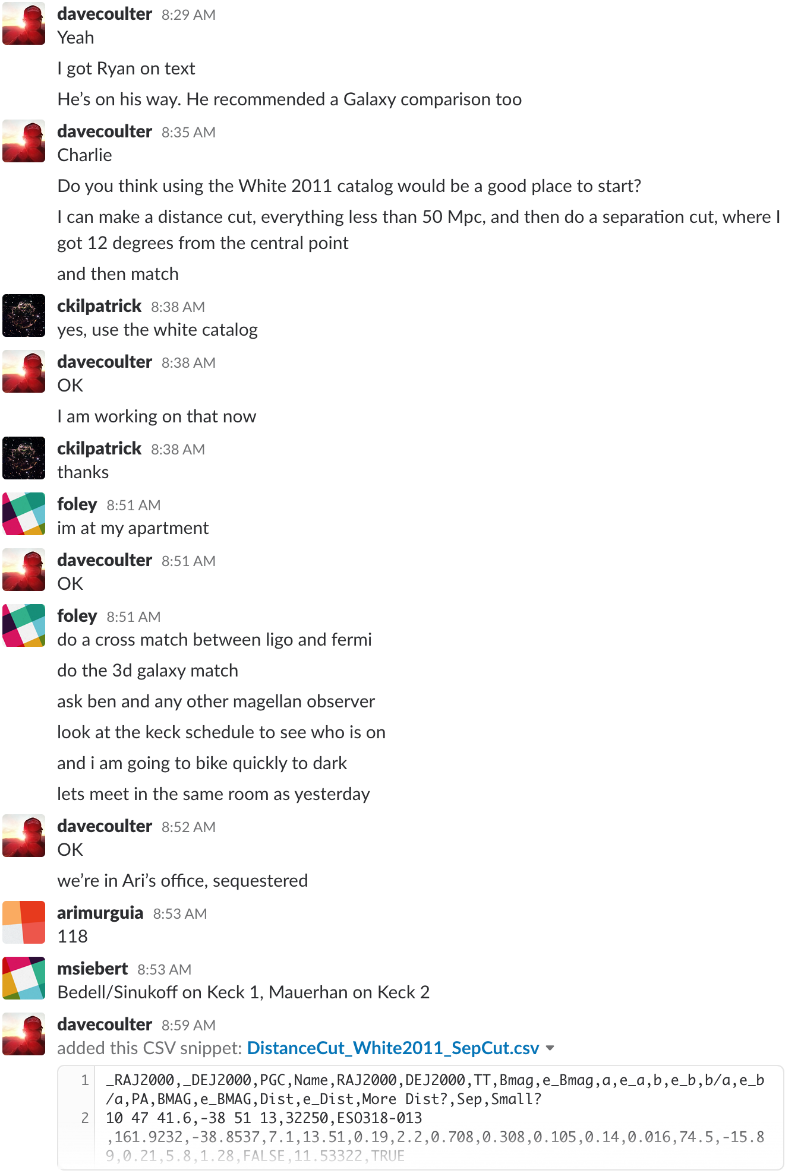


davecoulter 8:29 AM
Yeah

I got Ryan on text

He's on his way. He recommended a Galaxy comparison too

davecoulter 8:35 AM
Charlie

Do you think using the White 2011 catalog would be a good place to start?

I can make a distance cut, everything less than 50 Mpc, and then do a separation cut, where I got 12 degrees from the central point

and then match

ckilpatrick 8:38 AM
yes, use the white catalog

davecoulter 8:38 AM
OK

I am working on that now

ckilpatrick 8:38 AM
thanks

foley 8:51 AM
im at my apartment

davecoulter 8:51 AM
OK

foley 8:51 AM
do a cross match between ligo and fermi

do the 3d galaxy match

ask ben and any other magellan observer

look at the keck schedule to see who is on

and i am going to bike quickly to dark

lets meet in the same room as yesterday

davecoulter 8:52 AM
OK

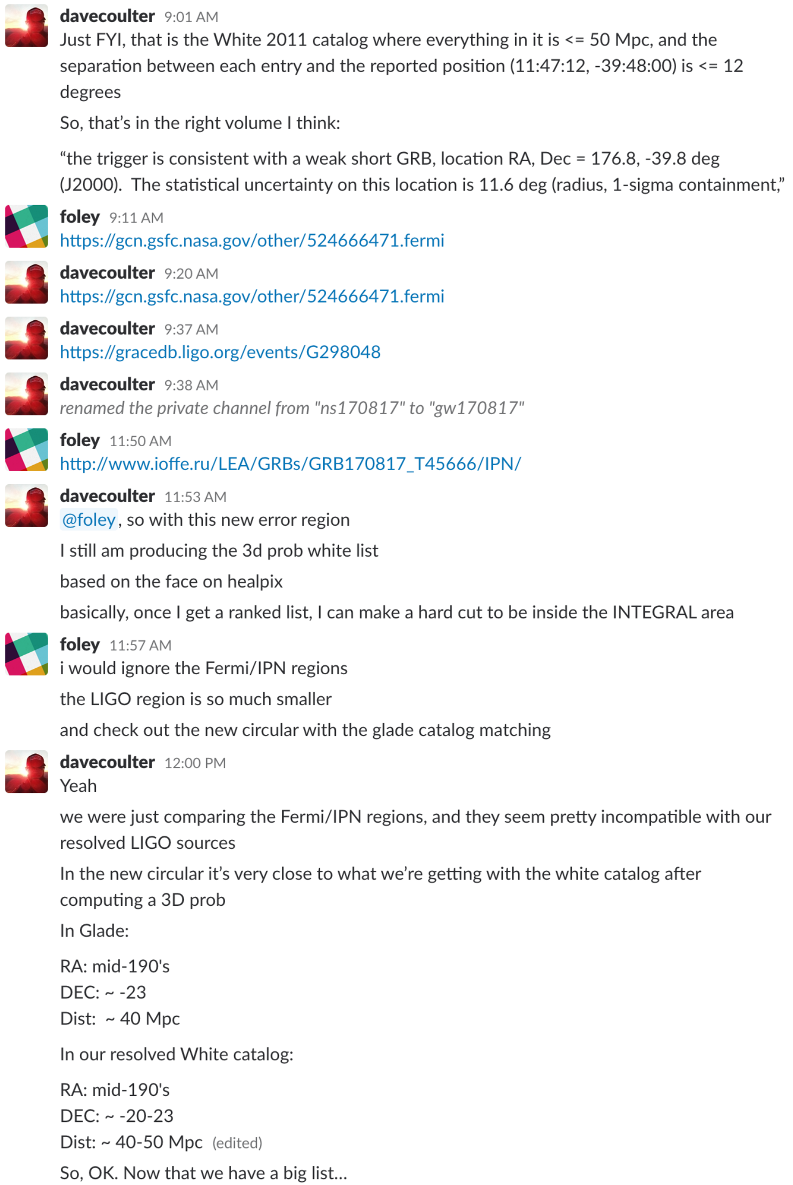
we're in Ari's office, sequestered

arimurguia 8:53 AM
118

msiebert 8:53 AM
Bedell/Sinukoff on Keck 1, Mauerhan on Keck 2

davecoulter 8:59 AM
added this CSV snippet: DistanceCut_White2011_SepCut.csv

```
_RAJ2000,_DEJ2000,PGC,Name,RAJ2000,DEJ2000,TT,Bmag,e_Bmag,a,e_a,b,e_b,b/a,e_b
/a,PA,BMAG,e_BMAG,Dist,e_Dist,More Dist?,Sep,Small?
10 47 41.6,-38 51 13,32250,ESO318-013
,161.9232,-38.8537,7.1,13.51,0.19,2.2,0.708,0.308,0.105,0.14,0.016,74.5,-15.8
9,0.21,5.8,1.28,FALSE,11.53322,TRUE
```



davecoulter 9:01 AM

Just FYI, that is the White 2011 catalog where everything in it is <= 50 Mpc, and the separation between each entry and the reported position (11:47:12, -39:48:00) is <= 12 degrees

So, that's in the right volume I think:

"the trigger is consistent with a weak short GRB, location RA, Dec = 176.8, -39.8 deg (J2000). The statistical uncertainty on this location is 11.6 deg (radius, 1-sigma containment,"

foley 9:11 AM

https://gcn.gsfc.nasa.gov/other/524666471.fermi

davecoulter 9:20 AM

https://gcn.gsfc.nasa.gov/other/524666471.fermi

davecoulter 9:37 AM

https://gracedb.ligo.org/events/G298048

davecoulter 9:38 AM

renamed the private channel from "ns170817" to "gw170817"

foley 11:50 AM

http://www.ioffe.ru/LEA/GRBs/GRB170817_T45666/IPN/

davecoulter 11:53 AM

@foley, so with this new error region

I still am producing the 3d prob white list

based on the face on healpix

basically, once I get a ranked list, I can make a hard cut to be inside the INTEGRAL area

foley 11:57 AM

i would ignore the Fermi/IPN regions

the LIGO region is so much smaller

and check out the new circular with the glade catalog matching

davecoulter 12:00 PM

Yeah

we were just comparing the Fermi/IPN regions, and they seem pretty incompatible with our resolved LIGO sources

In the new circular it's very close to what we're getting with the white catalog after computing a 3D prob

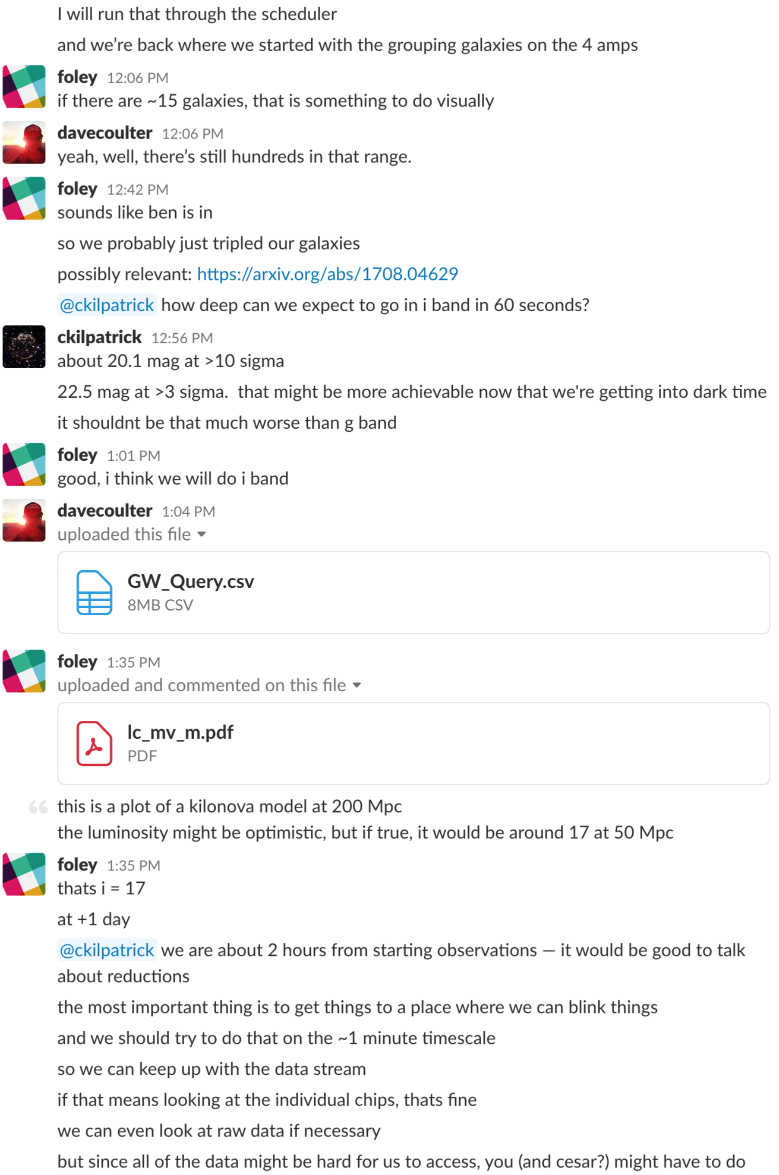
In Glade:

RA: mid-190's
DEC: ~ -23
Dist: ~ 40 Mpc

In our resolved White catalog:

RA: mid-190's
DEC: ~ -20-23
Dist: ~ 40-50 Mpc (edited)

So, OK. Now that we have a big list...



I will run that through the scheduler

and we're back where we started with the grouping galaxies on the 4 amps

foley 12:06 PM

if there are ~15 galaxies, that is something to do visually

davecoulter 12:06 PM

yeah, well, there's still hundreds in that range.

foley 12:42 PM

sounds like ben is in

so we probably just tripled our galaxies

possibly relevant: https://arxiv.org/abs/1708.04629

@ckilpatrick how deep can we expect to go in i band in 60 seconds?

ckilpatrick 12:56 PM

about 20.1 mag at >10 sigma

22.5 mag at >3 sigma. that might be more achievable now that we're getting into dark time

it shouldnt be that much worse than g band

foley 1:01 PM

good, i think we will do i band

davecoulter 1:04 PM

uploaded this file

GW_Query.csv

8MB CSV

foley 1:35 PM

uploaded and commented on this file

lc_mv_m.pdf

PDF

> this is a plot of a kilonova model at 200 Mpc
> the luminosity might be optimistic, but if true, it would be around 17 at 50 Mpc

foley 1:35 PM

thats i = 17

at +1 day

@ckilpatrick we are about 2 hours from starting observations — it would be good to talk about reductions

the most important thing is to get things to a place where we can blink things

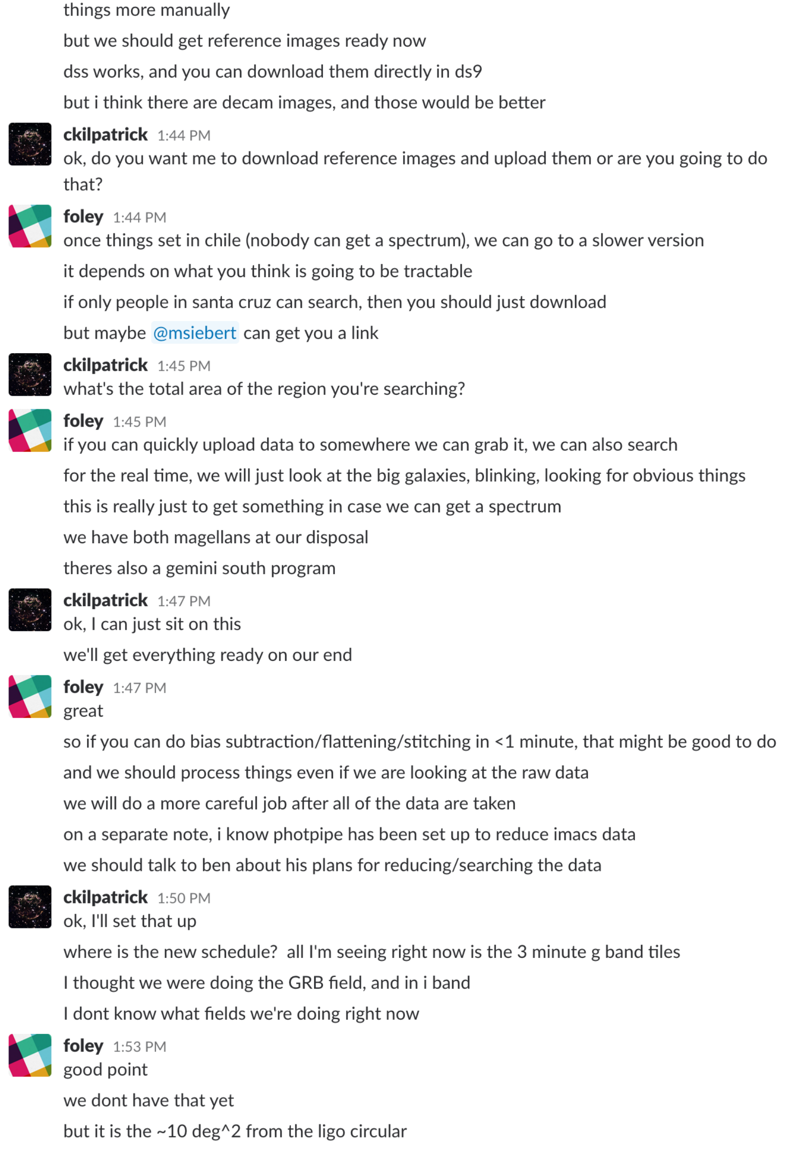
and we should try to do that on the ~1 minute timescale

so we can keep up with the data stream

if that means looking at the individual chips, thats fine

we can even look at raw data if necessary

but since all of the data might be hard for us to access, you (and cesar?) might have to do



things more manually

but we should get reference images ready now

dss works, and you can download them directly in ds9

but i think there are decam images, and those would be better

ckilpatrick 1:44 PM

ok, do you want me to download reference images and upload them or are you going to do that?

foley 1:44 PM

once things set in chile (nobody can get a spectrum), we can go to a slower version

it depends on what you think is going to be tractable

if only people in santa cruz can search, then you should just download

but maybe @msiebert can get you a link

ckilpatrick 1:45 PM

what's the total area of the region you're searching?

foley 1:45 PM

if you can quickly upload data to somewhere we can grab it, we can also search

for the real time, we will just look at the big galaxies, blinking, looking for obvious things

this is really just to get something in case we can get a spectrum

we have both magellans at our disposal

theres also a gemini south program

ckilpatrick 1:47 PM

ok, I can just sit on this

we'll get everything ready on our end

foley 1:47 PM

great

so if you can do bias subtraction/flattening/stitching in <1 minute, that might be good to do

and we should process things even if we are looking at the raw data

we will do a more careful job after all of the data are taken

on a separate note, i know photpipe has been set up to reduce imacs data

we should talk to ben about his plans for reducing/searching the data

ckilpatrick 1:50 PM

ok, I'll set that up

where is the new schedule? all I'm seeing right now is the 3 minute g band tiles

I thought we were doing the GRB field, and in i band

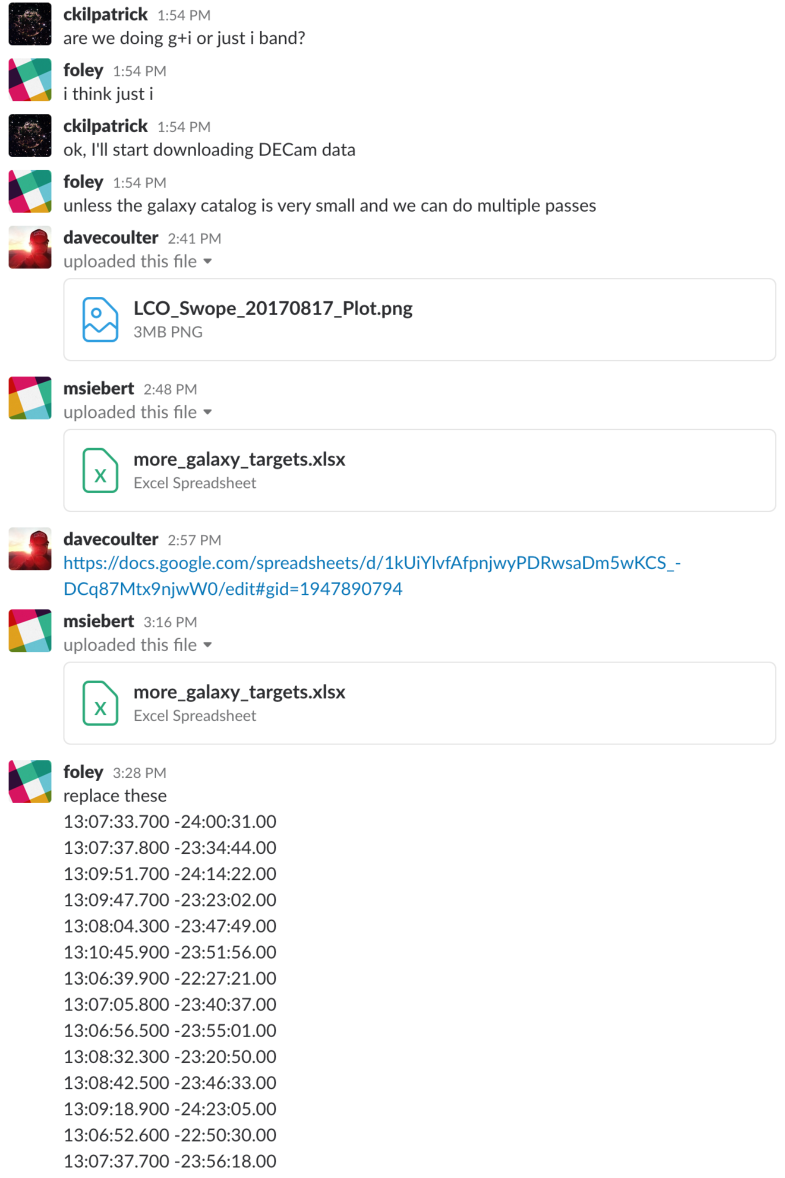
I dont know what fields we're doing right now

foley 1:53 PM

good point

we dont have that yet

but it is the ~10 deg^2 from the ligo circular



ckilpatrick 1:54 PM
are we doing g+i or just i band?

foley 1:54 PM
i think just i

ckilpatrick 1:54 PM
ok, I'll start downloading DECam data

foley 1:54 PM
unless the galaxy catalog is very small and we can do multiple passes

davecoulter 2:41 PM
uploaded this file ▾

LCO_Swope_20170817_Plot.png
3MB PNG

msiebert 2:48 PM
uploaded this file ▾

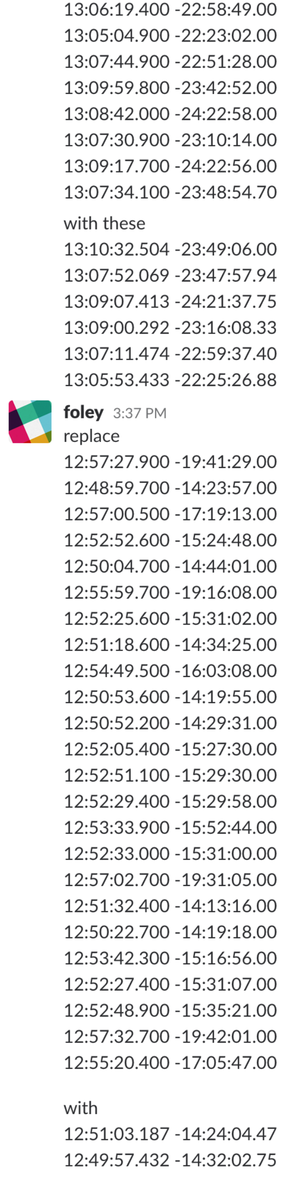
more_galaxy_targets.xlsx
Excel Spreadsheet

davecoulter 2:57 PM
https://docs.google.com/spreadsheets/d/1kUiYlvfAfpnjwyPDRwsaDm5wKCS_-DCq87Mtx9njwW0/edit#gid=1947890794

msiebert 3:16 PM
uploaded this file ▾

more_galaxy_targets.xlsx
Excel Spreadsheet

foley 3:28 PM
replace these
13:07:33.700 -24:00:31.00
13:07:37.800 -23:34:44.00
13:09:51.700 -24:14:22.00
13:09:47.700 -23:23:02.00
13:08:04.300 -23:47:49.00
13:10:45.900 -23:51:56.00
13:06:39.900 -22:27:21.00
13:07:05.800 -23:40:37.00
13:06:56.500 -23:55:01.00
13:08:32.300 -23:20:50.00
13:08:42.500 -23:46:33.00
13:09:18.900 -24:23:05.00
13:06:52.600 -22:50:30.00
13:07:37.700 -23:56:18.00



13:06:19.400 -22:58:49.00
13:05:04.900 -22:23:02.00
13:07:44.900 -22:51:28.00
13:09:59.800 -23:42:52.00
13:08:42.000 -24:22:58.00
13:07:30.900 -23:10:14.00
13:09:17.700 -24:22:56.00
13:07:34.100 -23:48:54.70

with these
13:10:32.504 -23:49:06.00
13:07:52.069 -23:47:57.94
13:09:07.413 -24:21:37.75
13:09:00.292 -23:16:08.33
13:07:11.474 -22:59:37.40
13:05:53.433 -22:25:26.88

foley 3:37 PM
replace
12:57:27.900 -19:41:29.00
12:48:59.700 -14:23:57.00
12:57:00.500 -17:19:13.00
12:52:52.600 -15:24:48.00
12:50:04.700 -14:44:01.00
12:55:59.700 -19:16:08.00
12:52:25.600 -15:31:02.00
12:51:18.600 -14:34:25.00
12:54:49.500 -16:03:08.00
12:50:53.600 -14:19:55.00
12:50:52.200 -14:29:31.00
12:52:05.400 -15:27:30.00
12:52:51.100 -15:29:30.00
12:52:29.400 -15:29:58.00
12:53:33.900 -15:52:44.00
12:52:33.000 -15:31:00.00
12:57:02.700 -19:31:05.00
12:51:32.400 -14:13:16.00
12:50:22.700 -14:19:18.00
12:53:42.300 -15:16:56.00
12:52:27.400 -15:31:07.00
12:52:48.900 -15:35:21.00
12:57:32.700 -19:42:01.00
12:55:20.400 -17:05:47.00

with
12:51:03.187 -14:24:04.47
12:49:57.432 -14:32:02.75

12:52:52.738 -15:28:43.23
12:54:11.615 -15:58:49.24
12:56:13.260 -17:11:07.76
12:56:46.736 -19:29:16.53

@ckilpatrick these will be the most important fields for searching

each has at least 2 galaxies, and a few have ~9

ckilpatrick 3:41 PM

ok, understood

foley 3:42 PM

added and commented on this Plain Text snippet: gw_gal.reg

```
# Region file format: DS9 version 4.1
global color=green dashlist=8 3 width=1 font="helvetica 10 normal roman" select=1 highlite=1 dash=0 fixed=0 edit=1 move=1 delete=1 include=1 source=1
fk5
circle(12:57:27.9    ,-19:41:29.0,30")
```

region file containing all of the galaxies on current schedule

foley 3:42 PM

there is a region file

you can just load that into any image and you should be able to see the galaxies that we care about

ckilpatrick 3:43 PM

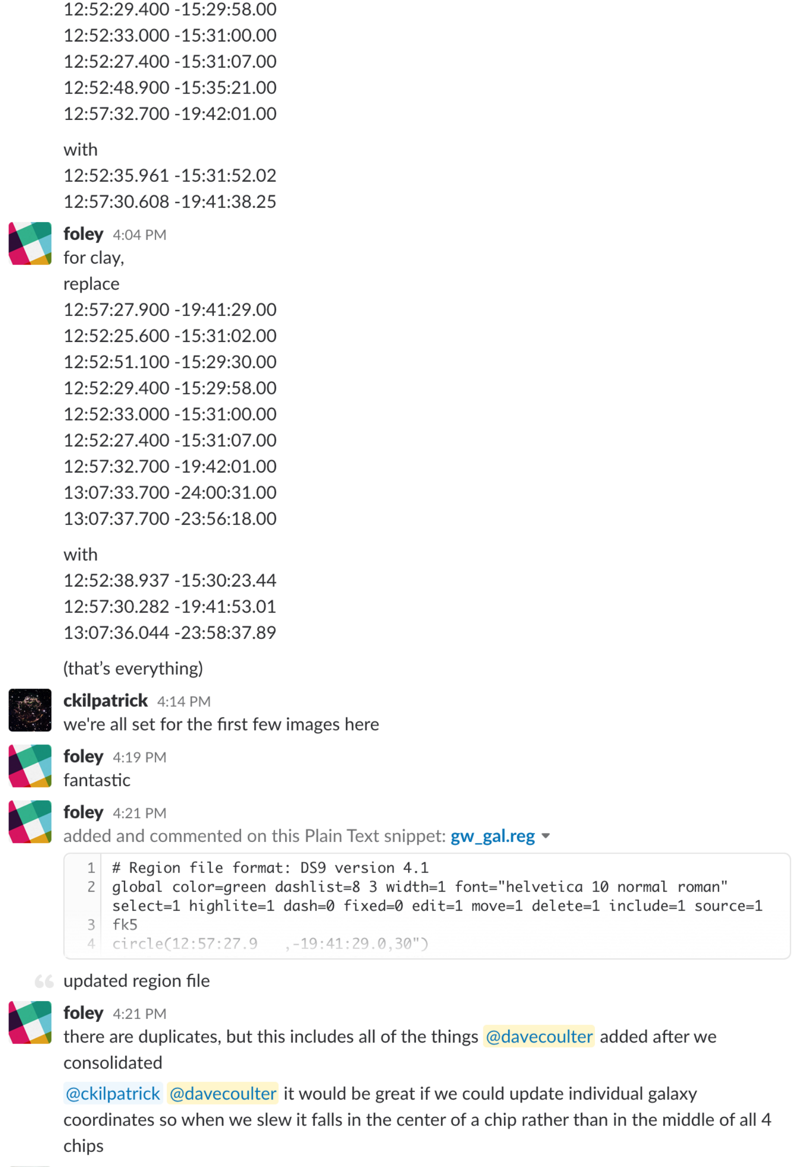
thanks

foley 3:54 PM

replace
13:07:33.700 -24:00:31.00
13:07:37.800 -23:34:44.00
13:08:04.300 -23:47:49.00
13:07:05.800 -23:40:37.00
13:06:56.500 -23:55:01.00
13:08:42.500 -23:46:33.00
13:07:37.700 -23:56:18.00
13:08:42.000 -24:22:58.00
13:09:17.700 -24:22:56.00
13:07:34.100 -23:48:54.70

with
13:08:23.151 -23:48:31.62
13:07:23.670 -23:37:58.16
13:07:15.598 -23:52:18.40
13:07:22.426 -23:59:49.55
13:08:59.982 -24:22:40.99

replace
12:57:27.900 -19:41:29.00
12:52:25.600 -15:31:02.00
12:52:51.100 -15:29:30.00



12:52:29.400 -15:29:58.00
12:52:33.000 -15:31:00.00
12:52:27.400 -15:31:07.00
12:52:48.900 -15:35:21.00
12:57:32.700 -19:42:01.00

with
12:52:35.961 -15:31:52.02
12:57:30.608 -19:41:38.25

foley 4:04 PM
for clay,
replace
12:57:27.900 -19:41:29.00
12:52:25.600 -15:31:02.00
12:52:51.100 -15:29:30.00
12:52:29.400 -15:29:58.00
12:52:33.000 -15:31:00.00
12:52:27.400 -15:31:07.00
12:57:32.700 -19:42:01.00
13:07:33.700 -24:00:31.00
13:07:37.700 -23:56:18.00

with
12:52:38.937 -15:30:23.44
12:57:30.282 -19:41:53.01
13:07:36.044 -23:58:37.89

(that's everything)

ckilpatrick 4:14 PM
we're all set for the first few images here

foley 4:19 PM
fantastic

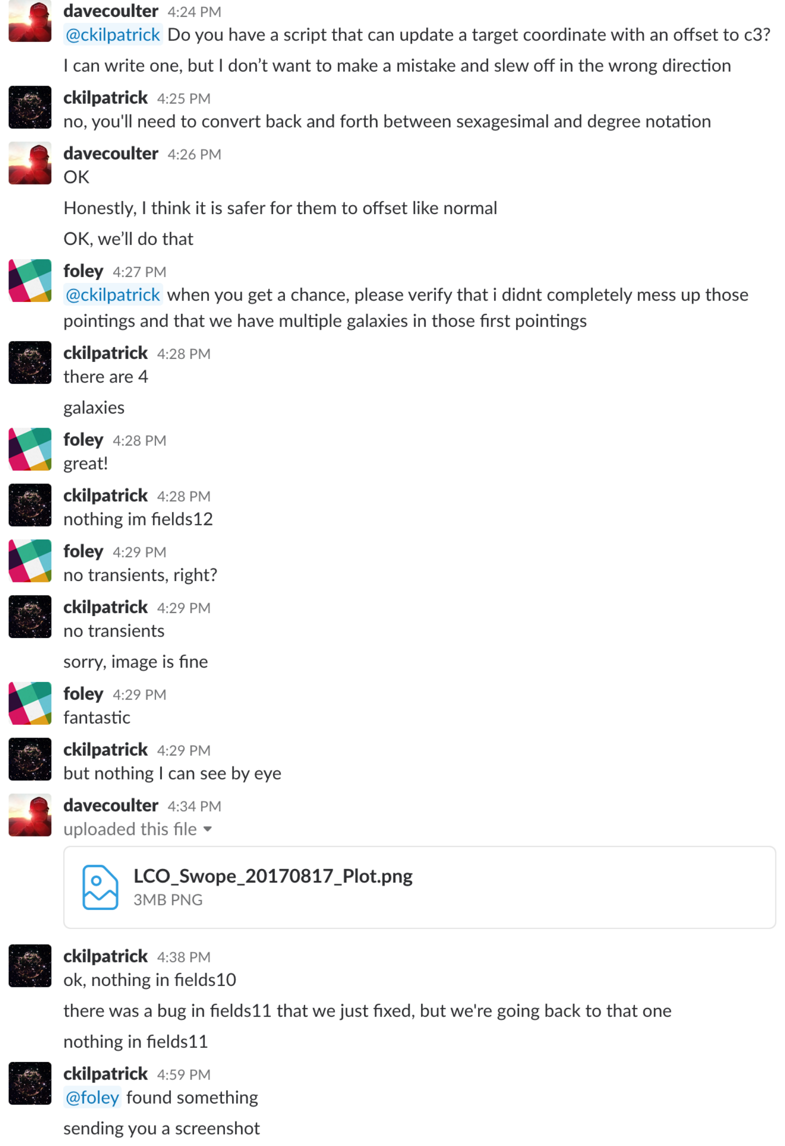
foley 4:21 PM
added and commented on this Plain Text snippet: gw_gal.reg

```
# Region file format: DS9 version 4.1
global color=green dashlist=8 3 width=1 font="helvetica 10 normal roman"
select=1 highlite=1 dash=0 fixed=0 edit=1 move=1 delete=1 include=1 source=1
fk5
circle(12:57:27.9    ,-19:41:29.0,30")
```

updated region file

foley 4:21 PM
there are duplicates, but this includes all of the things @davecoulter added after we consolidated

@ckilpatrick @davecoulter it would be great if we could update individual galaxy coordinates so when we slew it falls in the center of a chip rather than in the middle of all 4 chips



davecoulter 4:24 PM

@ckilpatrick Do you have a script that can update a target coordinate with an offset to c3?

I can write one, but I don't want to make a mistake and slew off in the wrong direction

ckilpatrick 4:25 PM

no, you'll need to convert back and forth between sexagesimal and degree notation

davecoulter 4:26 PM

OK

Honestly, I think it is safer for them to offset like normal

OK, we'll do that

foley 4:27 PM

@ckilpatrick when you get a chance, please verify that i didnt completely mess up those pointings and that we have multiple galaxies in those first pointings

ckilpatrick 4:28 PM

there are 4

galaxies

foley 4:28 PM

great!

ckilpatrick 4:28 PM

nothing im fields12

foley 4:29 PM

no transients, right?

ckilpatrick 4:29 PM

no transients

sorry, image is fine

foley 4:29 PM

fantastic

ckilpatrick 4:29 PM

but nothing I can see by eye

davecoulter 4:34 PM

uploaded this file ▾

LCO_Swope_20170817_Plot.png

3MB PNG

ckilpatrick 4:38 PM

ok, nothing in fields10

there was a bug in fields11 that we just fixed, but we're going back to that one

nothing in fields11

ckilpatrick 4:59 PM

@foley found something

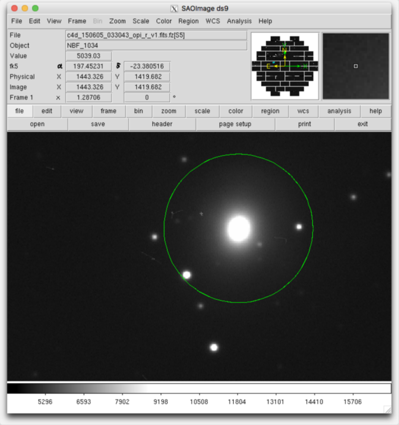
sending you a screenshot

foley 4:59 PM
wow!

davecoulter 4:59 PM
!

ckilpatrick 4:59 PM
template

ckilpatrick 4:59 PM
uploaded this image: Screen Shot 2017-08-17 at 4.59.27 PM.png



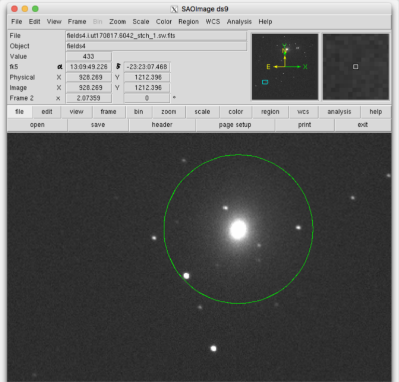
SAOImage ds9

File c4d_150605_033043_opi_r_v1.fits.fz[S5]
Object NBF_1034
Value 5039.03
fk5 α 197.45231 δ -23.380516
Physical X 1443.326 Y 1419.682
Image X 1443.326 Y 1419.682
Frame 1 × 1.28706 0 °

File Edit View Frame Bin Zoom Scale Color Region WCS Analysis Help
file edit view frame bin zoom scale color region wcs analysis help
open save header page setup print exit
N
E
5296 6593 7902 9198 10508 11804 13101 14410 15706

ckilpatrick 5:00 PM
us

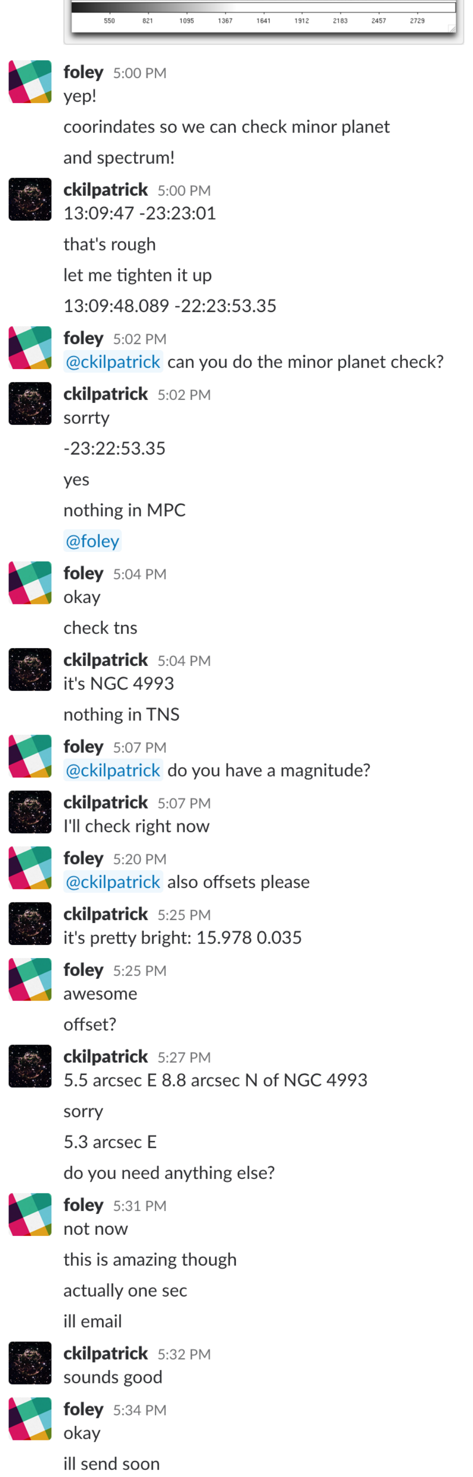
ckilpatrick 5:00 PM
uploaded this image: Screen Shot 2017-08-17 at 4.59.53 PM.png



SAOImage ds9

File fields4.i.ut170817.6042_stch_1.sw.fits
Object fields4
Value 433
fk5 α 13:09:49.226 δ -23:23:07.468
Physical X 928.269 Y 1212.396
Image X 928.269 Y 1212.396
Frame 2 × 2.07359 0 °

File Edit View Frame Bin Zoom Scale Color Region WCS Analysis Help
file edit view frame bin zoom scale color region wcs analysis help
open save header page setup print exit
N
E
X
Y



foley 5:00 PM
yep!

coorindates so we can check minor planet

and spectrum!

ckilpatrick 5:00 PM
13:09:47 -23:23:01

that's rough

let me tighten it up

13:09:48.089 -22:23:53.35

foley 5:02 PM
@ckilpatrick can you do the minor planet check?

ckilpatrick 5:02 PM
sorrty

-23:22:53.35

yes

nothing in MPC

@foley

foley 5:04 PM
okay

check tns

ckilpatrick 5:04 PM
it's NGC 4993

nothing in TNS

foley 5:07 PM
@ckilpatrick do you have a magnitude?

ckilpatrick 5:07 PM
I'll check right now

foley 5:20 PM
@ckilpatrick also offsets please

ckilpatrick 5:25 PM
it's pretty bright: 15.978 0.035

foley 5:25 PM
awesome

offset?

ckilpatrick 5:27 PM
5.5 arcsec E 8.8 arcsec N of NGC 4993

sorry

5.3 arcsec E

do you need anything else?

foley 5:31 PM
not now

this is amazing though

actually one sec

ill email

ckilpatrick 5:32 PM
sounds good

foley 5:34 PM
okay

ill send soon