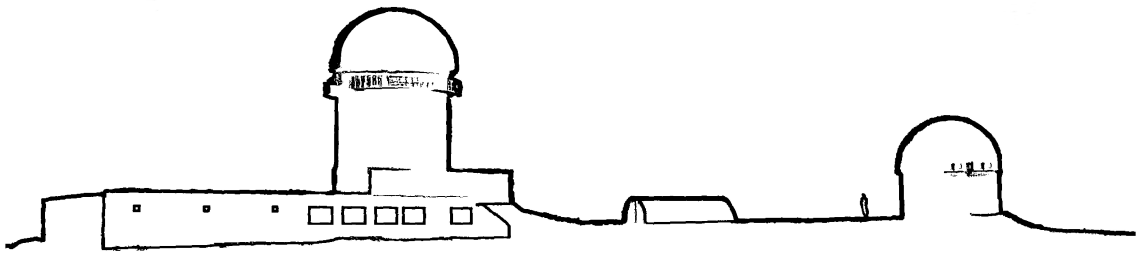
The J-PAS Survey

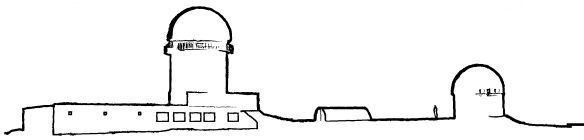
Silvia Bonoli



CEFCA

The Javalambre-PAU Astrophysical Survey

A Spanish-Brazilian collaboration,
the J-PAS survey will scan
~8500 deg² of the northern sky
with 54 narrow-band filters covering
the whole optical range
from the dedicated 2.5m telescope in
the *sierra of Javalambre*



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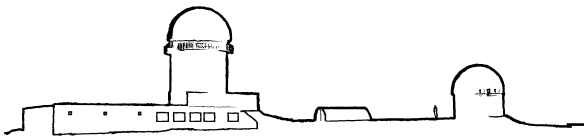

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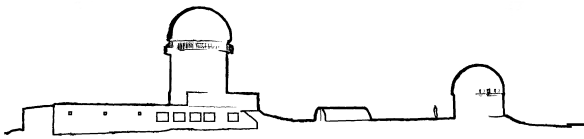

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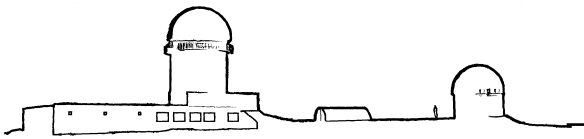


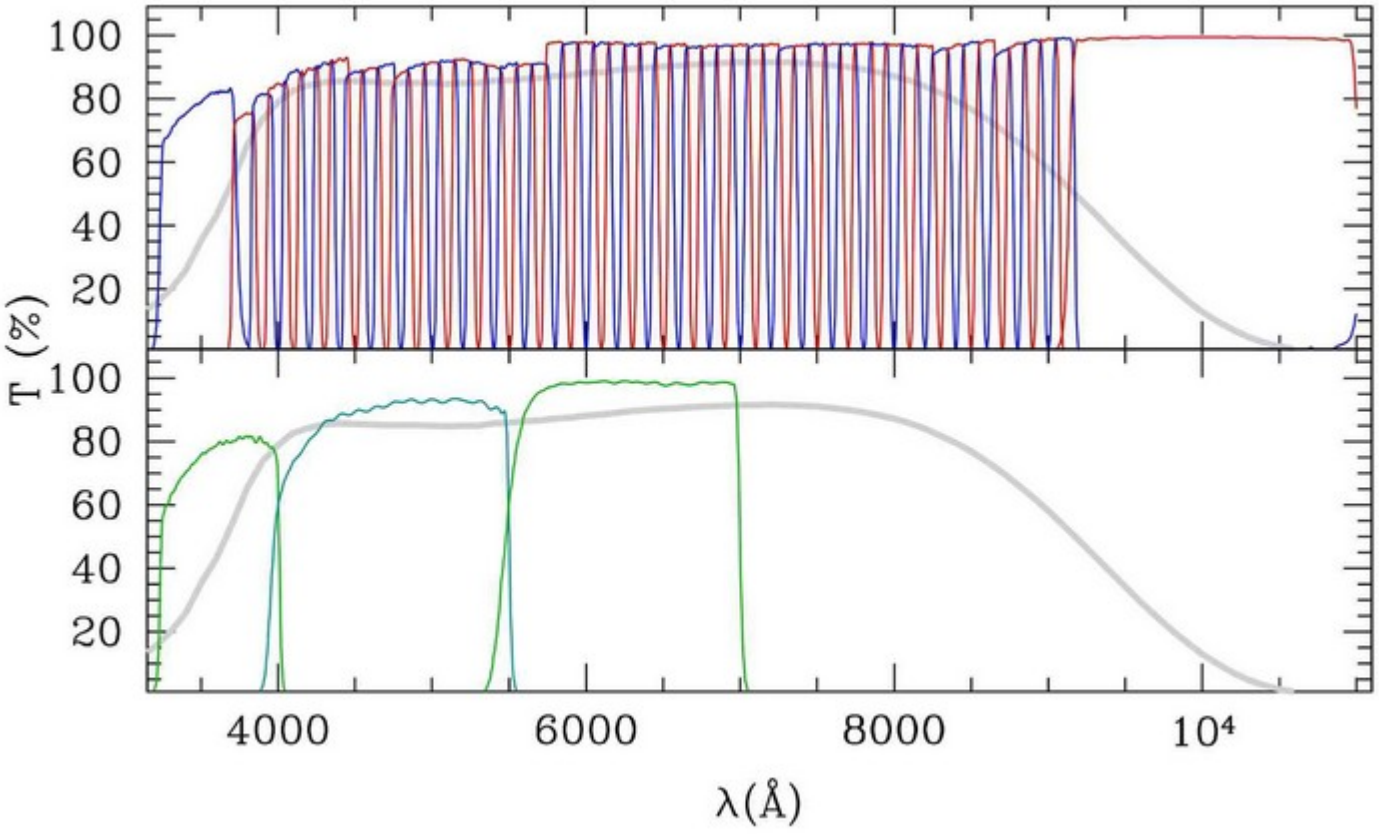
The filter system

- 54 NB filters
(FWHM~145Å; Δλ~10nm
From 3785Å to 9100Å

- 1 Blue MB filter
(FWHM~260Å; λ_c~3600Å

- 1 Red BB filter
(FWHM~620Å; λ_c~9500Å

- Sloan u, g, r



Pseudo-spectrum in every pixel of the sky down to M_{AB} ~ 22.5-24

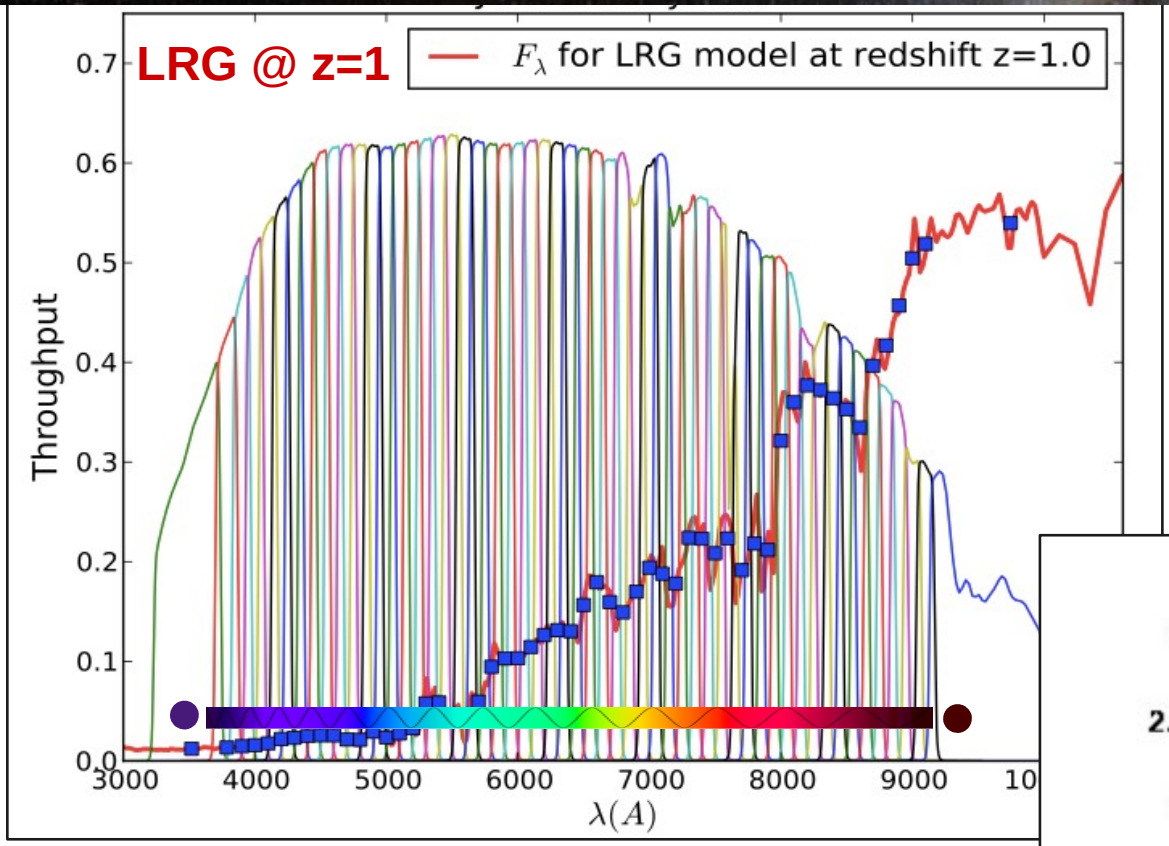
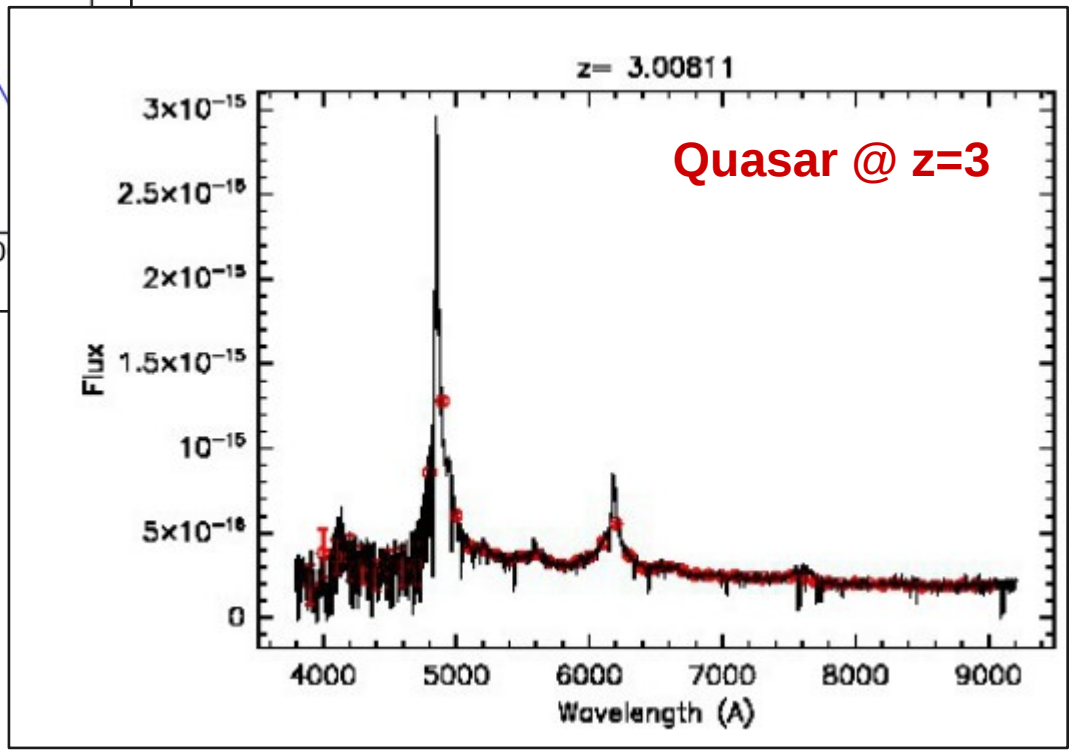
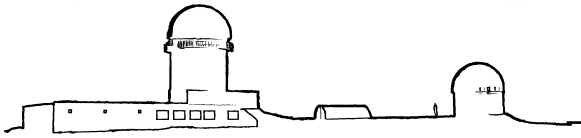


Photo-z precision as good as 0.003(1+z)

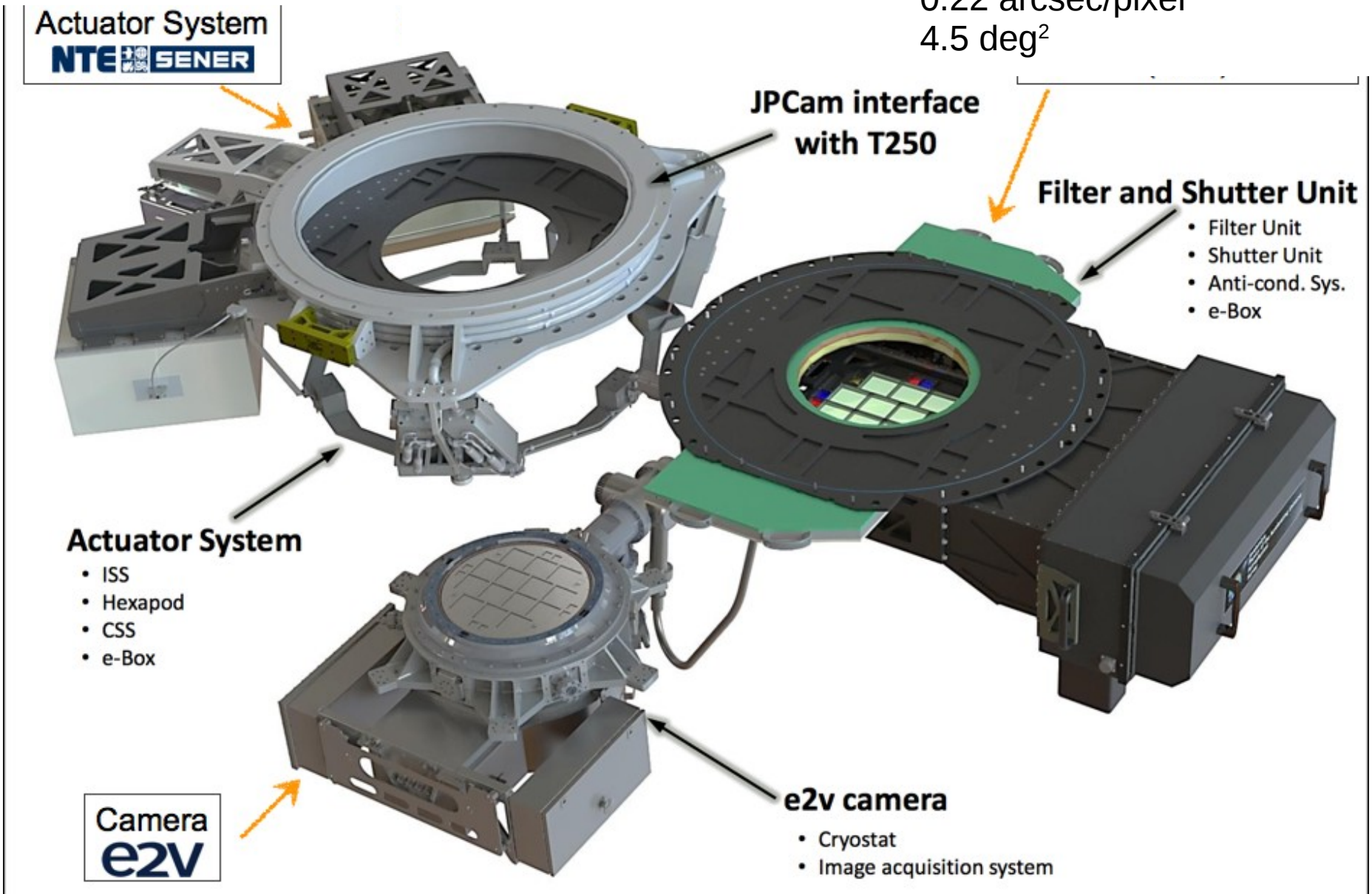


200M galaxies
90M LRG+ELG
Ms of quasars



The camera JPCam

1.2 Giga pixels
(14 CCD of 9200x9200)
0.22 arcsec/pixel
4.5 deg^2



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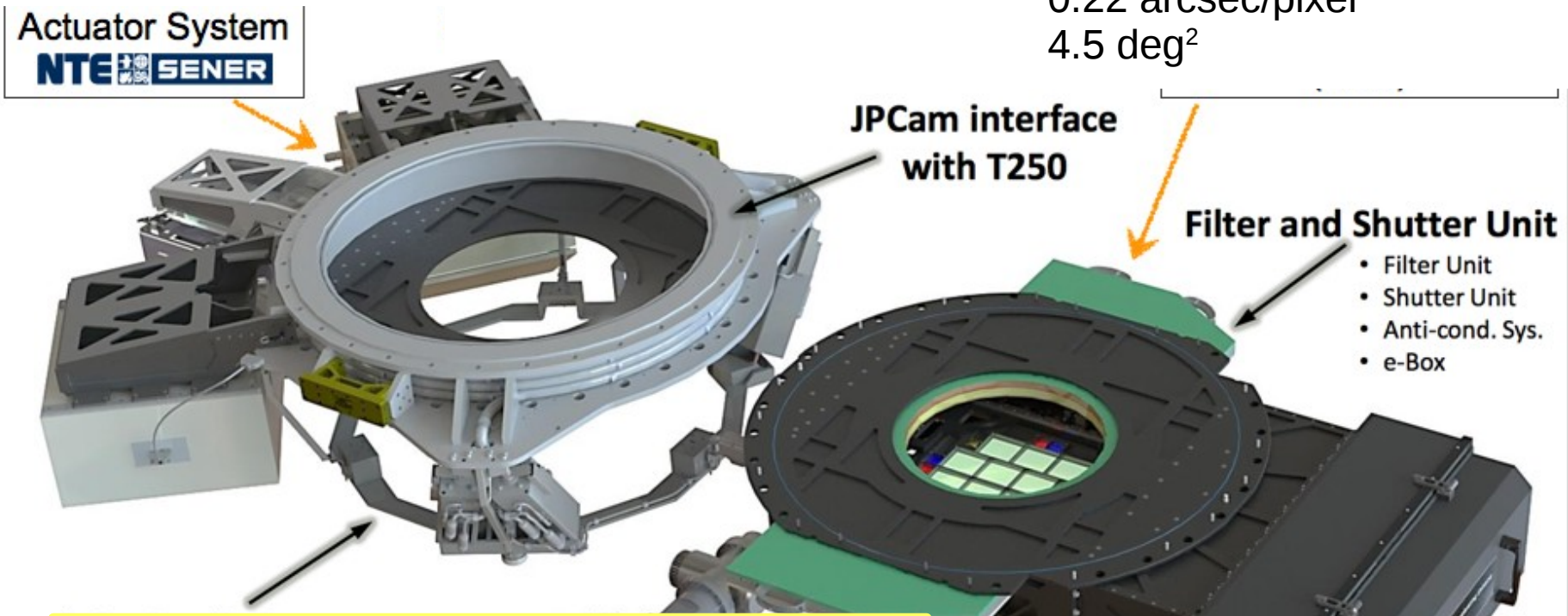
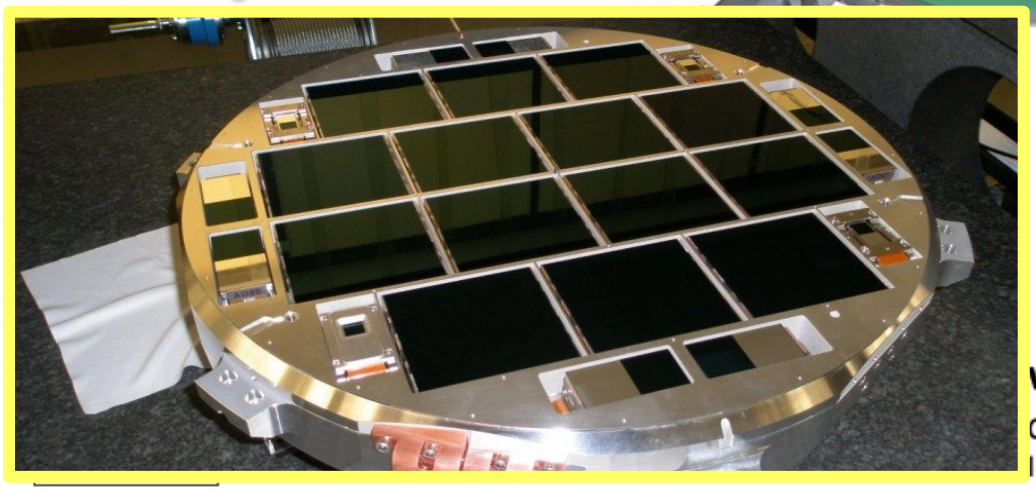
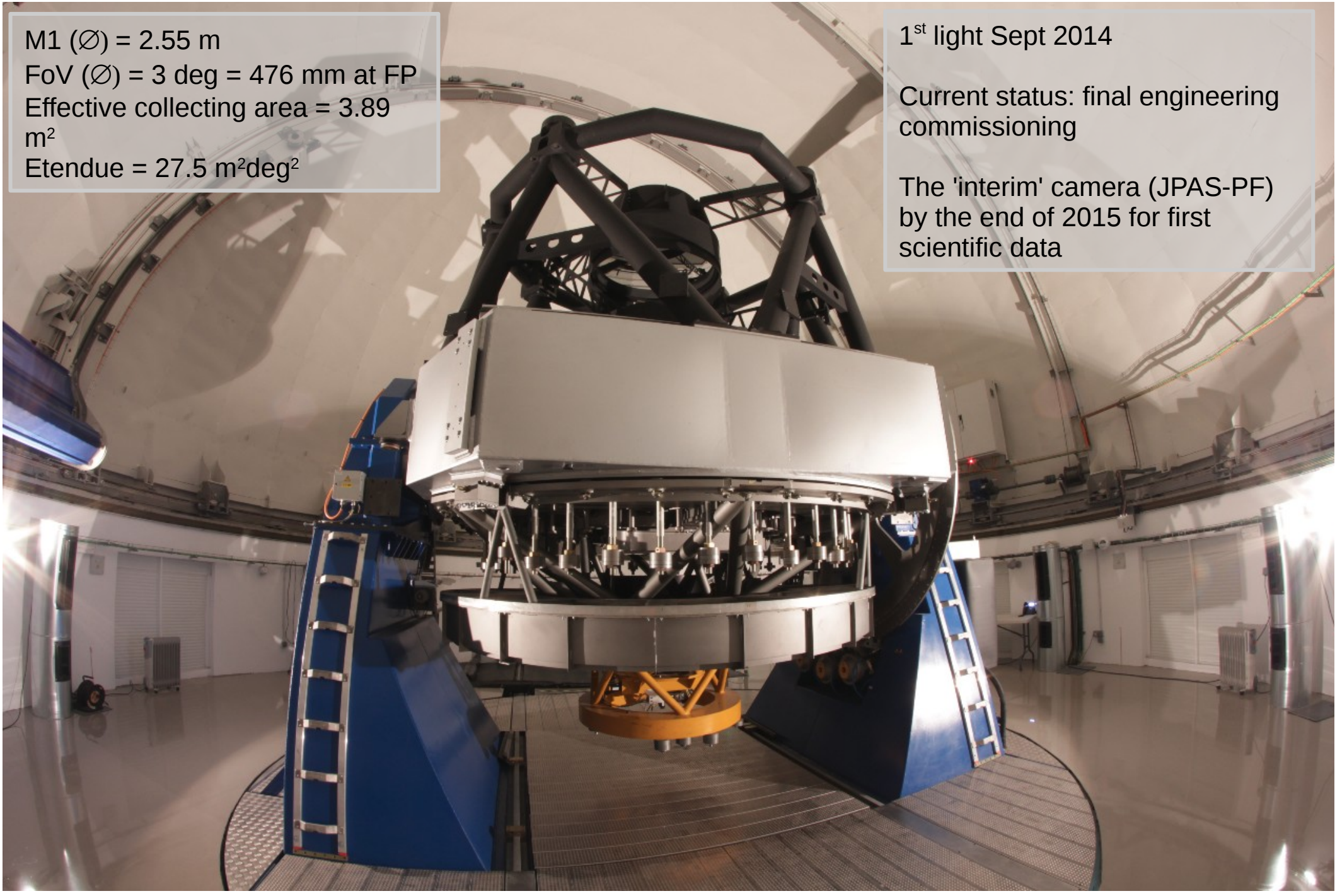




v camera
Cryostat
Image acquisition system

The telescope

T250



M1 (∅) = 2.55 m
FoV (∅) = 3 deg = 476 mm at FP
Effective collecting area = 3.89 m^2
Etendue = 27.5 $m^2 deg^2$

1st light Sept 2014

Current status: final engineering commissioning

The 'interim' camera (JPAS-PF) by the end of 2015 for first scientific data

Javalambre
Physics of the Accelerating Universe
Astrophysical
Survey

The Javalambre Observatory

In the “Sierra de Javalambre” @1960m

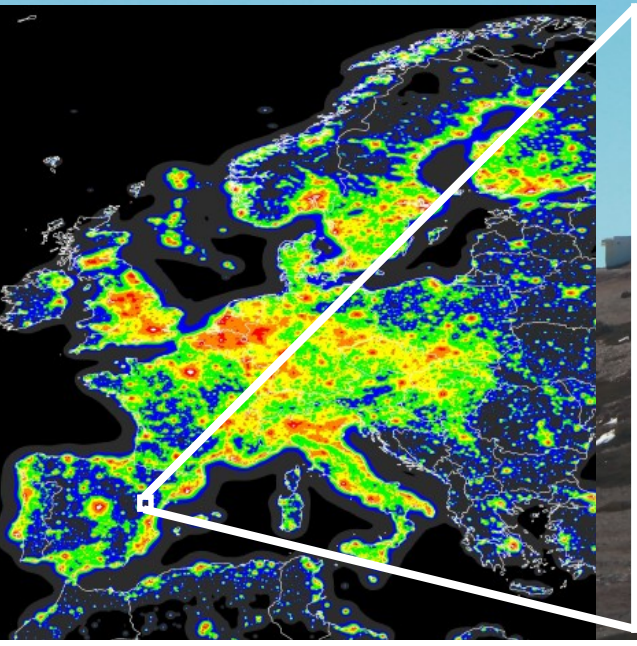
now officially a Spanish “scientific and technical facility” (soon available for 20% open-time)

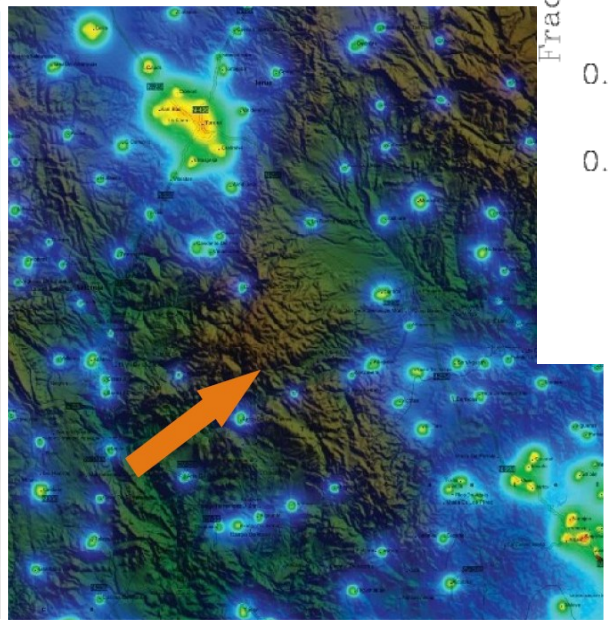
The Javalambre Observatory

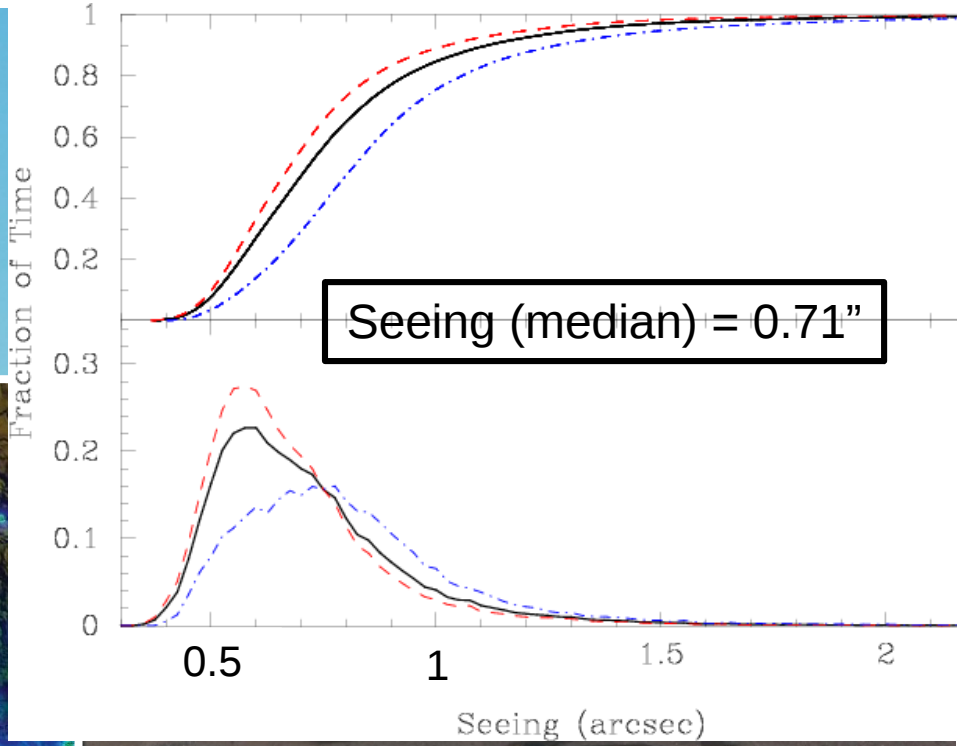
In the "Sierra de Javalambre" @1960m

now officially a Spanish "scientific and technical facility" (soon available for 20% open-time)

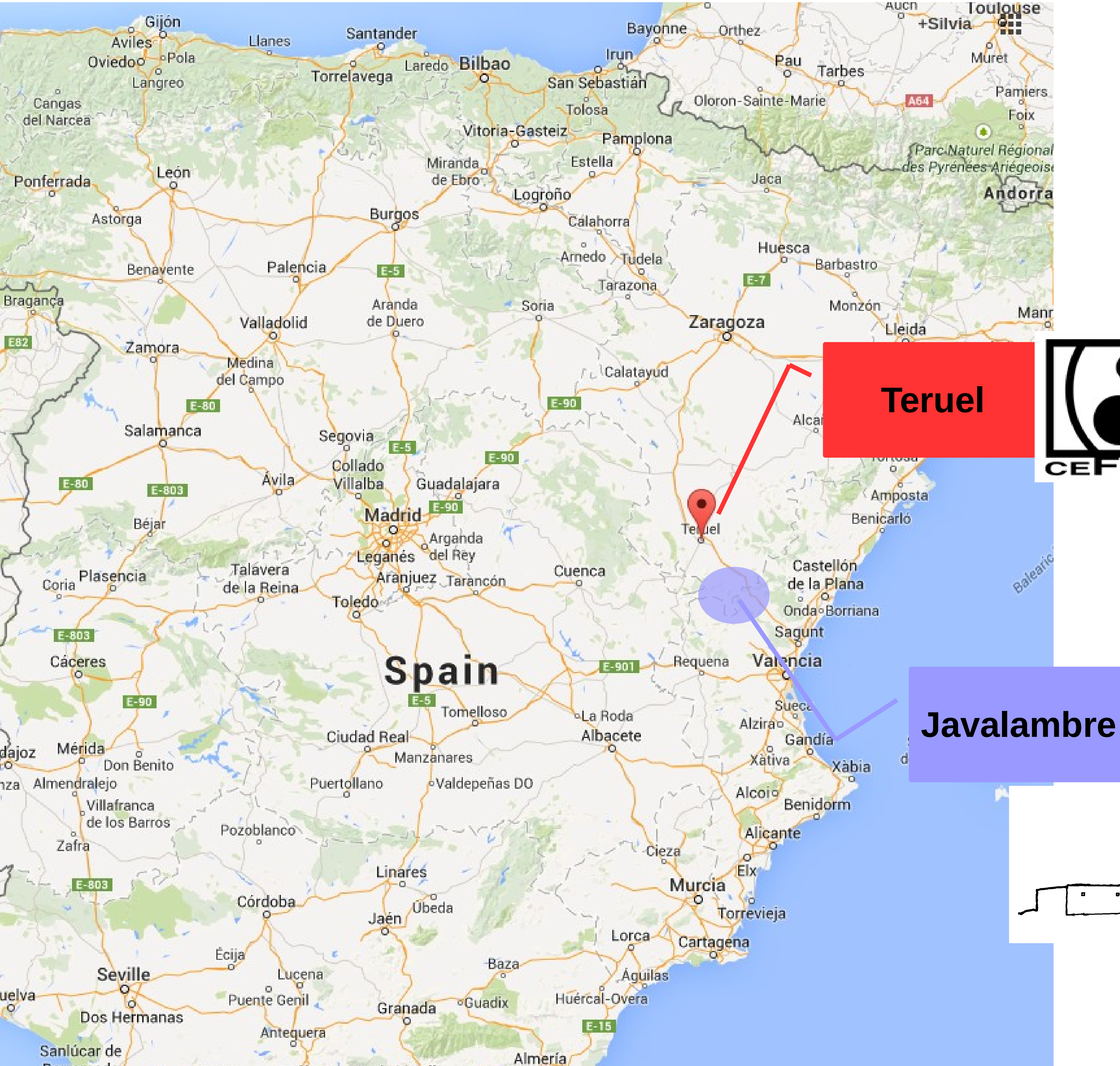
Comparable (at similar altitudes) to
Mauna Kea or La Silla



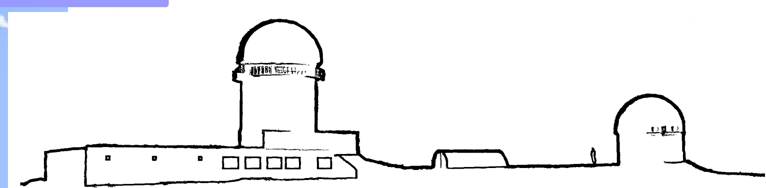




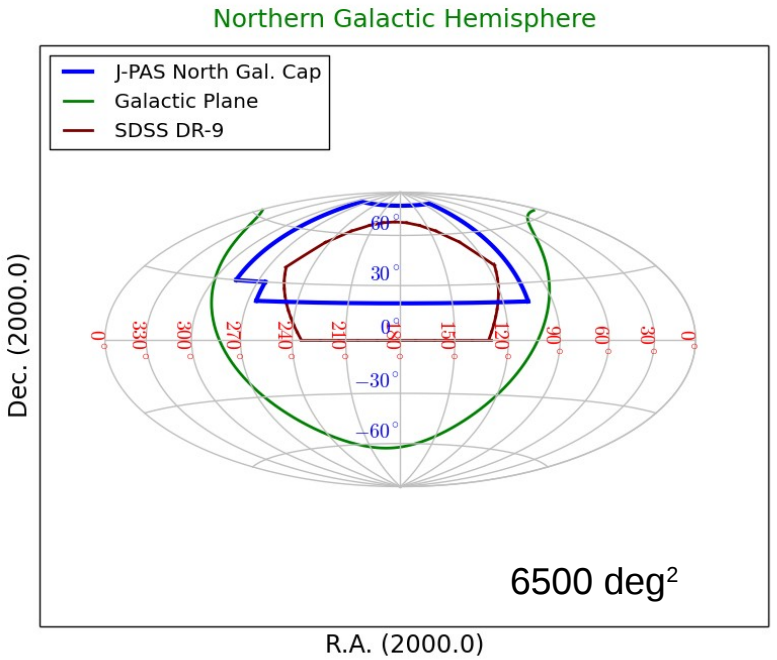
Location

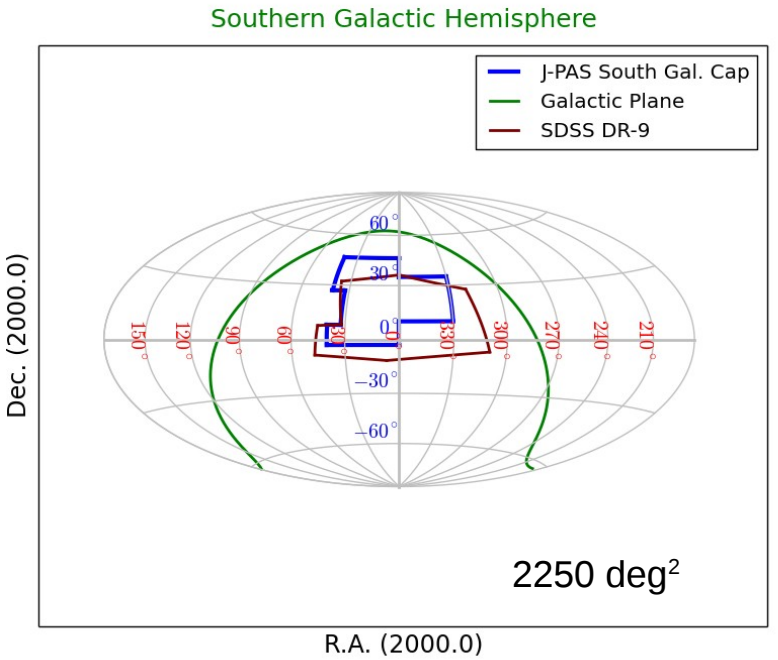


CEFCA



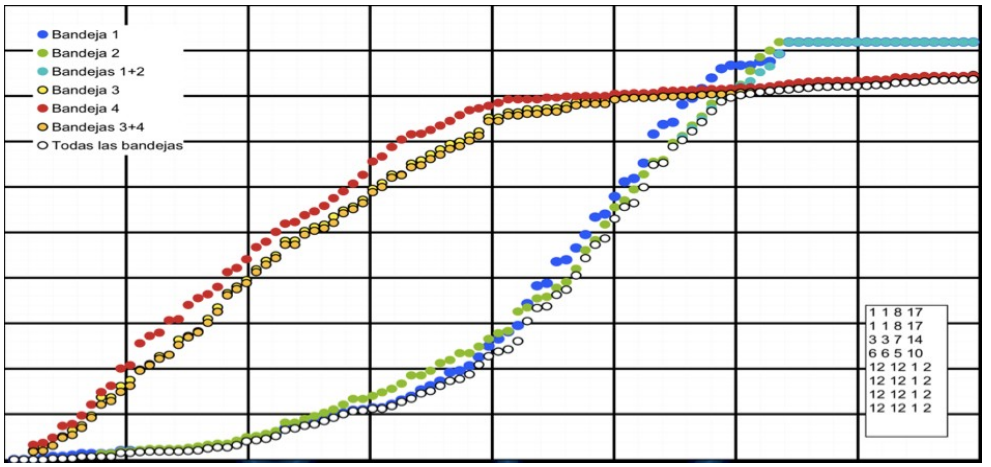
Footprint and Survey strategy

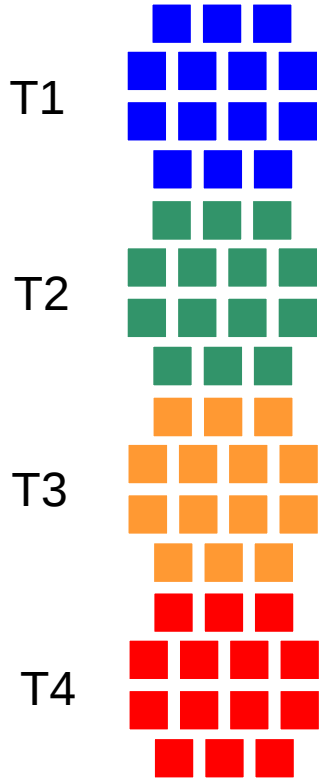




Compromise visibility from the OAJ and galactic extinction

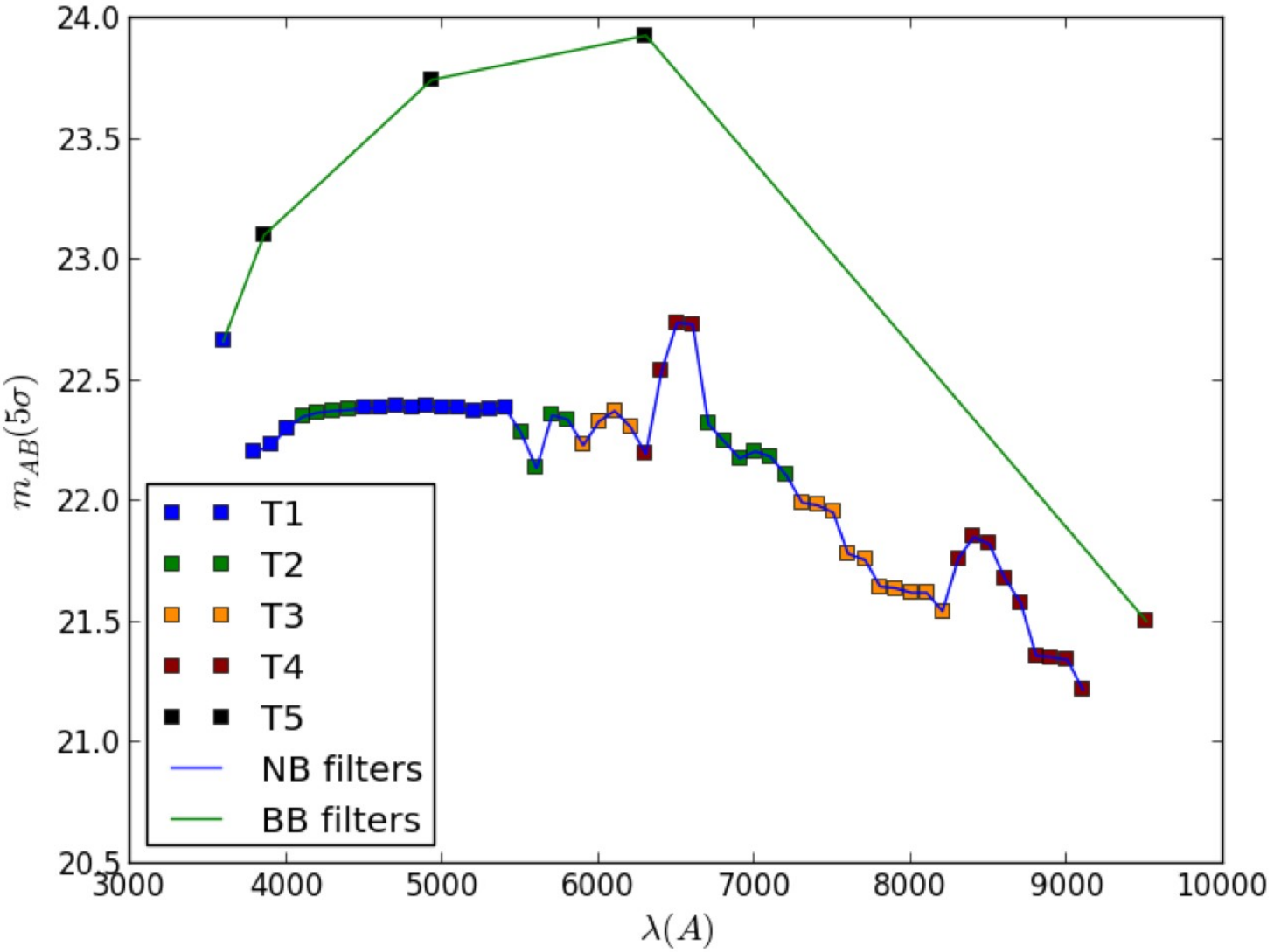
14 different filters in each tray
at least 4 exposures in each filter





Limiting magnitude

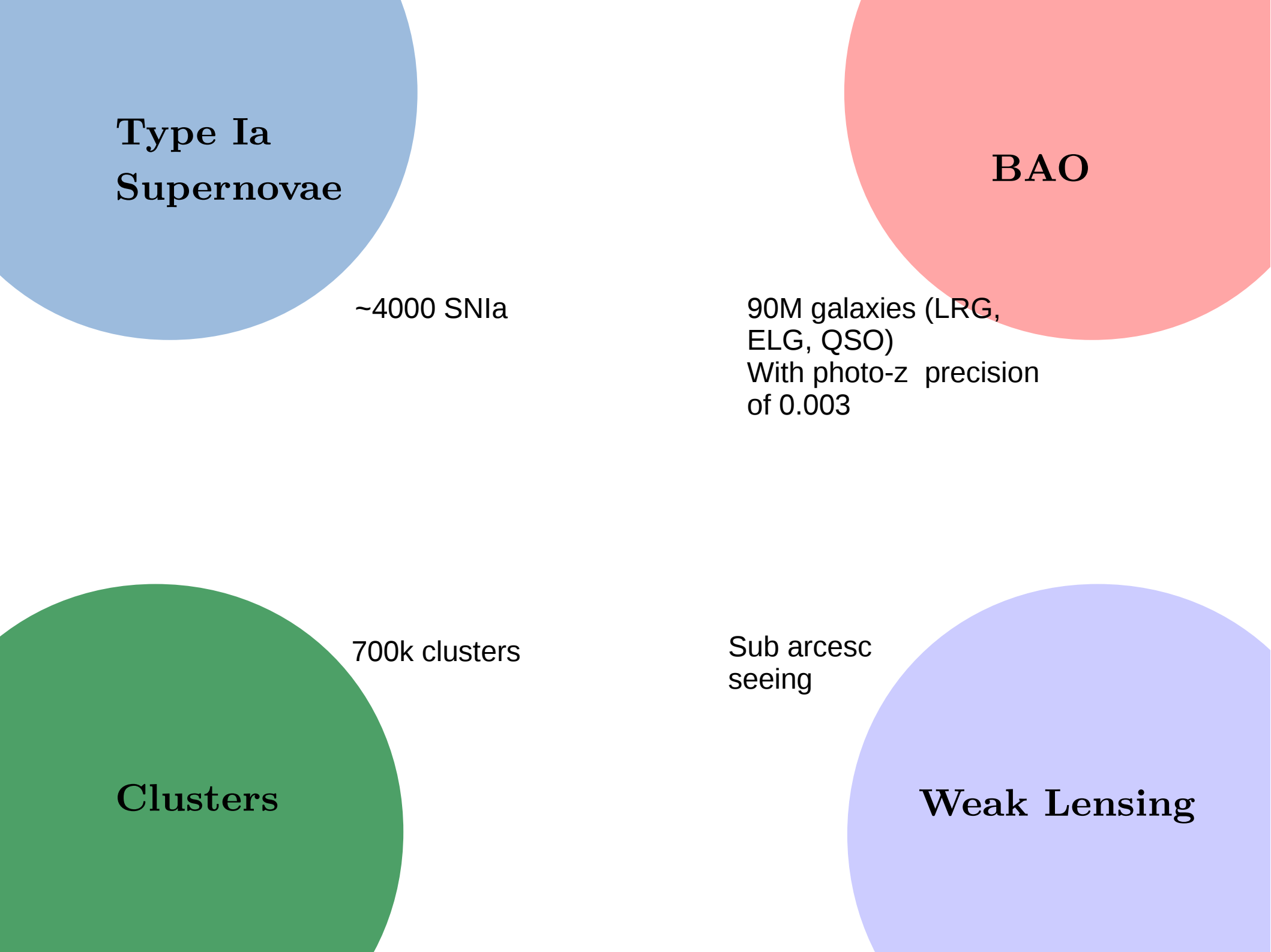
5σ
3arcsec aperture



Data processing and storage

J-PAS: 1.3Tb of data per observing night

Data reduction, catalogs and storage
managed @ CEFCA


Type Ia Supernovae
~4000 SNIa
BAO
90M galaxies (LRG, ELG, QSO)
With photo-z precision of 0.003
Clusters
700k clusters
Weak Lensing
Sub arcesc seeing

Type Ia Supernovae

BAO

~4000 SNIa

90M galaxies
With photo-z precision of 0.003

And...

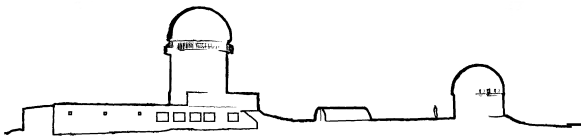
- Galaxy evolution
- AGN and quasars
- “IFU”-type science for extended objects
- Milky-Way
- Transient objects
- ...

700K clusters

Sub-arcsec seeing

Clusters

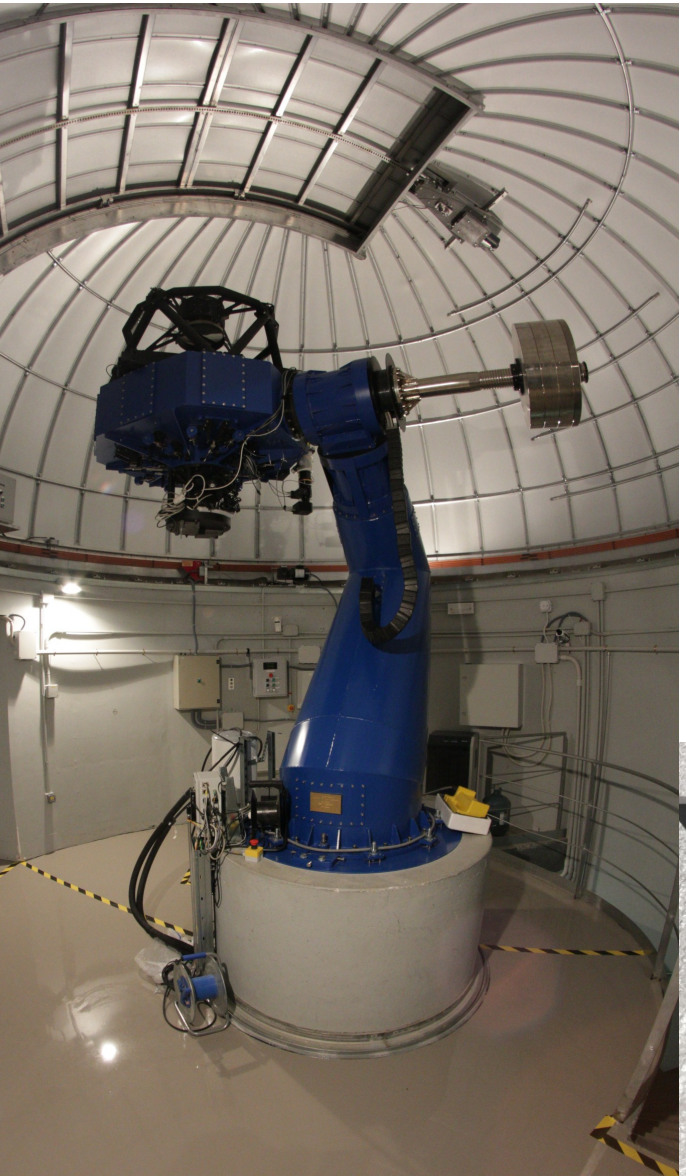
Weak Lensing

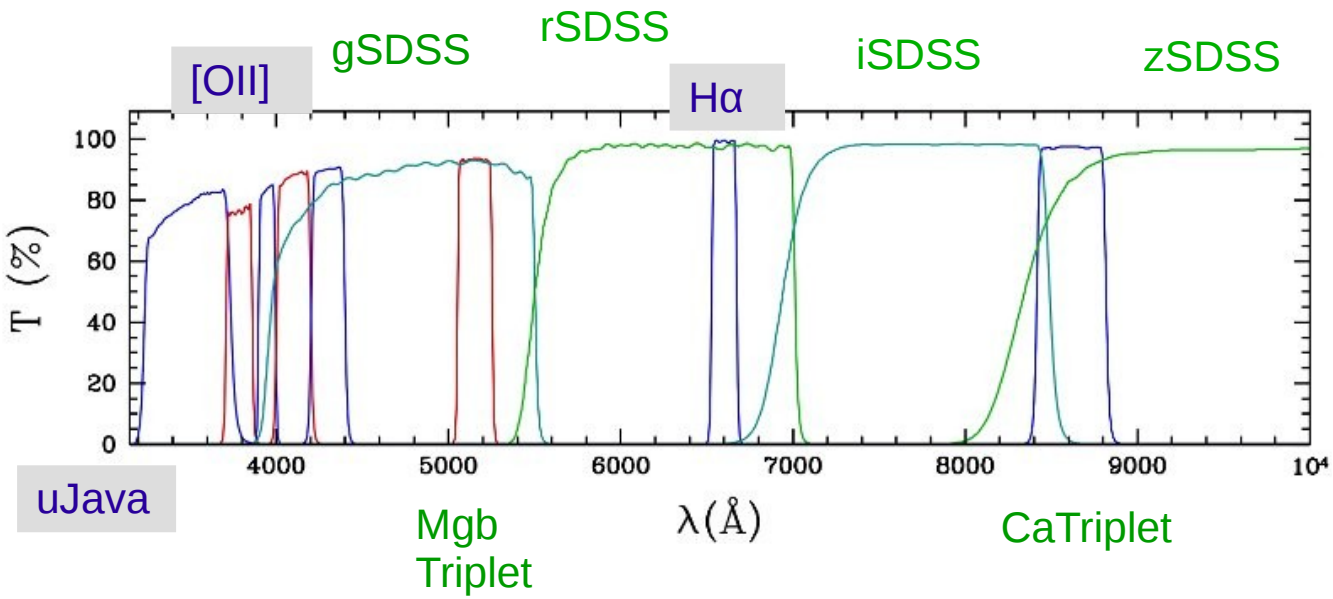


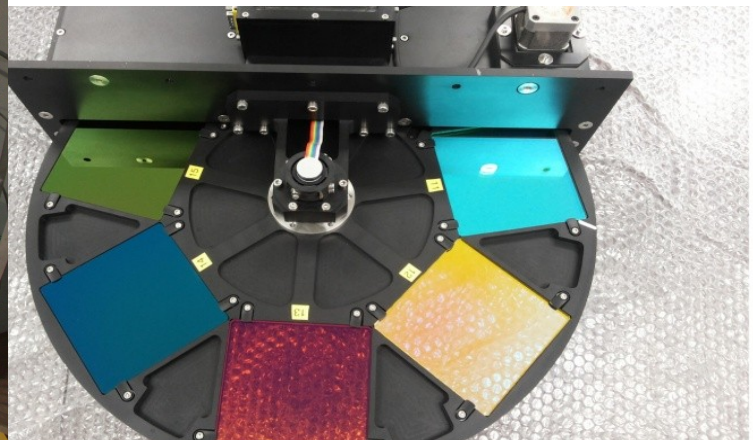
The J-PLUS survey

Javalambre Photometric Local Universe Survey

T80



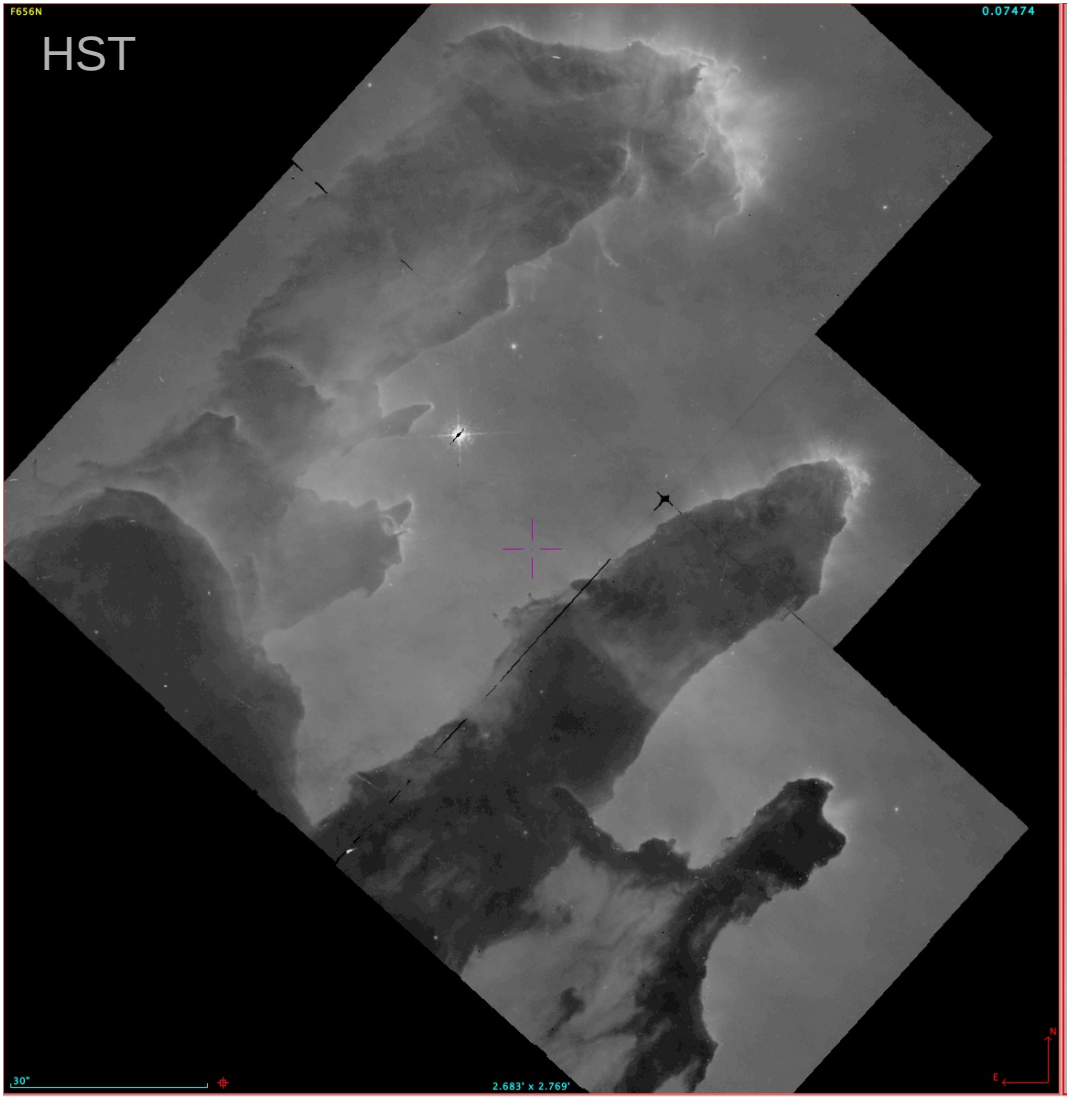


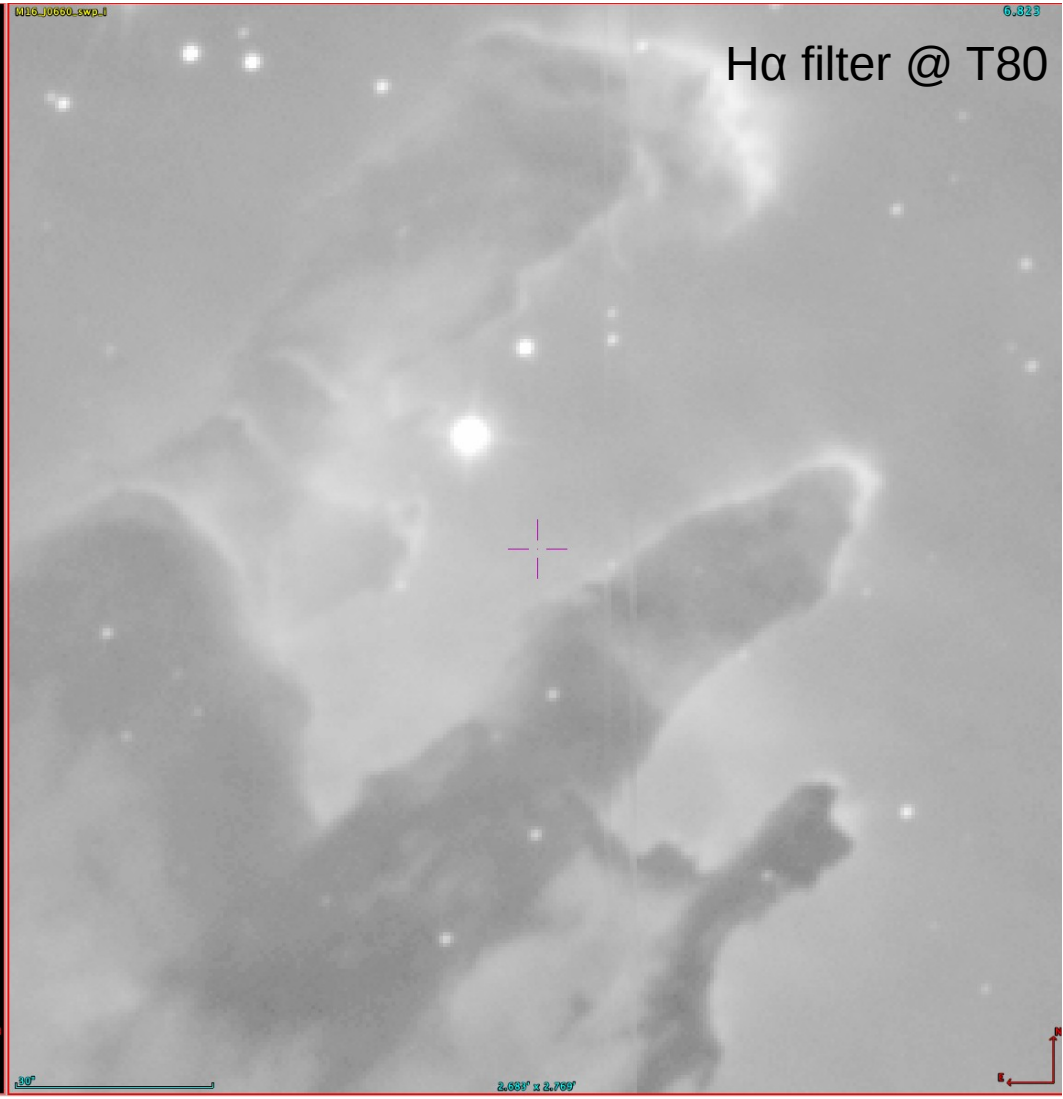


12 filters
1 CCD of 9200x9200 pixels
0.55 arcsec/pixel
1.4x1.4 deg^2
~ 1 mag deeper then SDSS

T80 + T80Cam

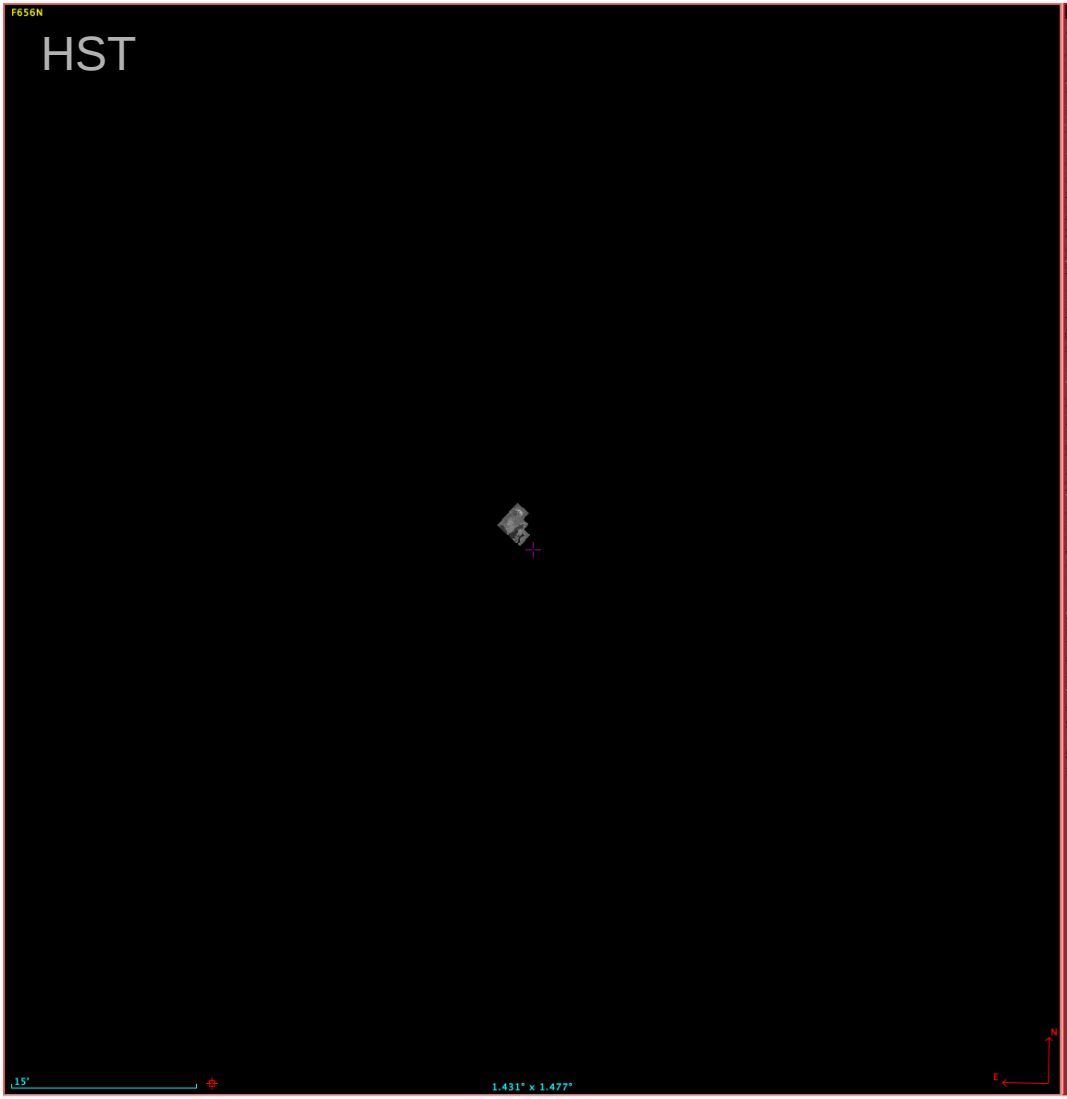
M16

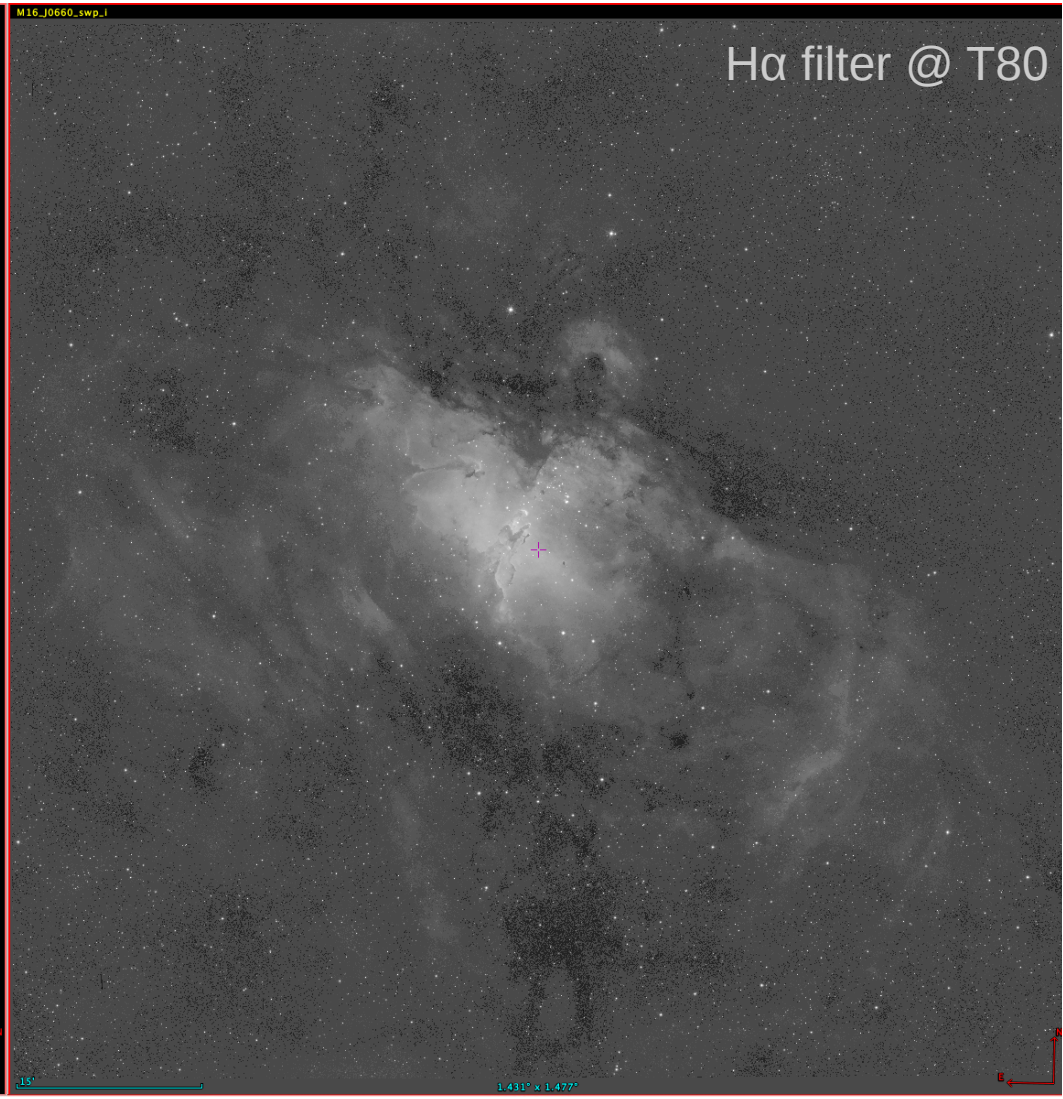




T80 + T80Cam

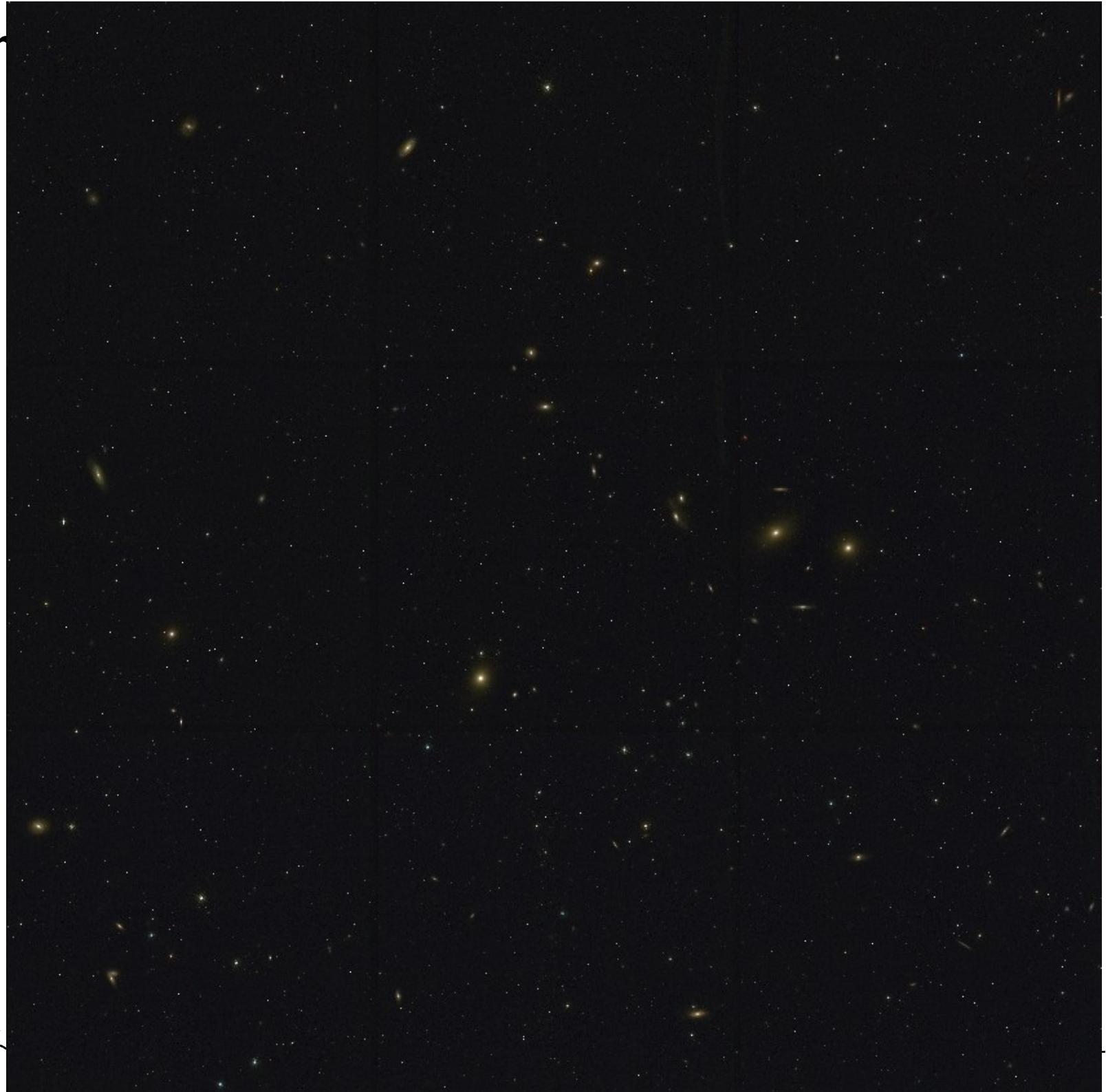
M16



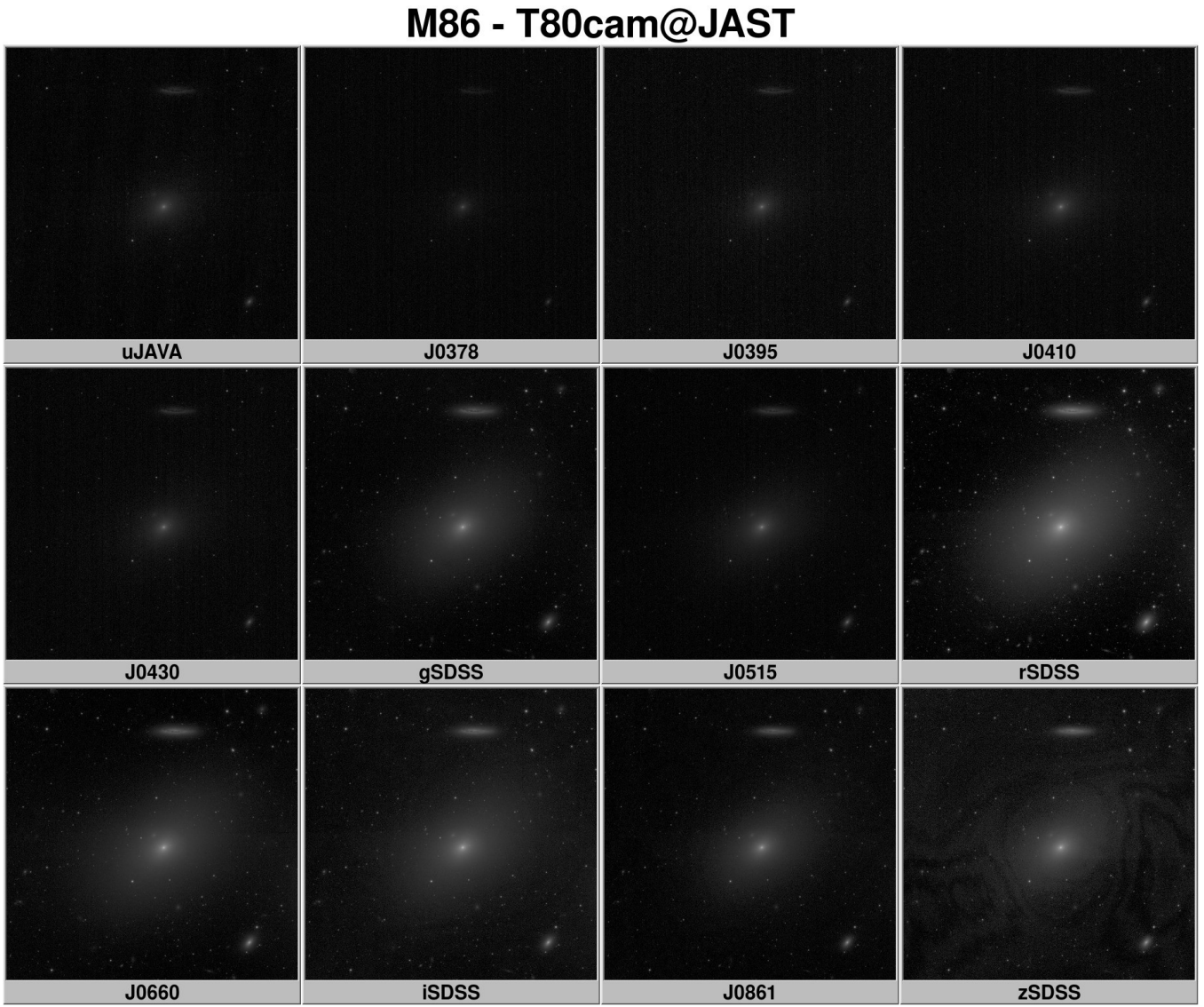


T80 + T80Cam

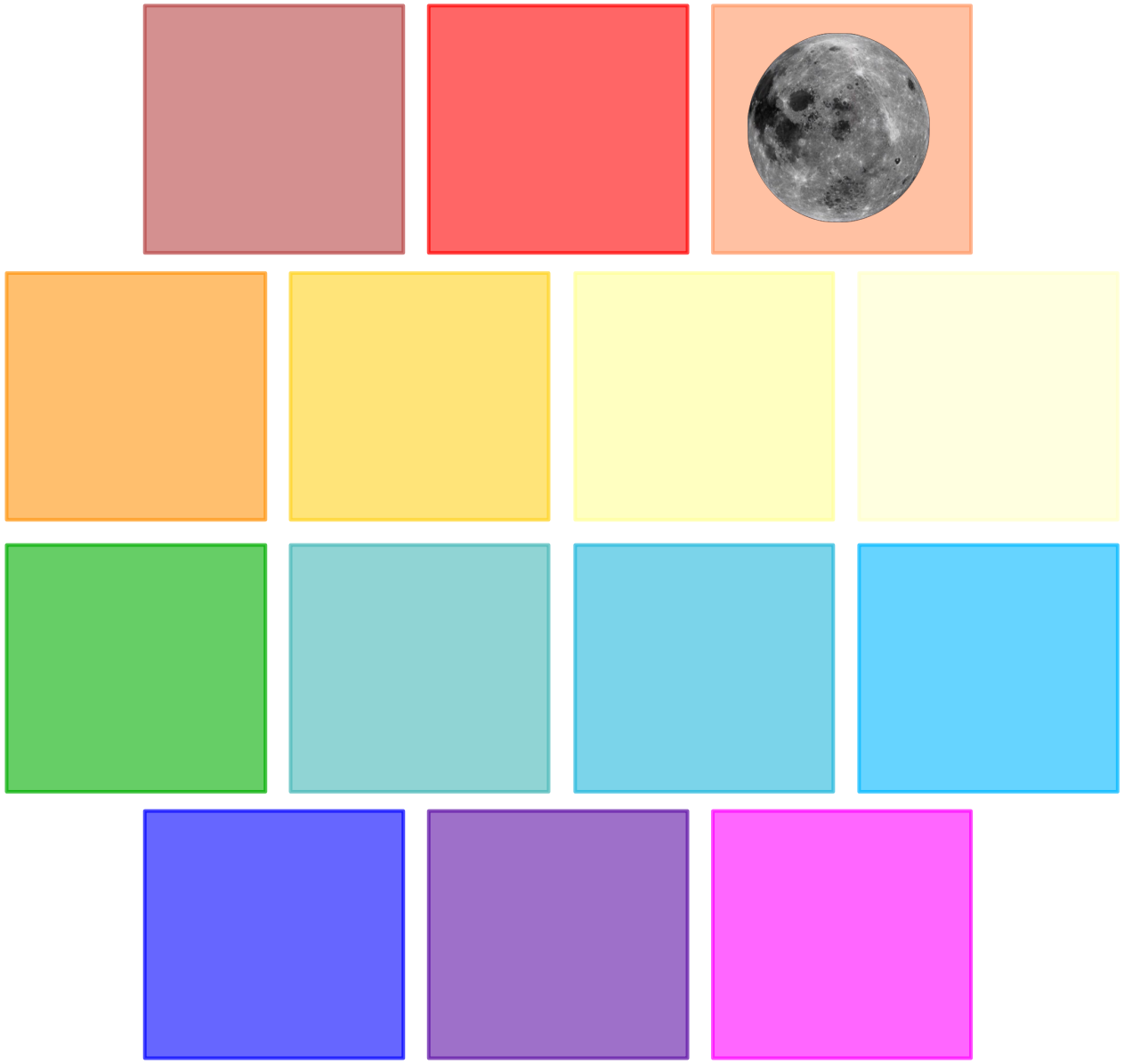
Mosaic of Virgo



T80 + T80Cam


M86 - T80cam@JAST
uJAVA
J0378
J0395
J0410
J0430
gSDSS
J0515
rSDSS
J0660
iSDSS
J0861
zSDSS

JPCam



T80Cam

8500 deg² observed from Spain with **2** telescopes

- **54** NB + **5** MB/BB filters
- **4.5** deg² FoV
- Up to mag ~**24**
- **90M** ELG and LRG
- Reaching **0.3%** photo-z precision
- **Millions** of quasars
- **200M** of galaxies
- **4000** SNIa
- **700k** of groups and clusters
- Starts in **2016**

Possible replica in the South

http://www.j-pas.org/

J-PLUS

- **12** NB/MB/BB filters
- **2** deg² FoV
- Up to mag ~**23**
- ~ **1** mag deeper than SDSS
- SEDs of **5M** stars
- Starts in the fall of **2015**

Already replica in the South
@Cerro Tololo
S-PLUS – start in 2016

http://www.j-plus.es/

Javalambre
Physics of the Accelerating Universe
Astrophysical
Survey

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J-PAS: The Javalambre-Physics of the Accelerated Universe Astrophysical Survey

arXiv:1403.5237

N. Benítez[a,b], R. Dupke[b,c,d], M. Moles[e,a], L. Sodré[f], J. Cenarro[e], A. Marín-Franch[e], K. Taylor[b], D. Cristóbal[e], A. Fernández-Soto[g], C. Mendes de Oliveira[f], J. Cepa-Nogué[h], L.R. Abramo[i], J.S. Alcaniz[b], R. Overzier[b], C. Hernández-Monteagudo[e], E. J. Alfaro[a], A. Kanaan[j], J. M. Carvano[b], R.R.R. Reis[k], E. Martínez González[l], B. Ascaso[a], F. Ballesteros[g], J. Varela[e], H.S. Xavier[i], T. Broadhurst[n], E. Cypriano[f], R. Angulo[e], J. M. Diego[l], A. Zandivárez[o], E. Díaz[o], P. Melchior[p], K. Umetsu[q], P. F. Spinelli[r], A. Zitrin[s], D. Coe[an], G. Yepes[t], P. Vielva[l], V. Sahni[u], A. Marcos-Caballero[l], F. Shu Kitaura[v], A. L. Maroto[w], M. Masip[at], S. Tsujikawa[x], S. Carneiro[y], J. González Nuevo[l], G. C. Carvalho[b], M. J. Rebouças[av], J. C. Carvalho[b,z], E. Abdalla[i], A. Bernui[b], C. Pigozzo[y], E.G. Ferreira[i], N. Chandrachani Devi[b], C.A.P. Bengaly Jr.[b], M. Campista[b], A. Amorim[g], N. V. Asari[aa], A. Bongiovanni[h], S. Bonoli[e], G. Bruzual[ab], N. Cardiel[l], A. Cava[ac], R. Cid Fernandes[j], P. Coelho[ai], A. Cortesi[f], R. G. Delgado[a], L. Díaz Garcia[e], J. M. R. Espinosa[h], E. Galliano[b], J. I. González-Serrano[l], J. Falcón-Barroso[h], J. Fritz[ad], C. Fernandes[b], J. Gorgas[l], C. Hoyos[e], Y. Jiménez-Teja[a,b], J. A. López-Aguerri[h], C. López-San Juan[f], A. Mateus[j], A. Molino[a], P. Novais[f], A. O'Mill[f], I. Oteo[h], B. Poggianti[af], R. Proctor[b], E. Ricciardelli[g], P. Sánchez-Blázquez[t], T. Storchi-Bergmann[ag], E. Telles[b], W. Schoennell[a], N. Trujillo[h], A. Vazdekis[h], K. Viironen[e], S. Daflon[b], T. Aparicio[b], D. Rocha[ah], A. Ederoclite[e], H. Vázquez Ramió[f], T. Ribeiro[ai], M. Borges[b], S. L. Martins[ah], W. Marcolino[ah], D. Martínez-Delgado[i,aj], M.A. Pérez-Torres[f], B.B. Siffert[k], M.O. Calvão[k], M. Sako[m], R. Kessler[ak], A. Álvarez-Candal[b], M. De Prá[b], F. Roig[b], D. Lazzaro[b], J. Gorosábel[a], R. Lopes de Oliveira[al], G. B. Lima-Neto[f], J. Irwin[d], J. F. Liu[aj], E. Álvarez[t], I. Balmés[i], A. A. da Costa[f], S. Chueca[e], A. Y. Díaz[e], M. C. Díaz-Martín[e], M. V. C. Duarte[i], J. Fabregat[g], F. Ferrari[ao], B. Gavela[t], S. G. Gracia[f], N. Gruel[ae], J. L. L. Gutiérrez[f], R. Guzmán[ap], J. D. Hernández-Fernández[e], D. Herranz[h], L. Hurtado-Gil[q], F. Jablonsky[au], R. Laporte[au], J Licandro[h], M. Lima[i], E. Martín[aq], V. Martínez[g], J. J. C. Montero[f], P. Penteado[f], C.B. Pereira[b], V. Peris[g], V. Quilis[g], N. M. Sacristán[f], M. Sánchez-Portal[ar], A. C. Soja[f], E. Solano[ao], J. Torra[as], L. Valdivielso[e]

+N. Greisel