

# The CANDELS-UDS Multiwavelength catalog

## Galametz et al. 2013

### ReadMe -

#### \* Data:

- u	CFHT/MegaCam (Almaini et al. in prep.)
- B, V, Rc, i', z'	Subaru/Suprime-Cam (SXDS; Furusawa et al. 2008, ApJS 176, 1)
- F606W, F814W	<i>HST</i> /ACS (CANDELS; Koekemoer, A. M. et al. 2011, ApJS 197, 36)
- F125W, F160W	<i>HST</i> /WFC3 (CANDELS; Koekemoer, A. M. et al. 2011, ApJS 197, 36)
- Y, Ks	VLT/HAWK-I (HUGS; Fontana et al. in prep.)
- J, H, K	WFCAM/UKIRT (UKIDSS Data Release 8; Almaini et al. in prep.)
- 3.6, 4.5 $\mu$ m	<i>Spitzer</i> /IRAC (SEDS; Ashby et al. 2013, in press)
- 5.8, 8.0 $\mu$ m	<i>Spitzer</i> /IRAC (SpUDS)

#### \* Column description:

# 1 ID	Identification number of the source (1)
# 2 IAU designation	
# 3 R.A. (deg)	Right Ascension (J2000) (1)
# 4 Dec. (deg)	Declination (J2000) (1)
# 5 Flag	Flag (2)
# 6 Class_star	Class_star SExtractor parameter (1)

\*\*\*\*\* Photometry \*\*\*\*\*

# 7 Flux_u_cfht	Flux density (in $\mu$ Jy) in the u-band (CFHT/MegaCam) (3)
# 8 Fluxerr_u_cfht	Flux uncertainty (in $\mu$ Jy) in the u-band (CFHT/MegaCam) (3)
# 9 Flux_B_subaru	Flux density (in $\mu$ Jy) in the B-band (Subaru/Suprime-Cam) (3)
# 10 Fluxerr_B_subaru	Flux uncertainty (in $\mu$ Jy) in the B-band (Subaru/Suprime-Cam) (3)
# 11 Flux_V_subaru	Flux density (in $\mu$ Jy) in the V-band (Subaru/Suprime-Cam) (3)
# 12 Fluxerr_V_subaru	Flux uncertainty (in $\mu$ Jy) in the V-band (Subaru/Suprime-Cam) (3)
# 13 Flux_Rc_subaru	Flux density (in $\mu$ Jy) in the Rc-band (Subaru/Suprime-Cam) (3)
# 14 Fluxerr_Rc_subaru	Flux uncertainty (in $\mu$ Jy) in the Rc-band (Subaru/Suprime-Cam) (3)
# 15 Flux_i'_subaru	Flux density (in $\mu$ Jy) in the i'-band (Subaru/Suprime-Cam) (3)
# 16 Fluxerr_i'_subaru	Flux uncertainty (in $\mu$ Jy) in the i'-band (Subaru/Suprime-Cam) (3)
# 17 Flux_z'_subaru	Flux density (in $\mu$ Jy) in the z'-band (Subaru/Suprime-Cam) (3)
# 18 Fluxerr_z'_subaru	Flux uncertainty (in $\mu$ Jy) in the z'-band (Subaru/Suprime-Cam) (3)
# 19 Flux_F606W_hst	Flux density (in $\mu$ Jy) in the F606W-band ( <i>HST</i> /ACS) (3)
# 20 Fluxerr_F606W_hst	Flux uncertainty (in $\mu$ Jy) in the F606W-band ( <i>HST</i> /ACS) (3)
# 21 Flux_F814W_hst	Flux density (in $\mu$ Jy) in the F814W-band ( <i>HST</i> /ACS) (3)
# 22 Fluxerr_F814W_hst	Flux uncertainty (in $\mu$ Jy) in the F814W-band ( <i>HST</i> /ACS) (3)

# 23 Flux_F125W_hst	Flux density (in $\mu\text{Jy}$ ) in the F125W-band ( <i>HST/WFC3</i> ) (3)
# 24 Fluxerr_F125W_hst	Flux uncertainty (in $\mu\text{Jy}$ ) in the F125W-band ( <i>HST/WFC3</i> ) (3)
# 25 Flux_F160W_hst	Flux density (in $\mu\text{Jy}$ ) in the F160W-band ( <i>HST/WFC3</i> ) (3)
# 26 Fluxerr_F160W_hst	Flux uncertainty (in $\mu\text{Jy}$ ) in the F160W-band ( <i>HST/WFC3</i> ) (3)
# 27 Flux_Y_hawki	Flux density (in $\mu\text{Jy}$ ) in the Y-band ( <i>VLT/HAWK-I</i> ) (3)
# 28 Fluxerr_Y_hawki	Flux uncertainty (in $\mu\text{Jy}$ ) in the Y-band ( <i>VLT/HAWK-I</i> ) (3)
# 29 Flux_Ks_hawki	Flux density (in $\mu\text{Jy}$ ) in the Ks-band ( <i>VLT/HAWK-I</i> ) (3)
# 30 Fluxerr_Ks_hawki	Flux uncertainty (in $\mu\text{Jy}$ ) in the Ks-band ( <i>VLT/HAWK-I</i> ) (3)
# 31 Flux_J_ukidss DR8	Flux density (in $\mu\text{Jy}$ ) in the J-band ( <i>UKIRT/WFCAM</i> ) (3)
# 32 Fluxerr_J_ukidss DR8	Flux uncertainty (in $\mu\text{Jy}$ ) in the J-band ( <i>UKIRT/WFCAM</i> ) (3)
# 33 Flux_H_ukidss DR8	Flux density (in $\mu\text{Jy}$ ) in the H-band ( <i>UKIRT/WFCAM</i> ) (3)
# 34 Fluxerr_H_ukidss DR8	Flux uncertainty (in $\mu\text{Jy}$ ) in the H-band ( <i>UKIRT/WFCAM</i> ) (3)
# 35 Flux_K_ukidss DR8	Flux density (in $\mu\text{Jy}$ ) in the K-band ( <i>UKIRT/WFCAM</i> ) (3)
# 36 Fluxerr_K_ukidss DR8	Flux uncertainty (in $\mu\text{Jy}$ ) in the K-band ( <i>UKIRT/WFCAM</i> ) (3)
# 37 Flux_ch1_seds	Flux density (in $\mu\text{Jy}$ ) in the 3.6 $\mu\text{m}$ -band ( <i>Spitzer/IRAC</i> ) (3)
# 38 Fluxerr_ch1_seds	Flux uncertainty (in $\mu\text{Jy}$ ) in the 3.6 $\mu\text{m}$ -band ( <i>Spitzer/IRAC</i> ) (3)
# 39 Flux_ch2_seds	Flux density (in $\mu\text{Jy}$ ) in the 4.5 $\mu\text{m}$ -band ( <i>Spitzer/IRAC</i> ) (3)
# 40 Fluxerr_ch2_seds	Flux uncertainty (in $\mu\text{Jy}$ ) in the 4.5 $\mu\text{m}$ -band ( <i>Spitzer/IRAC</i> ) (3)
# 41 Flux_ch3_spuds	Flux density (in $\mu\text{Jy}$ ) in the 5.8 $\mu\text{m}$ -band ( <i>Spitzer/IRAC</i> ) (3)
# 42 Fluxerr_ch3_spuds	Flux uncertainty (in $\mu\text{Jy}$ ) in the 5.8 $\mu\text{m}$ -band ( <i>Spitzer/IRAC</i> ) (3)
# 43 Flux_ch4_spuds	Flux density (in $\mu\text{Jy}$ ) in the 8.0 $\mu\text{m}$ -band ( <i>Spitzer/IRAC</i> ) (3)
# 44 Fluxerr_ch4_spuds	Flux uncertainty (in $\mu\text{Jy}$ ) in the 8.0 $\mu\text{m}$ -band ( <i>Spitzer/IRAC</i> ) (3)
# 45 Spectroscopic redshift	Spectroscopic redshift if available ('-99' otherwise)
# 46 Reference	Origin of the spectroscopic redshift when available ('-99' otherwise) (4)

\*\*\*\*\* Limiting magnitudes & Covariance Indexes \*\*\*\*\*

# 47 Limiting_Magnitude_u	Limiting magnitude at the source position in u (AB) (5)
# 48 Limiting_Magnitude_B	Limiting magnitude at the source position in B (AB) (5)
# 49 Limiting_Magnitude_V	Limiting magnitude at the source position in V (AB) (5)
# 50 Limiting_Magnitude_Rc	Limiting magnitude at the source position in Rc (AB) (5)
# 51 Limiting_Magnitude_i	Limiting magnitude at the source position in i' (AB) (5)
# 52 Limiting_Magnitude_z	Limiting magnitude at the source position in z' (AB) (5)
# 53 Limiting_Magnitude_f606w	Limiting magnitude at the source position in f606w (AB) (5)
# 54 Limiting_Magnitude_f814w	Limiting magnitude at the source position in f814w (AB) (5)
# 55 Limiting_Magnitude_f125w	Limiting magnitude at the source position in f125w (AB) (5)
# 56 Limiting_Magnitude_f160w	Limiting magnitude at the source position in f160w (AB) (5)
# 57 Limiting_Magnitude_Yhawki	Limiting magnitude at the source position in Y (AB) (5)
# 58 Limiting_Magnitude_Khawki	Limiting magnitude at the source position in Ks (AB) – HAWK-I (5)
# 59 Limiting_Magnitude_DR8J	Limiting magnitude at the source position in J (AB) (5)
# 60 Limiting_Magnitude_DR8H	Limiting magnitude at the source position in H (AB) (5)
# 61 Limiting_Magnitude_DR8K	Limiting magnitude at the source position in K (AB) – UKIRT (5)
# 62 Limiting_Magnitude_irac1	Limiting magnitude at the source position in IRAC/channel1 (AB) (5)
# 63 Limiting_Magnitude_irac2	Limiting magnitude at the source position in IRAC/channel2 (AB) (5)
# 64 Limiting_Magnitude_irac3	Limiting magnitude at the source position in IRAC/channel3 (AB) (5)
# 65 Limiting_Magnitude_irac4	Limiting magnitude at the source position in IRAC/channel4 (AB) (5)

# 66 Covariance_u	Maximum covariance index in u
# 67 Covariance_B	Maximum covariance index in B
# 68 Covariance_V	Maximum covariance index in V
# 69 Covariance_Rc	Maximum covariance index in Rc
# 70 Covariance_i	Maximum covariance index in i'
# 71 Covariance_z	Maximum covariance index in z'
# 72 Covariance_Yhawki	Maximum covariance index in HAWK-I Y
# 73 Covariance_Khawki	Maximum covariance index in HAWK-I Ks
# 74 Covariance_DR8J	Maximum covariance index in J DR8
# 75 Covariance_DR8H	Maximum covariance index in H DR8
# 76 Covariance_DR8K	Maximum covariance index in K DR8
# 77 Covariance_irac1	Maximum covariance index in IRAC/channel1
# 78 Covariance_irac2	Maximum covariance index in IRAC/channel2
# 79 Covariance_irac3	Maximum covariance index in IRAC/channel3
# 80 Covariance_irac4	Maximum covariance index in IRAC/channel4

\*\*\*\*\* SExtractor parameters derived from the CANDELS HST data \*\*\*\*\*

# 81 x_image	Object position along x (pixel)
# 82 y_image	Object position along y (pixel)
# 83 xpeak_image	X-coordinate of the brightest pixel (pixel)
# 84 ypeak_image	Y-coordinate of the brightest pixel (pixel)
# 85 xmin_image	Minimum x-coordinate among detected pixels (pixel)
# 86 xmax_image	Maximum x-coordinate among detected pixels (pixel)
# 87 ymin_image	Minimum y-coordinate among detected pixels (pixel)
# 88 ymax_image	Maximum y-coordinate among detected pixels (pixel)
# 89 x2_image	Variance along x (pixel <sup>2</sup> )
# 90 y2_image	Variance along y (pixel <sup>2</sup> )
# 91 xy_image	Covariance between x and y (pixel <sup>2</sup> )
# 92 cxx_image	Cxx ellipse parameter (pixel <sup>-2</sup> )
# 93 cyy_image	Cyy ellipse parameter (pixel <sup>-2</sup> )
# 94 cxy_image	Cxy ellipse parameter (pixel <sup>-2</sup> )
# 95 a_image	RMS position along major axis (pixel)
# 96 erra_image	RMS position error along major axis (pixel)
# 97 b_image	RMS position along minor axis (pixel)
# 98 errb_image	RMS position error along minor axis (pixel)
# 99 theta_image	Ellipse position angle (CCW/x) (deg)
# 100 errtheta_image	Ellipse position error (CCW/x) (deg)
# 101 theta_world	Ellipse position angle (CCW/world-x) (deg)
# 102 errtheta_world	Ellipse position error (CCW/world-x) (deg)
# 103 isoareaf_image	Isophotal area (filtered) above detection threshold (pixel <sup>2</sup> )
# 104-107 isoarea_image	Isophotal area above analysis threshold (pix <sup>2</sup> ) - f606w-f814w-f125w-f160w
# 108-111 background	Background at centroid position (count) - f606w-f814w-f125w-f160w
# 112-114 flux_radius1/2/3_f606w	20%/50%/80% enclosed fraction-of-light radius (pixels) – f606w
# 115-117 flux_radius1/2/3_f814w	20%/50%/80% enclosed fraction-of-light radius (pixels) – f814w
# 118-120 flux_radius1/2/3_f125w	20%/50%/80% enclosed fraction-of-light radius (pixels) – f125w
# 121-123 flux_radius1/2/3_f160w	20%/50%/80% enclosed fraction-of-light radius (pixels) – f160w

# 124-127 fwhm_image	FWHM assuming a Gaussian core (pixel) - f606w-f814w-f125w-f160w
# 128 kron_radius	Kron aperture
# 129 petro_radius	Petrosian aperture
# 130-133 flux_max	Peak flux above background ( $\mu\text{Jy}$ ) - f606w-f814w-f125w-f160w
# 134-135 flux_iso/fluxerr_iso f606w	Isophotal flux and uncertainty ( $\mu\text{Jy}$ ) - f606w
# 136-137 flux_iso/fluxerr_iso f814w	Isophotal flux and uncertainty ( $\mu\text{Jy}$ ) - f814w
# 138-139 flux_iso/fluxerr_iso f125w	Isophotal flux and uncertainty ( $\mu\text{Jy}$ ) - f125w
# 140-141 flux_iso/fluxerr_iso f160w	Isophotal flux and uncertainty ( $\mu\text{Jy}$ ) - f160w
# 142-143 flux_isocor/fluxerr_isocor f606w	Isophotal flux and uncertainty ( $\mu\text{Jy}$ ) - f606w
# 144-145 flux_isocor/fluxerr_isocor f814w	Isophotal flux and uncertainty ( $\mu\text{Jy}$ ) - f814w
# 146-147 flux_isocor/fluxerr_isocor f125w	Isophotal flux and uncertainty ( $\mu\text{Jy}$ ) - f125w
# 148-149 flux_isocor/fluxerr_isocor f160w	Isophotal flux and uncertainty ( $\mu\text{Jy}$ ) - f160w
# 150-151 flux_auto/fluxerr_auto f606w	Flux (and unc.) within a Kron-like aperture ( $\mu\text{Jy}$ ) - f606w
# 152-153 flux_auto/fluxerr-auto f814w	Flux (and unc.) within a Kron-like aperture ( $\mu\text{Jy}$ ) - f814w
# 154-155 flux_auto/fluxerr_auto f125w	Flux (and unc.) within a Kron-like aperture ( $\mu\text{Jy}$ ) - f125w
# 156-157 flux_auto/fluxerr_auto f160w	Flux (and unc.) within a Kron-like aperture ( $\mu\text{Jy}$ ) - f160w
# 158-159 flux_best/fluxerr_best f606w	Best of flux_auto and flux_isocor (and unc.) ( $\mu\text{Jy}$ ) - f606w
# 160-161 flux_best/fluxerr_best f814w	Best of flux_auto and flux_isocor (and unc.) ( $\mu\text{Jy}$ ) - f814w
# 162-163 flux_best/fluxerr_best f125w	Best of flux_auto and flux_isocor (and unc.) ( $\mu\text{Jy}$ ) - f125w
--- flux_best and fluxerr_best f160w # 34, 35	(see Galametz et al. 2013)
# 164-165 flux_aper1/fluxerr_aper1 f606w	Flux within a circular aperture ( $\mu\text{Jy}$ ) of diam. 0.088'' - f606w
# 166-167 flux_aper1/fluxerr_aper1 f814w	Flux within a circular aperture ( $\mu\text{Jy}$ ) of diam. 0.088'' - f814w
# 168-169 flux_aper1/fluxerr_aper1 f125w	Flux within a circular aperture ( $\mu\text{Jy}$ ) of diam. 0.088'' - f125w
# 170-171 flux_aper1/fluxerr_aper1 f160w	Flux within a circular aperture ( $\mu\text{Jy}$ ) of diam. 0.088'' - f160w
# 172-179 flux_aper2/fluxerr_aper2 f606w-f814w-f125w-f160w	- within an aperture of 0.125'' diam.
# 180-187 flux_aper3/fluxerr_aper3 f606w-f814w-f125w-f160w	- within an aperture of 0.176'' diam.
# 188-195 flux_aper4/fluxerr_aper4 f606w-f814w-f125w-f160w	- within an aperture of 0.25'' diam.
# 196-203 flux_aper5/fluxerr_aper5 f606w-f814w-f125w-f160w	- within an aperture of 0.35'' diam.
# 204-211 flux_aper6/fluxerr_aper6 f606w-f814w-f125w-f160w	- within an aperture of 0.5'' diam.
# 212-219 flux_aper7/fluxerr_aper7 f606w-f814w-f125w-f160w	- within an aperture of 0.71'' diam.
# 220-227 flux_aper8/fluxerr_aper8 f606w-f814w-f125w-f160w	- within an aperture of 1'' diam.
# 228-235 flux_aper9/fluxerr_aper9 f606w-f814w-f125w-f160w	- within an aperture of 1.414'' diam.
# 236-243 flux_aper10/fluxerr_aper10 f606w-f814w-f125w-f160w	- within an aperture of 2'' diam.
# 244-251 flux_aper11/fluxerr_aper11 f606w-f814w-f125w-f160w	- within an aperture of 2.828'' diam.
# 252-253 flux_petro/fluxerr_petro f606w	Flux (and unc.) in a Petrosian-like aperture ( $\mu\text{Jy}$ ) - f606w
# 254-255 flux_petro/fluxerr_petro f814w	Flux (and unc.) in a Petrosian-like aperture ( $\mu\text{Jy}$ ) - f814w
# 256-257 flux_petro/fluxerr_petro f125w	Flux (and unc.) in a Petrosian-like aperture ( $\mu\text{Jy}$ ) - f125w
# 258-259 flux_petro/fluxerr_petro f160w	Flux (and unc.) in a Petrosian-like aperture ( $\mu\text{Jy}$ ) - f160w

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## Notes:

(1) From the F160W-detected SExtractor catalog

(2) Flags:

- Regarding the F160W detection band

`0`: Non-contaminated source.

`2`: Source detected at the image edges or on the few artifacts of the f160w image.

`1`: Sources detected on star spikes, halos and the bright stars producing them.

`3`: Sources with both flag `1` and `2`.

An additional flag is added to mark sources with strongly discrepant photometry between Subaru and ACS. Sources with  $|(i' + z') / 2 - f814w| > 0.5$  have a flag of `4`; these sources usually also feature discrepant ( $v + Rc$ ) and  $f606w$  photometry. Sources with flag  $> 4$  are a combination of all flags above. We note however that the ACS data only cover 2/3 of the field.

(3) The photometry was not corrected from dust extinction. We consistently report values of `-99` if the source has no data or is strongly contaminated by a star spike in one specific band.

(4) The coding follows the scheme 'reference-type' (no space):

References: 'Y05' = Yamada et al. 2005; 'G07' = Geach et al. 2007; 'Si06' = Simpson et al. 2006; 'Si12' = Simpson et al. 2012; 'Sm08' = Smail et al. 2008; 'Ou08' = Ouchi et al. 2008; 'V08' = Vardoulaki et al. 2008; 'P10' = Papovich et al. 2010; 'T10' = Tanaka et al. 2010; 'F10' = Finoguenov et al. 2010; 'SIP' = Simpson et al. in prep.; 'AIP' = Akiyama et al. in prep.; 'CIP' = Cooper et al. in prep.; 'PIP' = Pearce et al. in prep.

Source types: 'NLAGN' = Narrow-line AGN; 'BLAGN' = Broad-line AGN; 'RadioS' = Radio Source; 'RG' = Radio Galaxy; 'XRay' = X-Ray Source; 'QSO' = Quasi Stellar Object; 'LAE' = Lyman Alpha Emitter; 'ClusterMemb' = Cluster member; 'OPEG' = Old Passively Evolving Galaxy.

Source types for galaxies in the radio source catalog from Simpson et al. 2006 and X-ray source catalog from Ueda et al. 2008 are coded as 'RadioS(Si06)' and 'XRay(U08)' respectively (or both for the only source that was detected in radio and X-ray, namely source # 24437). Possible (but questionable) counterparts of X-ray and radio sources are indicated by a '?'. Two sources falling within 1 arcsec of the two X-ray extended source candidates (sources # 7217 and # 9461) are coded as 'extXRay(U08)'.

(5) Limiting Magnitudes:

- For ground-based and HST data, the limiting magnitudes of a source were derived from the median value of the rms within the source segmentation aperture, reported to an area of one square arcsec (at a  $1\sigma$  level). The original SExtractor segmentation map was used for the HST data. For the ground-based data, we made use of the dilated segmentation map since the photometry in these bands was derived from a dilated segmentation area.

- The limiting magnitude for the *Spitzer*/IRAC bands was derived from the rms value at the position of the source reported to an area of one square arcsec.