INFN-To updates on WP11.3
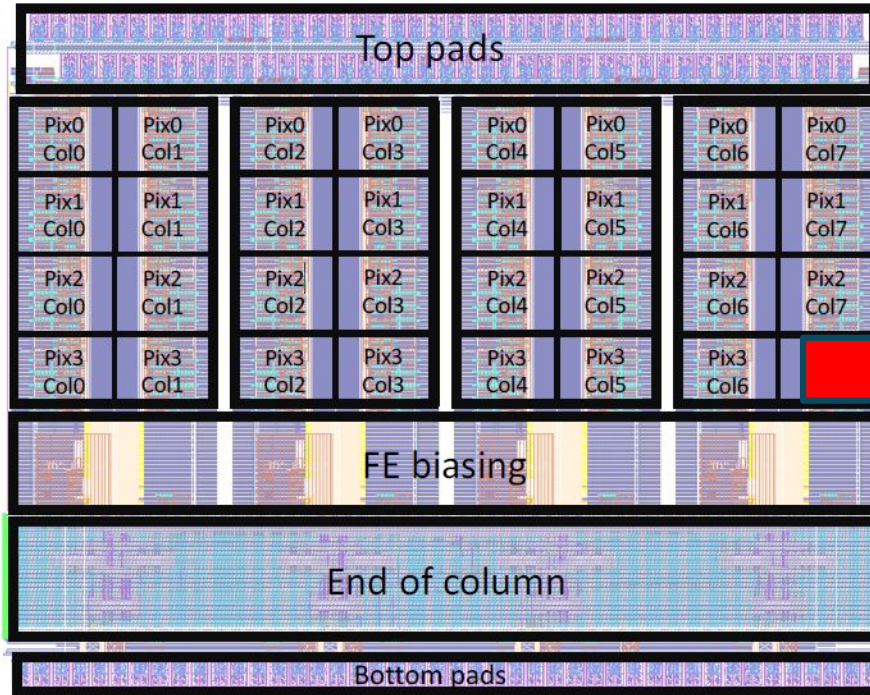

Istituto Nazionale di Fisica Nucleare

Developments in 110 nm

- **Many legacies with previous projects**

- **Efficient re-use of IPs**

- **Not strong motivations to migrate to 130 nm**

  - **MPWs reasonably cheap**

 - **Several projects on the same node: internal engineering run**

ALCOR ASIC

- 32 channels 4x8 pixels array
- pixel size 440 x 440 μm^2
- SiPM connection through wire bonding pads (top side)
- End of Column performs readout and SPI configuration
- 4 LVDS serializers (one every two columns) for data transmission
- Analogue I/O on the top side
- Digital I/O on the bottom side
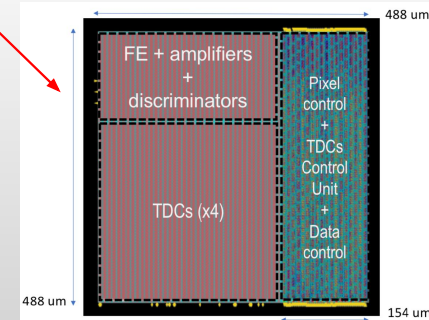
- **Extensively characterised**
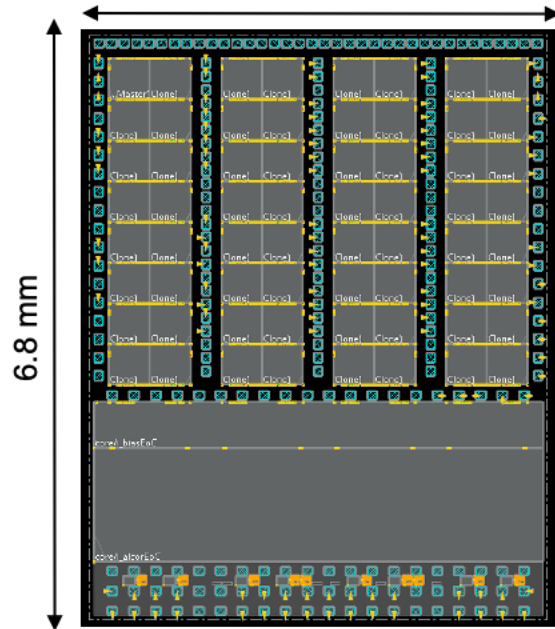
- **Engineering run production, several samples**

ALCOR ASIC for
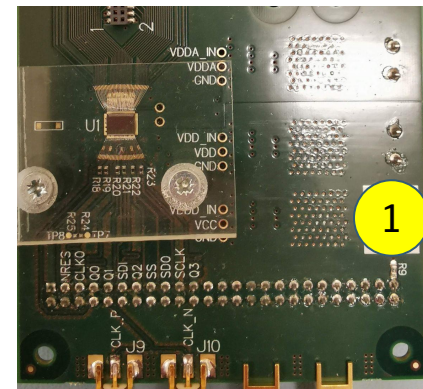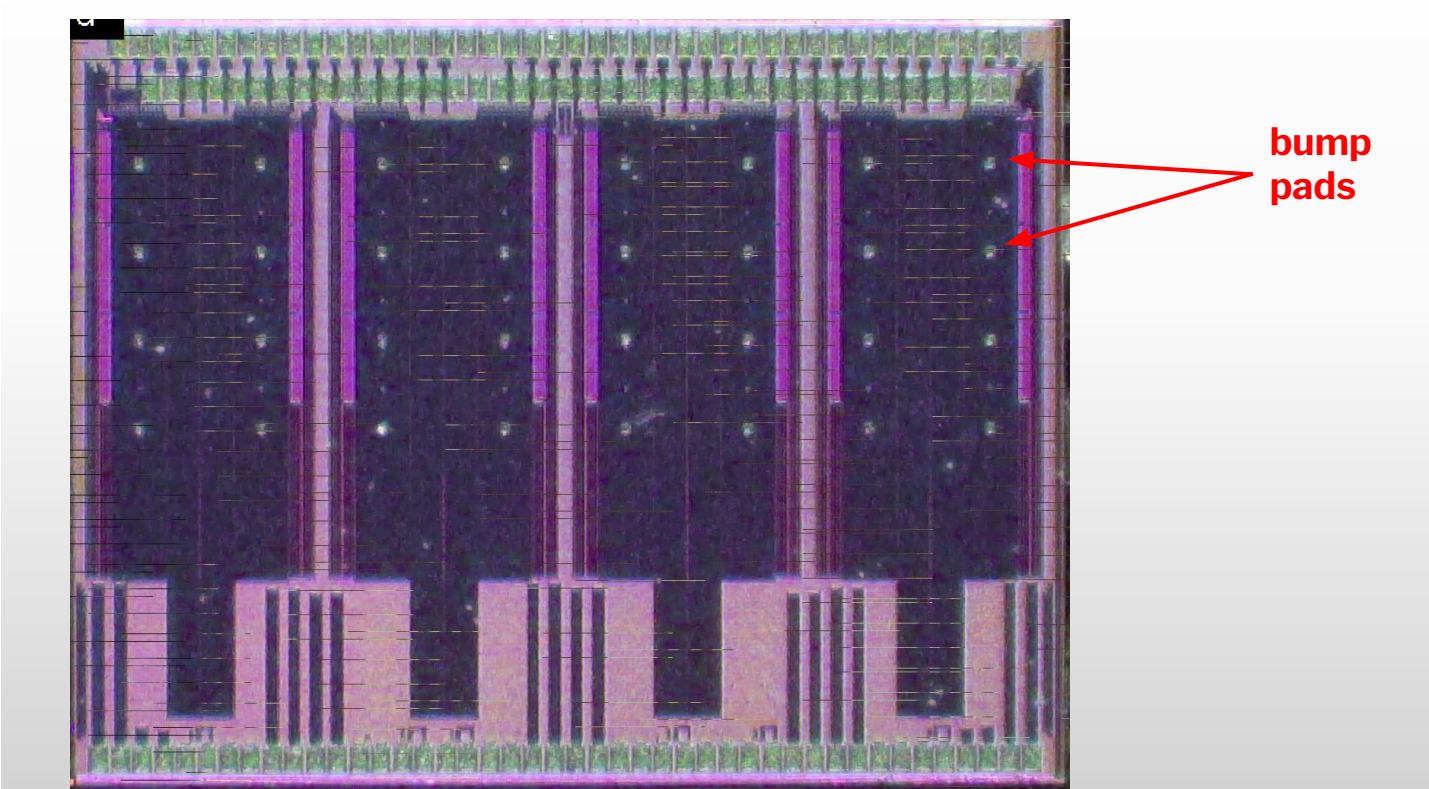
bump pads

- **INFN Ibis_next project**
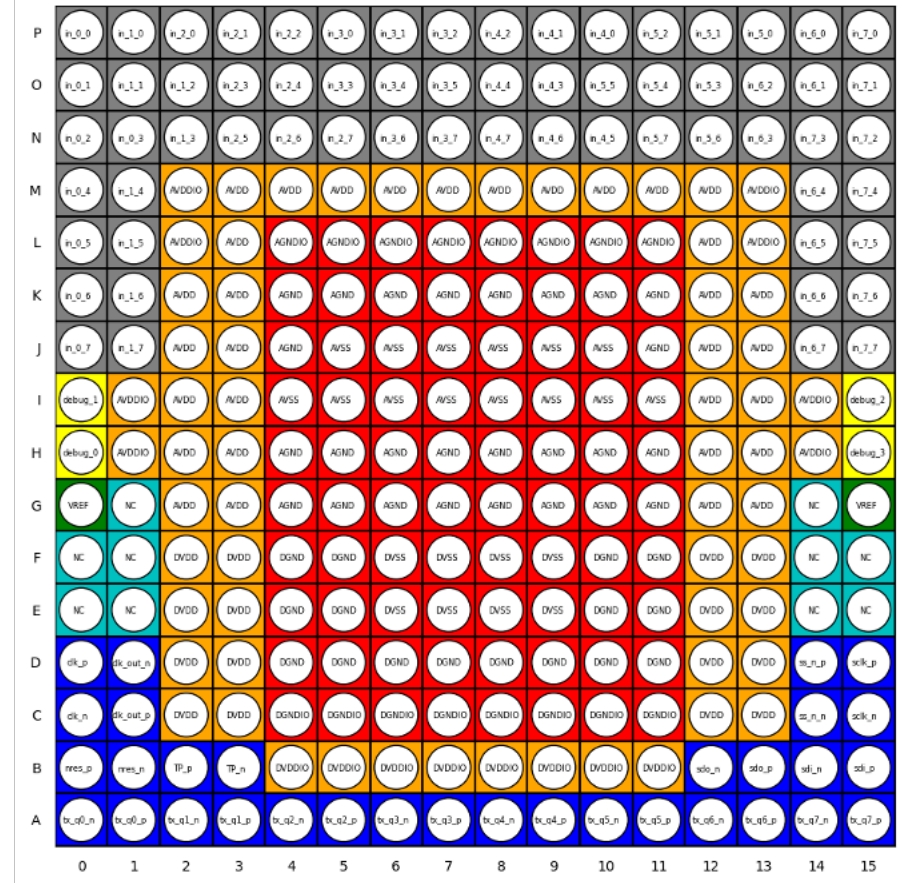
- **Direct bump bonding with mini-SiPM**

Example of use

- **ALCOR for EIC RICH detector**

8x8 pixel matrix ASIC (64 channels)
- SiPM inputs bump pads between the pixel sectors
- Digital EoC in the bottom part

256 balls BGA package (size = 12-16 mm)
- Power and ground on inner/mid contacts
- I/O on outer contacts

Multi-purpose waveform sampling ASIC in 65 nm

- **Sample and digitise in an capacitor array**

- **Each sampling cells contains a Wilkinson ADCs**

- **Simpler to increase the sampling frequency in future iterations**

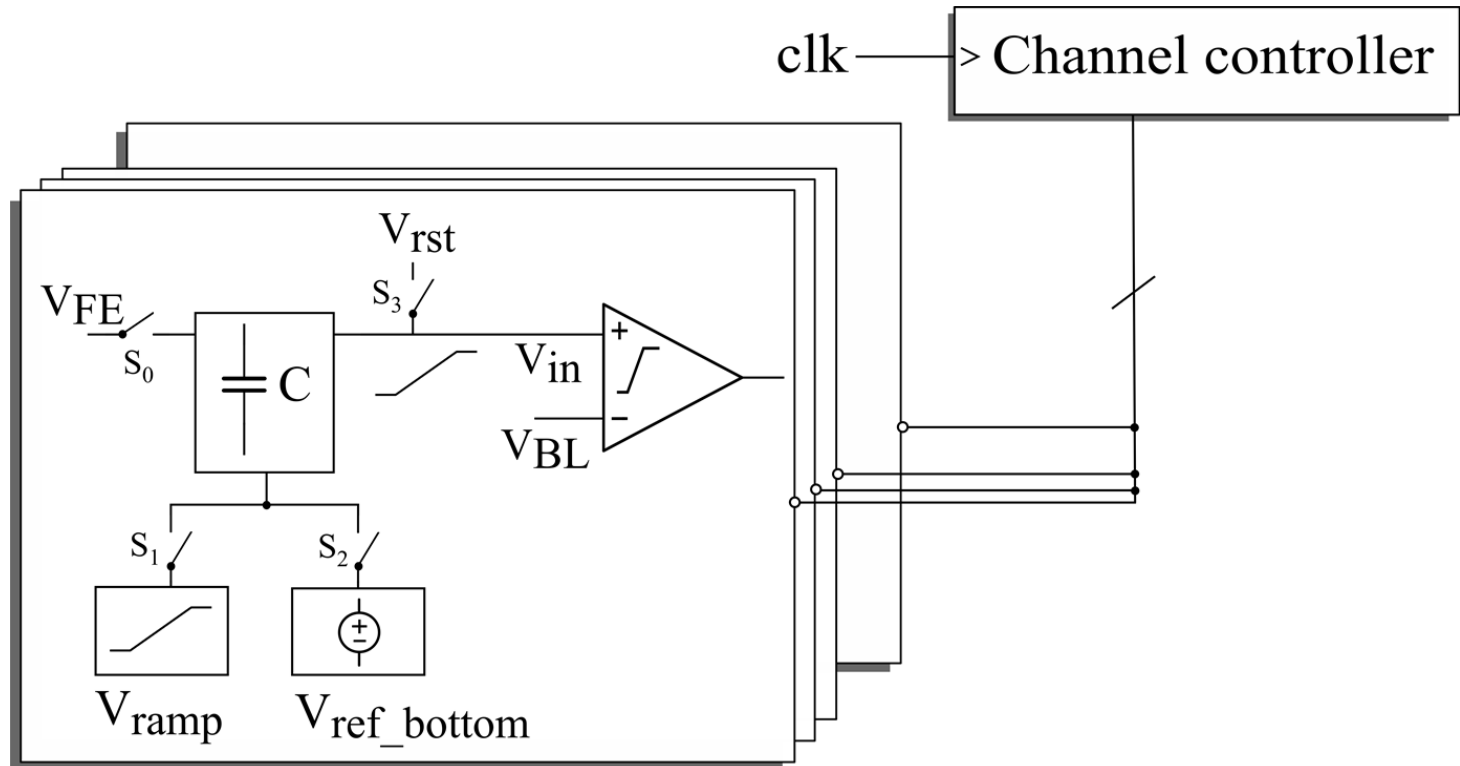- **256 digitizing cells, organised in buffers of programmale length for derandomisation**
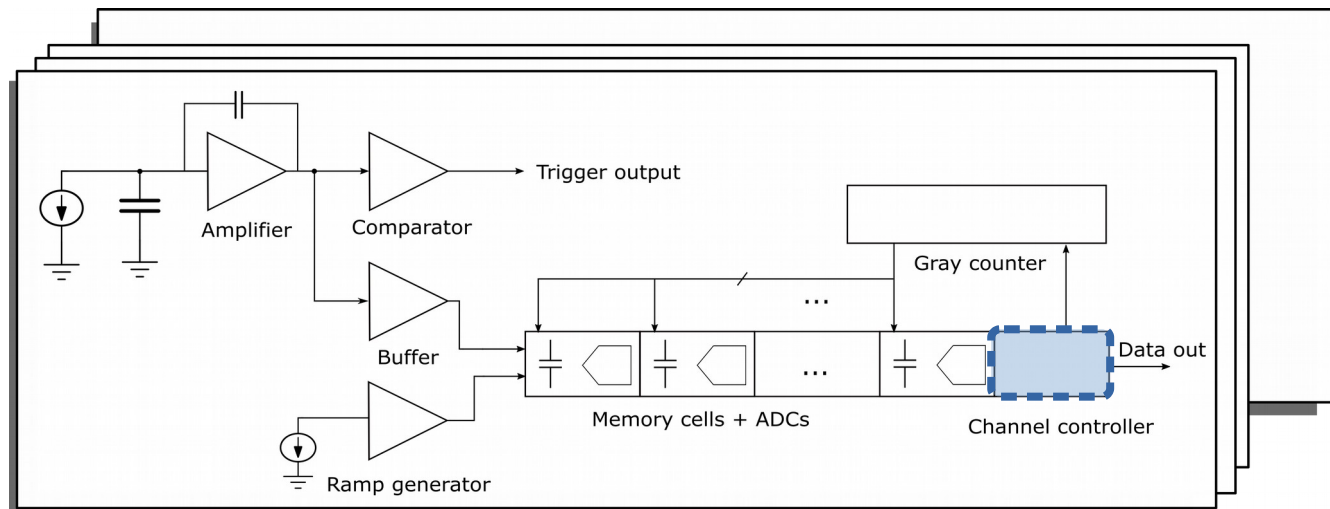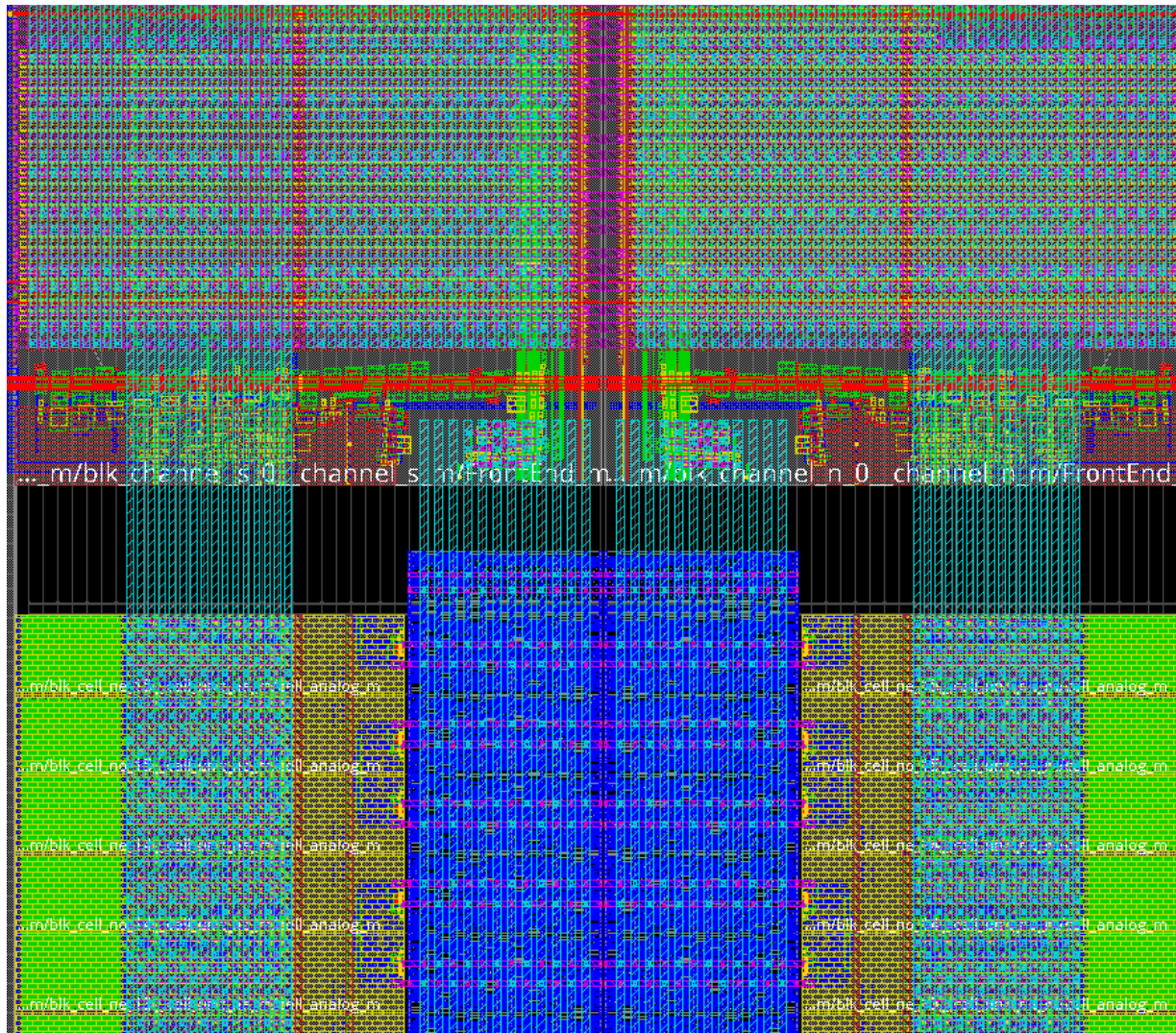
Multi-purpose waveform sampling ASIC in 65 nm

- **Present instance has front-end for SiPM**

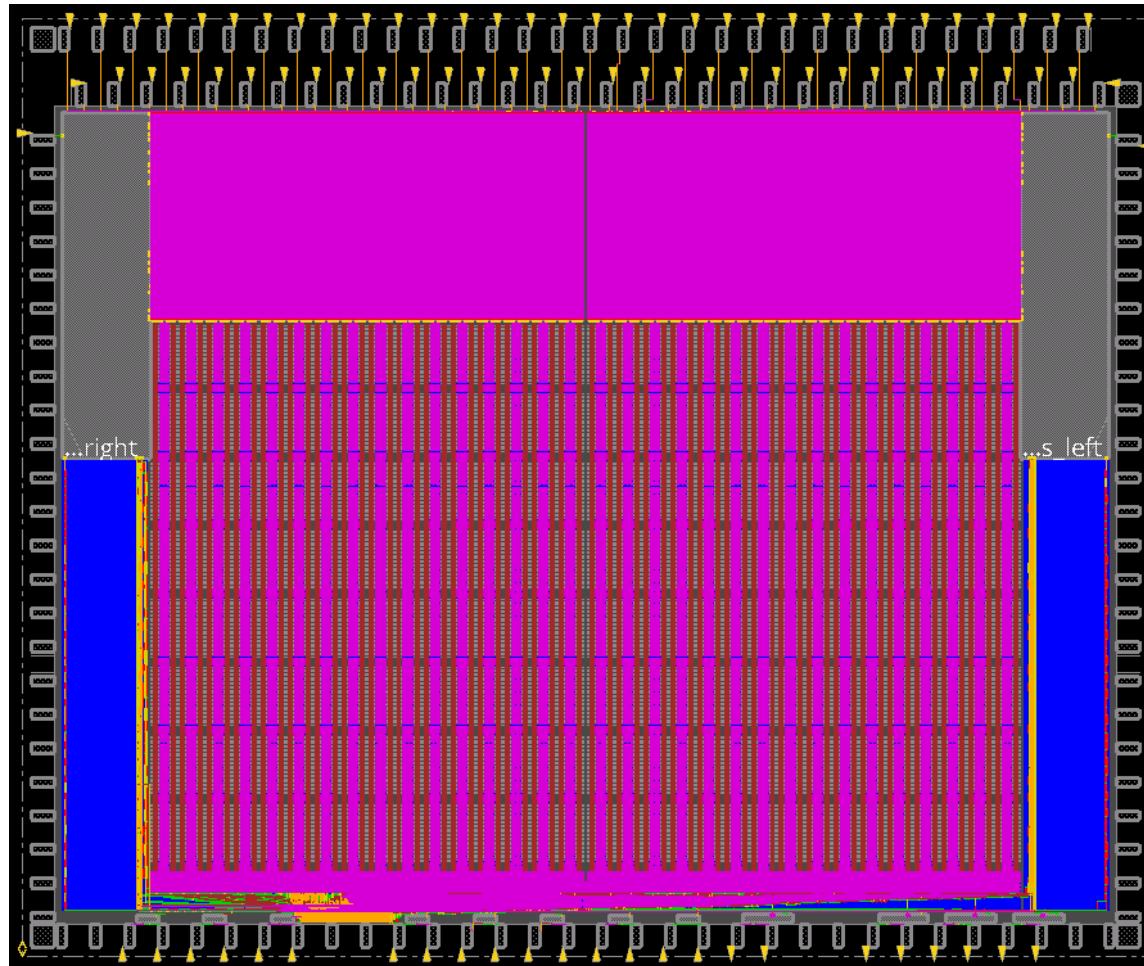- **Fairly easily adaptable to other detectors**
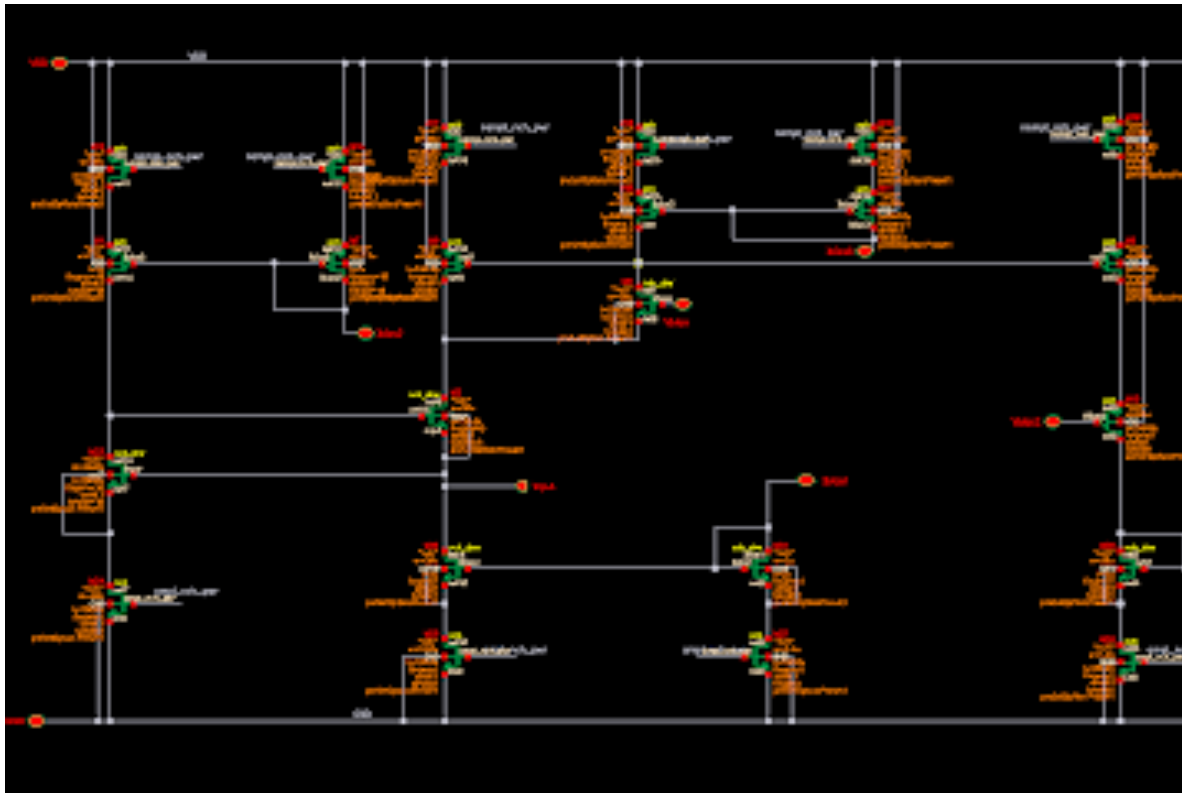
Multi-purpose waveform sampling ASIC in 65 nm

Multi-purpose waveform sampling ASIC in 65 nm

Multi-purpose waveform sampling ASIC in 65 nm

- **Design in final verification phase**