Theoretical Astrophysics Group

-- Major roles in SDSS, low-mid-z Supernovae, weak lensing, large scale structure, photometric redshifts

-- led to DES

-- E/B decomposition in CMB polarization → current excitement/detection of B-modes

-- First papers on Dark Energy (mid-1990s) and evidence from CMB (1999)

-- Modified Gravity as alternative and tests (growth of structure) to distinguish MG from DE

-- Adaptive hydro codes to understand impact of baryons on weak lensing

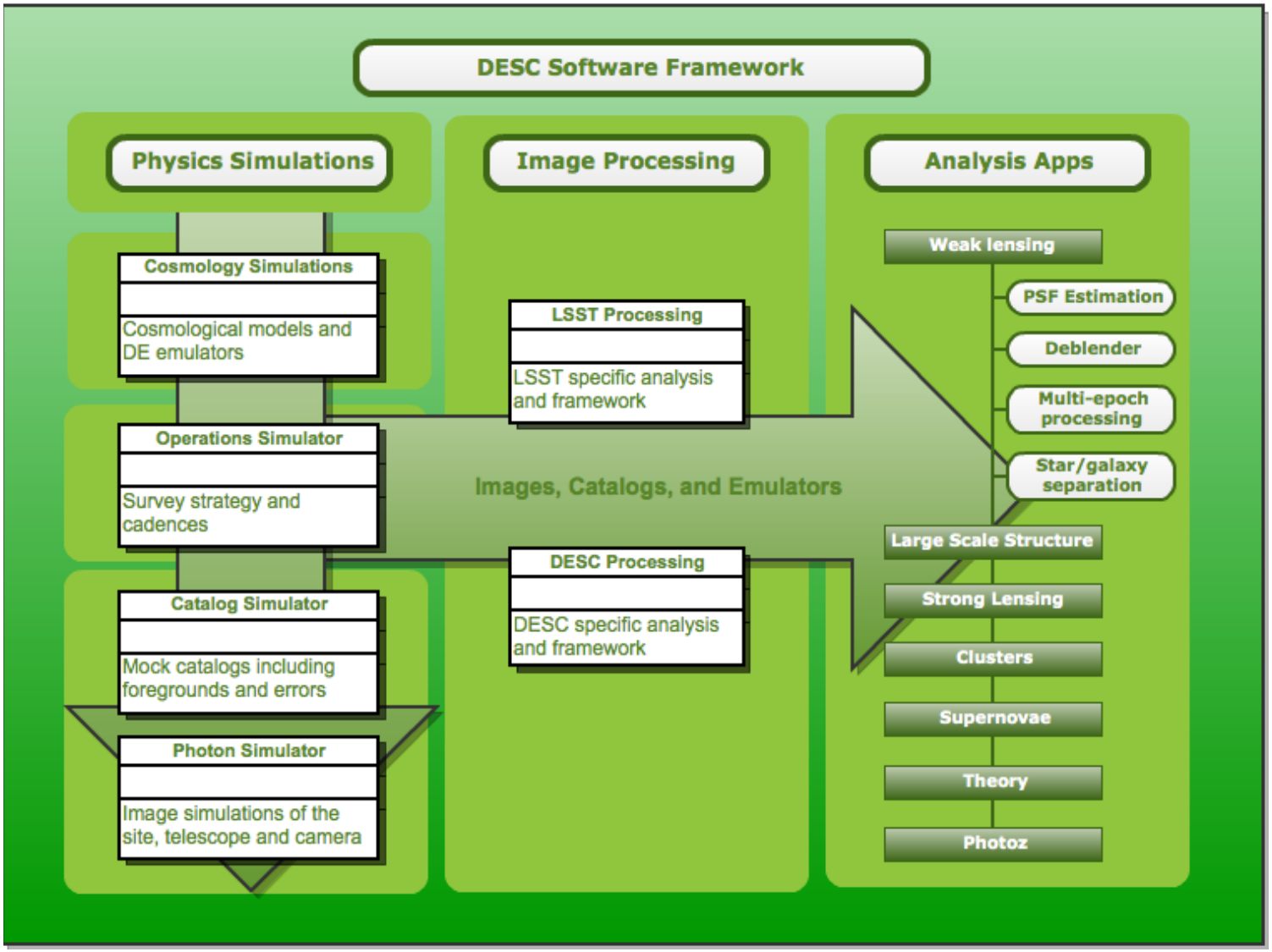
-- Leading effort in cross-correlations of DES/SPT and same sky spectro/photo

-- Early effort on 21 cm, persists after some set-backs

-- Burgeoning role in SPT (CMB Cluster Lensing)

-- Work with other labs, universities, particle physicists, postdocs, students, computer scientists to advance cosmic surveys and propose new ones

LSST Software Framework



LSST DESC Framework Use Cases

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Revision 11

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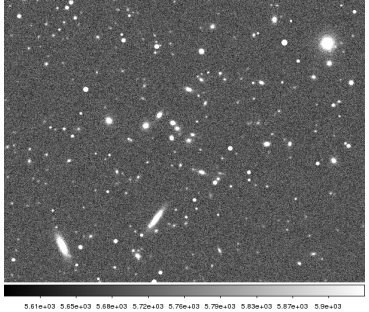
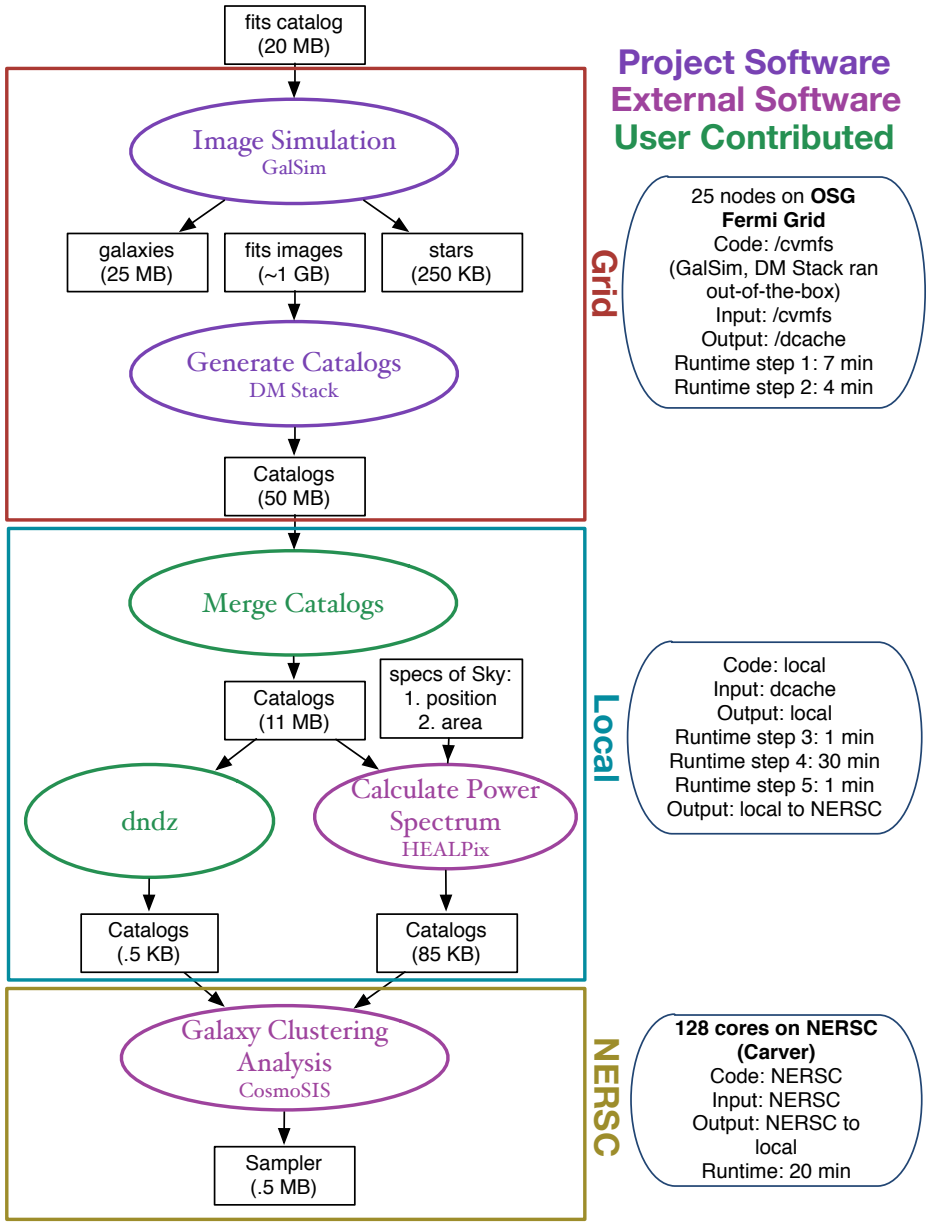




Project Software
External Software
User Contributed

Grid

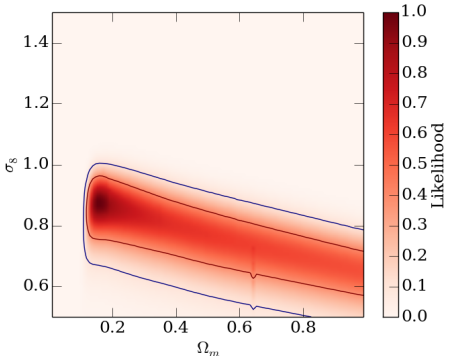
25 nodes on **OSG Fermi Grid**
Code: /cvmfs
(GalSim, DM Stack ran out-of-the-box)
Input: /cvmfs
Output: /dcache
Runtime step 1: 7 min
Runtime step 2: 4 min

Local

Code: local
Input: dcache
Output: local
Runtime step 3: 1 min
Runtime step 4: 30 min
Runtime step 5: 1 min
Output: local to NERSC

NERSC

128 cores on NERSC (Carver)
Code: NERSC
Input: NERSC
Output: NERSC to local
Runtime: 20 min



Fermilab