

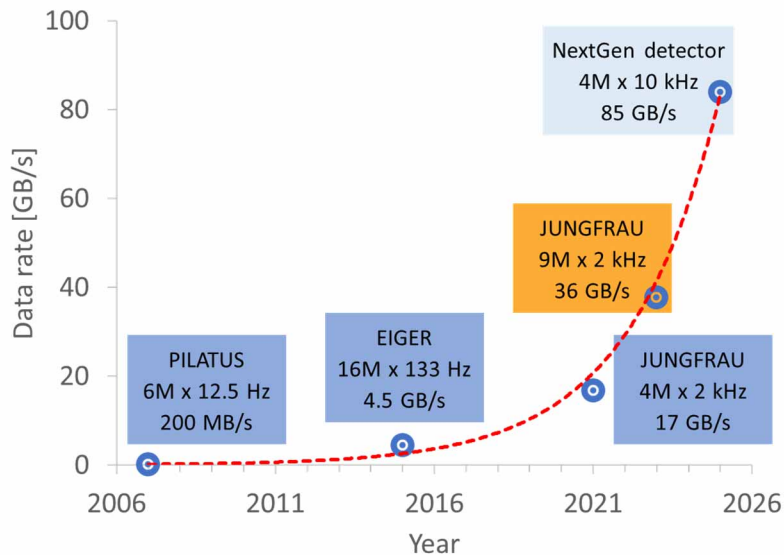
# JungfrauJoch: Data Acquisition and Real-Time Image Analysis System for KiloHertz X-Ray Pixel Array Detector

## Scientific application

Macromolecular serial crystallography at **synchrotrons** and X-ray free electron lasers

## Challenge to solve

Acquiring and analyzing images, given that data rates from X-ray detectors grow **exponentially**

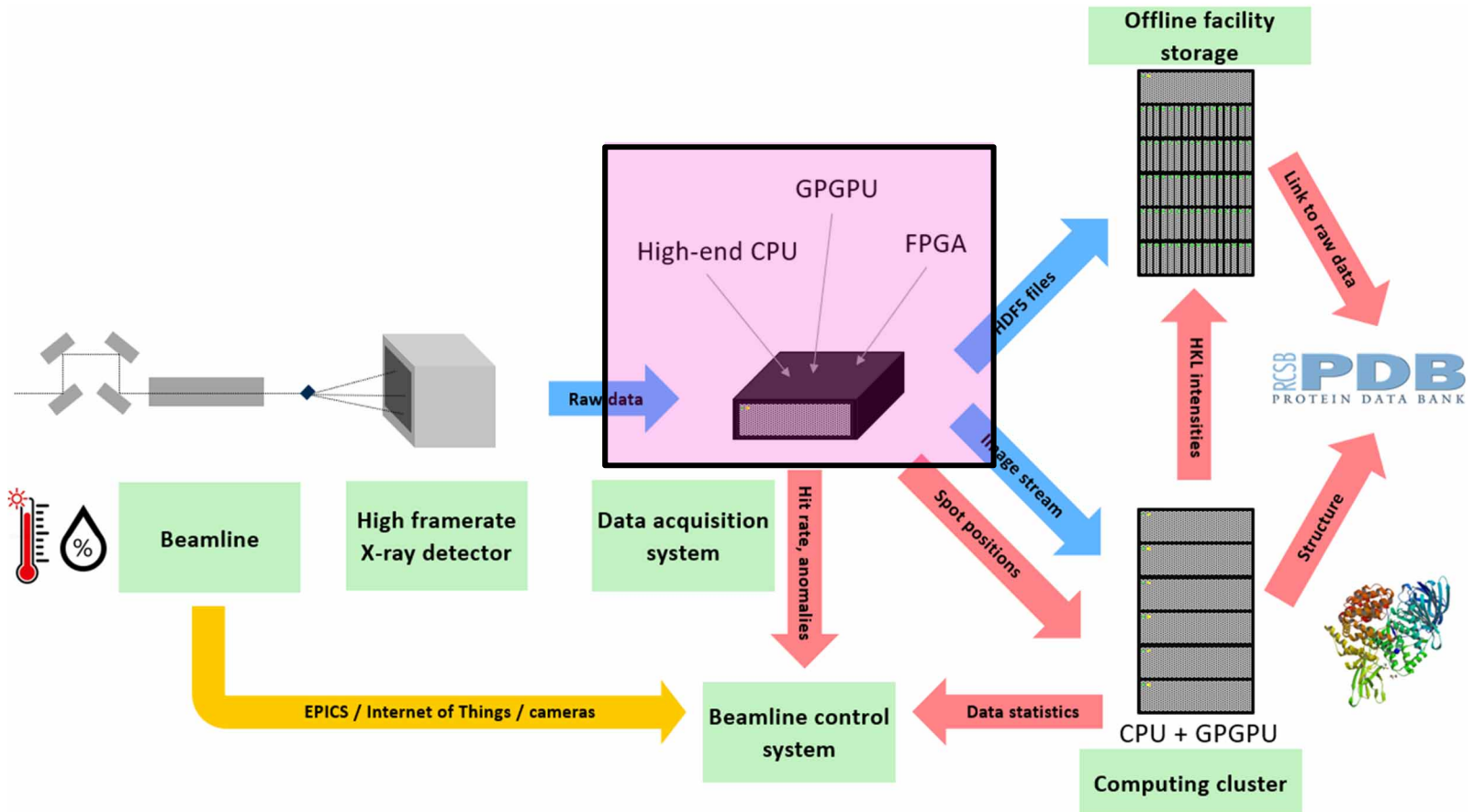


PSI JUNGFRAU 9 Mpixel @ 2 kHz  
36 GB/s detector

# Jungfraujoch: Data Acquisition and Real-Time Image Analysis System for KiloHertz X-Ray Pixel Array Detector

## Aim of the project

Create read-out system with high **throughput**, on-the fly **analysis**, and fast **deployment**



# JungfrauJoch: Data Acquisition and Real-Time Image Analysis System for KiloHertz X-Ray Pixel Array Detector

## Result: JungfrauJoch

Single server equipped with **FPGA smart network cards** (high-level synthesis) and general purpose GPUs **successfully acquires** data from 36 GB/s JUNGFRAU 9 Mpixel

## Current work

- **Lossy compression**, incl. suppression of frames that have no crystal diffraction
- Extending JungfrauJoch with company **DECTRIS** for their **photon counting** X-ray detectors

**I am happy to share experience on big data handling and to connect with experts from other facilities and from other fields of science:**  
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