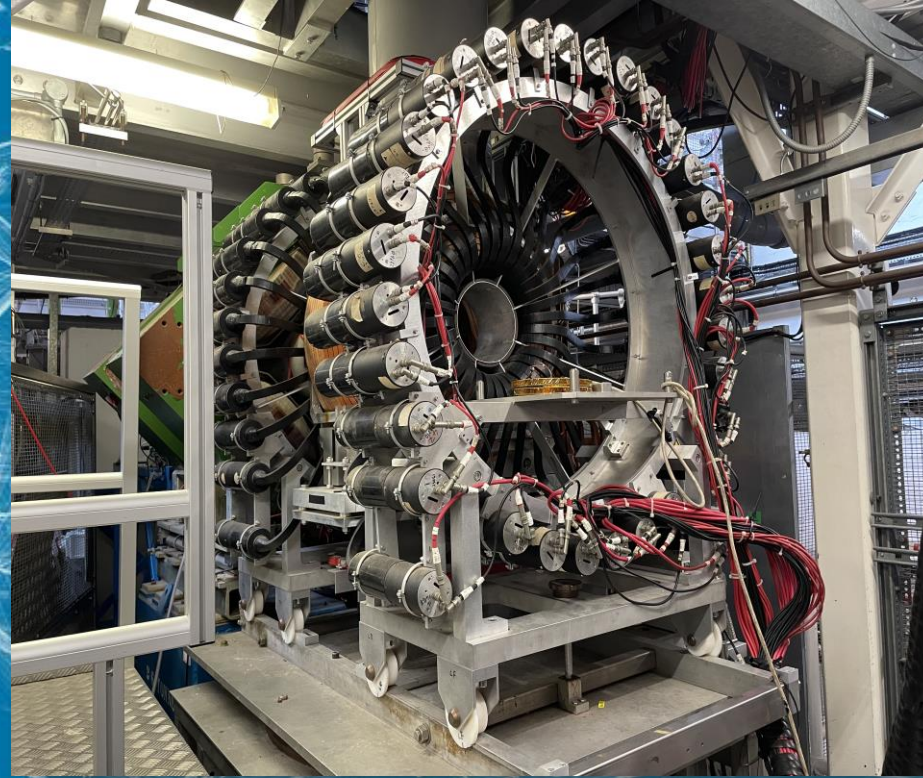
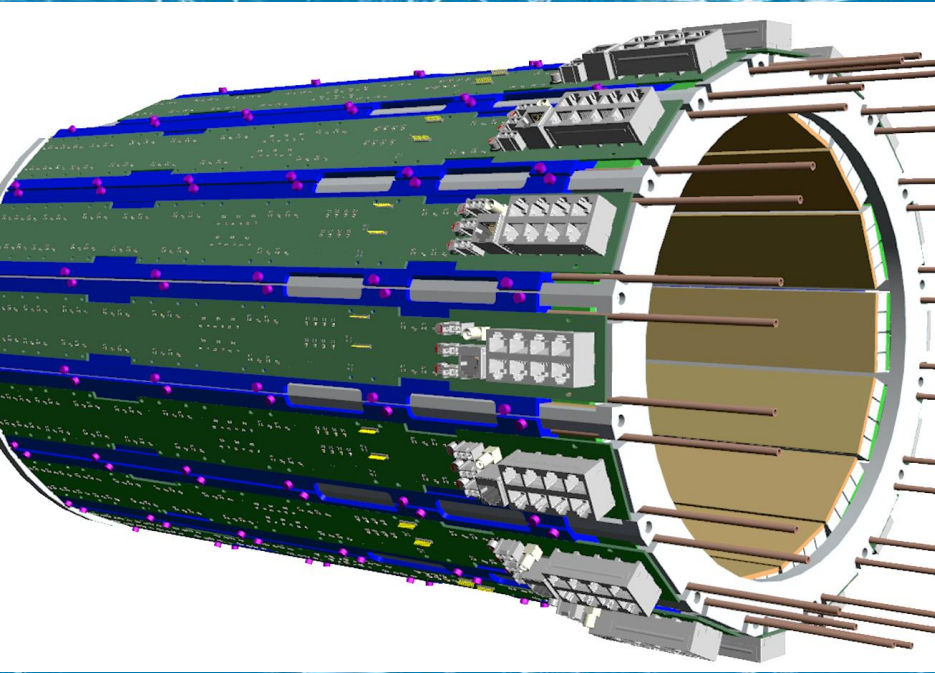


# High speed readout electronics for new generation Pulsed Muon Spectrometers



A. Abba  
F. Caponio  
D E Pooley  
F A Akeroyd  
P J Baker  
D. Kirk  
S P Cottrell  
R. Stewart  
A. Hillier  
C Macwaters  
D Nixon  
N J Rhodes  
E M Schooneveld  
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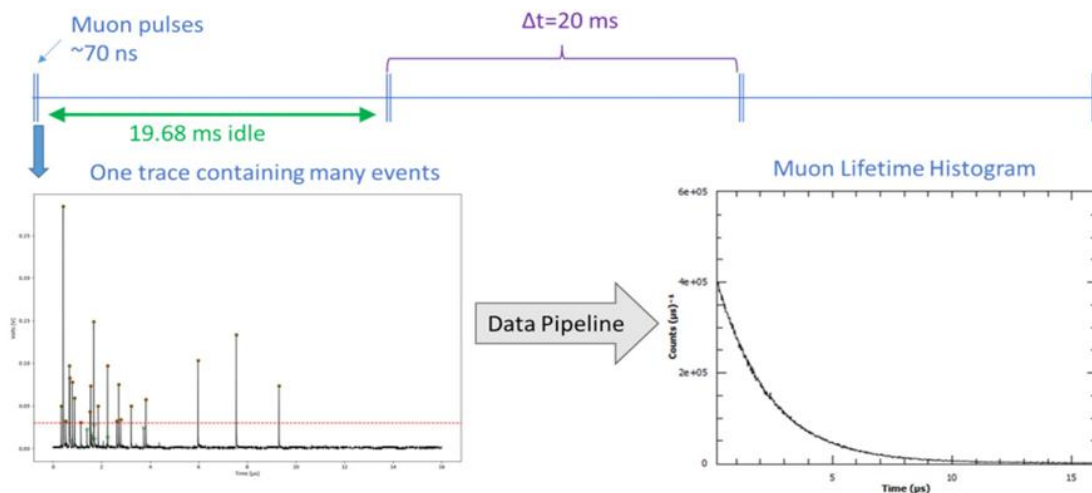
Upgrade of the MUSR and others muon instruments @ ISIS, STFC Harwell Campus



# High speed readout electronics for new generation Pulsed Muon Spectrometers

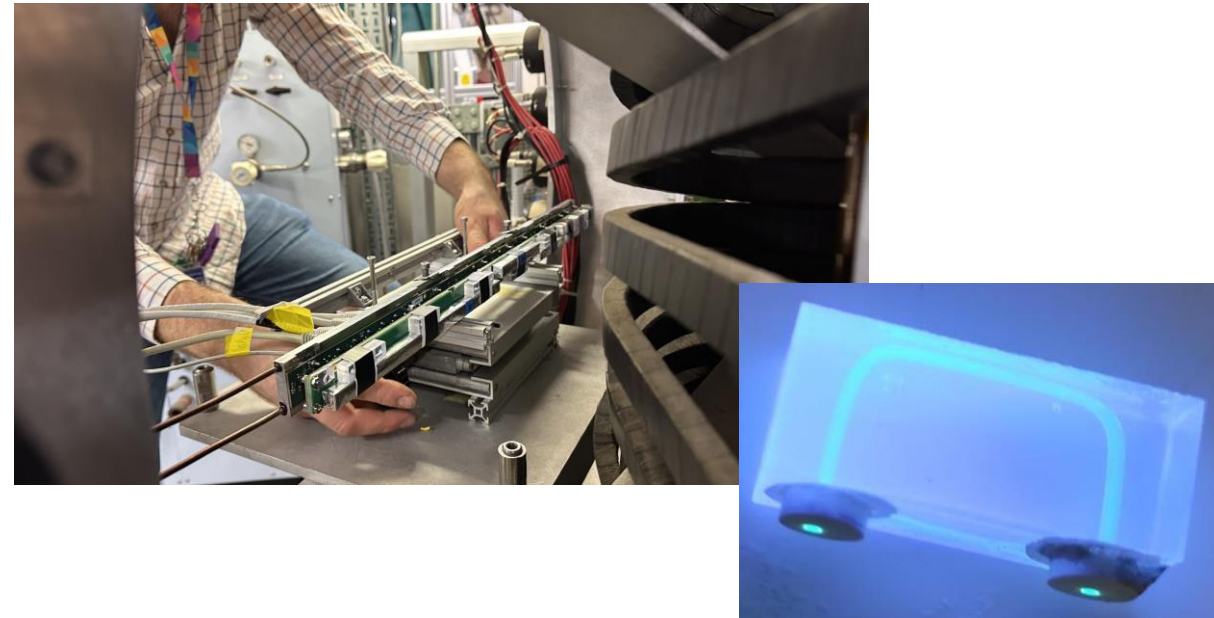
## HIGH-THROUGHPUT sub-ns MUON LIFE-TIME

Achieving sub-nanosecond muon lifetime measurements from over 2000 detectors, each operating at more than 100 Mcps per channel, poses significant technical challenges but promises groundbreaking results in high-energy physics and new material and life-science research.



## SIPM AND FAST AMPLIFIERS

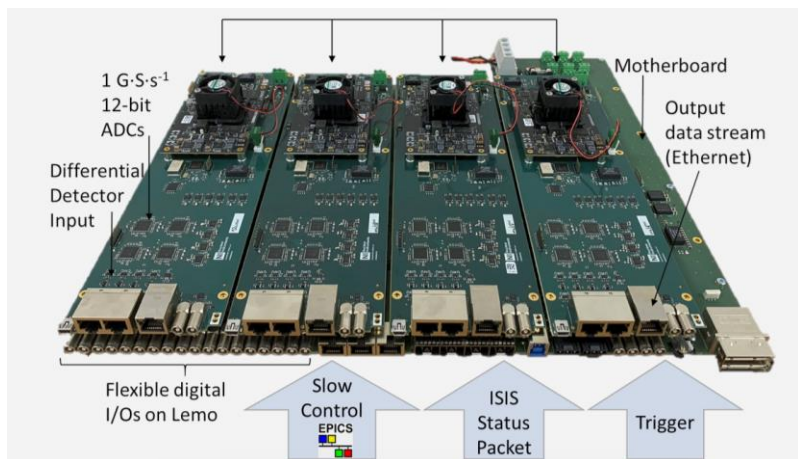
Our approach involves the utilization of SiPM detectors in conjunction with scintillators and optical fibers. These components are seamlessly integrated into a custom-designed multichannel front-end amplifier system boasting a bandwidth of up to one GHz.



# High speed readout electronics for new generation Pulsed Muon Spectrometers

## REAL TIME PROCESSOR

We designed a custom 32 channels 12/14 bit, 1 GSPS digitizer with SoC capable to operate in real-time with several algorithm distributed between FPGA and CPU



## PHA AND CFD AT 100 Mcps

Real-time second-order deconvolution handles extreme pile-up, DCFD ensures sub-nanosecond time resolution, with Energy and Time histograms calculated in real-time at extremely low deadtime.

