



THE DARK ENERGY SURVEY

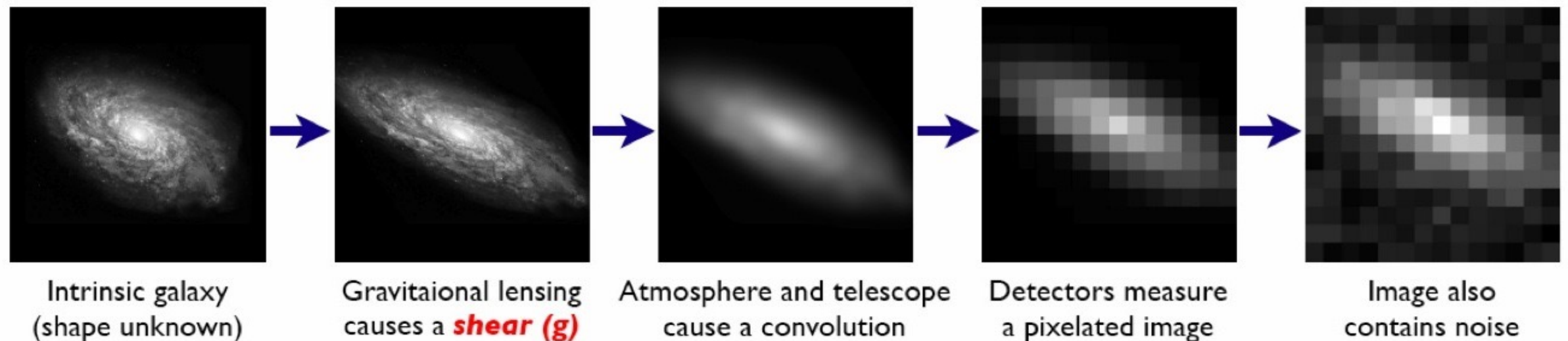


The University of Manchester

Capitalising on Gravitational Shear with The Dark Energy Survey

Richard Rollins, Research Software Engineer, University of Manchester
Code<->Theory Workshop, 16 Jan 2017

Theory -> Code: Creating Galaxy Shape Catalogues



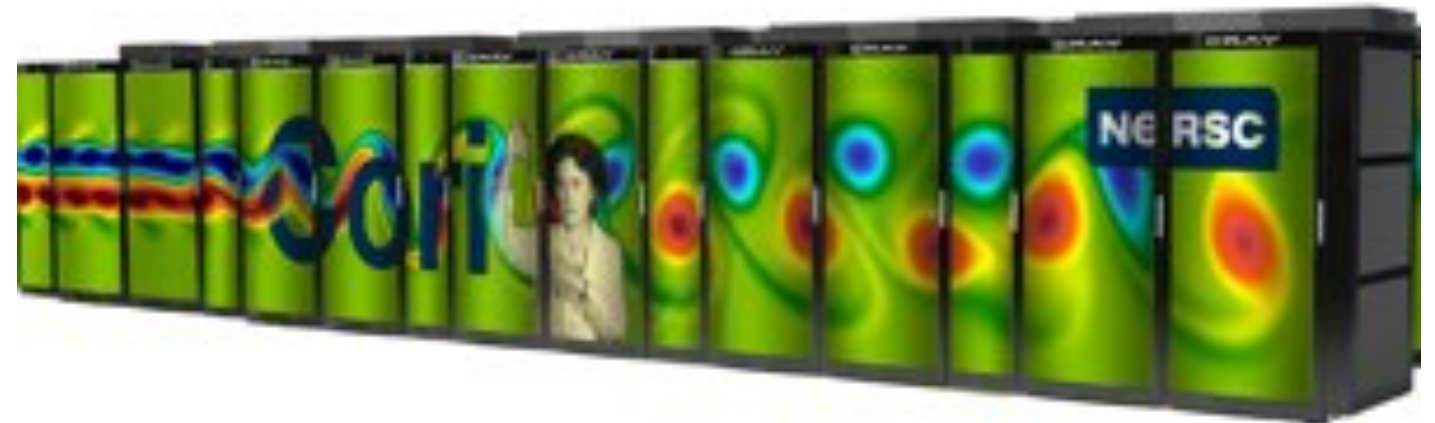
Bridle et. al. Ann. Appl. Stat. 2009

Requirements:

- 200 million galaxies
- 50TB reduced data
- Unbiased shapes to 0.1%

Constraints:

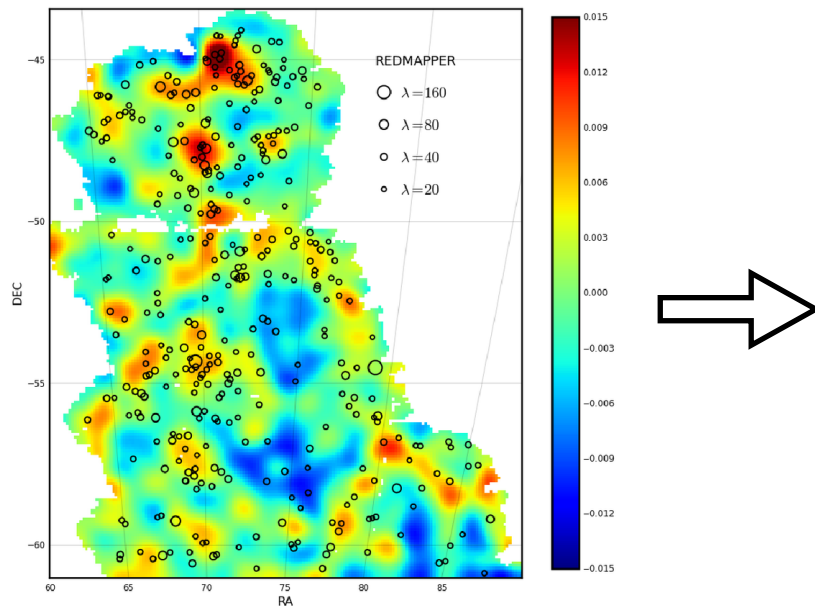
- Fast vs Accurate
- Frequentist vs Bayesian
- Calibration Scheme



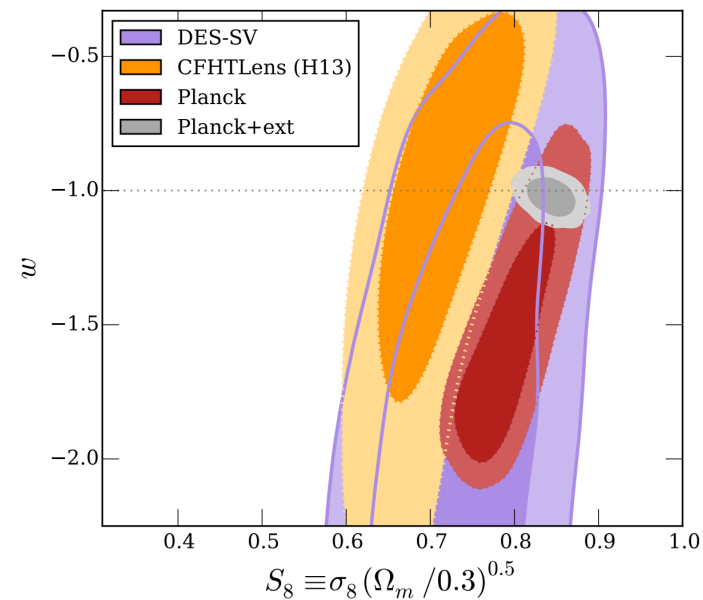
HPC as a limited and dynamic resource



Code -> Theory: Statistical Constraints on Cosmology



Vikram et. al. Phys. Rev. D 2015

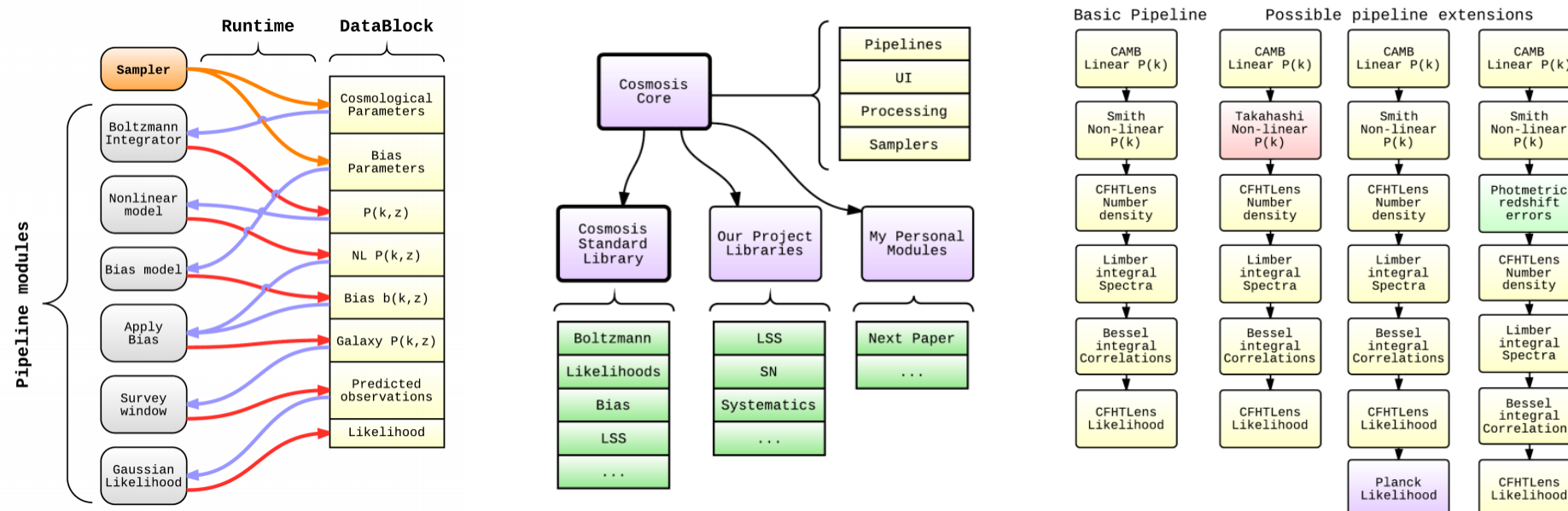


The Dark Energy Survey Collaboration Phys. Rev. D 2016

What to do with data?

- Two-Point Correlations
- Mass Mapping
- Peak Statistics
- Trough Lensing

CosmoSIS: A Cosmological Parameter Estimation Framework



Zuntz et. al. Astron. Comput. 2015