# Meeting in Temple: proposed agenda

The goal of the workshop for the “Electronics and DAQ” is to set a common ground and define the work plan.
A single parallel session (Friday morning) 3.5 h is sufficient.

**Logistic:** ***all participants will connect remotely to the parallel session.***

**Proposed agenda** (discussed before the meeting was turned to remote-only):

- Short introductory talk from the two conveners to present the WG
- Overview talk from R&D23 group (streaming readout) to present ongoing activities
  - Eventual specific talks from sub-groups discussing technical developments in the EIC framework
- Discussion about possible ideas to simulate a streaming readout system– starting from existing efforts
  - Today’s talk from M. Ungaro
- Open discussion: goals and deliverables for next meeting

We’ll discuss this agenda with the WG during our next meeting to gather further contributions and ideas.
***Workshop deliverable:*** a glossary of terms to be used in the Yellow Report document.

# From eR&D23 July 2018 report

- Starting point for the yellow report
- Some clarification on few points may help
  - Is streaming readout equivalent to software trigger readout?
  - Is streaming readout equivalent to triggerless readout?

- **Proposal:** start from this, integrate with missing items - circulate them on google group – discuss in Temple - and have a final document just after the Temple meeting

## Glossary

**Front-end electronics (FEE):** The electronics which interfaces with the detector, typically converting the analog signal from the detector via an analog-to-digital (ADC), charge-to-digital (QDC), or time-to-digital (TDC) converter into the digital domain.

**Triggered readout:** A data acquisition system in which hardware produces an electrical signal according to a trigger criterion based on a subset of detector information available quickly. The signal is used to control the conversion of detector signals into the digital domain, or to trigger the read-out of a data-window from a continuously filled buffer.

**Second-level / high-level trigger**: In triggered systems, higher-level triggers are often used to reduce deadtime (via a fast clear) or data amount (by dropping the so-far recorded data for that event). Each level in such a system typically has different time constraints and complexity limits. For example: a certain time frame could not be forwarded to the tracker if certain conditions are not met. In certain, complex, triggered setups, the later stages can resemble a streaming system, where a stream of events flows through a network of analysis nodes, and data selection criteria either accept or drop the event. The main remaining difference for this part is then that the data is organized and tagged by an event number instead of time stamps.

**Pipelined/buffered readout:** A triggered readout system where event data is stored on the front ends and read out asynchronously by the backend.

**Streaming readout:** A data acquisition system without an element producing electrical signals to control the conversion into the digital domain or readout of a buffer. Each channel, independently, record data over a certain threshold and stream them to a CPU farm for further elaboration.

**Zero suppression:** Removal of data if close to the no-signal level of the detector. For example, in ADC data, removal of the pedestal.

**Noise suppression:** Removal of data produced by intrinsic or extrinsic detector noise, for example by correlation with neighboring channels or shape analysis.

**Feature extraction:** Calculation of higher-level information. E.g. calculation of hit time and energy from ADC samples, or calculation of track information from hits. Often, but not necessarily, accompanied with the removal of the underlying lower-level data.

**Online Physics analysis:** Analysis of the high-level information provided by the feature extraction steps to produce physics-relevant information (e.g. missing mass).

**Data selection:** In a SRO system, data can be algorithmically selected for further processing and long-term storage. Not selected data is dropped and not further processed. This is equivalent to the function of first and higher-level triggers in triggered systems but can make use of all detector information and results from further analysis steps including feature extraction and online physics analysis.