Mapping the Background Universe with Cluster-Scale Gravitational Lenses

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Science Goals:

- Directly probe the gravitational potential → mass measurements + Mass Profiles
- Window into small scale dark matter distribution
- Statistical studies of lens and source properties:
  - Distribution of lens masses and redshift
  - Radial distribution of arcs from cluster cores
  - Distribution of azimuthal angles covered by giant arcs
- Background universe → leveraging large samples of cluster lenses to identify the most highly magnified, high-redshift background sources.

RCS2 Lens Sample:

- ~1000 deg² griz cluster survey covering z=0.2-1.0
- Highly uniform depth and seeing across entire area

SDSS Lens Sample:

- Cluster sample covering ~1/4 of the sky; z=0.1-0.4
- Lenses selected from the most optically rich/massive clusters