formed by top-level researchers with a strong background in industrial collaborations. The company Teledyne-Anafocus (<https://teledyne-anafocus.com/>), settled in Seville is a former spin-off created by some members of the host group. More detailed information about the position can be found at the website of the associate professor who sponsors it: <http://www.imse-cnm.csic.es/~juanle>.

### **Research area**

Information Science and Engineering (ENG)

Physics (PHY)

### **Project Description**

The project embraces the design of advanced image sensors in the collaborative framework of a research project with the company Teledyne-Anafocus. The target is to explore the potential of modern 3D fabrication technologies to implement a further generation of image sensor with in-pixel processing capabilities.

Traditionally the pixel pitch has been a limiting factor to add circuitry on pixel. Design houses try to keep it as small as possible to promote image quality over pixel focal-plane processing capabilities that require adding extra circuitry inside the pixel, degrading its fill factor.

Modern 3D fabrication technologies are presented as a possible solution for this classic trade-off between image quality and in-pixel processing. They allow to dedicate one entire level (tier) to sense light. Then, there is possibly to place processing circuitry beneath the photodiode in other tiers without increasing the pixel size. Tiers are



interconnected vertically by TSV (Through Silicon Via) or DBI (Direct Bonding Interconnect).

The project contemplates the study of pixel architectures that can exploit 3D processes. Within our research group, we have initiated the study of pixel architectures with advance processing capabilities that can be migrated to these emerging technologies. These pixels offer very High Dynamic Range (HDR) operation or pixels that can incorporate stacked photodiodes to sense color or SPADS. The candidate will beneficiate of this start point to implement advanced pixel structures of industrial interest with the aforementioned technology. Collaborations with the Teledyne group are expected.

Summarizing, the candidate will have the opportunity of participating in the design of cutting-edge image sensors with an advance technology in collaboration with a strong research group and a top-world image sensors design company.

#### **Applications documents to be submitted and deadlines**

A PhD in Electrical Engineering, Computer Science, Physics or in a related discipline is highly recommendable. Publications in internationally recognized peer-reviewed journals dealing with the project topic will be also highly valued.

Applicants should send their CVs to [juanle@imse-cnm.csic.es](mailto:juanle@imse-cnm.csic.es) clearly stating in the subject of the email the reference "PostdocMSCA2020".

The selection process will consist of an evaluation and ranking of all CVs received. Based on this evaluation, the highest ranked applicants will be eventually called for a personal interview to evaluate the skills of the candidate in a more precise way.