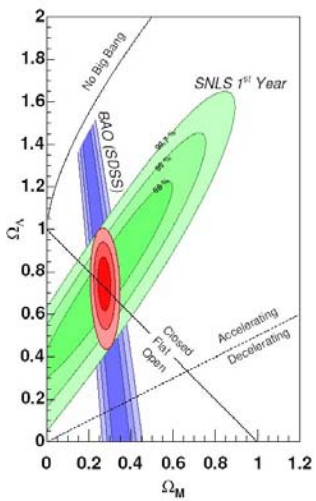
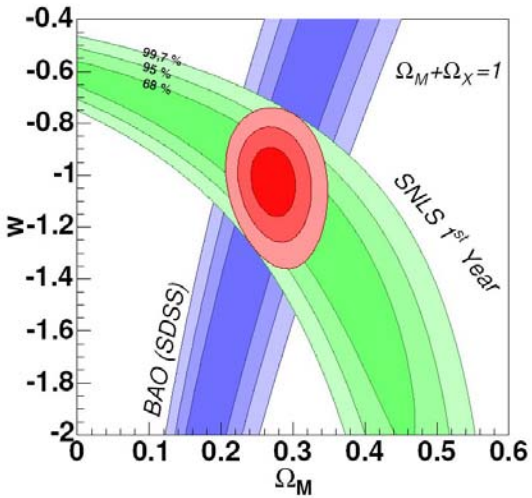
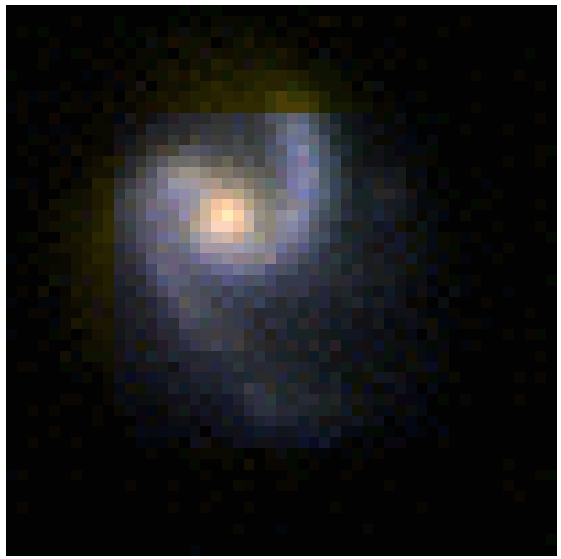
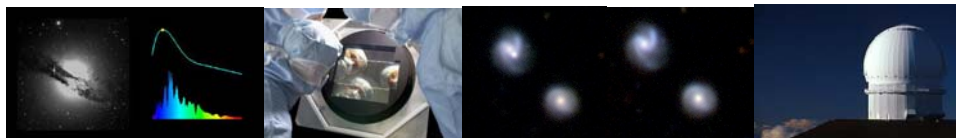
SNLS-2


No Big Bang
SNLS 1st Year
BAO (SDSS)
Closed
Flat
Open
Accelerating
Decelerating
Ω_Λ
Ω_M

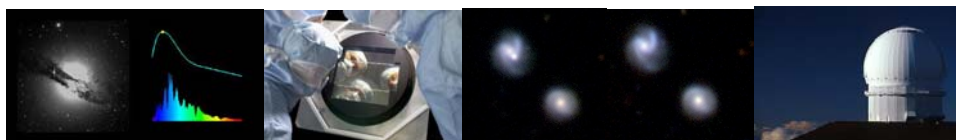

99.7 %
95 %
68 %
$\Omega_M+\Omega_X=1$
SNLS 1st Year
BAO (SDSS)
w
Ω_M





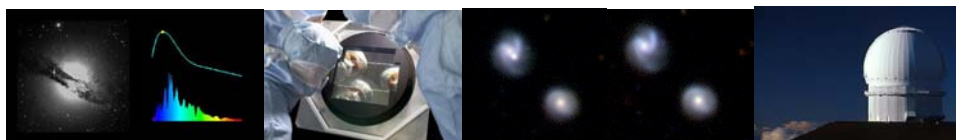
Boundary Conditions

- CFHT+MegaCam works; we have a ~3+ year window beyond 2008 in which we may outperform other planned surveys (:)
- Calib understood
- 2 working detection/photometry/cosmology pipelines tuned to MegaCam data
- Difficult to get much more CFHT time than we have now
- 8m spectroscopy will be increasingly difficult to get



Current SNLS

- 4 x 1 deg² area
- Typically 2 fields at any given time of year
- 5 epochs per queue run (11.4 hr per field), 23 hr total per queue run on average
  - Includes overheads
  - 2.3 hr per *average* epoch g'r'i'z' (varies a bit from epoch to epoch: 1,3,5 are longer)
  - 1.7 hr without z'
  - No u*

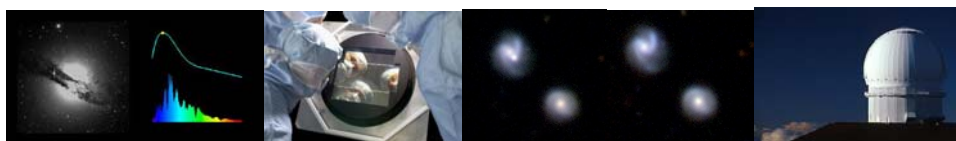


SNLS-2 - Lower z, larger Ω

Baseline:

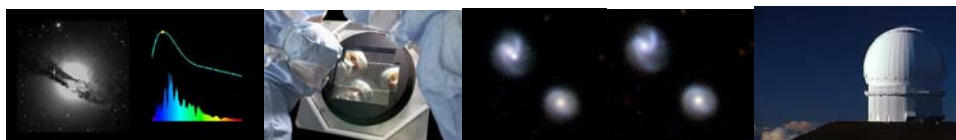
- 10x shorter exposures in g'r'i', no z'
- Same total obs time per Q run as SNLS

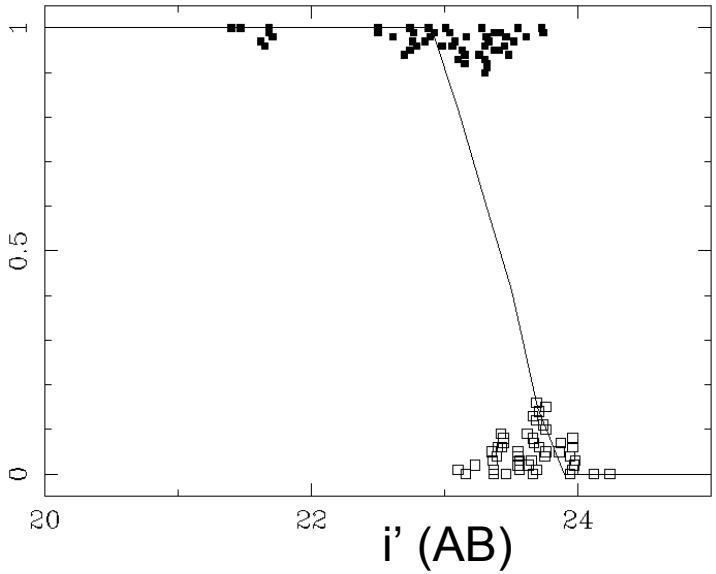
  → larger solid angle
- 3 years (2009-2011?)
- Photometric typing
- Host galaxy multislit spec for z

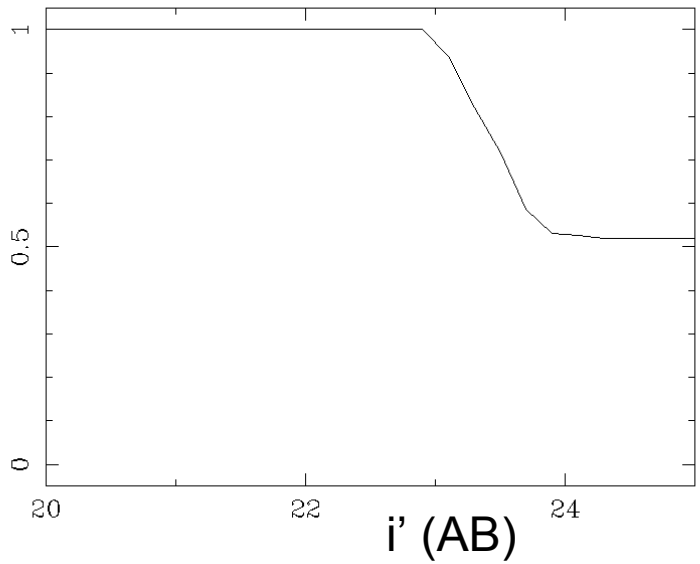


1. Limiting mag

- 2 x 3600s stacks Aug 2006
  - Each stack 7 x 520s
  - Previously searched for SNe
  - Seeing 0.65-0.8”
- Noise added to simulate 360s exposure
- DB ran entire finding algorithm start to finish as previously

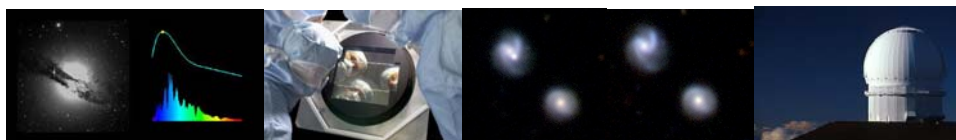






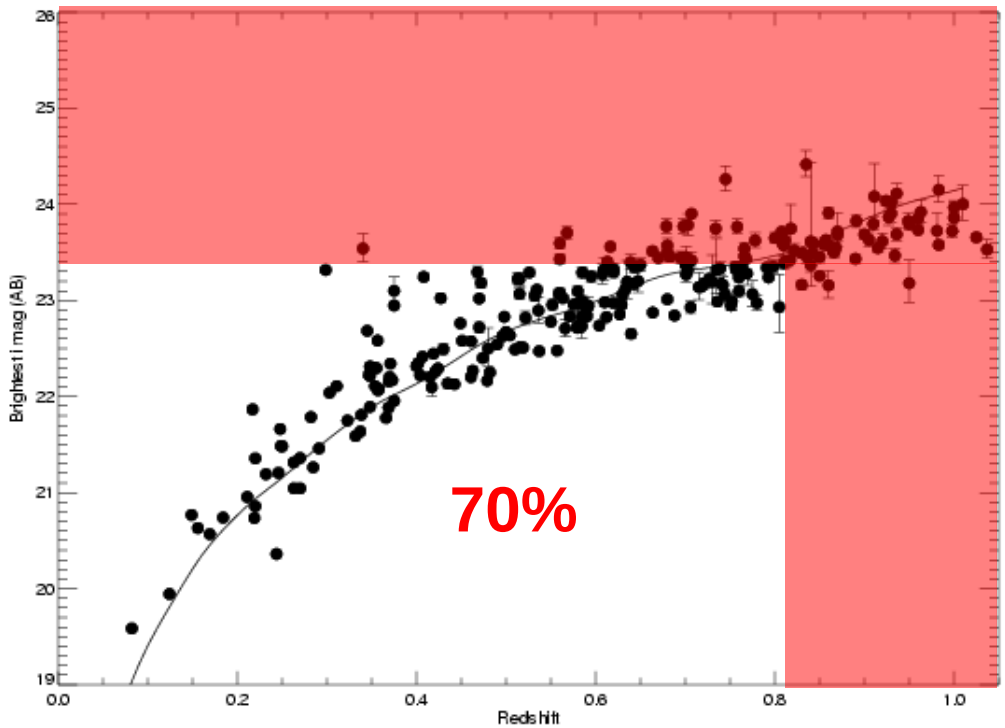
- 50% completeness at i'=23.4
- 360s exposure
- Same result starting with 5 x 360s stack (1800s)

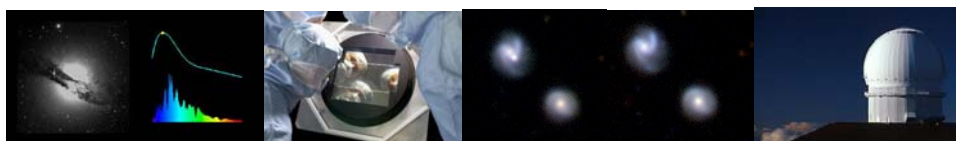
- Cumulative completeness 75% at i'=23.4



2. SNe Ia Numbers

- Obs max light (no stretch/colour correction, slight diff from true max) - MS

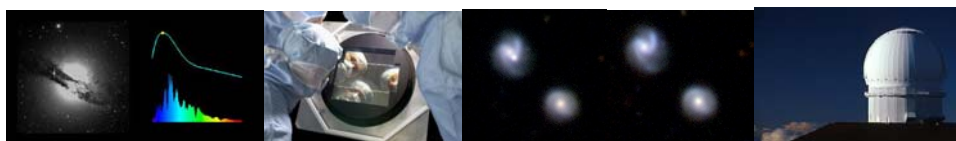




3. Final #s

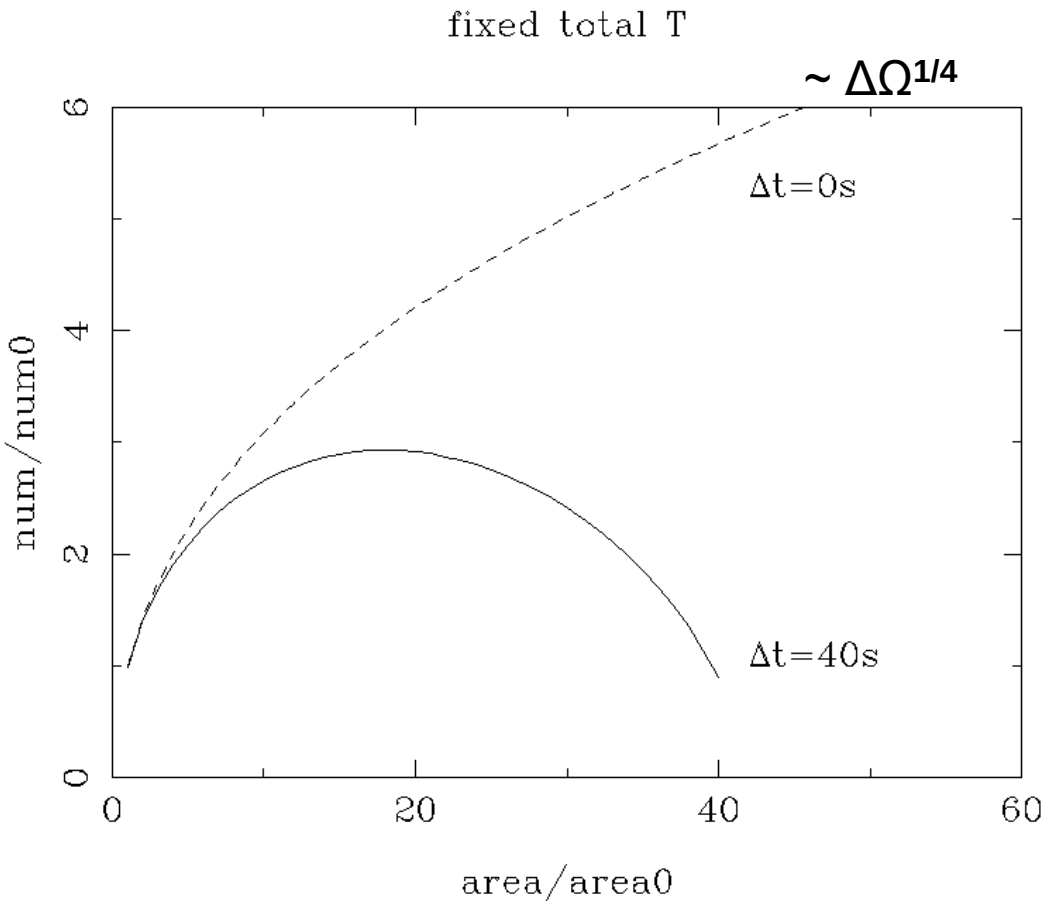
500 SNeIa	5yr SNLS, spec types **(conservative!)**
x 3/5	3 yr rather than 5yr
x 0.7	i<23.4, z<0.8
x 0.75	Average completeness at i'<23.4
x 11/0.8	11 hr per field now, 8 hr without z'; 10x shorter exposures, larger area
>2165 SNe	3 yr, 10x lower exp time per field, Ω=55 deg², *g'r'i'*

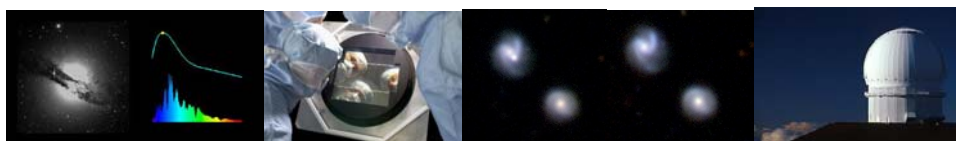
Baseline exp times 2m/4m/4m



4. Even larger area?

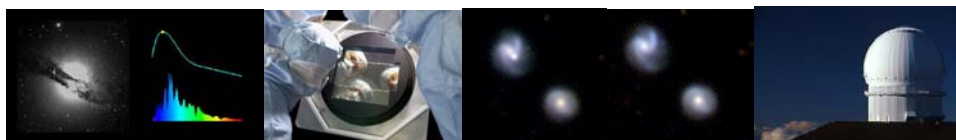
- No!





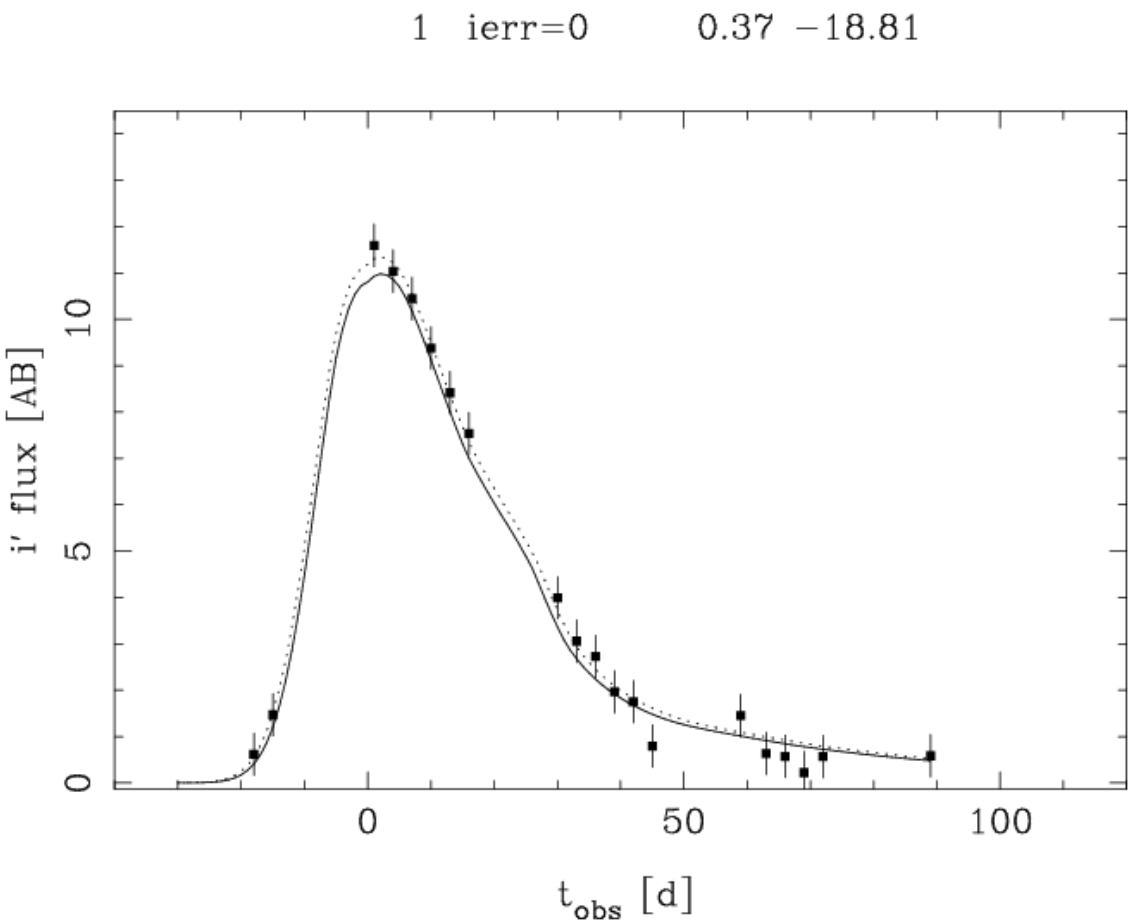
SNLS-2 Simulation

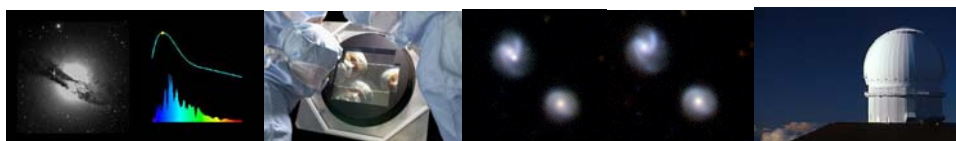
- Realistic z distribution 0.05<z<0.7
- Stretch-MBabs relation
- weather (70% clear, with correlations)
- 16 nights per dark run
- Photometric errors scaled from SNLS
- Input and fitted light curves, k corr, from Nugent template
- Crude light curve fitting



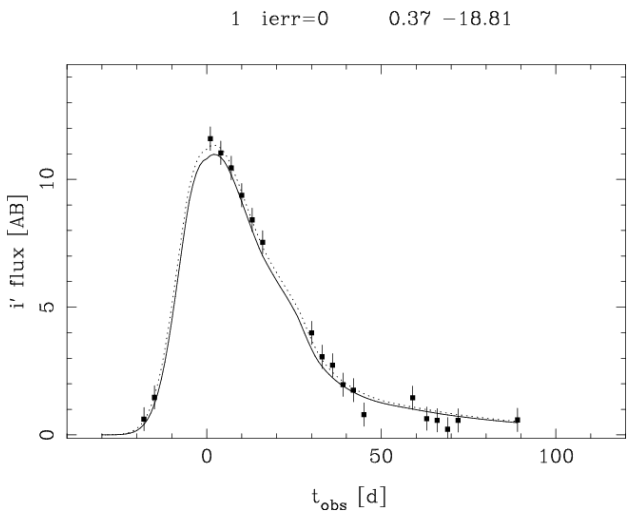
SNLS-2: the Movie

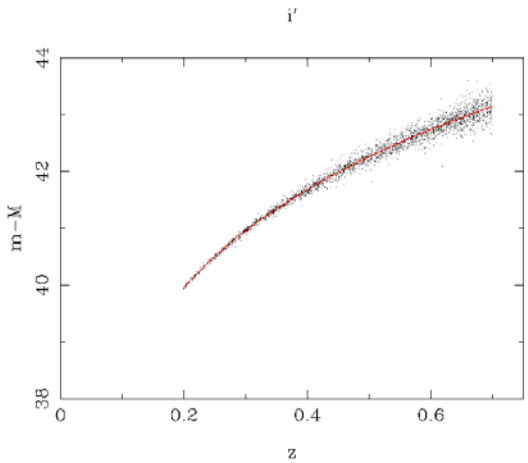
- Solid=true
- Dotted=fit
- Points=obs
- Flux=1 i'=25

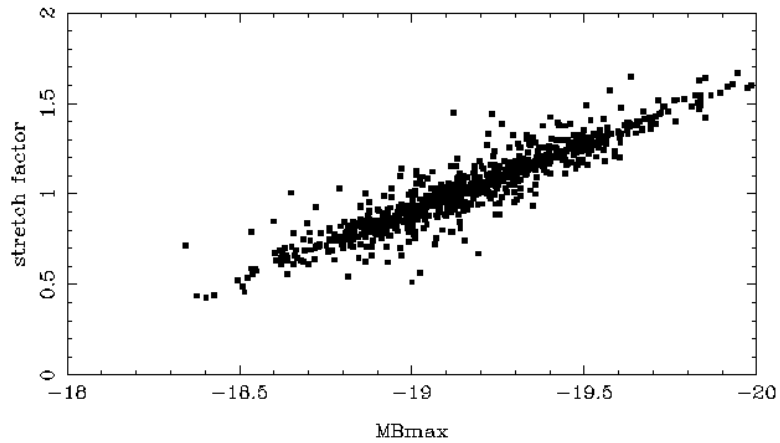


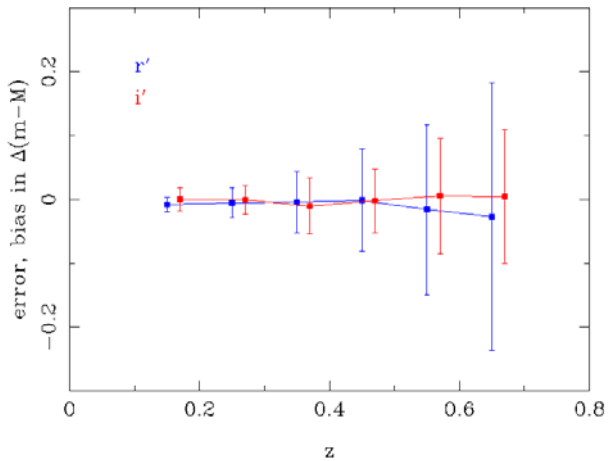


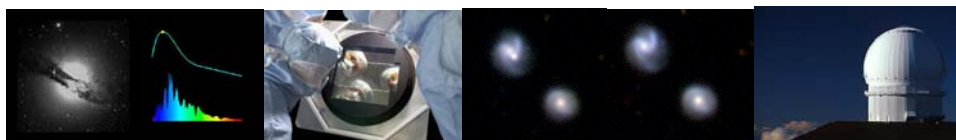
No intrinsic dispersion, photom errors only



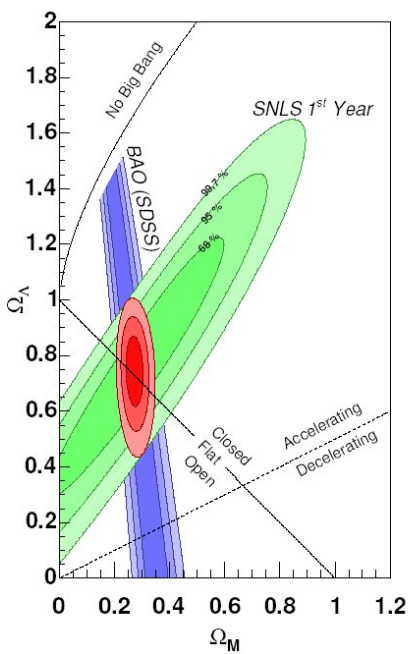








SNLS – 1st yr


No Big Bang
SNLS 1st Year
BAO (SDSS)
99.7 %
95 %
68 %
Closed
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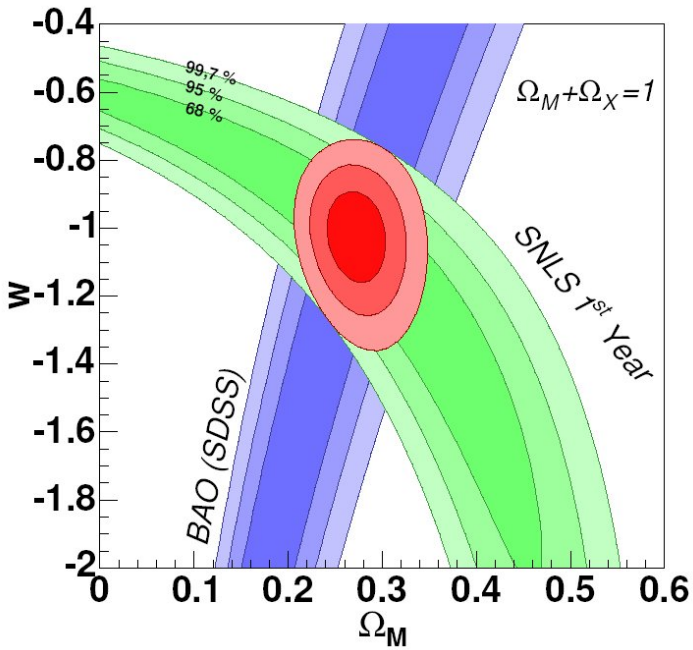
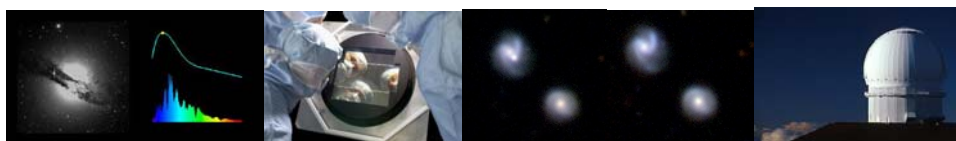
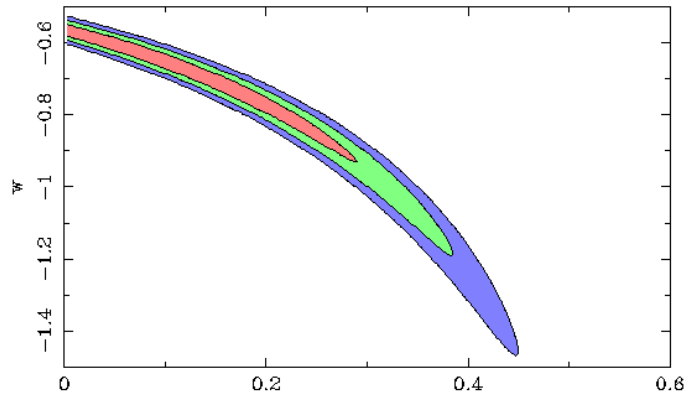
Ω_Λ
Ω_M

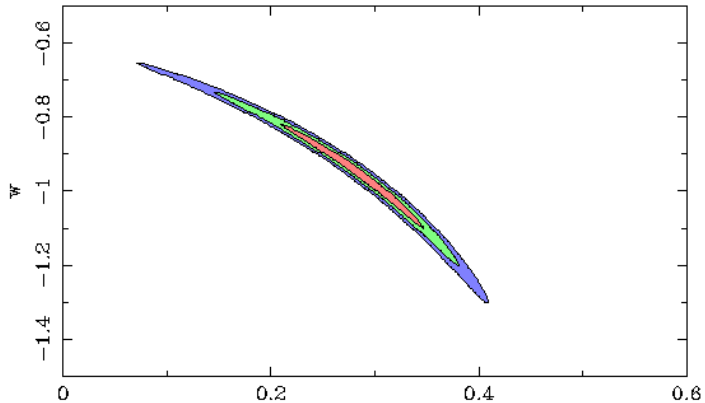

99.7 %
95 %
68 %
$\Omega_M+\Omega_X=1$
SNLS 1st Year
BAO (SDSS)
w
Ω_M



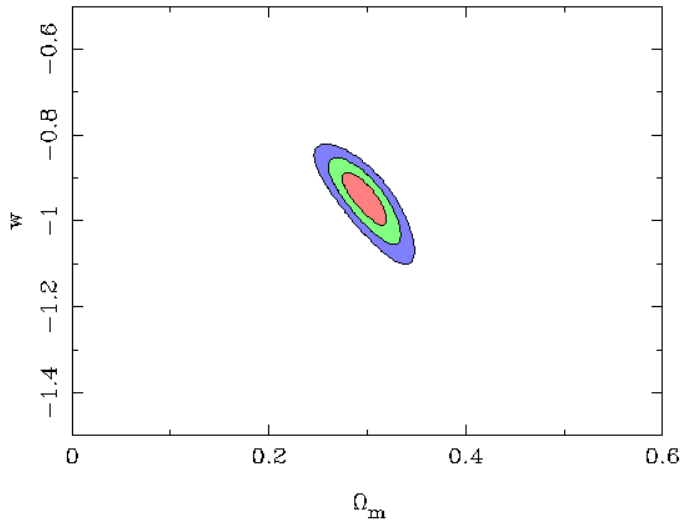
SNLS 3rd yr vs. SNLS-2

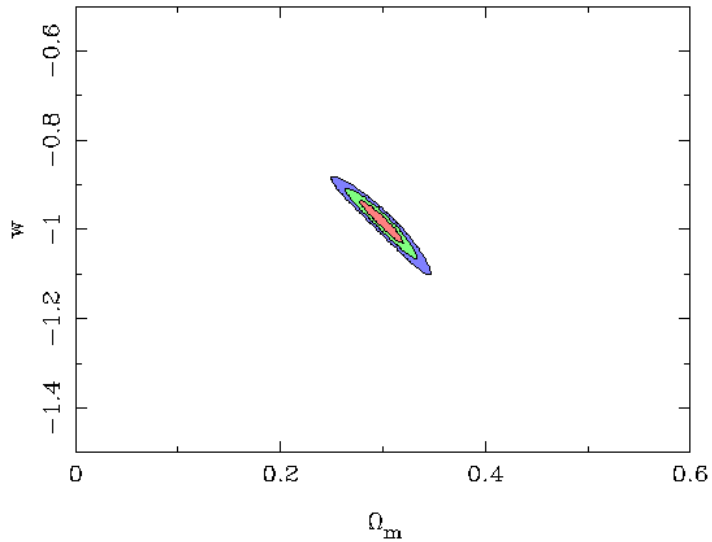


40 low z, 250 high z

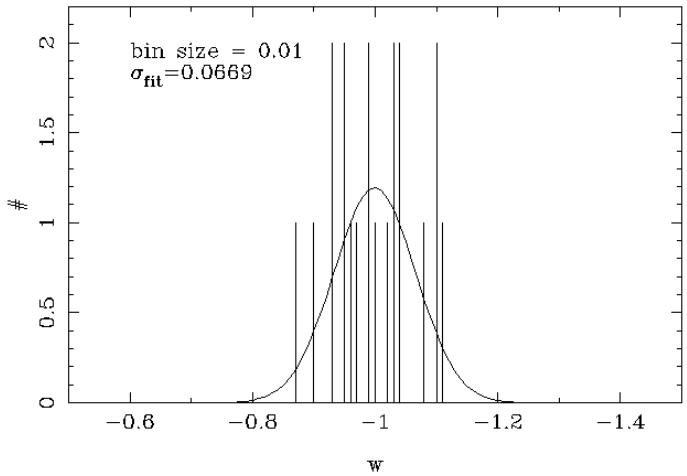


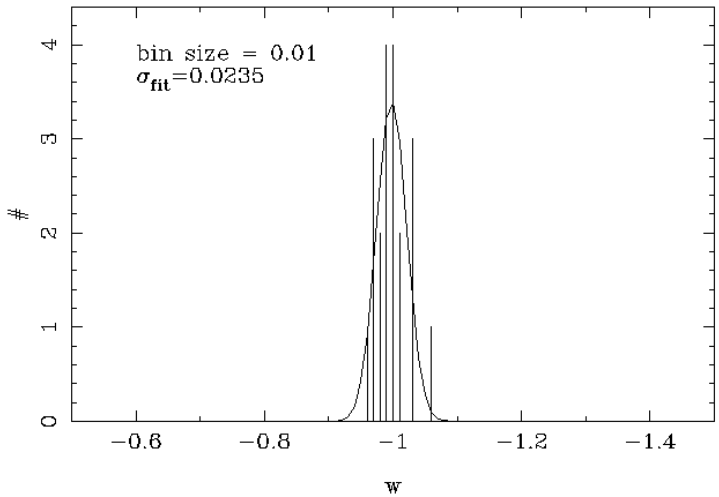
300 low z, 2500 high z

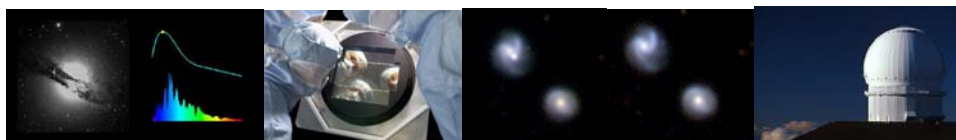




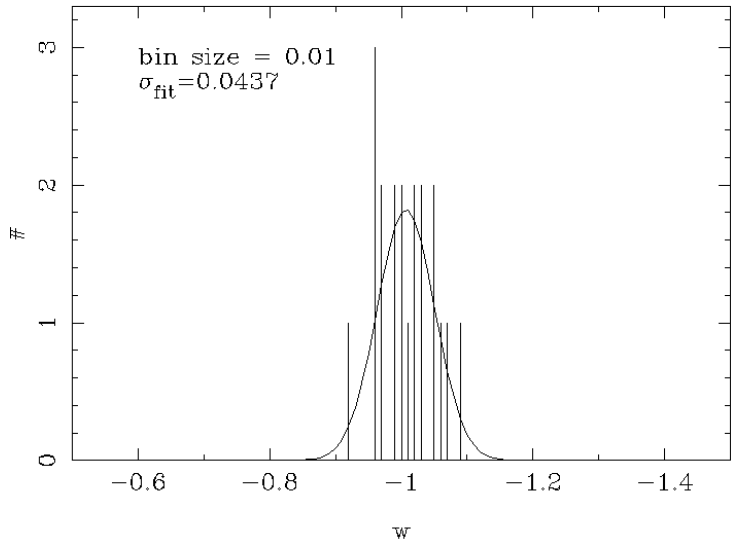
SNLS 3rd yr vs. SNLS-2

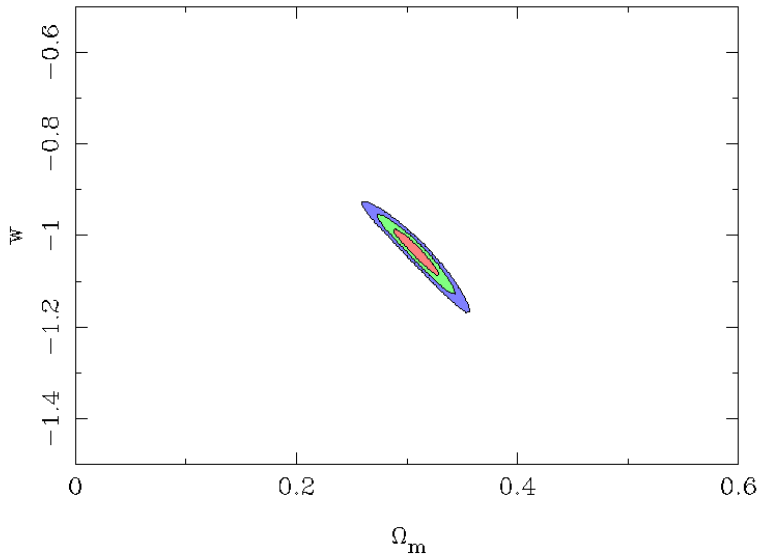


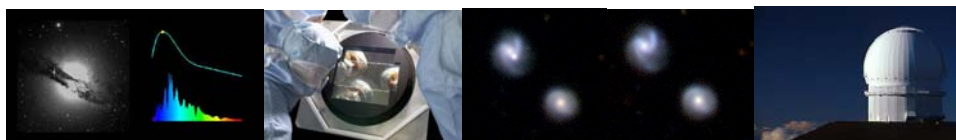




SNLS-2 with small low z sample

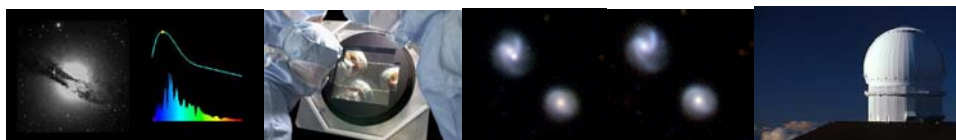






Why?

- √N improvement in errors in w?
- Subsamples and systematics
  - This is what we have to do before an even larger survey can go ahead.
- “Interesting 1% of SNeIa” – AH
- “Not doing it would be very Canadian.” – HH
- dw/dz – SNLS + SNLS-2 + SDSS have similar photometric systems -> low systematics



Other points

- Photometric typing required, spec typing requires huge allocations
  - z's from hosts: how often are hosts too faint? How often misidentified?
- Improvements in finding algorithms needed
  - Using all light curve points
  - Rejection of false positives