Using Galaxies in the DELVE Survey to Obtain New Constraints on Matter-Energy Density

Yueling Kathryn Xu
Supervisor: Francisco Javier Sánchez López
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Background: Dark Energy and Dark Matter

- Dark matter: 85% of matter
- Dark energy: dominant energy form of the universe
  - At war with gravitational potential
- In order to observe dark energy, we have to observe its effects:
  - Geometry
  - Growth of structure

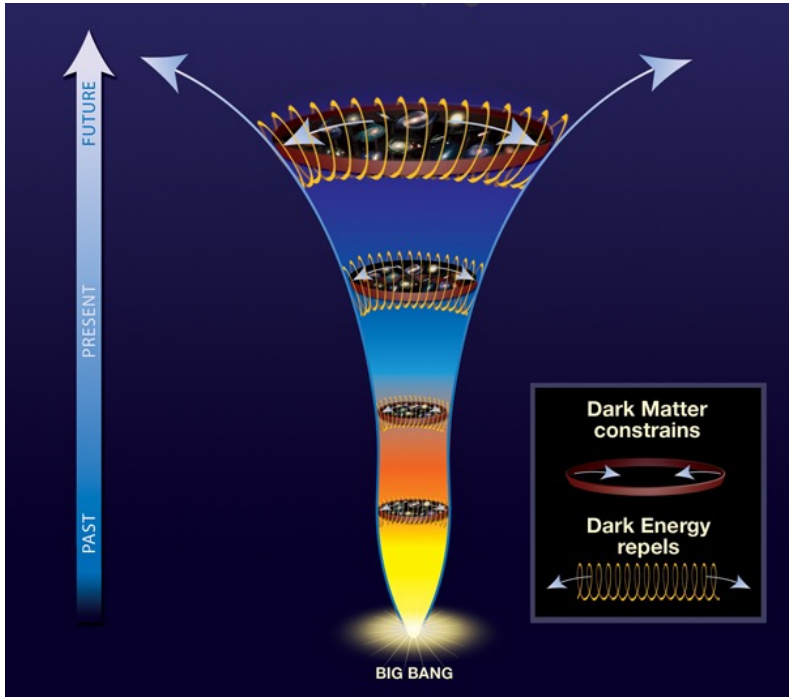

Image from Chandra X-Ray Observatory site

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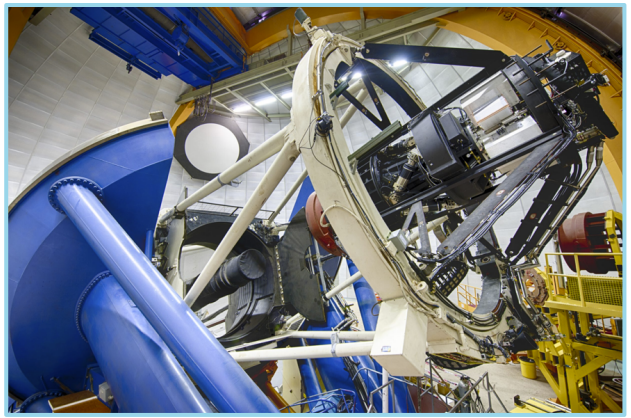
Background: DELVE (DECam Local Volume Explorer)



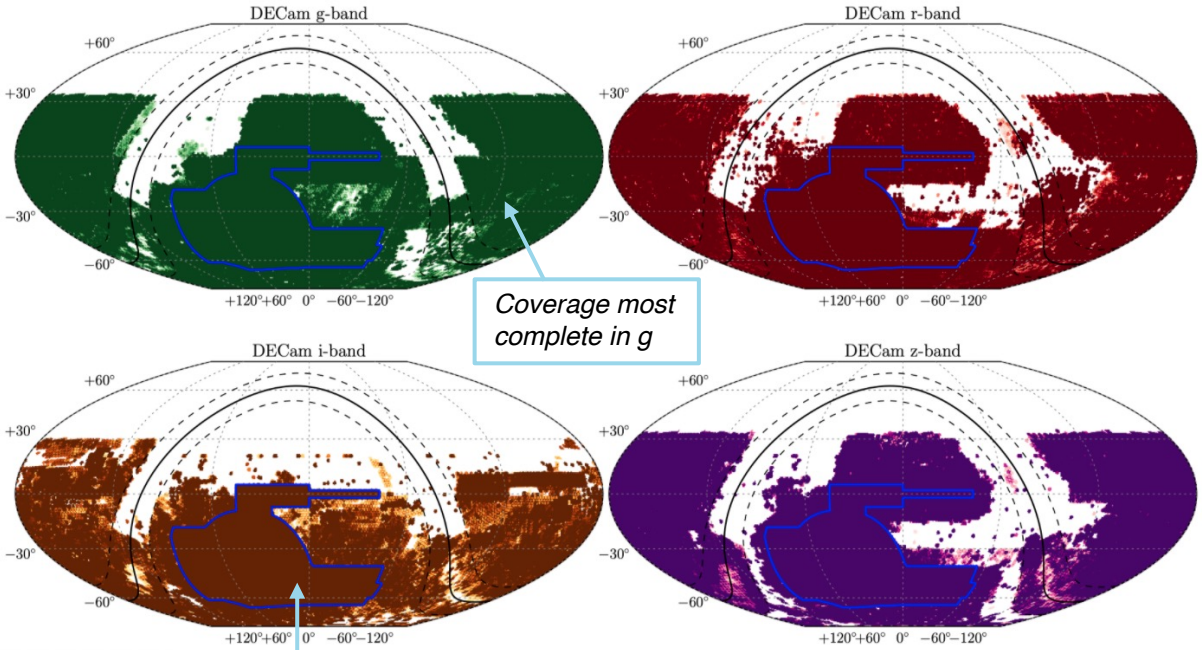


Image from DELVE: delve-survey.github.io

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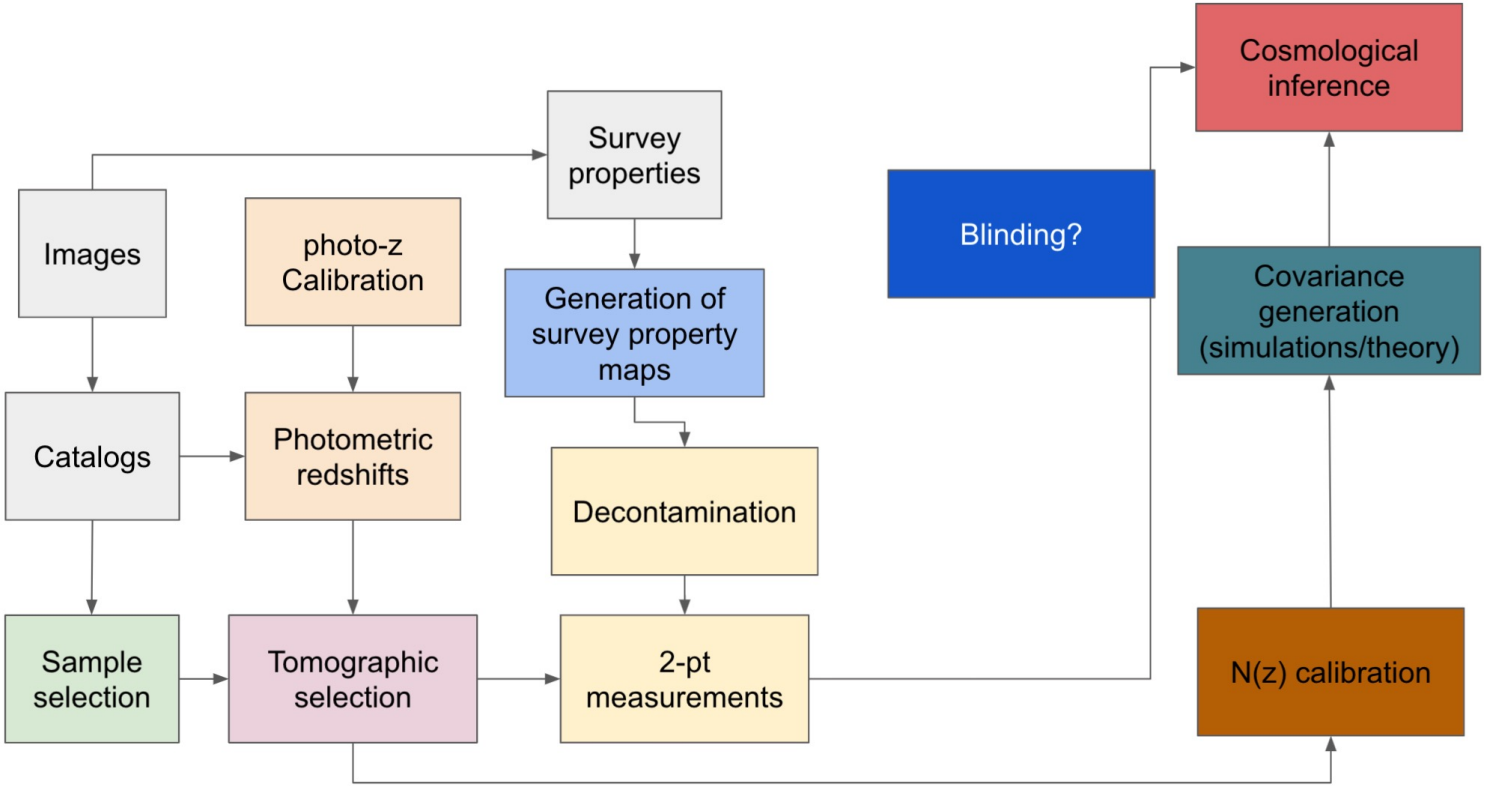
Project Workflow



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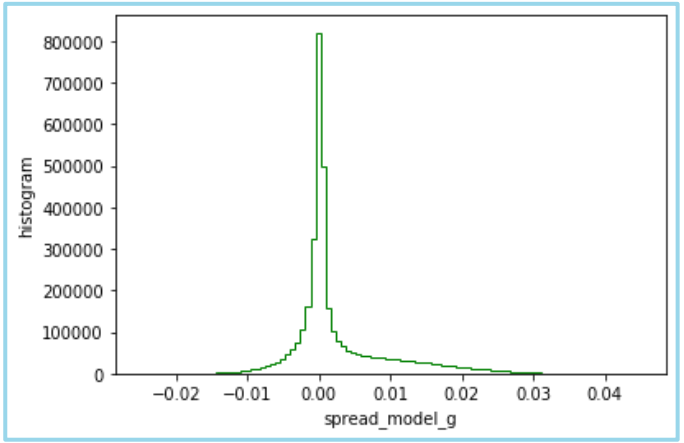
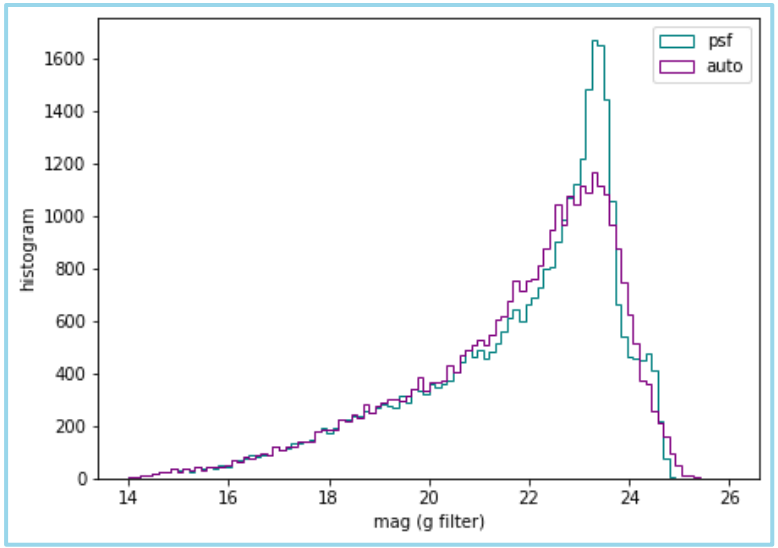
My Role: Sample Selection — Difficulties and Methods

- Not all the objects that DELVE measures are galaxies
  - How likely is it that an object is actually (or is actually not) a point-like source of light?
  - Galaxies may seem like point sources
- Built-in survey distinctions:
  - PSF magnitude vs. auto magnitude
  - Spread model values





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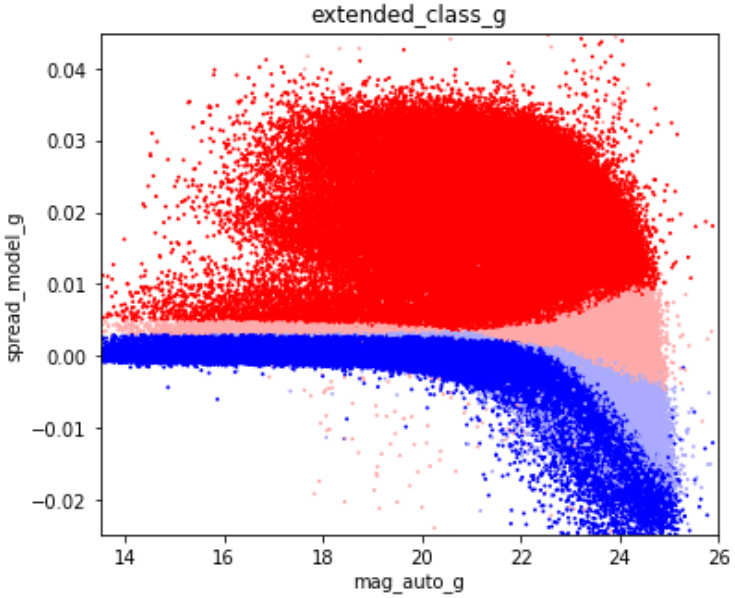
My Role: Sample Selection — Current Progress

Distinction-making:

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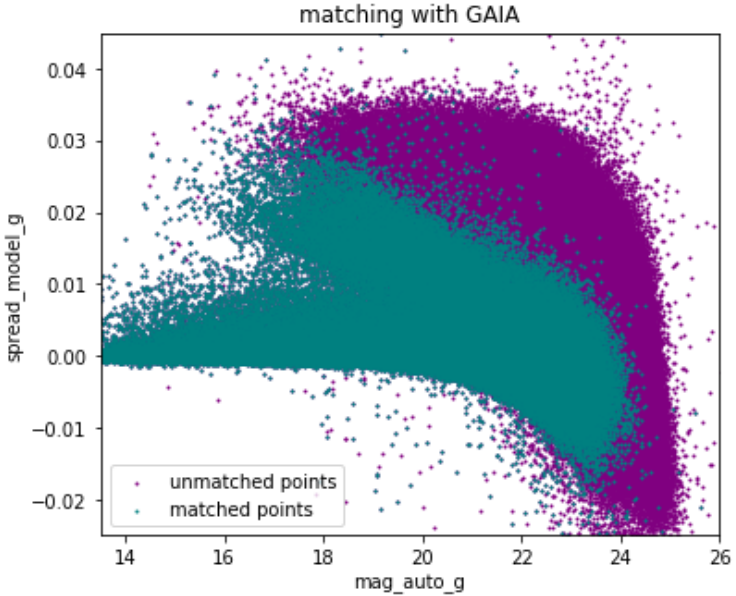
Comparing with GAIA:



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