AGH University of Science and Technology

AGH University of Science and Technology
Kraków, Poland

Faculty of Physics and Applied Computer Science

Nuclear Electronics and Radiation Detection Group
(Wladyslaw Dabrowski)

Group

Members

- 10 scientific/academic staff members
- 6 Doctoral students
- x Masters students
- 2 technicians

Facilities

- ASIC design tools (via EUROPRACTICE)
- FPGA design tools
- PCB design tools
- Clean room, probe station
- Wire bonding

Fields of interest

Rad-hard mixed-mode front-end ASICs

Fast DAQ systems

Semiconductor detectors – physics, radiation effects

Gas detectors

Multi-Electrode Array sytems for neuroscience

Current projects/involvements

ATLAS Inner Tracker Upgrade (SLHC-PP)

Lumical for ILC (EUDET, AIDA)

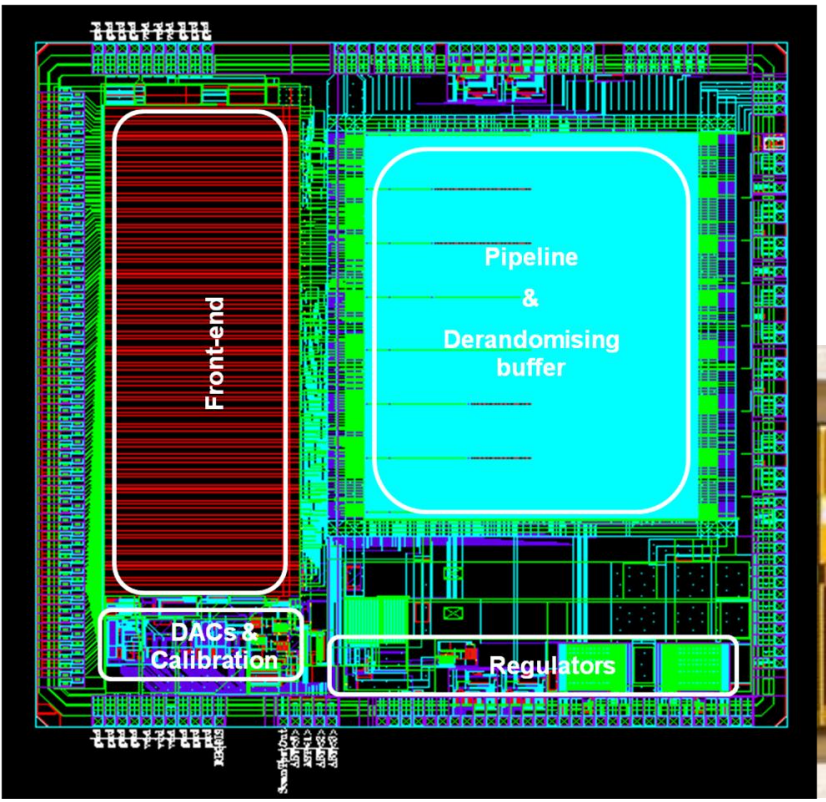
Fast 2-D strip readout of MSGC and GEM (NMI3)

Silicon strip detector for low energy X-rays

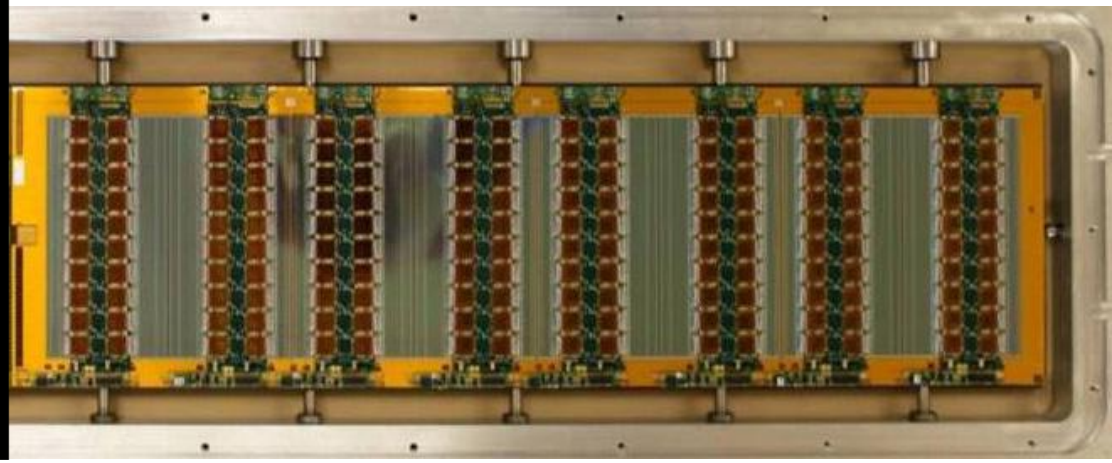
Imaging of live neuron systems

Example
ATLAS Inner Tracker Upgrade

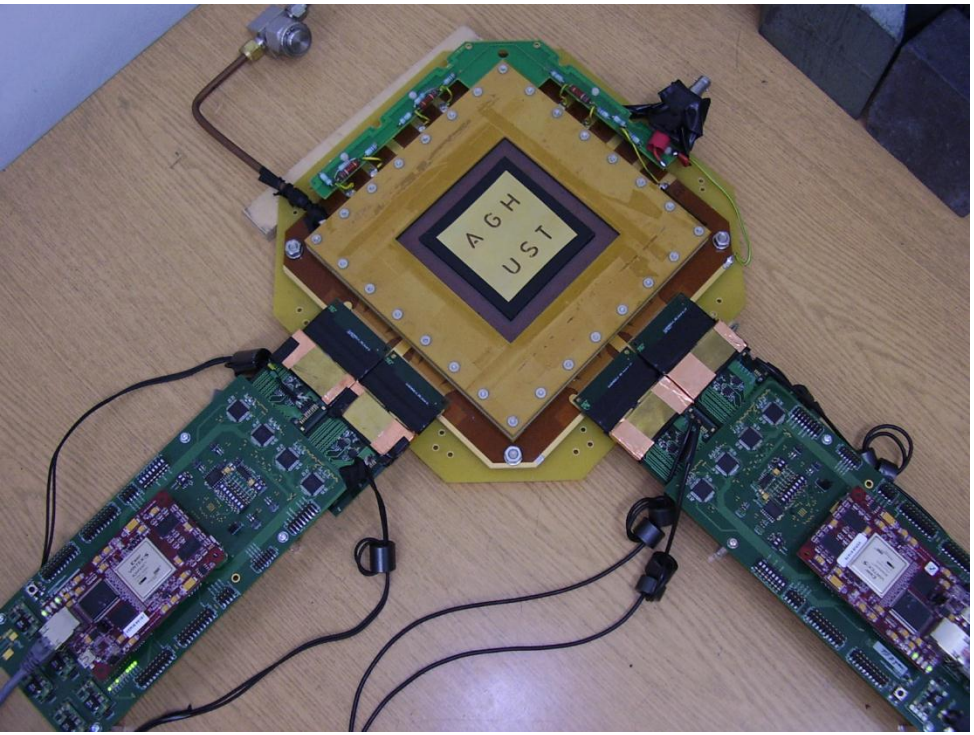
ABCN-25 ASIC for readout of silicon strips



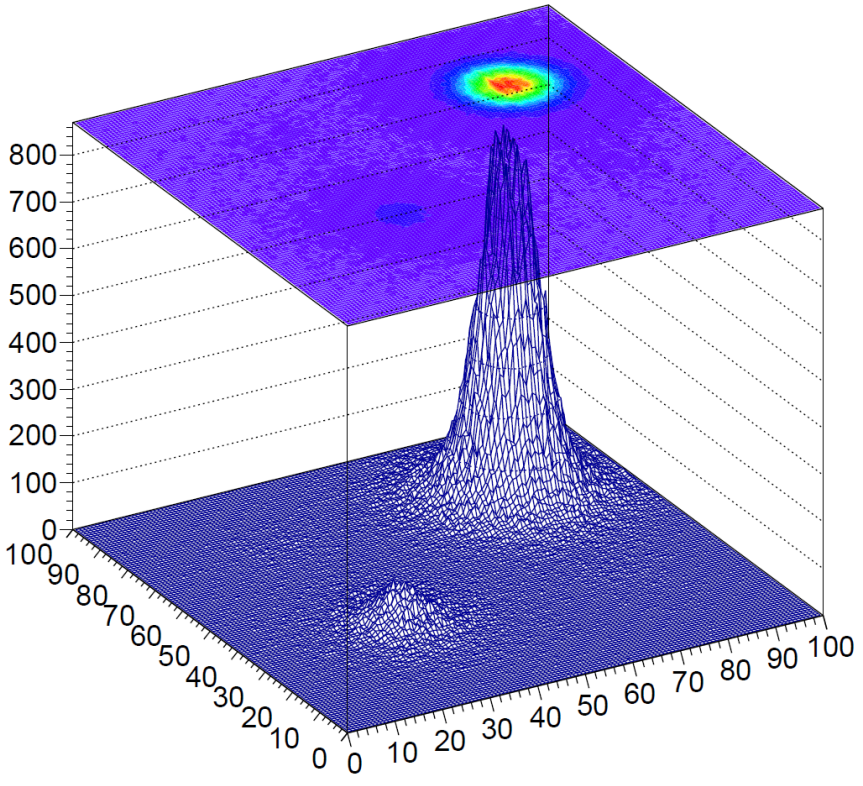
Prototype" stavelet"
4 modules 10×10 cm^2
(powered serially)
160 ABCN-25 ASICS



Example
Fast 2-D readout of GEM detectors

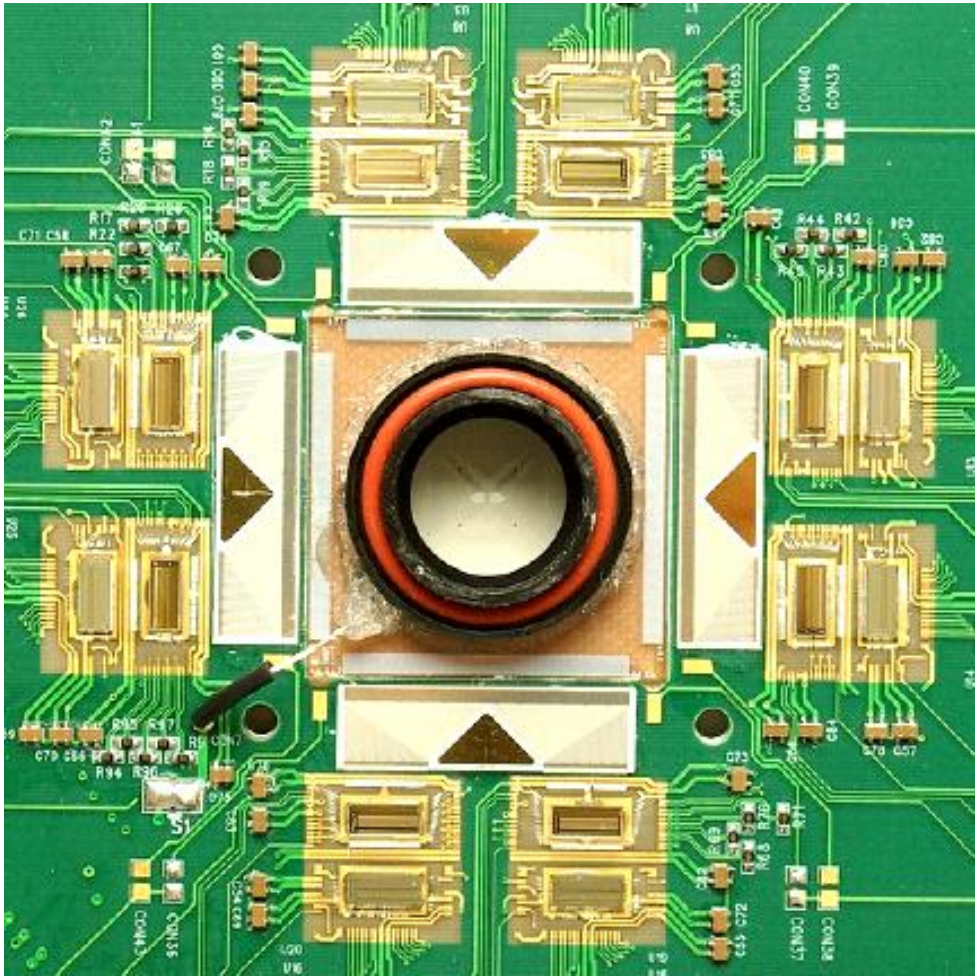


GEMROC ASICS
Custom DAQ boards with
Ethernet output protocol



2-D readout at count rate
~6 MHz/s

Example
Detector technology for neuroscience



512 electrode system for spatio-temporal distributed stimulation and recording of neural activity based on ASICs

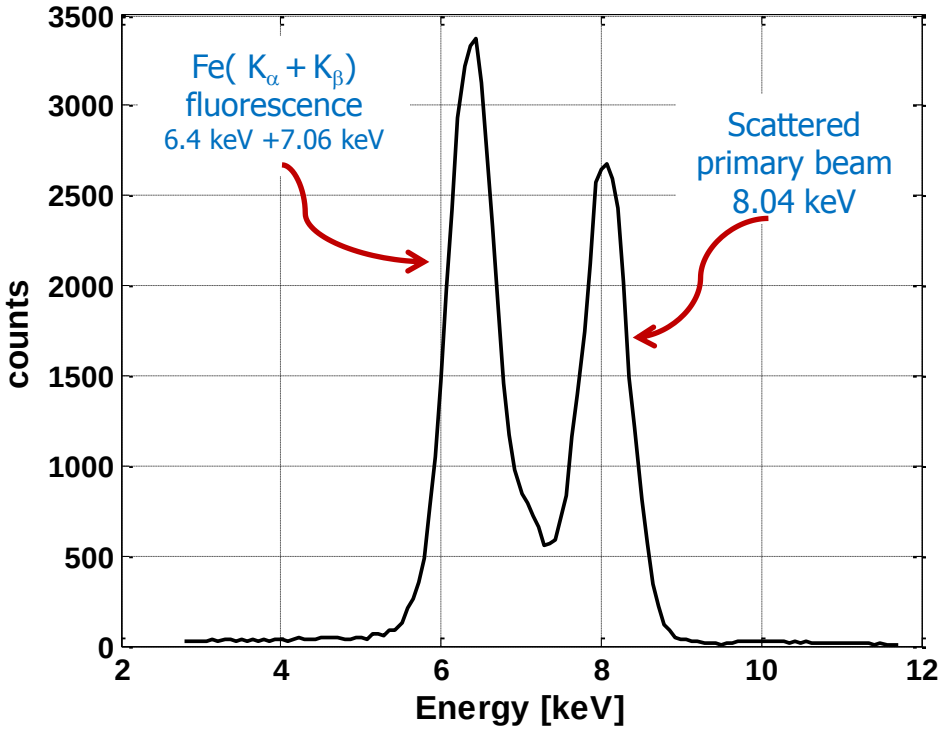
Application of ”detector” technologies to neuroscience

Example
Si-strip detector for X-ray diffraction

"LynxEye" detector for X-ray diffraction based oon Si-strips (from Bruker AXS)

Energy spectrum of a Fe_2O_3 sample

Improved energy resolution (600 eV FWHM) allows for electronic suppression of Fe flueorescence



Interest in Detector Technology and Systems Platform

Primary:

Readout for thermal neutron detectors (ASICs, DAQ)

We are open to exchange ideas/expertaise in other areas (mixed-mode ASICs, DAQ, detector physics, radiation effects)