The ROME/REA LCO Key Project

Overview & First observing season

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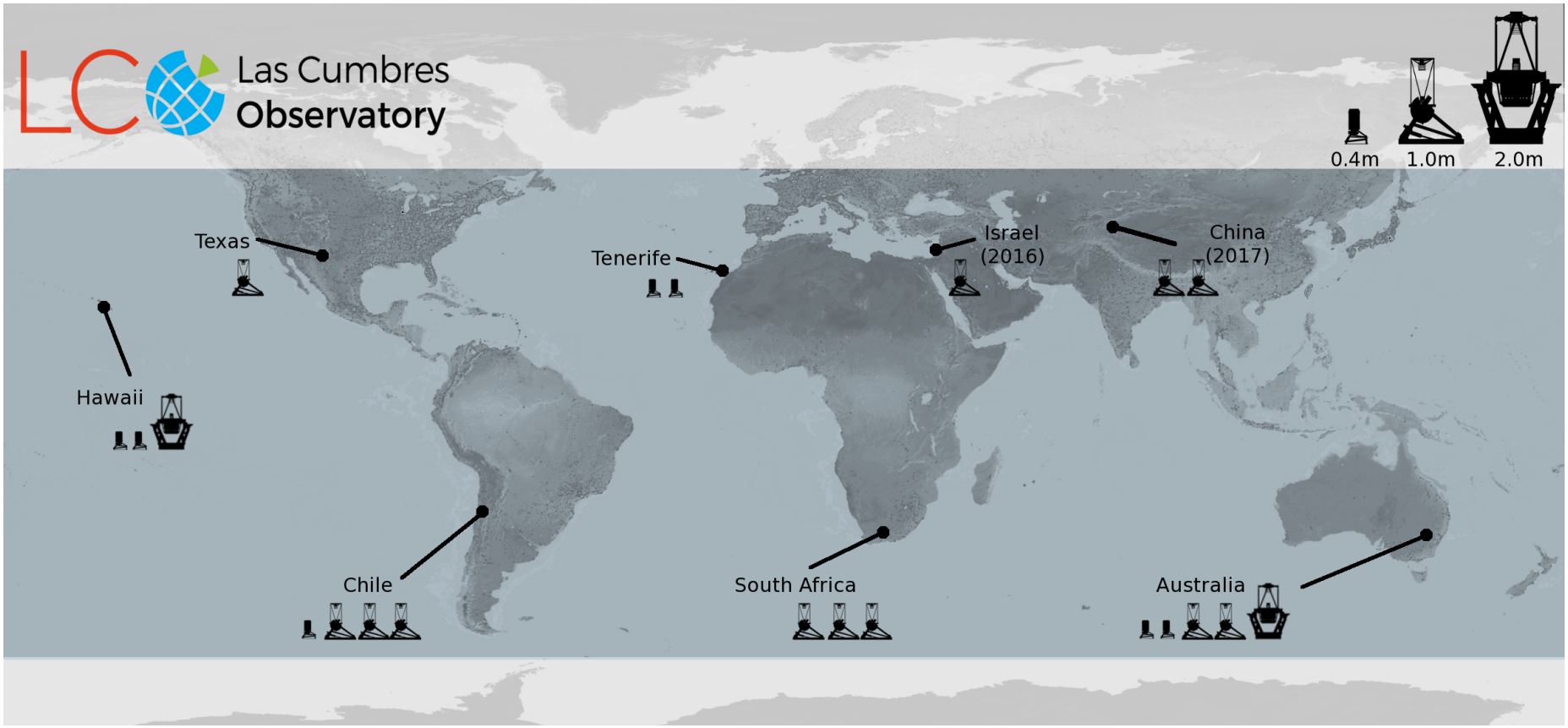
In a Nutshell

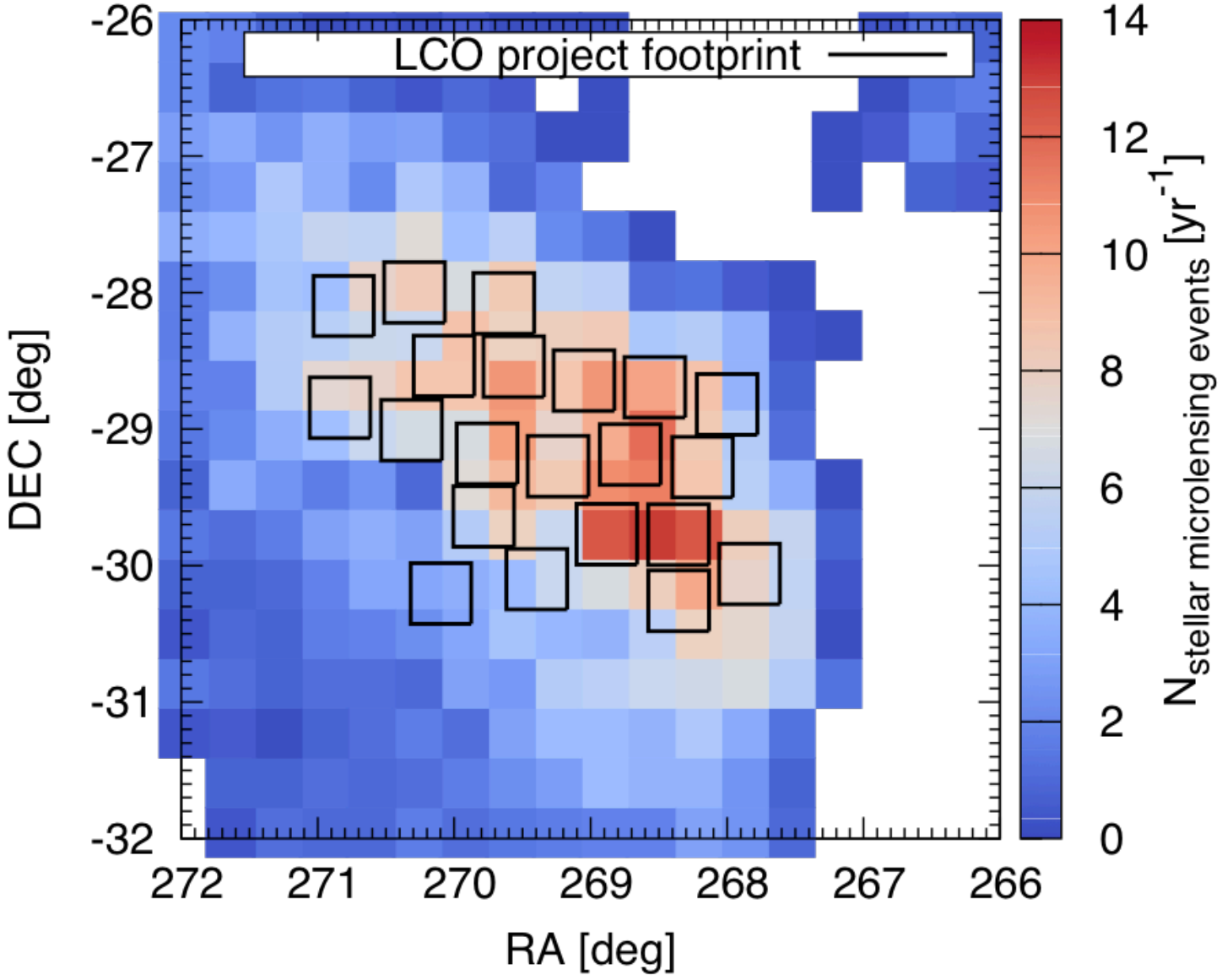
- ~2.3k hrs/yr to explore exoplanet demographics beyond the Snow-line



Strategy

- **20 target fields: ~4 sq. deg.** close to the GC
- Observations performed **in 3 bands** (SDSS-g',r',i') – aiming to characterize source stars
- 24/7 coverage from using southern LCO sites
- **ROME**: regular observations **every 7 hrs**
- **REA**: reactive observations of highly-magnified targets **every 60 min**

Target fields



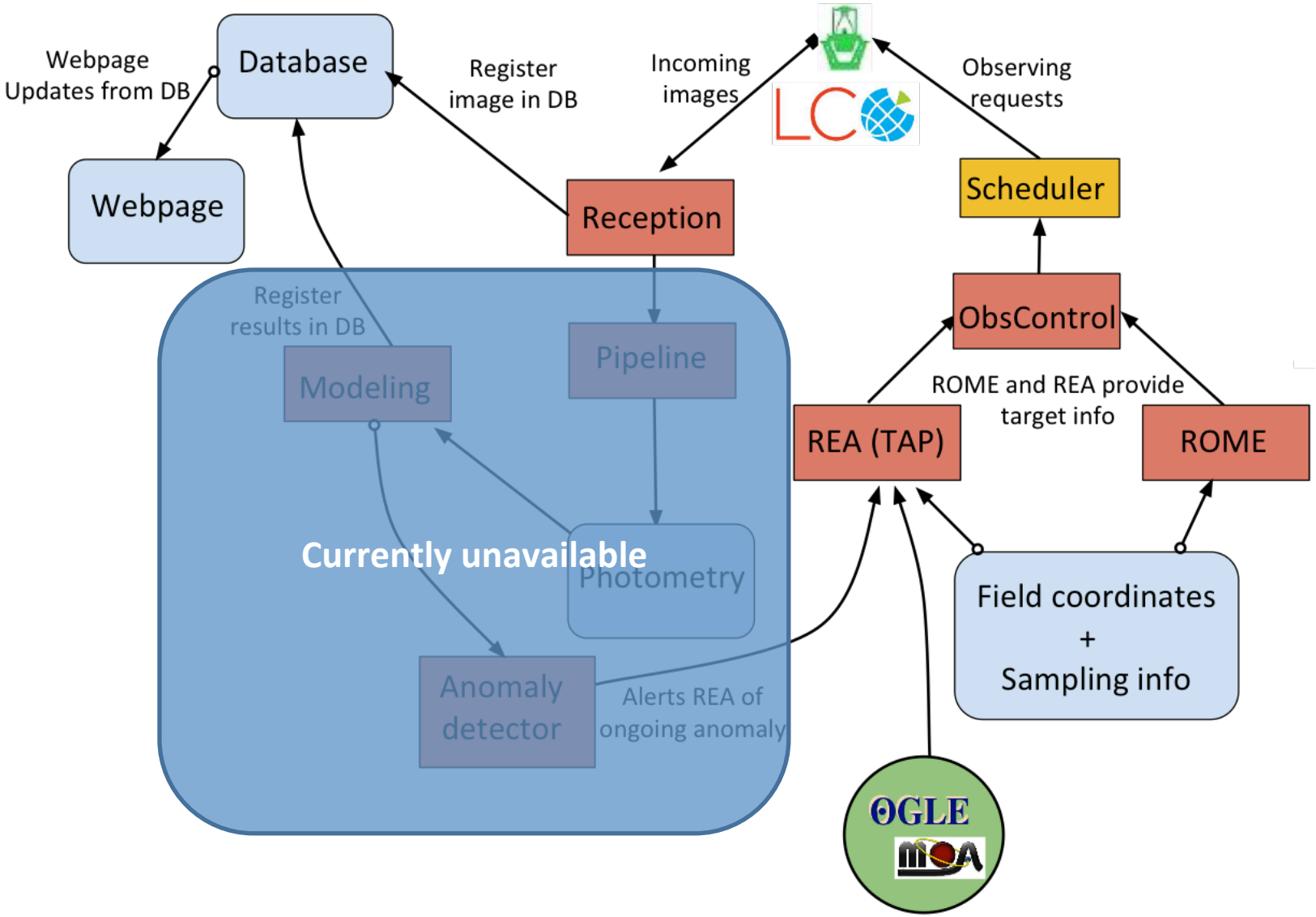
Expected yield

- Simulated light curve sampling for a full microlensing season
- Sampling based on observing strategy (inc. losses due to weather)
- Noise model calibrated using observations from previous seasons
- Detection probabilities evaluated after injecting artificial planetary signals

Expected yield

- ~ 300 stellar microlensing events/yr from ROME
- ~50/yr observed in responsive REA mode
- Expect **>10 new planets** by the end of the Key Project
- Estimate ~20% of planets will be in the 5-30 M_{Earth} range

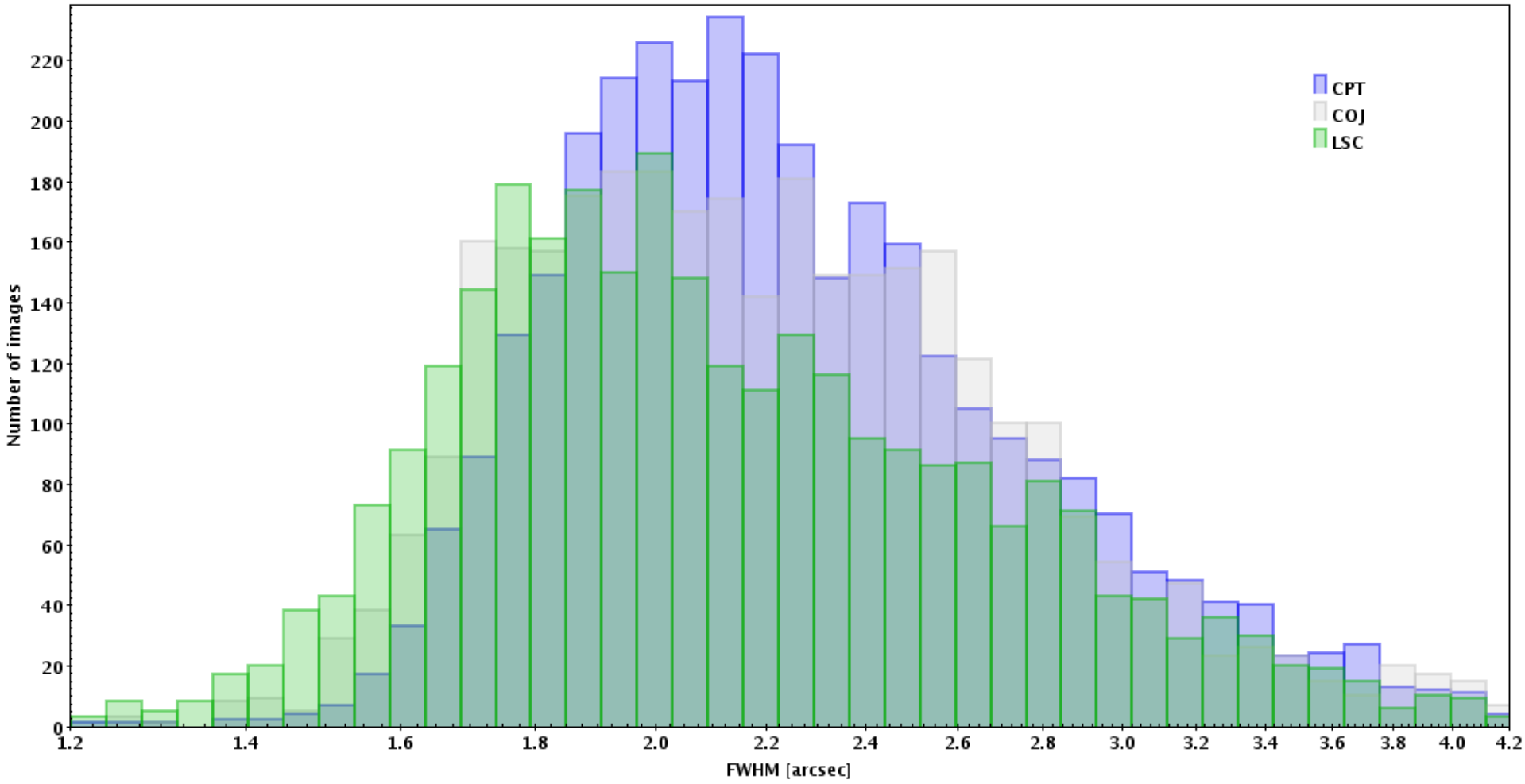
System architecture



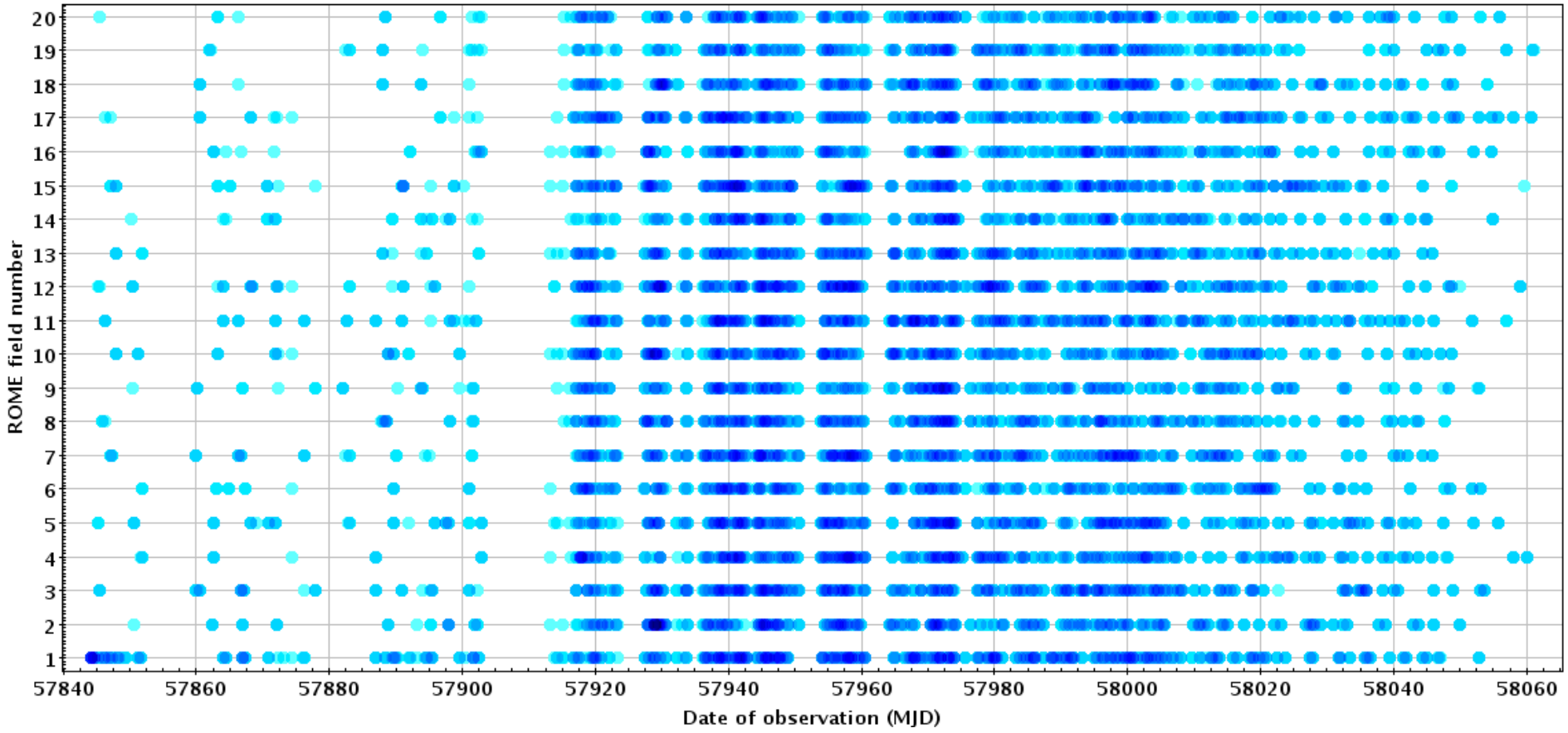
The story so far

- Observations commenced 1st April 2017
- Time used/allocated [2017]: 1282/2298 hrs
- Images obtained: 13618
- Template images not yet generated but preliminary results look as expected
- First light curves expected ~Jul.-Aug.2018

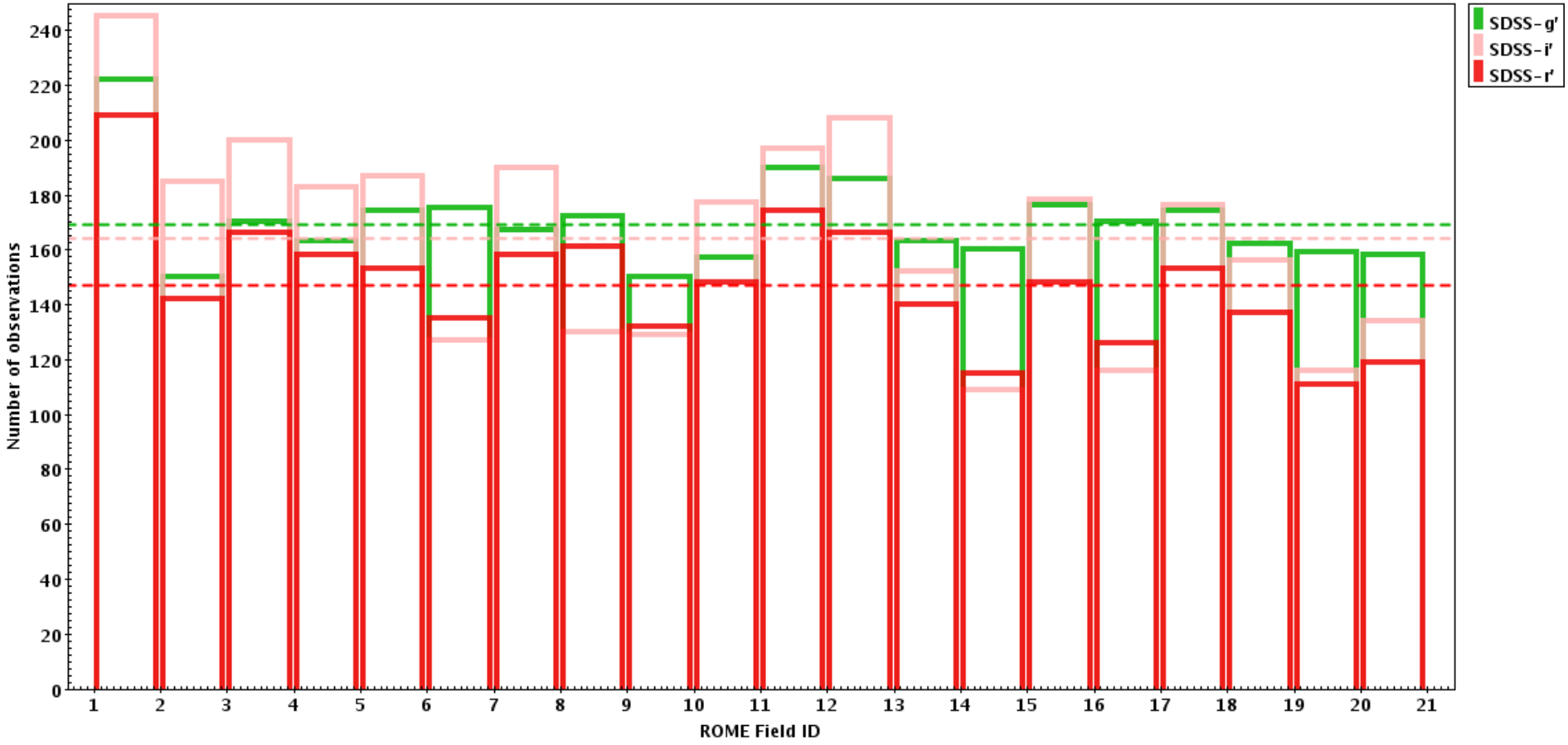
Average image quality

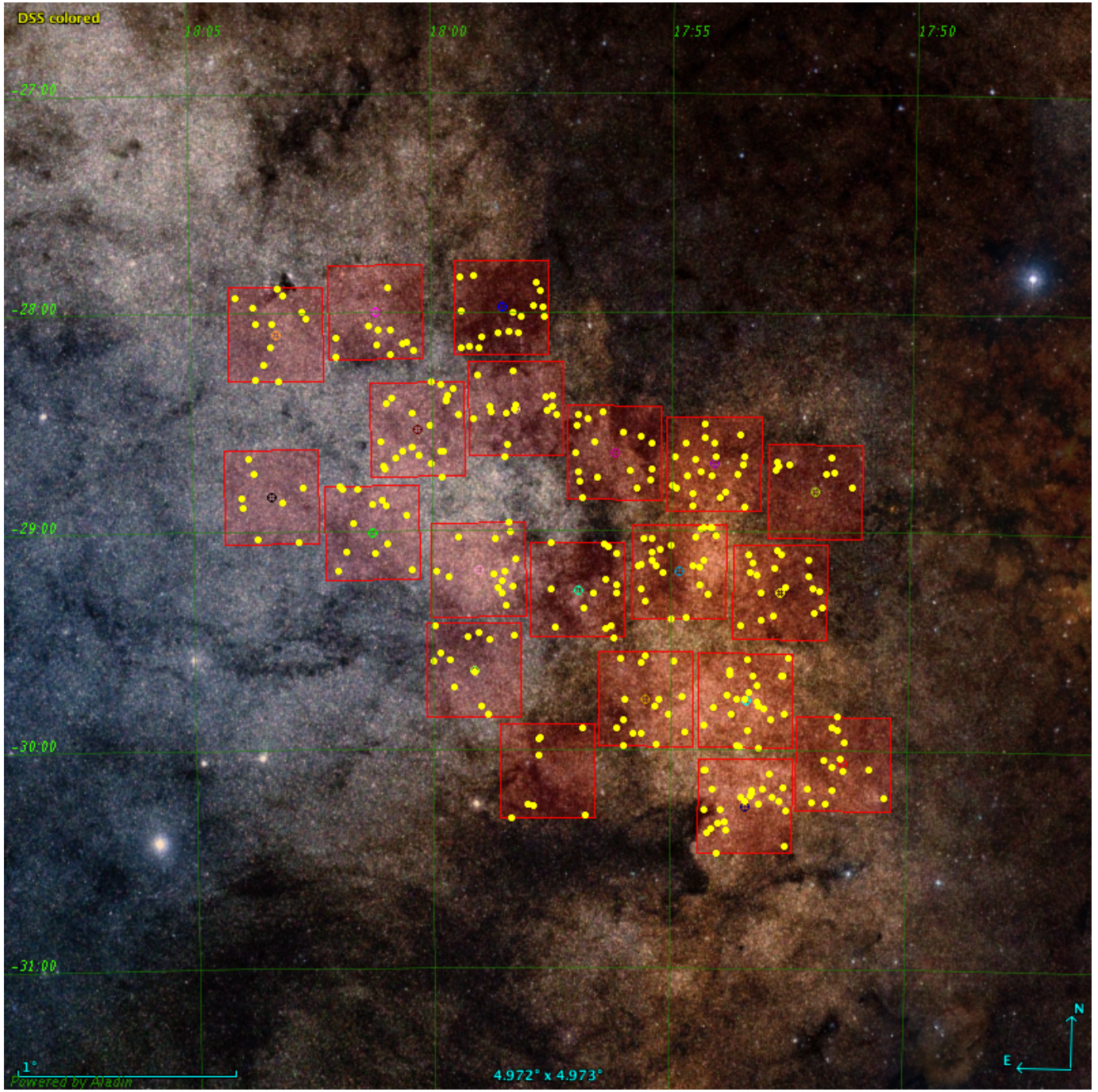


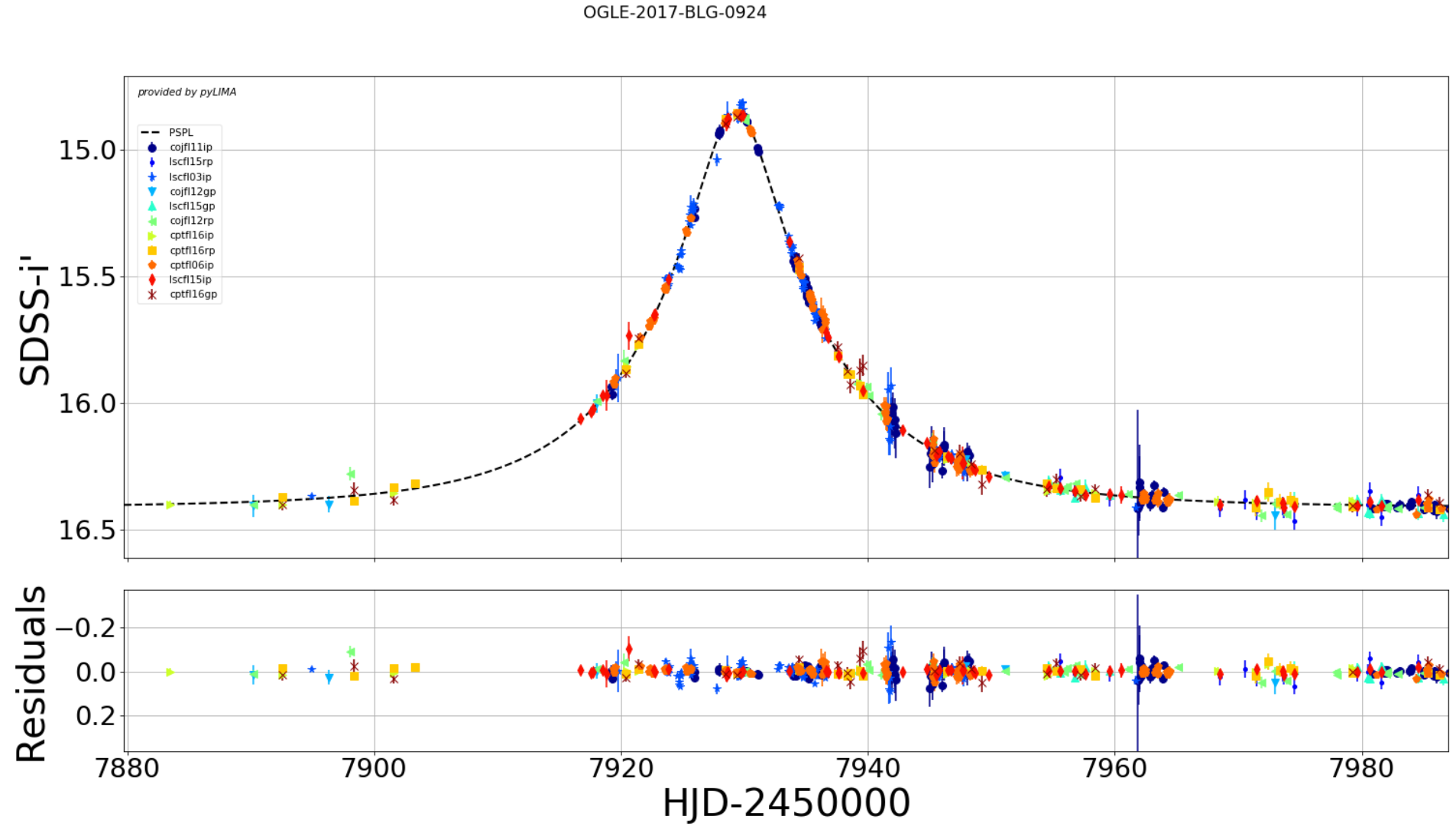
ROME observations



Field coverage




DSS colored
18:05
18:00
17:55
17:50
-27:00
-28:00
-29:00
-30:00
-31:00
1°
Powered by Aladin
4.972° x 4.973°
N
E


OGLE-2017-BLG-0924
provided by pyLIMA
PSPL
cojfl11ip
lscfl15rp
lscfl03ip
cojfl12gp
lscfl15gp
cojfl12rp
cptfl16ip
cptfl16rp
cptfl06ip
lscfl15ip
cptfl16gp
SDSS-i'
15.0
15.5
16.0
16.5
Residuals
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0.2
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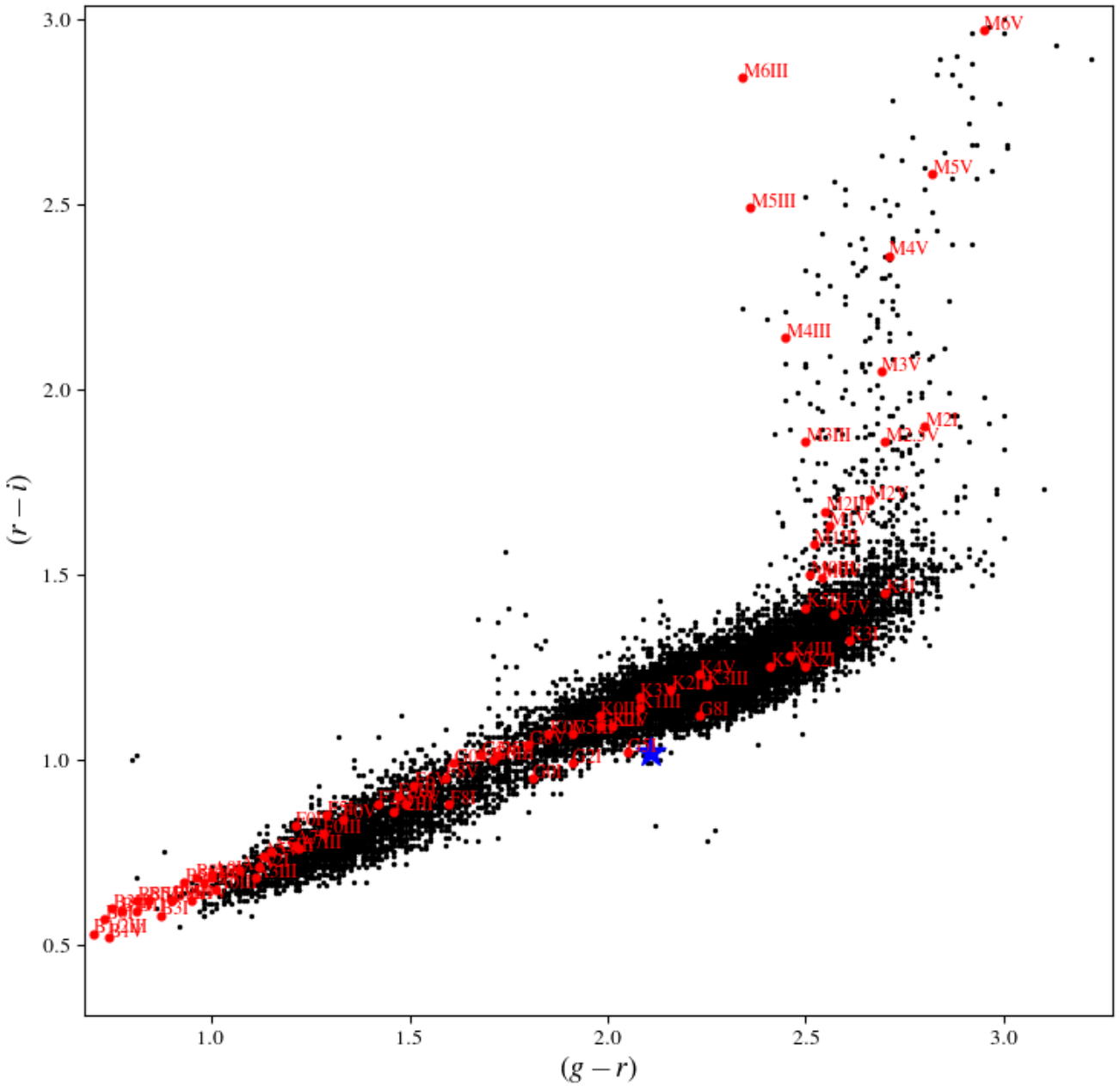
7900
7920
7940
7960
7980
HJD-2450000



M6V
M6III
M5V
M5III
M4V
M4III
M3V
M2I
M3III
M2.5V
M2V
M2III
M1V
M1III
K1I
K5III
K7V
K3I
K4III
K5V
K2I
K4V
K3III
K2II
K3V
K1III
G8I
K0III
K0V
G5I
G2I
G7I
G8I
F8I
F0III
F7III
F5III
B3I
B4V
B4III
3.0
2.5
2.0
1.5
1.0
0.5
1.0
1.5
2.0
2.5
3.0
$(r-i)$
$(g-r)$