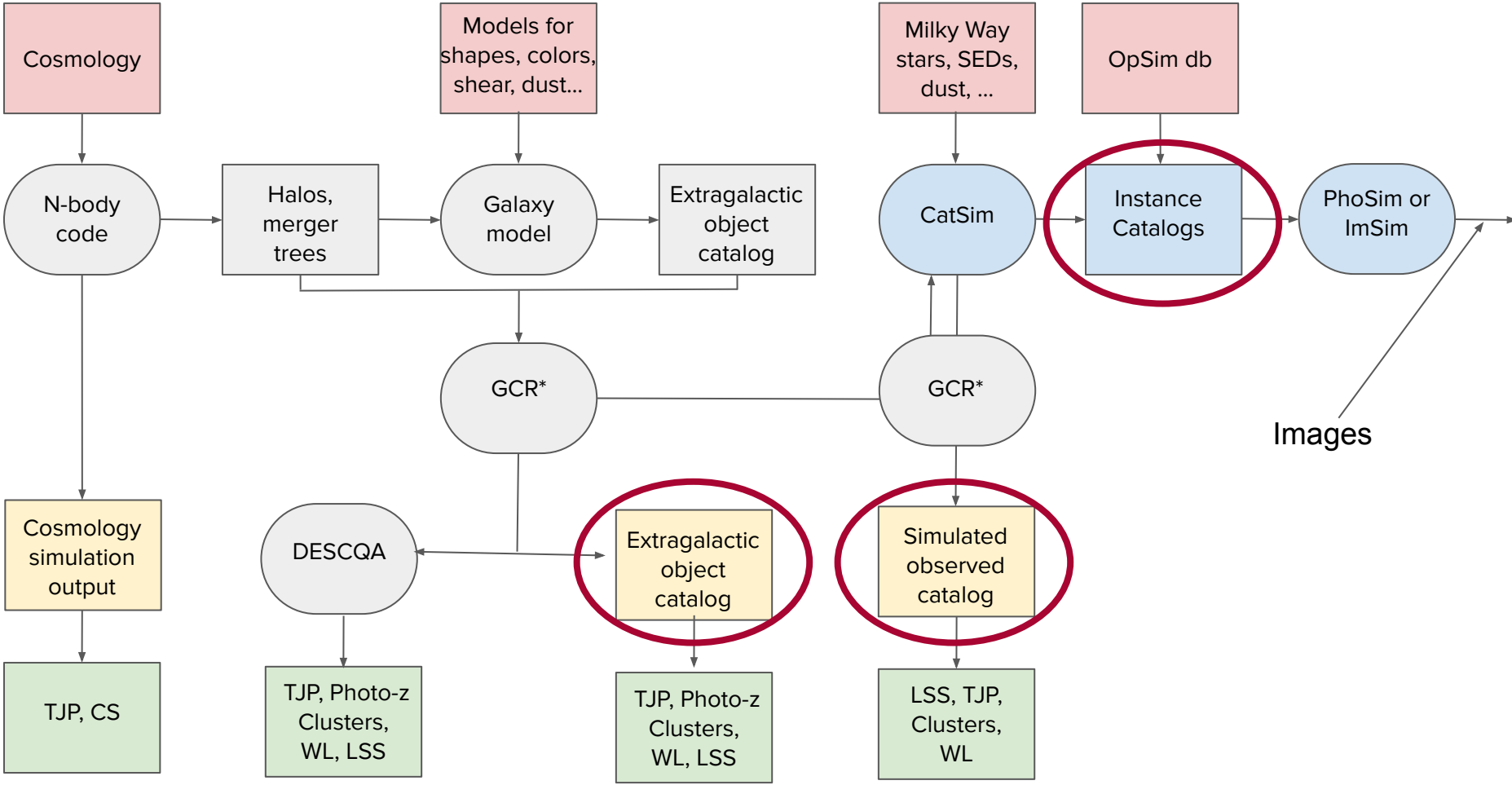
DC2

End-to-end simulation, reduction, and analysis of 300 sqdeg of LSST-Like images, based on a 5000 sqdeg nbody/galaxies simulation

Also includes a dynamic sky (certainly not complete)

- var. Stars+ AGN(strongly lensed in uDDF) + SN (Ia only, WFD et uDDF)

Baseline footprint and cadence, incomplete instrumental effects (but still decent)



From K. Heitman et al

Current stage ProtoDC2 and Run1.2p

- 5x5 WFD () et 1.1x1.1 uDDF (red square)
- Used as a validation stage
- Image simulation with either imsim or phosim for comparison

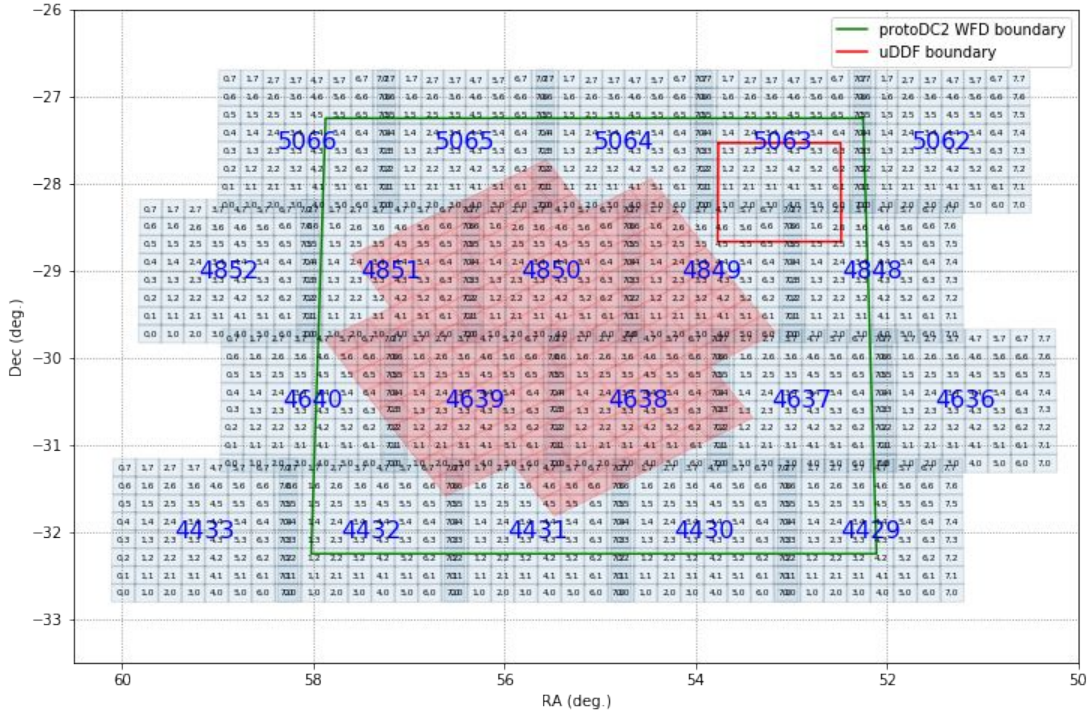


Image reduction

- Using the Project DM suite, called “the stack”, which is in full dev
  - Already a lot of feedback on code validation, parameter tweaking, bugs and features
- Deployed at CC-IN2P3 through a SLAC pipeline framework (SRS) that has been used for 10 years in the context of Fermi (strong SLAC-IN2P3 ties)
- HTC cluster with MPI parallelization, the stack providing MPI-enabled building blocks for image reduction:
  - SingleFrameDriver : single sensor ISR, background modeling, astrometric/photometric fit, source detection and measurement
  - SkyBackground/JointCal : refined “focal-plane constrained” of astrometric photometric solution, and sky background modeling
  - coaddDriver : builds the coadding of single visits into a series of tract/patches covering the footprint
  - multiBandDriver : cross-filter matching, deblending and final forced photometry in all filters of all deblended sources in coadd.

Current Status

- A mess **and** a nightmare….
  - Several serious issues in instance catalogue production
  - Interaction with DM in full speed to ensure that the stack is correctly parameterized for LSST data
  - Image simulation effort beyond resources : DC2 likely descoped in depth or size
  - **Absolutely crucial effort for us, in the context of the SDRP at CC**
- Run 1.2p : almost completed full processing at CC (1.2i happening at NERSC)
  - See pipeline front-end http://srs.slac.stanford.edu/Pipeline-II/exp/LSST-DESC/task.jsp?refreshRate=60&task=52380289&refreshIsOn=true&refreshCount=0
  - access to products via the stack's "butler", data products located at /sps/lsst/dataproducts/desc/DC2/Run1.2p/w_2018_30/rerun/coadd-all2
  - Soon to be started new processing (better calibration), though there may be an issue with the deblending

Things to do

- Comparison 1.2p/1.2i and NERSC/CC runs
    - We already know that for 1.2p phosim did not have extinction enabled…. So 1.2p is “too deep”
- Forensic profiling to understand the various loads of the pipeline better
- Possibly move away eventually from SRS (DM proposes batch submission protocols for their pipeline components, but CC-compliant system interface has not been tested)
- Look at the products! And (try to) do something with the catalogues

DC2 : projects

https://confluence.slac.stanford.edu/pages/viewpage.action?spaceKey=LSSTDESC&title=DC2+Projects

- Technical readiness of planned data analyses
- Attempts at federating the collaboration around well defined projects that match (if possible) the SRM