

# ACS UDF Parameters

## Hubble Space Telescope UDF/ACS Parameters: Pointing, Filters, Depth, and Status

Based on a consensus recommendation of a [Scientific Advisory Committee](#) to the STScI Director Steven Beckwith, supported by [planning documents](#) from a [local Working Group](#), the parameters below have been adopted for the HST/ACS Ultra Deep Field.

### Pointing

The UDF consists of a single ultra-deep field (412 orbits in total) within the CDF-S GOODS area. The pointing will be RA(J2000)=3 32 39.0 and Decl. (J2000)=-27 47 29.1 These coordinates were changed slightly in May 2003 due to guide star availability and implementation issues. We have attempted to include in the field both a spectroscopically confirmed  $z=5.8$  galaxy and a spectroscopically confirmed type Ia SN at  $z=1.3$ . The pointing avoids the gaps with the lowest effective exposure on the Chandra ACIS image of CDFS.

GOODS image of the UDF field

[blocked URL](#)

schematic of UDF pointing with respect to the GOODS 15 tile-mosaic

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At the center of this picture the light blue diamond shows the ACS/WFC pointing of the Ultra Deep Field (UDF). The WFPC2 parallels to the UDF show up as the characteristic chevron shape in dark blue above and to the left of the primary field. The NICMOS and STIS parallels are shown as red and orange respectively. The small purple squares closer to the main field are the ACS/HRC auto-parallel pointings that are currently being reduced by the ST-ECF ACS grism team.

A complementary Treasury Program, with Rodger Thompson as PI, has also imaged the UDF with NICMOS as a 3x3 mosaic. This field is shown as red within the primary UDF field. In turn these NICMOS data have parallels and particularly noteworthy are the large fields covered by the ACS parallels, to the right and below, which are themselves among the deepest ACS public images available. Please read further for a more detailed description of the fields overlay diagram:

The figure is shown in standard astronomical convention, with North up and East to the left. The GOODS-South field is outlined in green, and the ACS UDF is shown within it in a bright blue or cyan, with the slightly smaller field covered by the NICMOS UDF (Thompson et al.) in red within it. Also shown in red are the NICMOS parallels to the ACS UDF program, with the more northern overlapping pair representing the Epoch 1 observations at ORIENT 310 (more northern of the two) and ORIENT 314, which is slightly to the southeast. The more southern overlapping pair of NICMOS parallels in red represent Epoch 2, with observations at ORIENT 40 being the more northerly and those at ORIENT 44 being slightly to the southwest. The more northerly of the nearly completely overlapping but distinctive WFPC2 "bat wing" or "chevron" shapes marks the location of the Epoch 1 observations at ORIENT 310 (more western) and ORIENT 314, which is slightly farther to the East and is mostly contained within the GOODS field, while its southern counterpart (also farther to the East and just outside the GOODS area) represents the Epoch 2 observations, with those at ORIENT 40 being slightly more to the North, and those at ORIENT 44 being slightly more to the South. The two barely overlapping STIS fields in orange at the top (North) are from Epoch 1 at ORIENT 310 (westernmost) and ORIENT 314 (more to the East), and the two STIS fields in orange on the eastern edge of the figure are from Epoch 2, with the more northern of the two being that for ORIENT 40, and the southern one of the pair representing the field at ORIENT 44. The two small overlapping pairs of apertures in purple immediately to the South of the UDF are the ACS/HRC autoparallels to the ACS UDF, with those of Epoch 1 at ORIENT 310 being farthest to the northeast, and overlapping with those of ORIENT 314 to the southwest, while Epoch 2 ACS/HRC autoparallels are farther to the west, with those at ORIENT 40 being to the southeast and overlapping with those at ORIENT 44 which are farther to the northwest. Finally, the larger cyan or light blue blocks and the small purple lattice-work overlays on the southern and western edges of the GOODS-South field are (respectively) the ACS/WFC and ACS/HRC parallels of the Thompson et al. NICMOS UDF.

### Filters/Expected Depth

The survey will use four filters: F435W (56 orbits), F606W (56 orbits), F775W (150 orbits), and F850LP (150 orbits). Based on the [ACS planning document](#), the limiting AB magnitudes below are expected for extended source which gives S/N of 10 in aperture  $\approx 0.2$  sq arcsec (For WFC this is 9x9 pix). Average zodiac and Earthshine are assumed. The F435W (B) and F606W (V) exposures will be  $\sim 1$  magnitude deeper than the equivalent HDF filters. The F775W (I) exposure will be  $\sim 1.5$  magnitude deeper than the equivalent HDF exposure. The depth in F775W and F850LP is optimized for searching very red objects at the detection limit of the F850LP image.

#### Relative Depth of UDF w.r.t other HST surveys

Survey	Camera + Filter	Pivot Lamdda	No. of Orbits	Lim AB Mag	Depth increase
(1)	(2)	(3)	(4)	(5)	w.r.t the HDF
					(6)
UDF	ACS, F435W (B)	4311.80	56	28.7	1.0
UDF	ACS, F606W (V)	5915.38	56	29.0	0.9
UDF	ACS, F775W (I)	7697.34	150	29.0	1.4
UDF	ACS, F850LP (z)	9103.29	150	28.4	N/A
GOODS	ACS, F435W (B)	4311.80	3.0	27.2	-0.7
GOODS	ACS, F606W (V)	5915.38	2.5	27.5	-0.8
GOODS	ACS, F775W (I)	7697.34	2.5	26.8	-0.8
GOODS	ACS, F850LP (z)	9103.29	5.0	26.7	N/A

HDF	WFPC2, F300W (U)	2992.0	-	26.98	-
HDF	WFPC2, F450W (B)	4556.47	-	27.86	-
HDF	WFPC2, F606W (V)	6001.06	-	28.21	-
HDF	WFPC2, F814W (I)	8001.61	-	27.60	-

## ACS Phase II and Status

The phase II is accessible on the web as DD proposal [9978](#)

Data were taken between September 24, 2003 and January 16, 2004.

(For latest updates see the internal UDF ACS observing [monitor](#).)

Data Release information can be found on the [Data Release](#) page.