Mechanical Design of PICO Focal Plane

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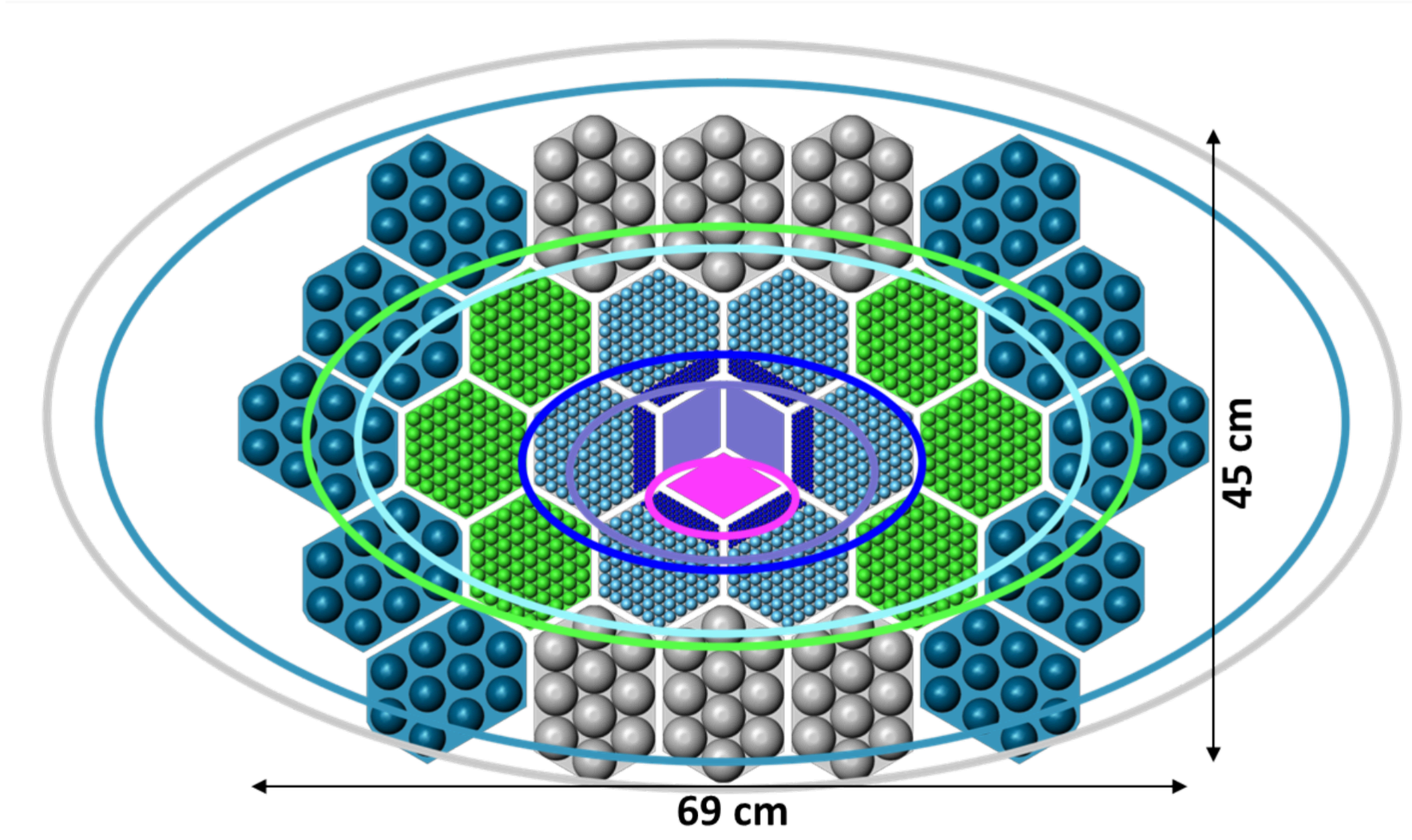
- Goal: provide mechanical support and heat sink for PICO focal plane (Lenslet wafer + detector wafer + TDM boards)



Karl Young, SPIE

Lenslet pixel

Toki's thesis
http://digitalassets.lib.berkeley.edu/etd/ucb/text/Suzuki_berkeley_0028E_13878.pdf

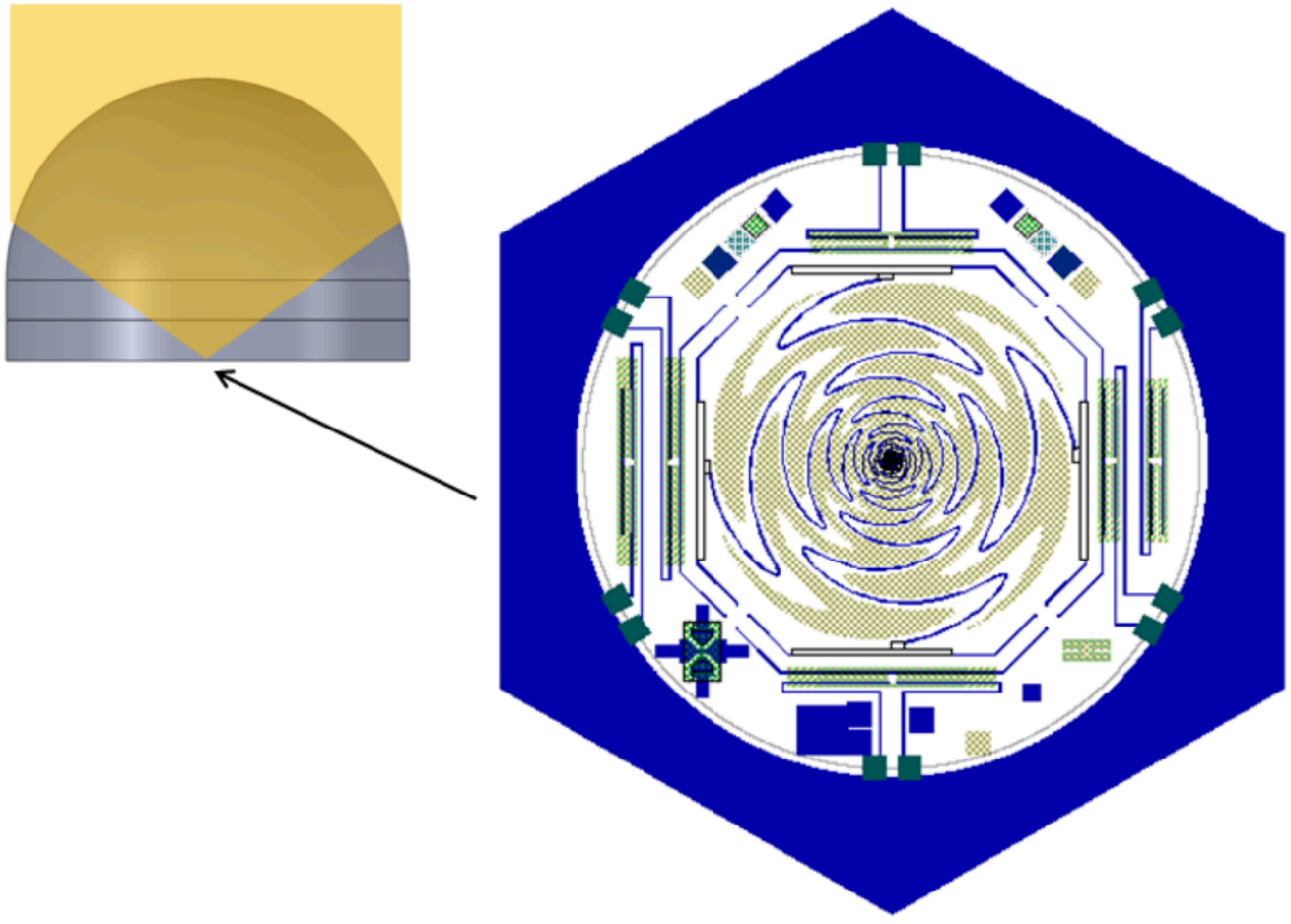
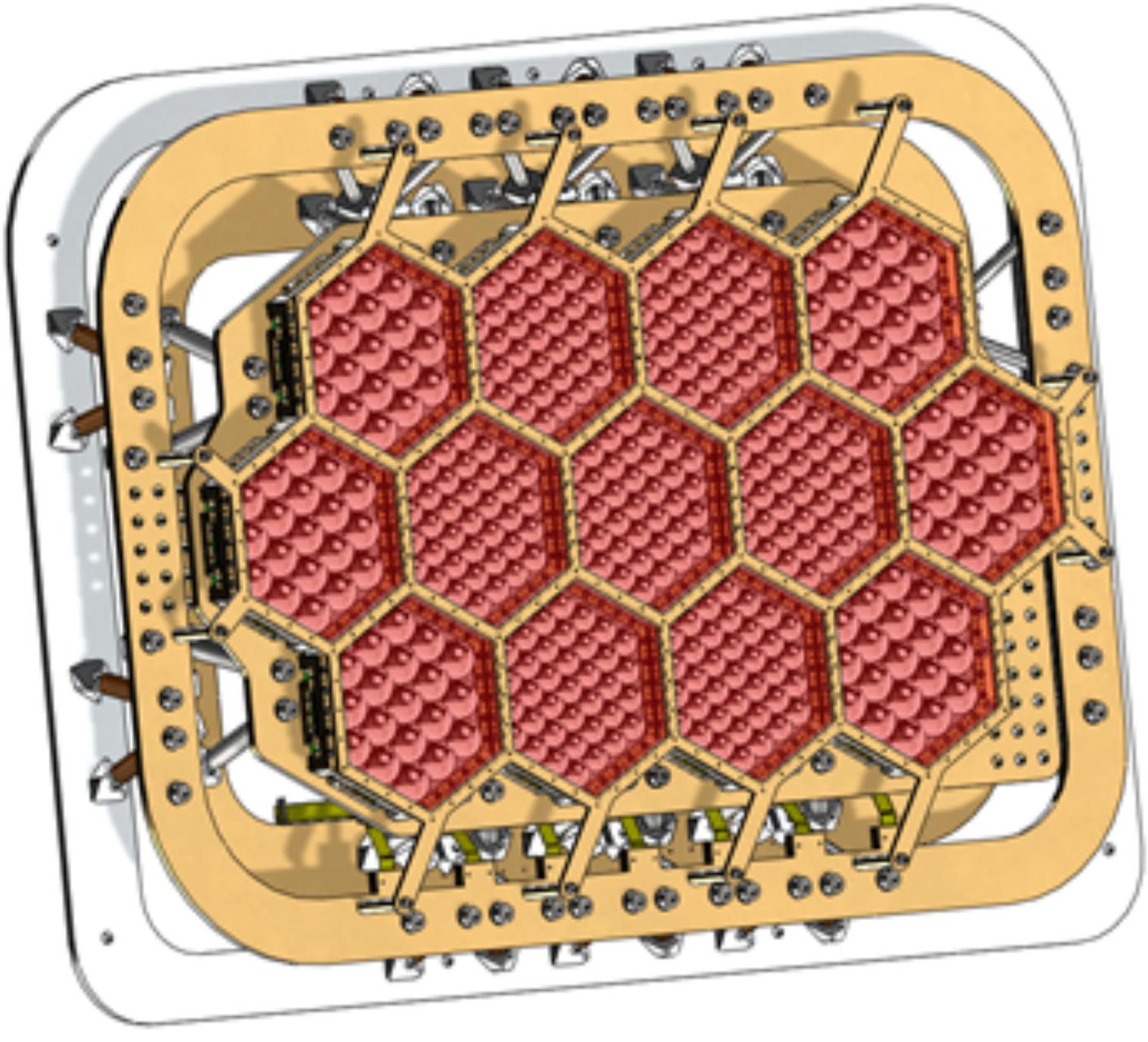


Figure 5.2: CAD of a pixel. Sinuous antenna is at the center of the pixel. Four diplexer filters surround the sinuous antenna. Four optical bolometers surrounds the filters. Dark bolometers and test structures surrounds optical bolometers. Twelve pads at the edge of circle connects wiring inside of pixel to on-wafer wiring.

LiteBird

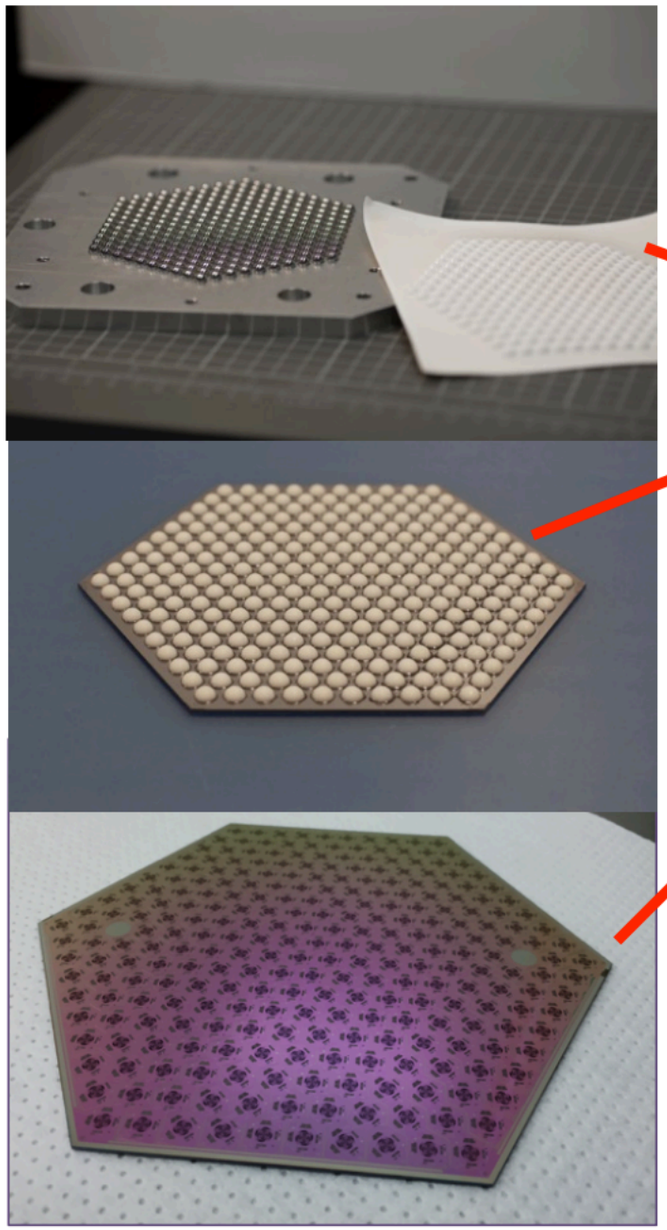


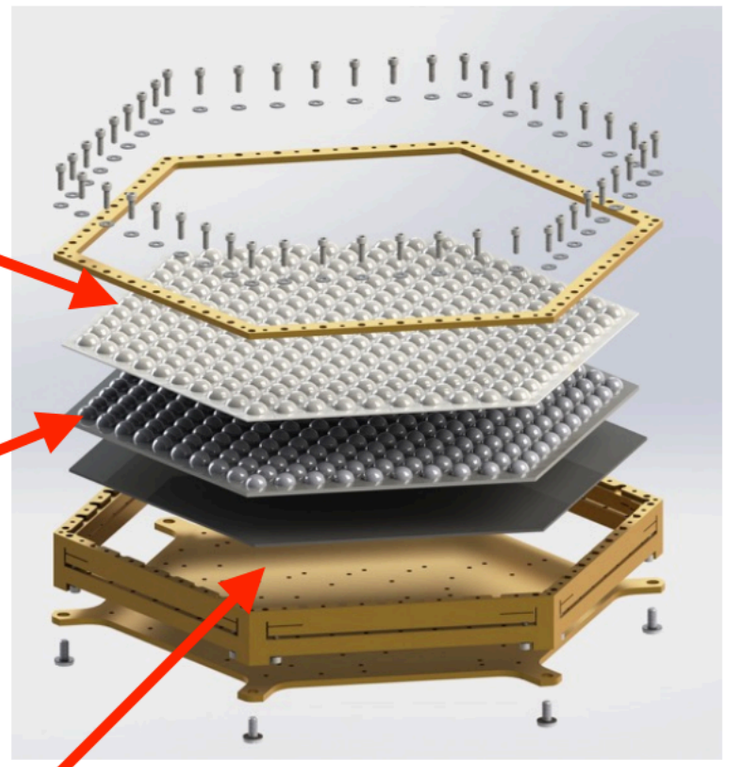
This includes
1) Detector wafer
2) Lenslet wafer
3) Invar holders
4) LC chips and associated hardware to mount it to invar holders
5) 100 mK plate to mount invar holders
6) Vespel struts between 100 mK, 350 mK and 1.5 Kelvin
7) Some plate (very empty) to screw these vespel struts to

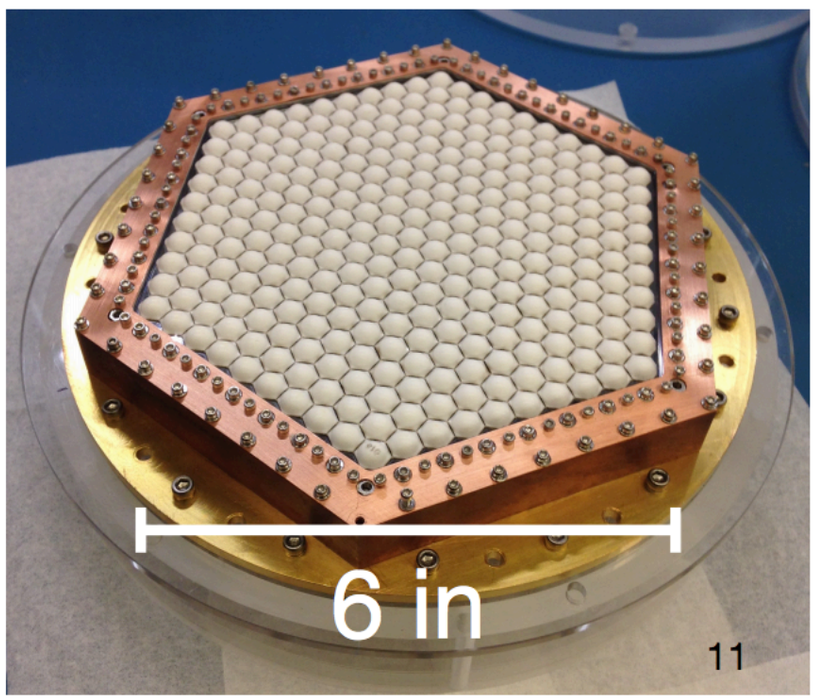
Dimension (L x W x H)
400 mm x 250 mm 400 mm

https://arxiv.org/pdf/1801.06987.pdf

SPT 3G



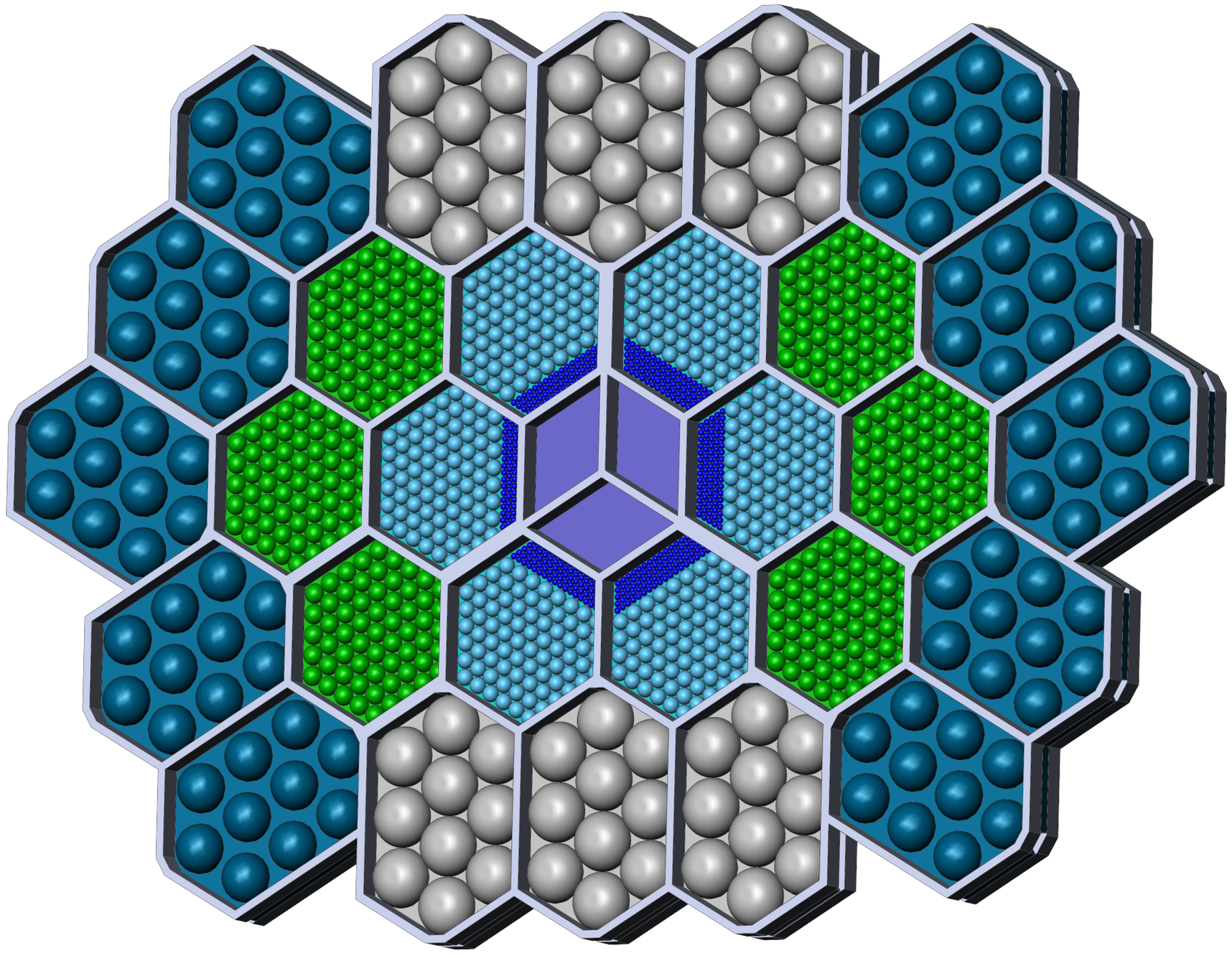




detectors from:
MIC…

https://indico.cern.ch/event/557734/contributions/2335649/attachments/1356450/2050463/20161017_INFIERI.pdf

PICO focal plane (preliminary)



- Questions Qi wants to ask:
- 1. Is it good enough to heat sink only through the edge of the wafers?
- 2. TDM vs FDM, any significant difference in terms of size, thickness?