

Weak Lensing Course Spring 2022

- Motivation
- Rules of the game
- Lessons

Galaxy surveys

Stage IV experiments

- Spectroscopic
 - Dark Energy Spectroscopic Instrument (DESI)
- Photometric
 - Vera Rubin Observatory (before LSST)



Photometric

https://www.legacysurvey.org/viewer#NGC 1611

RA,Dec = 68.3473, -4.2776, zoom 12

5 arcmin

Contrast: 1

Brightness: 1

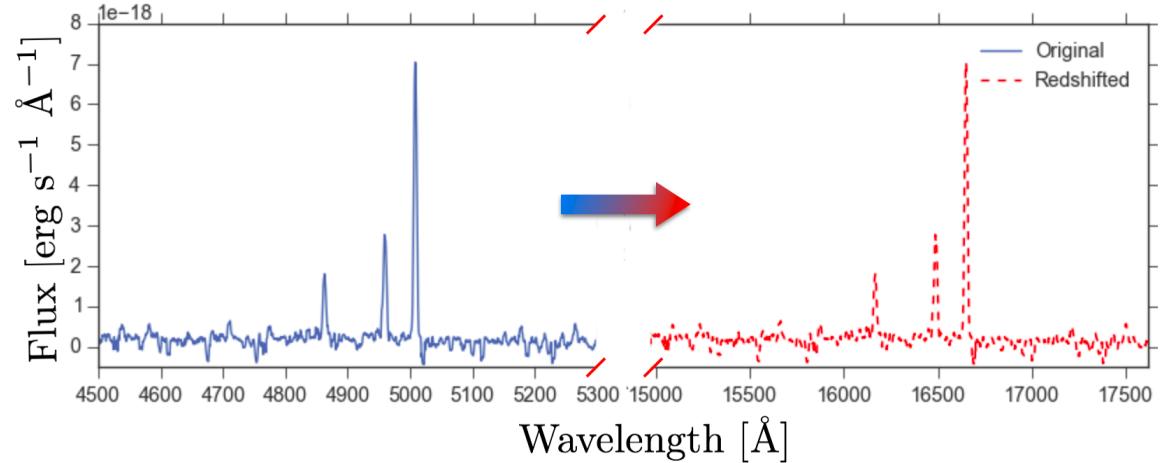
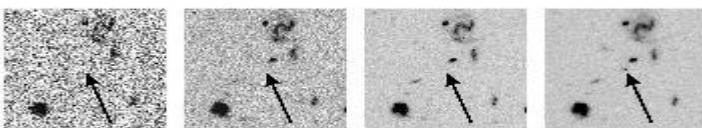
Jump to object: NGC 5614

Custom catalog upload (FITS or CSV; RA,Dec,[name,color,radius]):
Browse... No file selected. Upload

- Images
 - + Legacy Surveys DR9 images
 - + Older Legacy Surveys
 - + unWISE W1/W2 NEO6
 - + More surveys
- Overlays
 - + Boundaries
 - + Imaging catalogs
 - + Spectroscopy
 - + DESI
 - Bright Objects
 - Bright stars
 - Tycho-2 stars
 - Star clusters & Planetary Nebulae
 - NGC/IC galaxies
 - Siena Galaxy Atlas
 - HyperLEDA/SGA galaxies
 - DR9 Photo-z
 - Constellations

Tips & Tricks | Leaflet | Source | © Legacy Surveys / D Lang (Perimeter Institute)

Photometric



Photometric

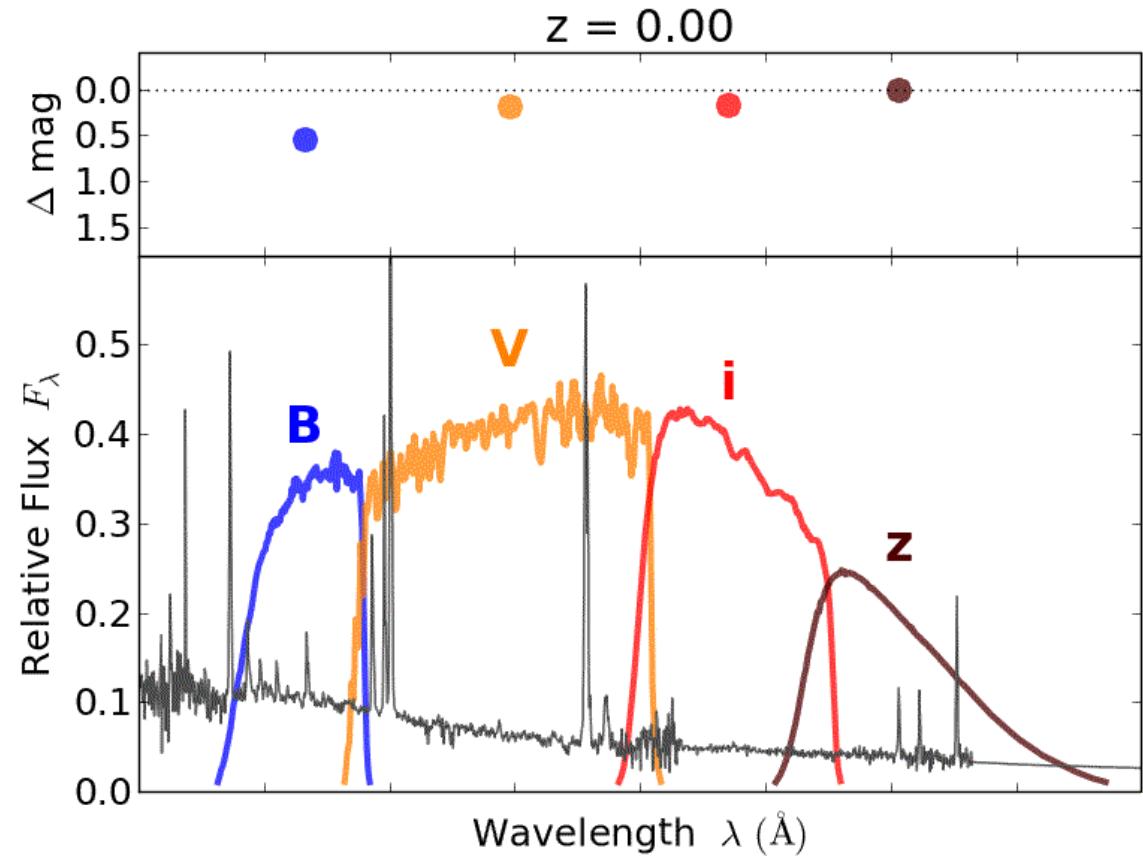
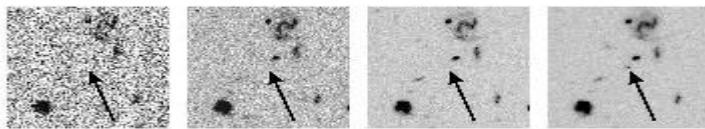
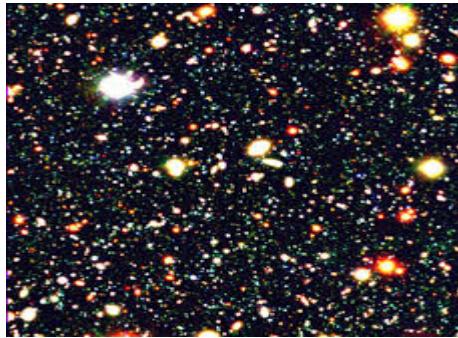


Photo-z

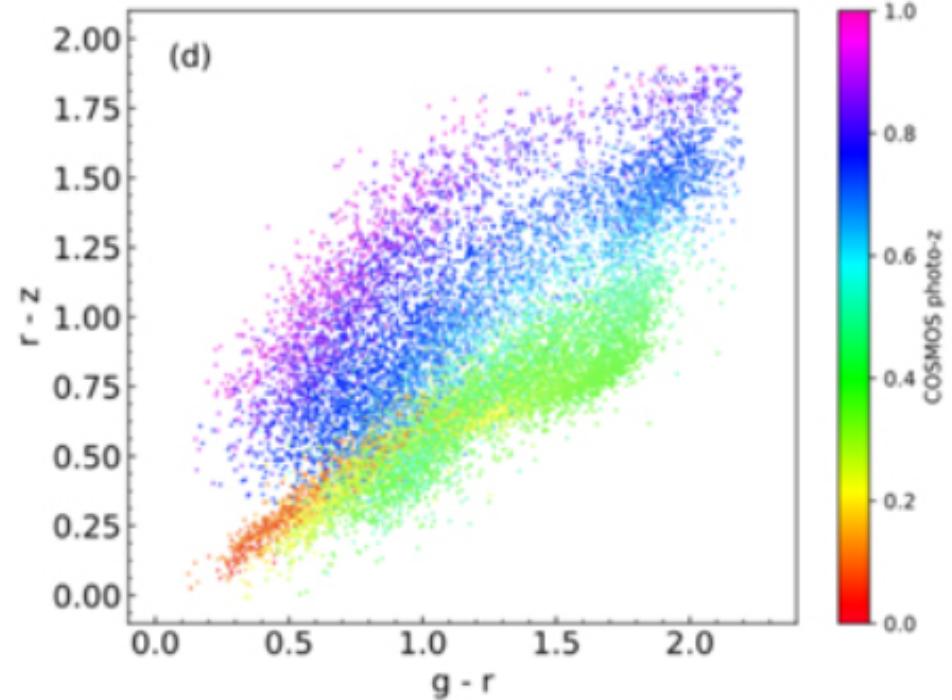
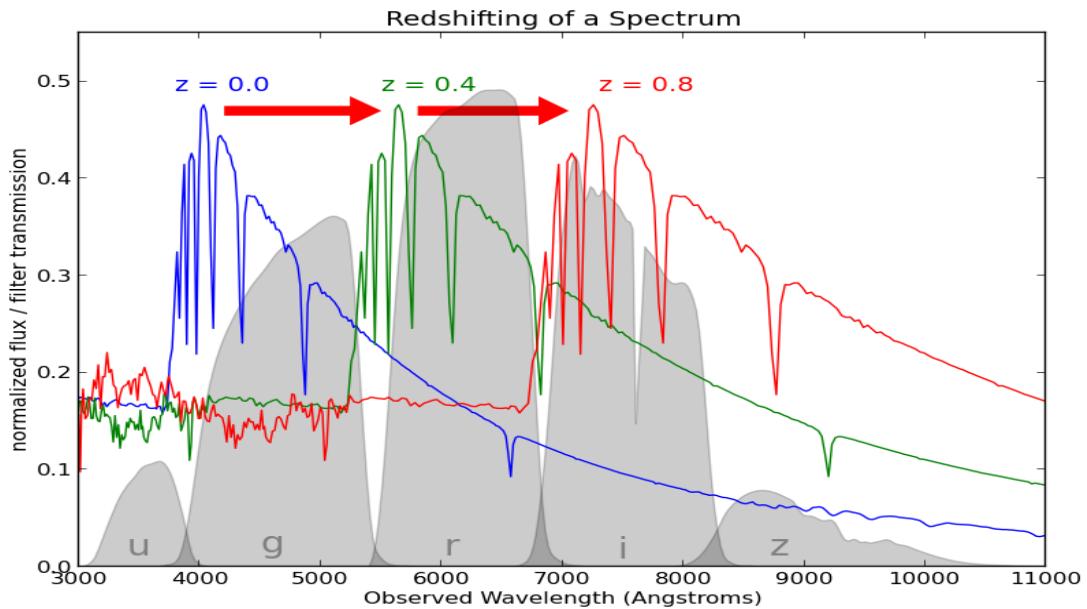
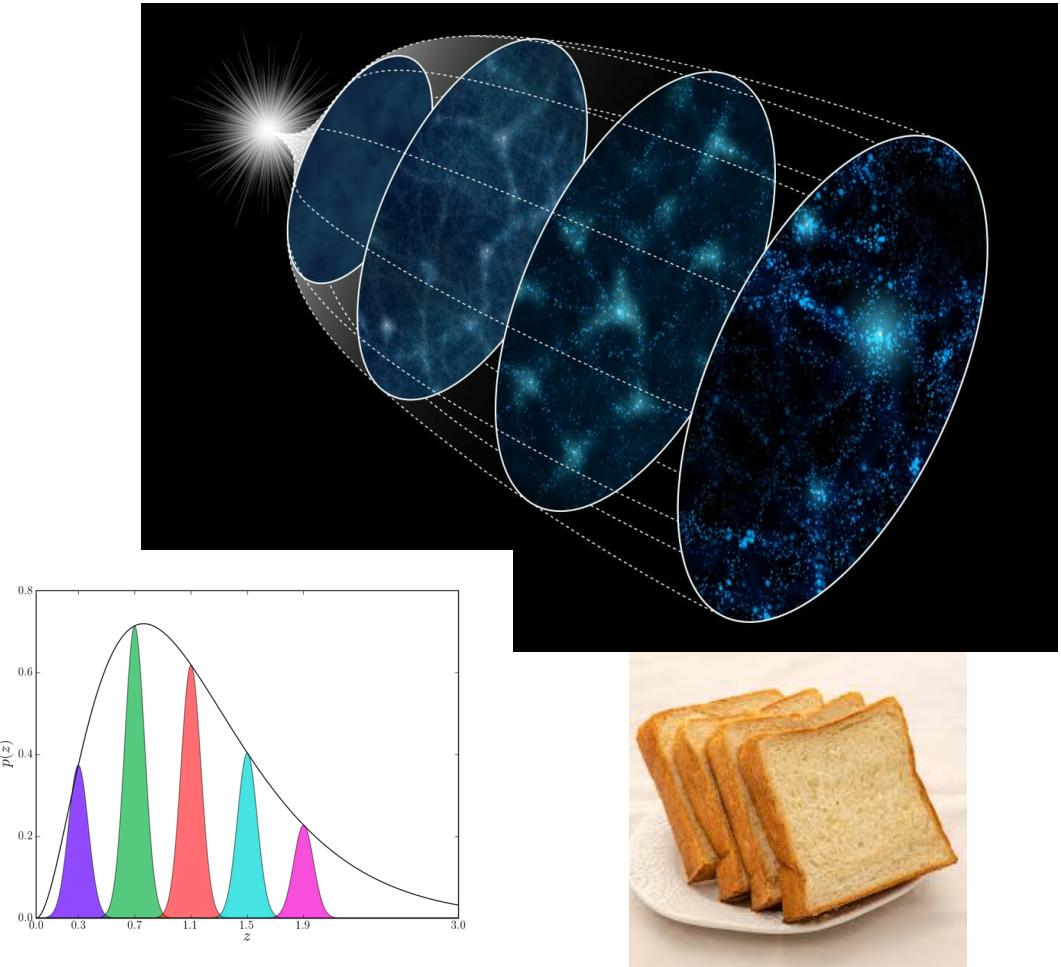
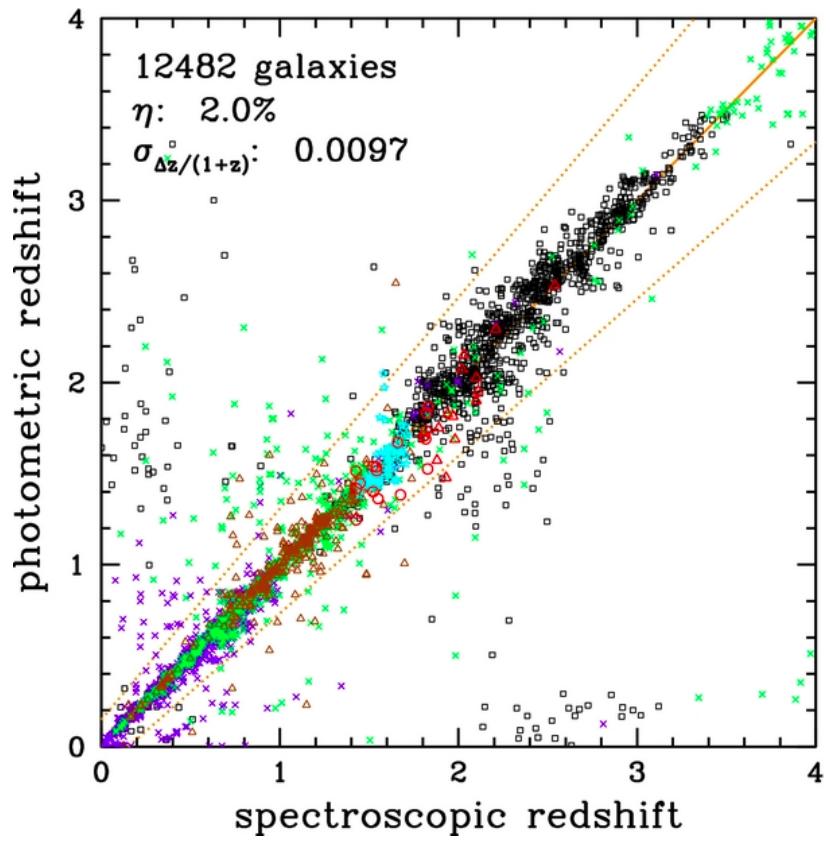


Photo-z

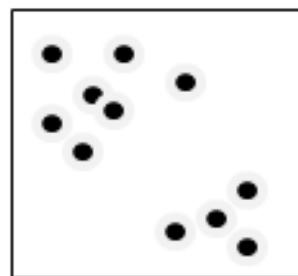


Photometric – Vera Rubin O.

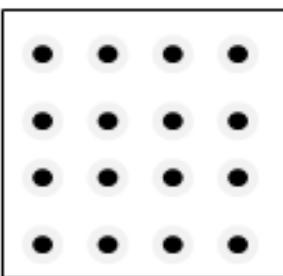
- Telescope in Chile with
 - 8.4m mirror
 - 3200 Megapixel camera
- 10 years survey will produce image of
 - 14,000 squared degrees
 - 37 billion galaxies and stars
- 20 Terabytes of data per night (Big data)
- Transients, MW, SNI...



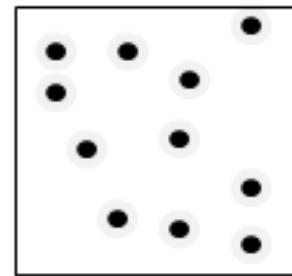
How to study LSS information?



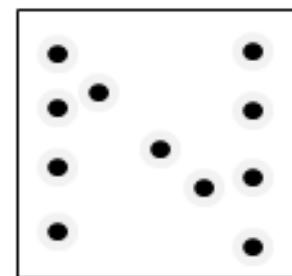
clustered



ordered

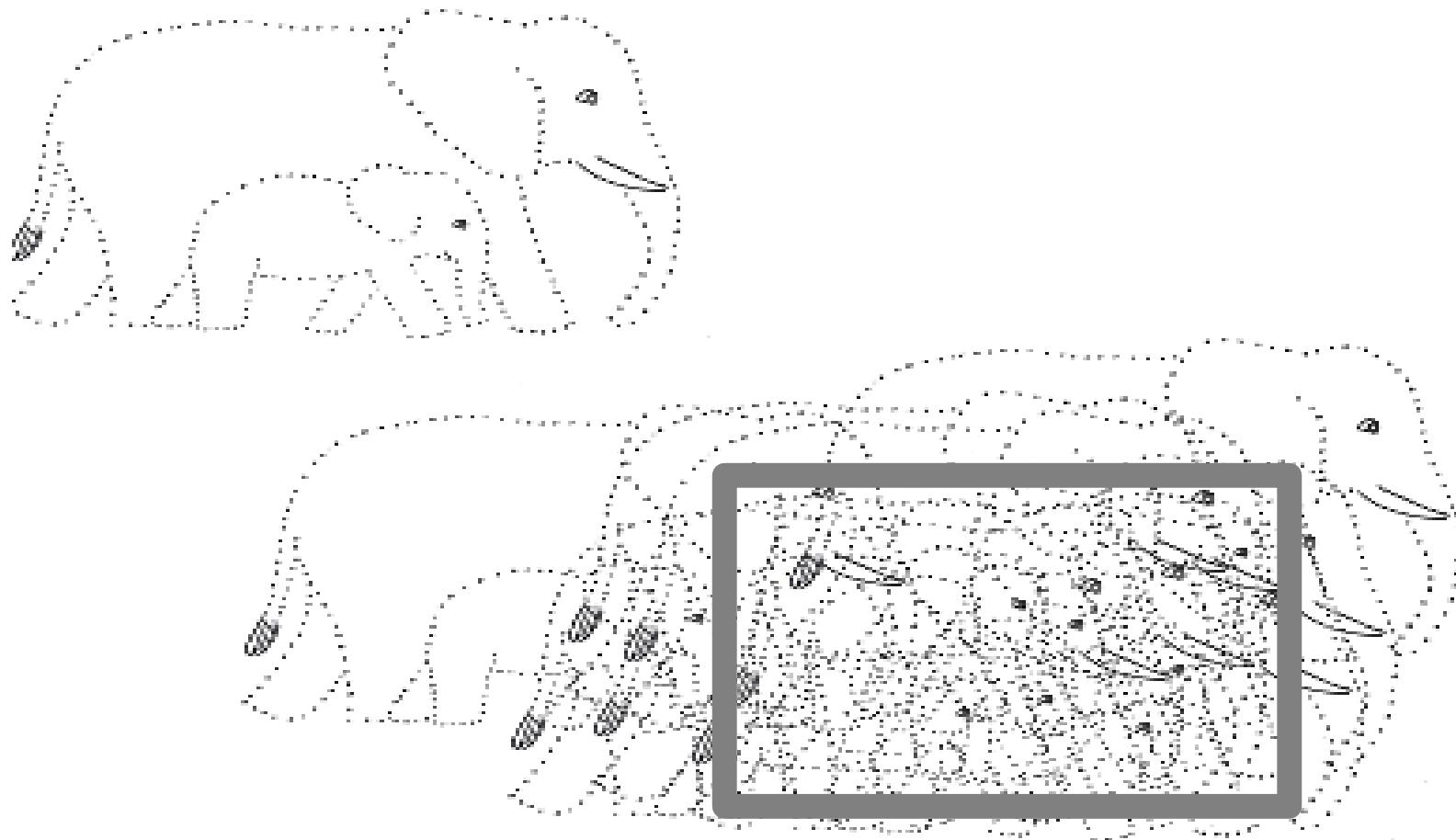


random

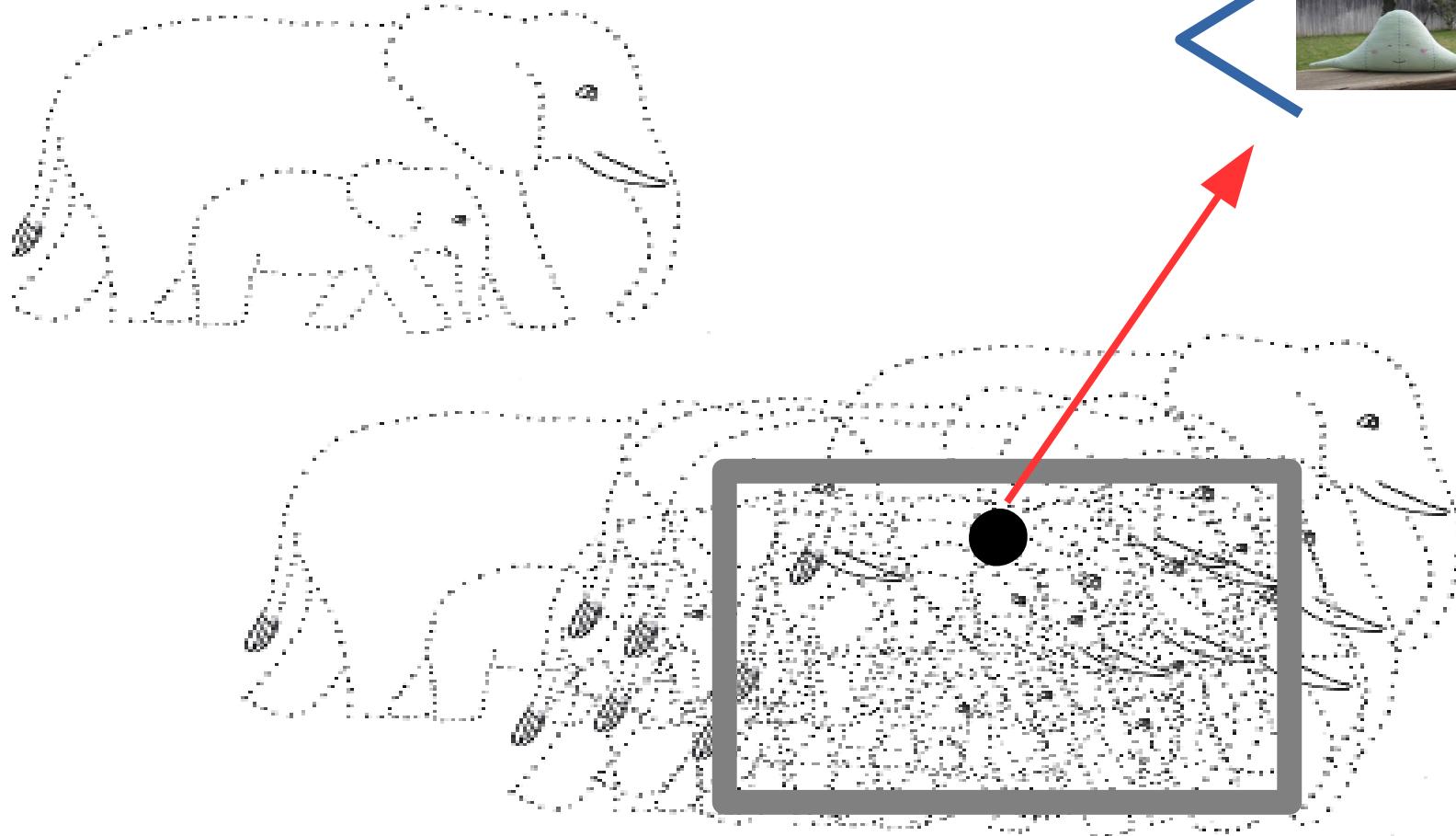


patterned

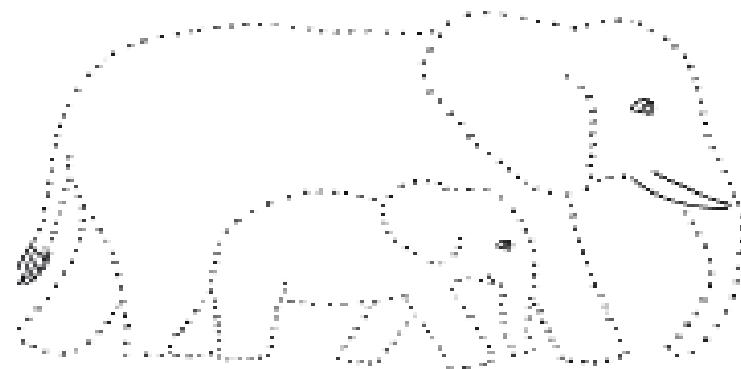
How to study LSS information?



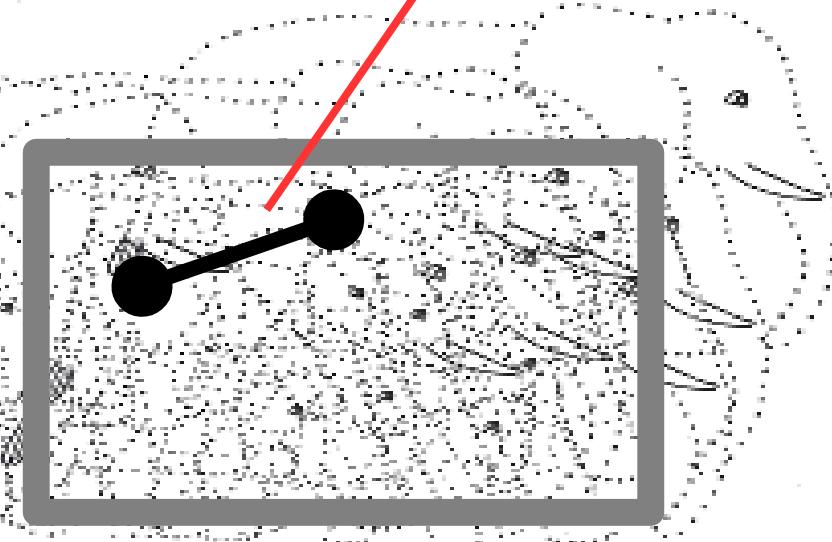
1-pt statistics



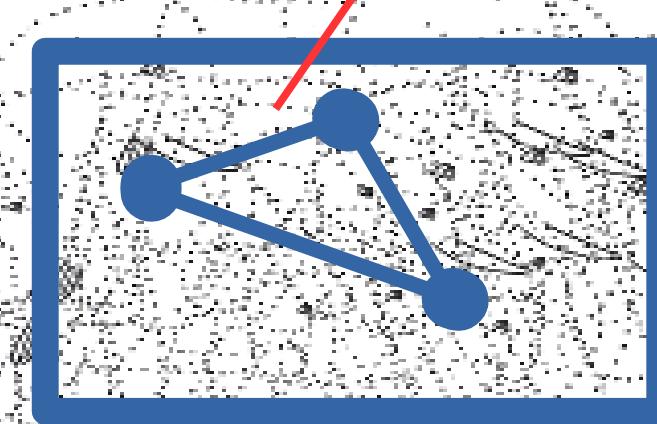
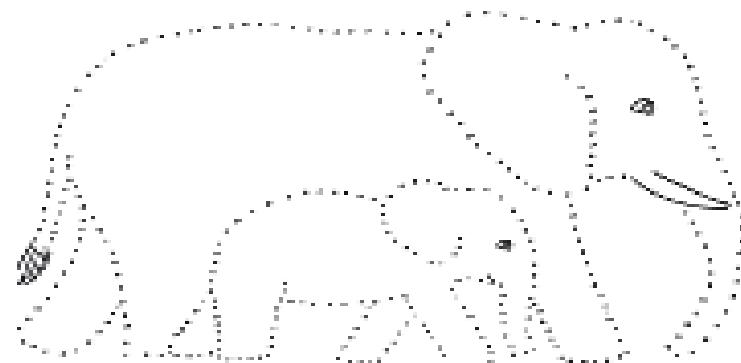
2-point statistics



$$\xi \sim$$

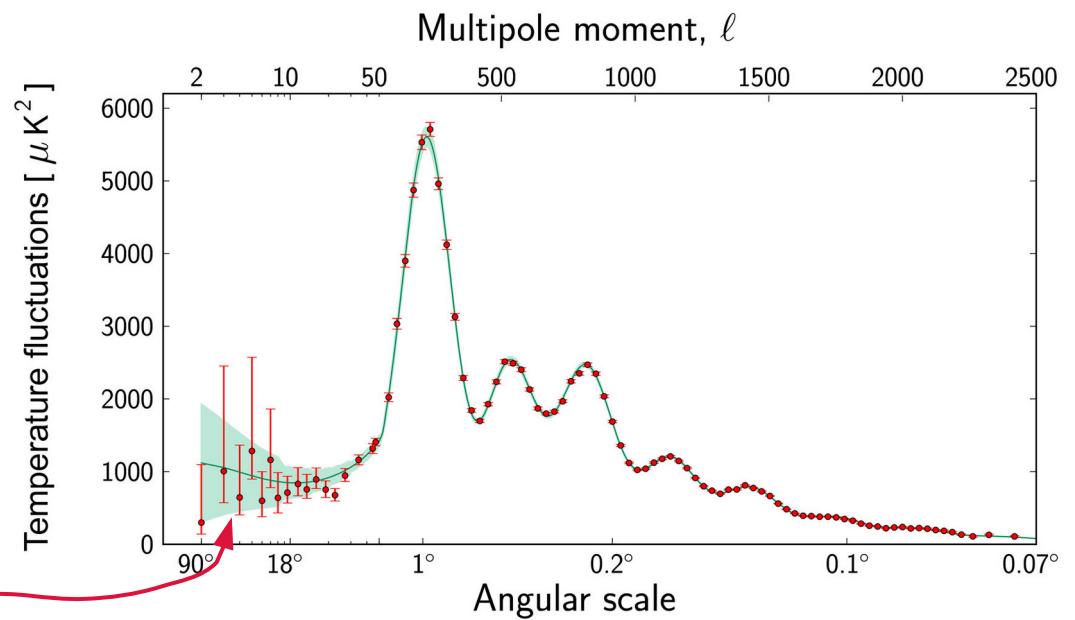
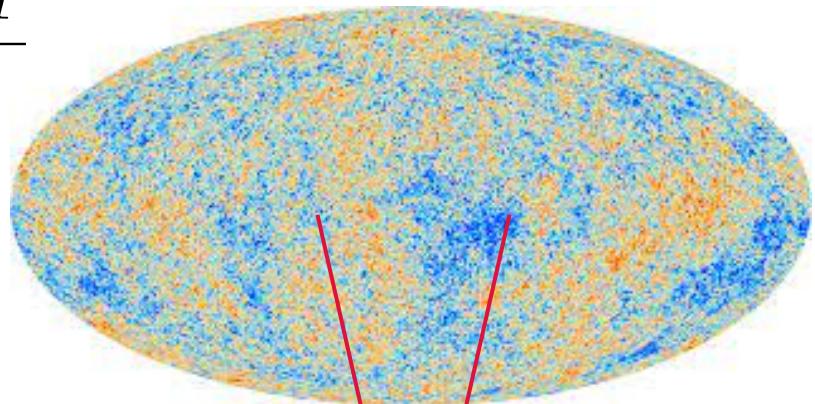


higher order statistics

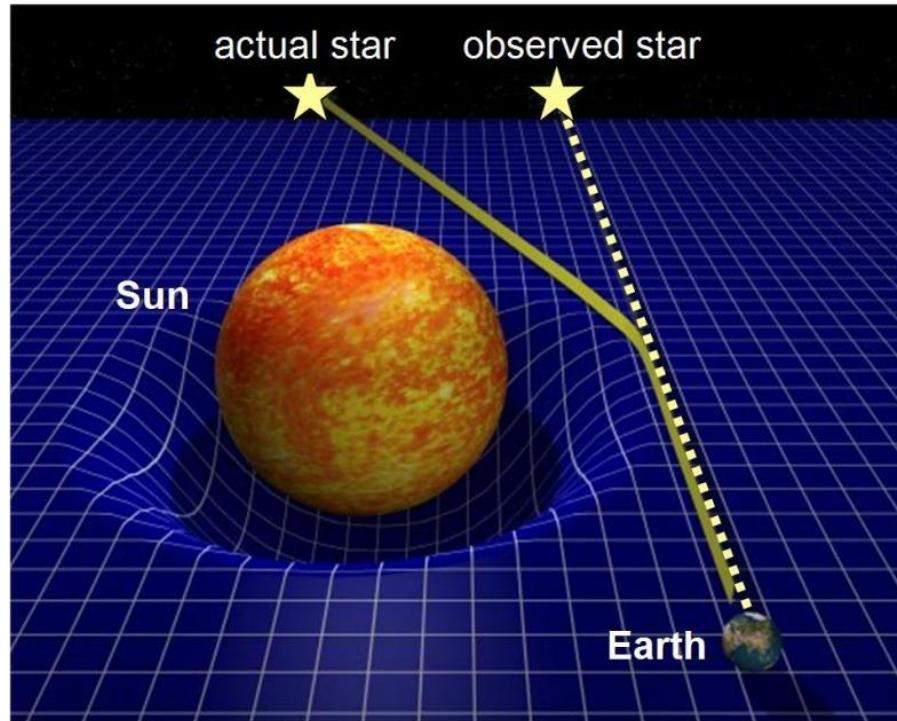


Beyond positions (e.g. CMB)

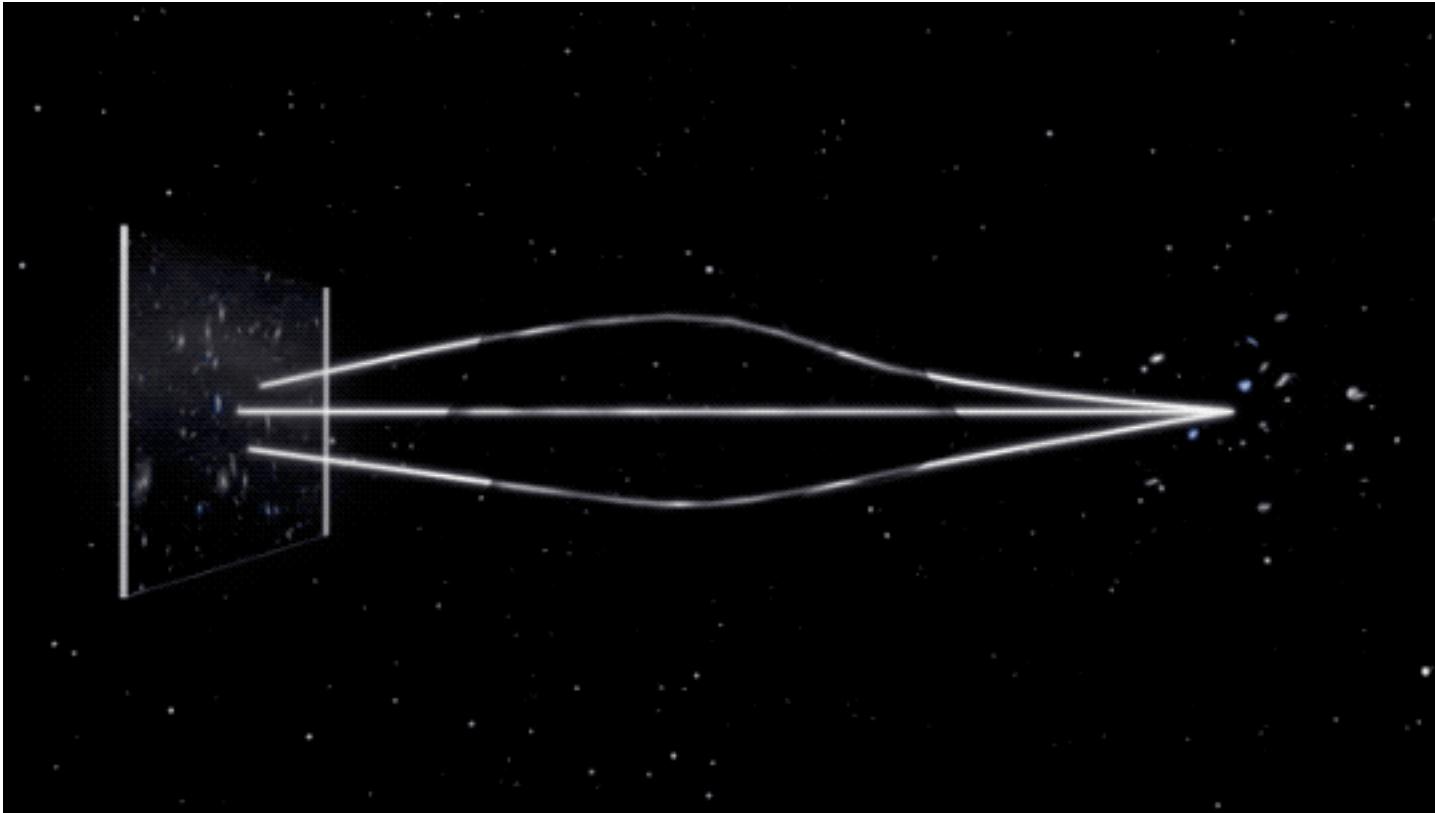
$$\frac{\Delta T}{T}$$



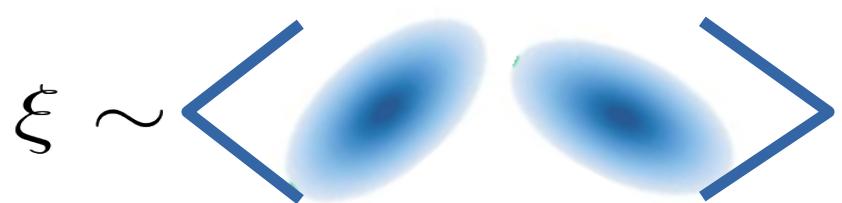
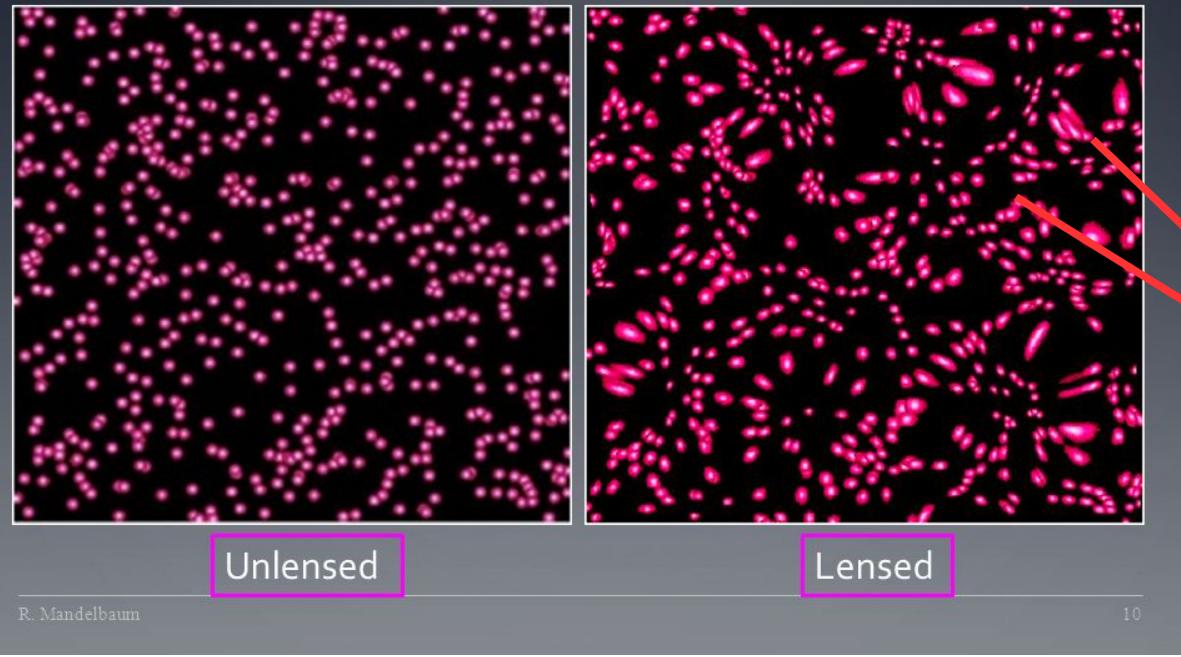
Weak Lensing

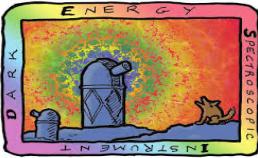


Weak Lensing

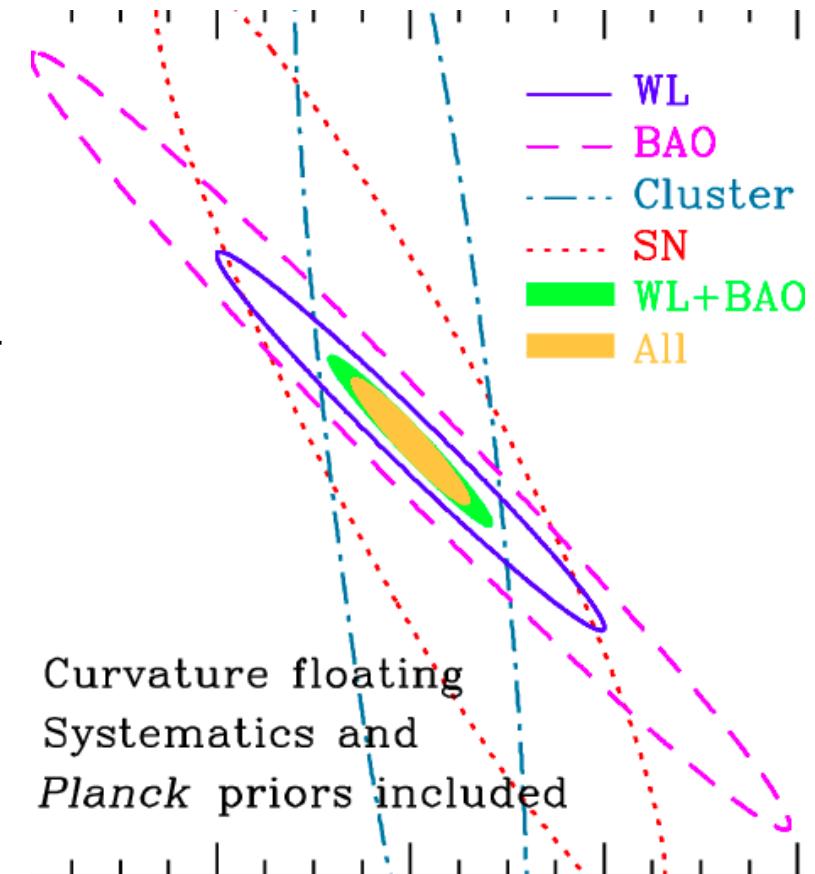
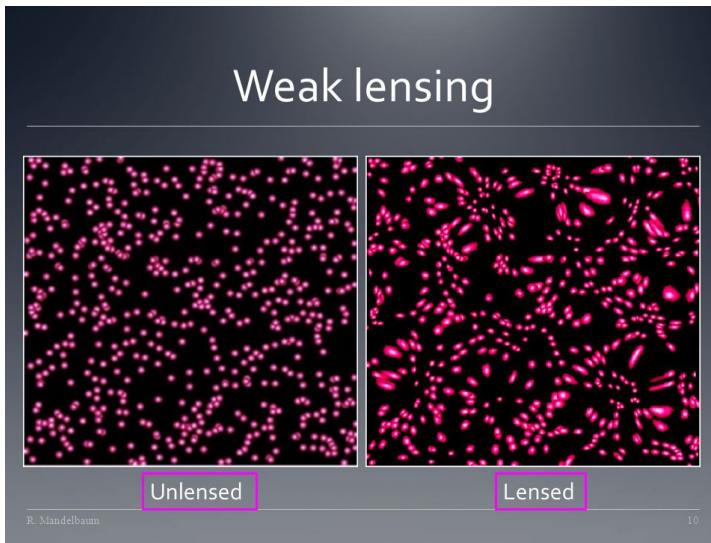


Weak lensing





Your second
favorite parameter



Your favorite parameter

Rubin Obs.

- There is a Mexican participation
 - One subteam with a project on

3 point statistics!



Opportunities for talented students

Curso

3 Sesiones teóricas – Alejandro Avilés

2 Sesiones prácticas – Abraham Arvizu y Gustavo Niz

Curso

Repositorio Github del curso: <https://github.com/MEX-WL/CourseSpring2022/>

Inscripción a Github Classroom: <https://classroom.github.com/a/rr0xjRdt>

Zoom:

<https://cuaieed-unam.zoom.us/j/4489432398?pwd=bVB2b1liY3BXYLhRaHZ4dFhRRE9aZz09>

Meeting ID: 448 943 2398 Passcode: wl2022

Info adicional para llenar:

https://docs.google.com/spreadsheets/d/1XRCmON9F_i2-bYDRIs0IMLmG0ry2SGnku3yz0VQI7CI/edit?usp=sharing