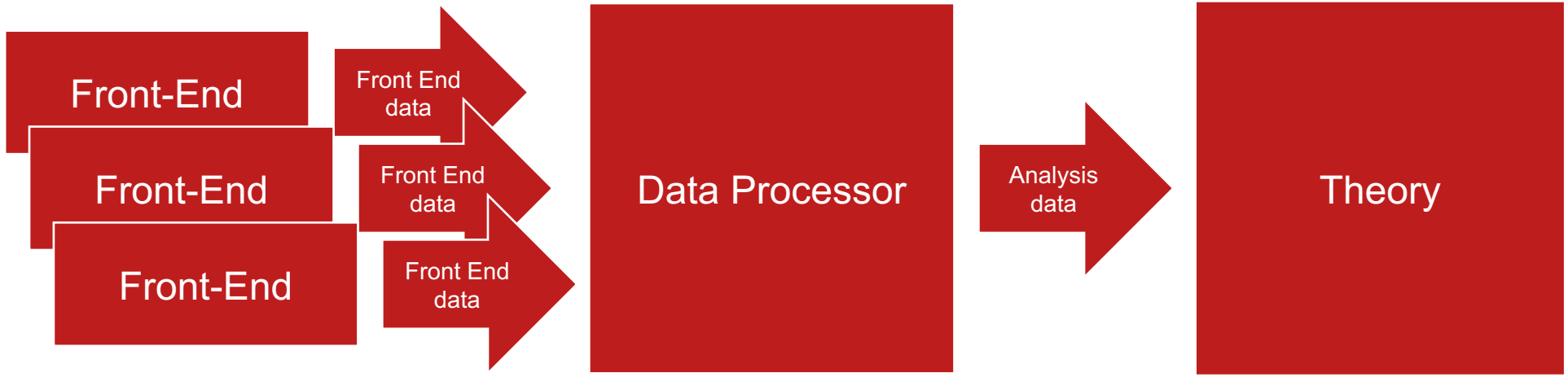
Streaming Readout from the Perspective of the ePIC Software & Computing Effort

- **Maximize physics reach**: We will take full advantage of **streaming readout**, **AI/ML**, and **heterogeneous computing** for ePIC.
- **Advanced technologies**: The compute-detector integration using streaming readout will be one of the highlights of the ePIC experiment.
- This is reflected in **EIC Software: Statement of Software Principles**:

> 2 **We will have an unprecedented compute-detector integration:**
>
> - We will have a common software stack for online and offline software, including the processing of streamed data and its time-ordered structure.
> - We aim for autonomous alignment and calibration.
> - We aim for a rapid, near-real-time turnaround of the raw data to online and offline productions.

- **Priorities for 2023**
  - Streaming readout in the simulations of the detector readout (digitization)
    - This will allow to develop reconstruction algorithms for streaming readout.
  - Choose a computing model for streaming readout and simulate it.
    - Graham Heyes (Jefferson Lab) discusses Computing Models that Feature Streaming.

Integration of DAQ, analysis and theory to optimize physics reach



Research model with seamless data processing from DAQ to data analysis

- Building the best detector that fully supports streaming readout and AI/ML:
  - FastML for alignment, calibration, and reconstruction in near real time.
  - AI for intelligent decisions
- For rapid turnaround of data for the physics analysis and to start the work on publications.
- **Holistic view**:
  - We will use the full, detailed information from all detector components to reconstruct events.
    - That will include event building and filtering.
  - Streamline workflows: DAQ, online, and offline experts as part of streaming readout WG.

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