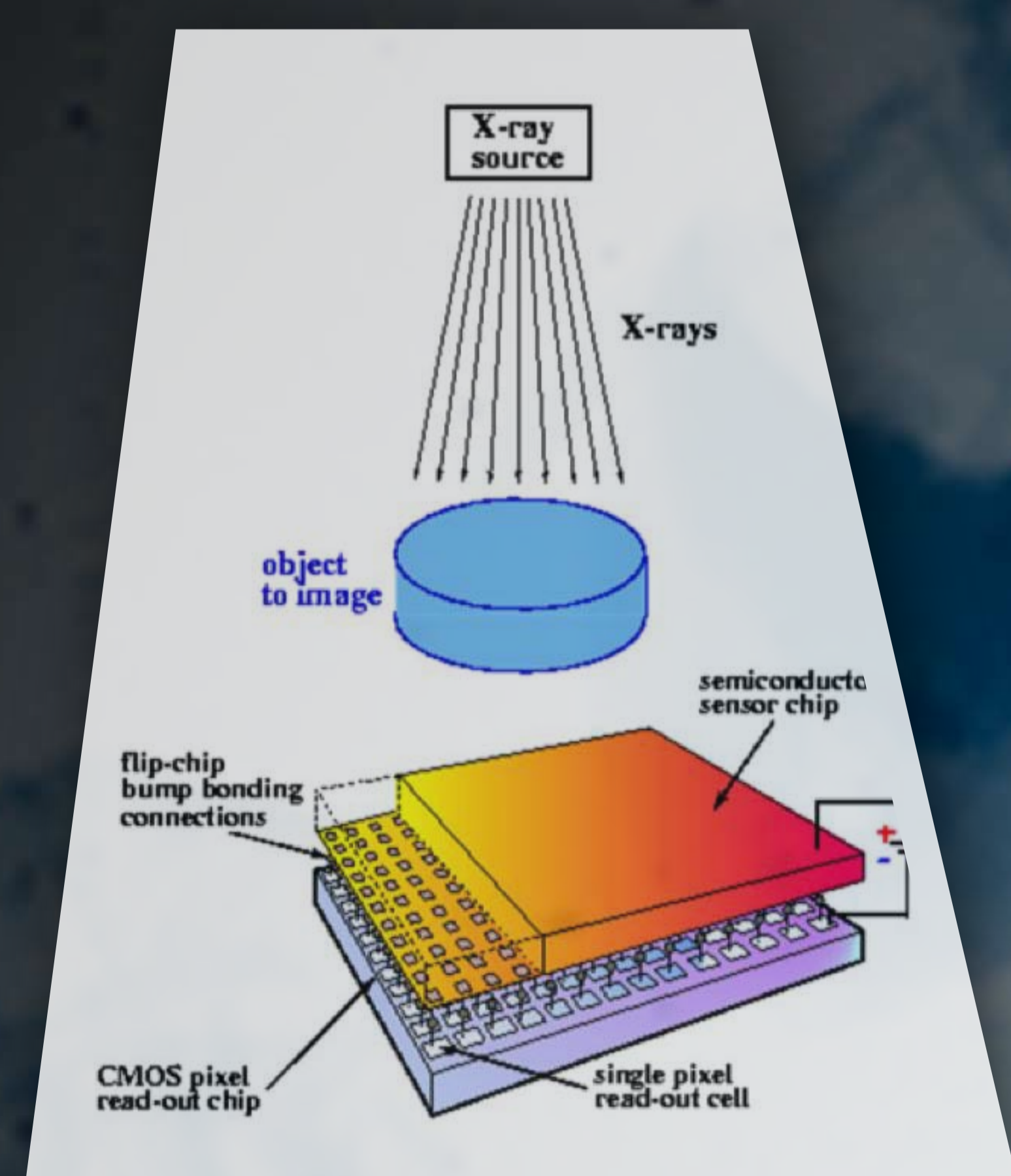


Detector Research and Development at Nikhef

>Nikhef develops detectors for particles (mostly at high-energy accelerators) and ionizing radiation (X-ray imaging).



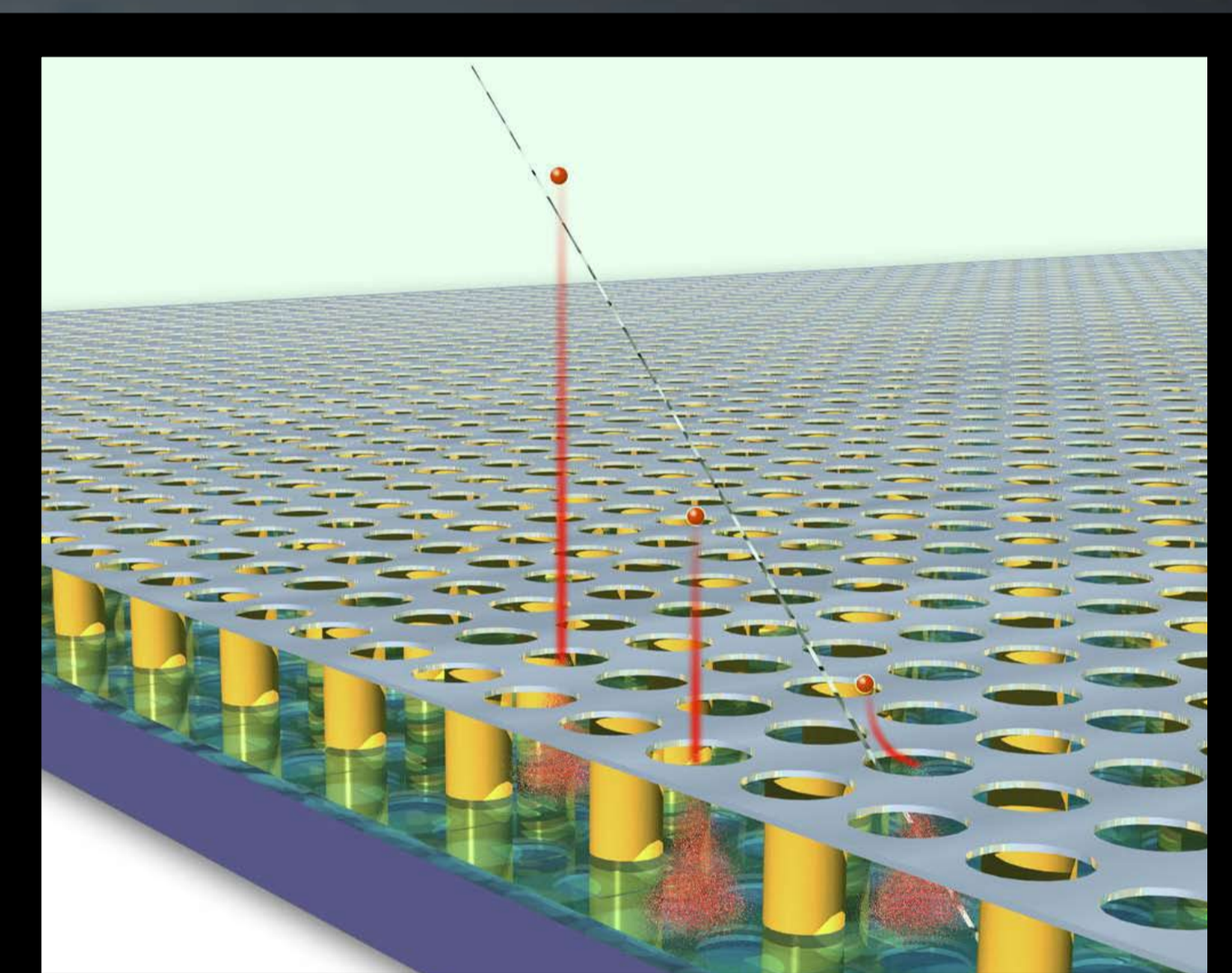
▲ Bump bonding sensor to CMOS ASIC for X-ray detection

>Collaboration

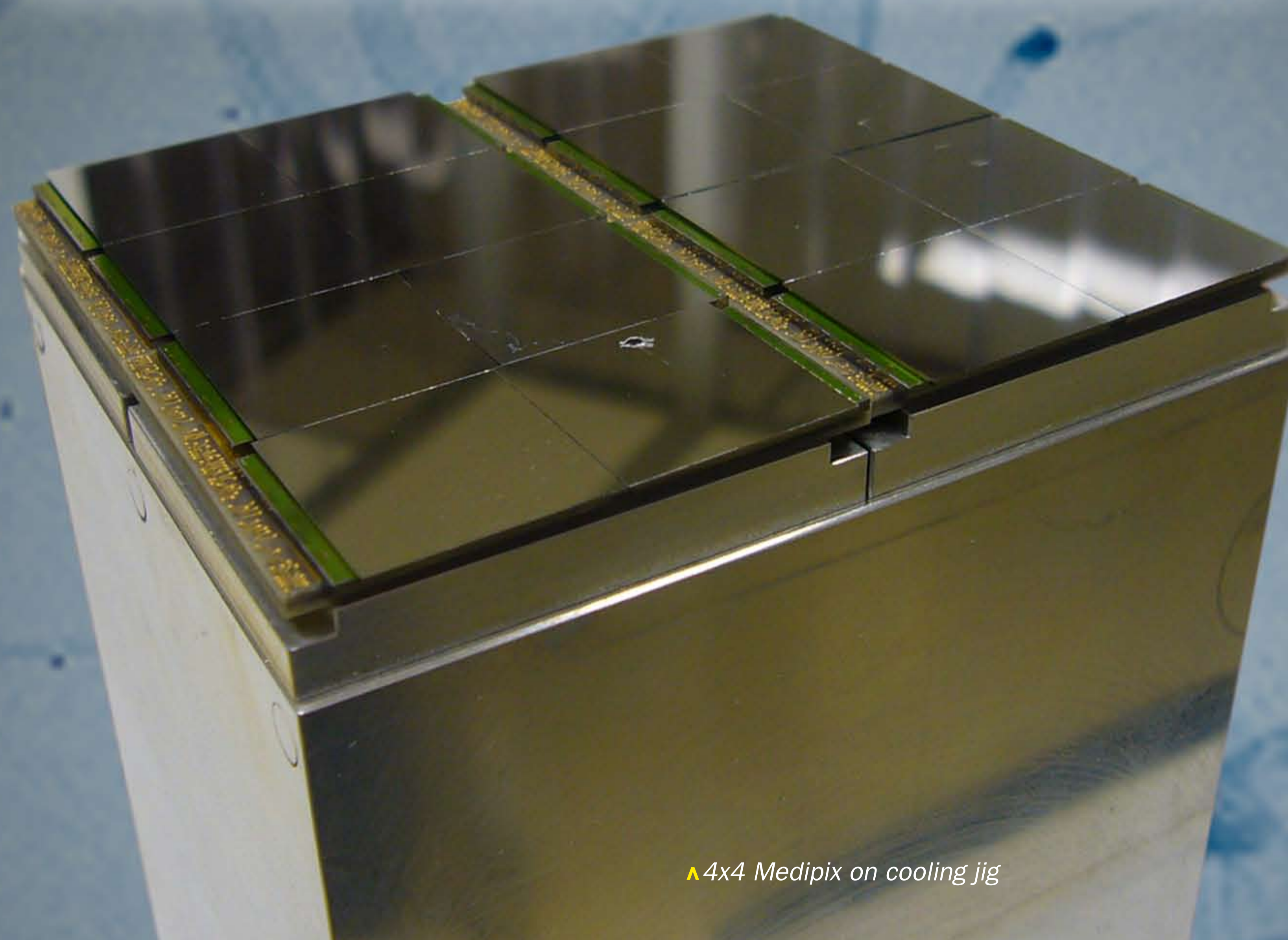
Nikhef participates in the Medipix 2/3 collaborations at CERN for the development of deep-submicron readout circuits for single-X-ray-photon counting hybrid pixel detectors.

The RELAXD project, together with PANalytical, IMEC and Canberra, aims to develop large sensitive detector areas, without dead spaces, and with multi-gigabit per second readout. Such detectors have applications for example in medicine and non-destructive material studies.

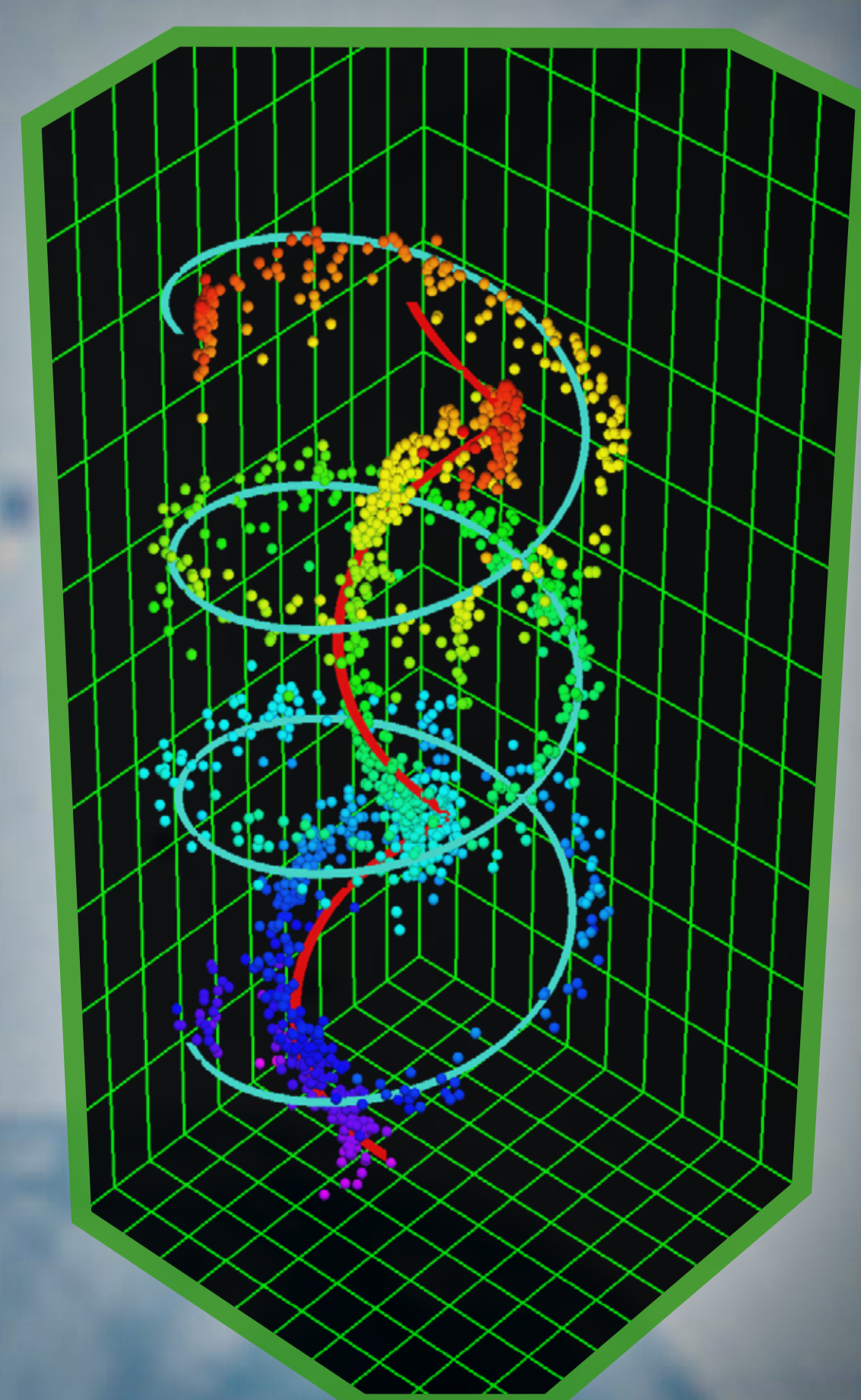
Recently, the European Hidralon project was also funded by SenterNovem. Nikhef will work together with Philips Healthcare on extending the applications of our detectors to (bio-)medical diagnosis equipment.



Gridpix gas chamber ▲



▲ 4x4 Medipix on cooling jig



Two electron tracks spiralling in magnetic field ▲

>Gridpix, Timepix, ...

Gridpix devices for next-generation charged particle detectors consist of gas-filled drift volumes above a thin metallic grid mounted at a short distance (50 μm) on a pixelised CMOS readout chip; the Timepix chip is derived from the Medipix chip, including arrival time measurement of the charge on every pixel. This allows 3D reconstruction of the particle tracks. The grid is grown on the chip using wafer post-processing technology at the MESA+ institute at the University of Twente.

▲ Watch as seen by X-rays