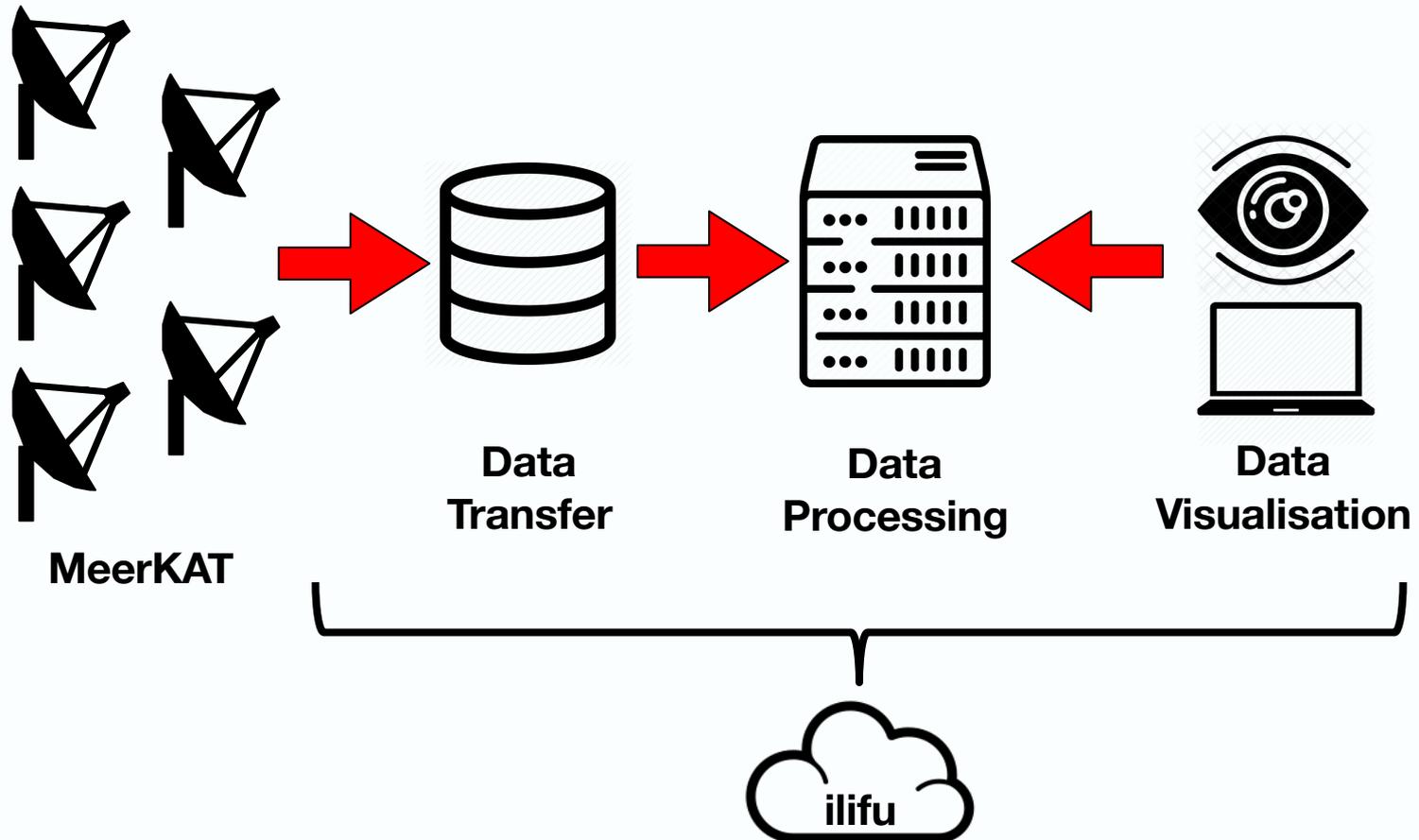


# ilifu and the MeerKAT toolbelt

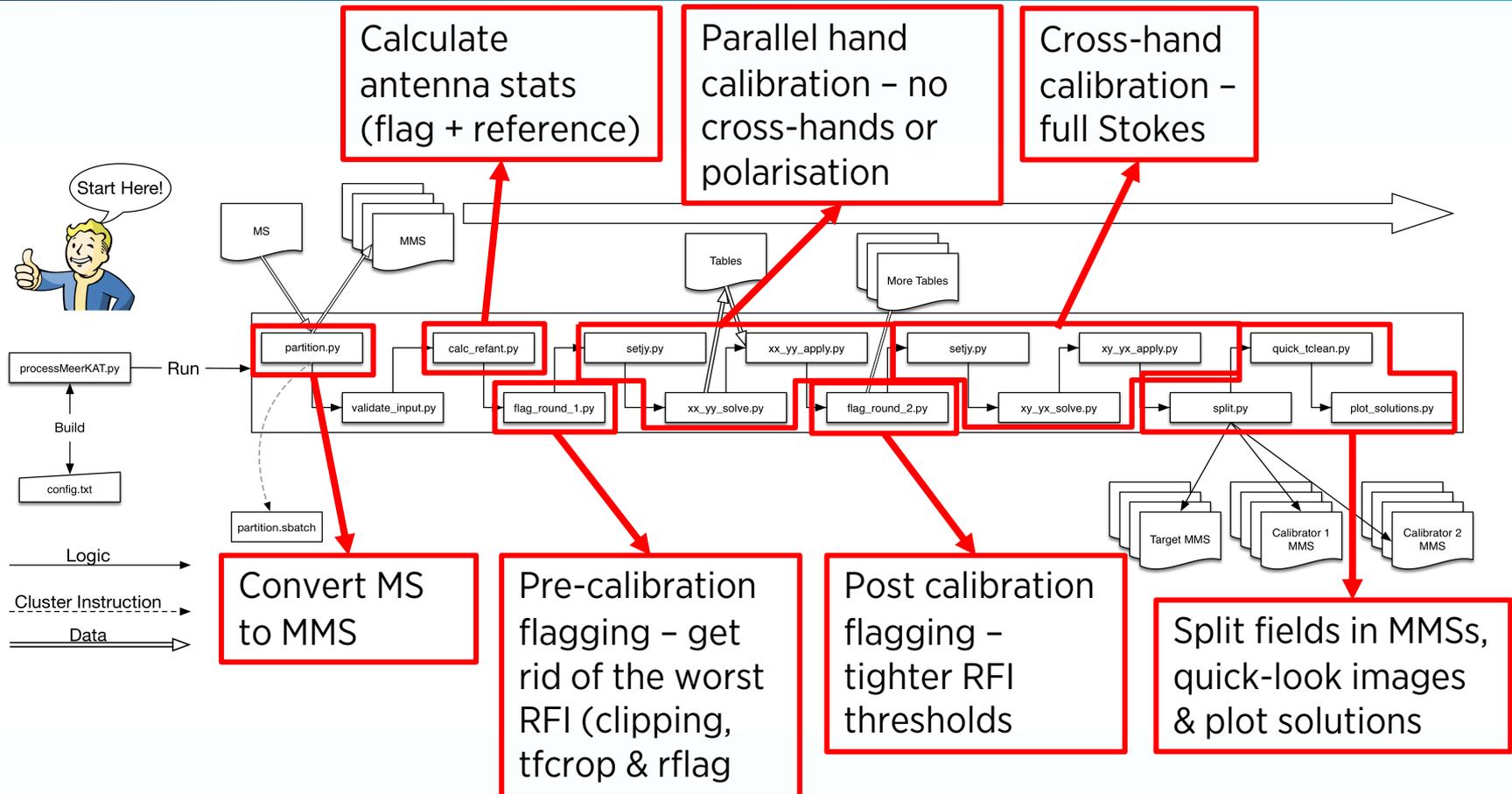


# IDIA MeerKAT pipeline (processMeerKAT.py)

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- Brad Frank, Jordan Collier, Srikrishna Sekhar, Russ Taylor
  - V1.0 (released March 2019) performance tested by LSPs
- Full Stokes calibration in CASA
  - Continuum images + polarisation cubes + spectral line cubes
- Parallelised package for HPC processing (SLURM + cluster)
  - Uses multi-measurement sets (MMS) to parallelise across a cluster
- Robust, generic, fast implementation of a priori calibration
- Easy to use, transparent, reproducible
- Builds and submits pipeline jobs to SLURM
  - Input measurement set, build / run your config file, request resources
  - Optionally insert your own scripts, specify containers and MPI wrappers
- Aim:  $T(\text{cal}) \sim T(\text{obs})$

# IDIA MeerKAT pipeline (processMeerKAT.py)



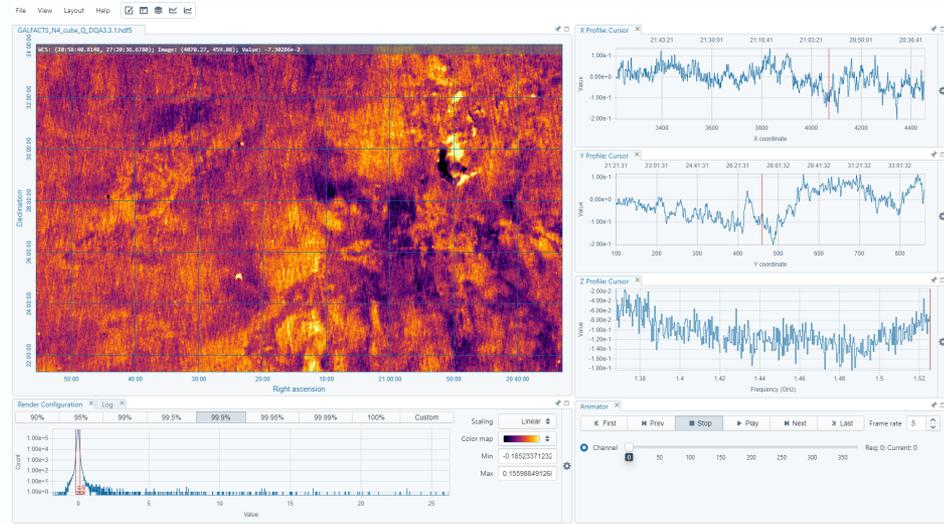
# MeerKAT LSP Data Products

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- Full-Stokes continuum images and cubes (MIGHTEE, others)
- Continuum subtracted cubes and moment maps (LADUMA, MHONGOOSE, Fornax, MALS, others)
- Multi-Epoch images (ThunderKAT)

# CARTA

- Cube Analysis and Rendering Tool for Astronomy
  - IDIA (South Africa) – NRAO (US) – ASIAA (Taiwan)
  - Cloud-based Visual analytic of remote large image cubes
  - Supports many image formats: FITS, CASA, Miriad, and HDF5
  - v1.3 released March 31, 2020, available online: <https://cartavis.github.io>
  - To be deployed at ALMA Regional Science Centres



# CARTA HDF5 format

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- Purpose-built HDF5 schema developed at IDIA
  - Efficient FITS to HDF5 converter tool developed at IDIA
- Files go through an “ingestion process”
  - Rotated dataset (XYZ -> ZYX) cached for spectral profile generation
  - Pre-calculated statistics & histogram for image loading (slides & cubes)
  - Pre-calculated tiles for image loading (v1.4)