



# detector seminar

SPEAKER: Andrea Del Monte  
TITLE: **Technology development of CMOS Image sensors**  
DATE: 15 Nov 2019, 11:00  
PLACE: 40/S2-A01 - Salle Anderson

## ABSTRACT

CMOS Image sensors (CIS) are today the predominant electronic device in the field of digital imaging, in almost any application. A significant demand increase has been observed during last years, and a market growth rate close to 10% per year has been reported by market analysts. The mass production of CIS wafers represents the main manufacturing line of Lfoundry fab in Avezzano (Italy) since 2006. A basic review of the working principles of CMOS image sensor, in particular of the pinned photodiode device, explaining the importance of p-n-p structure in minimizing the dark current and read noise and reviewing the architecture and readout of a standard 4-T cell. The main technologies and process modules (such as Back-Side Illumination, integrated lightguides and anti-reflective coatings, buried light shields, hybrid bonding) used in the manufacturing of CMOS Image Sensors (CIS) will be described, focusing on their correlation with the performance of pixel array. Popular CIS features such as global shutter and high dynamic range will be also covered. The importance of process control in a manufacturing line impacting the pixel performances, like for example the photodiode dark current, will be also described.