



PYX-XL



A large scale ultra high resolution platform for scientific community

B. Dupont
PYXALIS, France

Challenges and context

In some scientific image sensor, there is a need for very high resolution / Very large focal plane image sensors. It is particularly the case in electron beam microscopy, synchrotron or in earth observations with the possibility even to achieve by 2025 geostationary earth observation sensors. Furthermore, there are existing synergies with professional imaging.

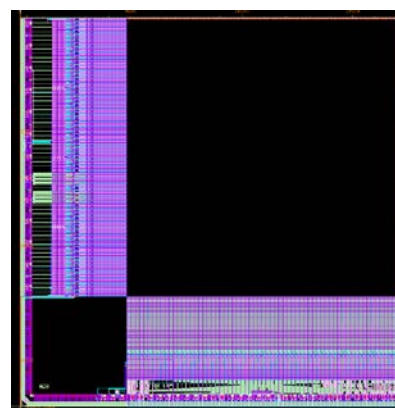
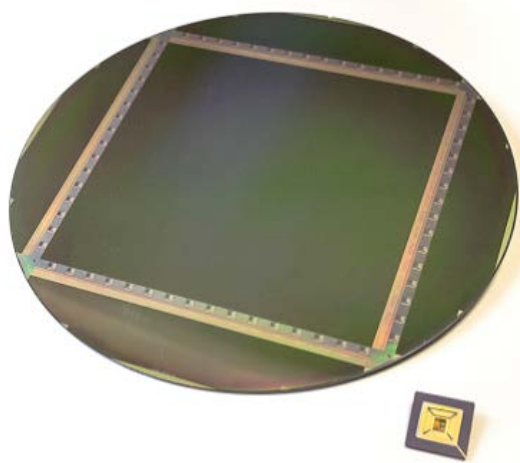
Through this project, we propose to design and manufacture the world largest resolution sensor. It is also the largest monolithic sensor with a 29cm diagonal. The following table shows a set of target specification:

Target specification	Value
Pixel pitch	5-20 um
Sensor diagonal	290cm
Sensor resolution	>1.5 GPixels
Frame rate	>100 FPS

To design such sensor, several challenges have to be overcome: first, the number of pixels is so high that a traditional matrix organization with readout on the edges will not work anymore. Thus, an organization in array of readout, sacrificing optical columns and lines, has to be accommodated. To minimize the number of inactive cells, the sensor will have to be 3D stacked using through silicon via.

World largest resolution sensor for scientific applications

Pyxalis will design this sensor to be scalable as a platform, allowing the scientific community to have semi-custom sensors dedicated to their needs, in terms of area, speed, and resolution...



Example of 12'' waferscale imager (left) and design detail (right) by Pyxalis

Potential Impact

- The world highest resolution image sensor!
- Shorter development time of future ultra-high resolution detectors
- Reduced development risks and costs for next generation of scientific detectors.