Some Major Ongoing Space-Ground Programmes

Involving ESO Facilities

- ***GOODS*** **Raw data immediately public, reduced data later**

  ⋆Mass assembly and morphology of galaxies to $z \sim 6$

- ***GEMS*** **HST data immediately public, other data within one year**

  ⋆Mass assembly and morphology of galaxies in their LLS context to $z \sim 1$

- ***COSMOS*** **Raw data immediately public, reduced data later**

  ⋆Mass assembly and morphology of galaxies in their LLS context to $z \sim 3$

Great Observatories Origin Deep Survey – GOODS

The most complete deep probe of the universe, ever:

- ***SIRTF*** **Legacy Program, 647 hours ($>$ Aug. 2003-Feb. 2004)**
  - **IRAC & MIPS imaging at 3.6; 4.5; 5.8; 8.0; and 24μm**
- ***HST/ACS*** **Treasury Program, 398 HST orbits (Aug. 2002-Feb. 2003)**
  - **ACS $BViz$ imaging (allthe data already taken; V0.5 releases)**
- ***VLT/ISAAC*** **Large Programme, 298 hours of telescope time, 2001-03**
  - **ISAAC JHK imaging ($\sim 1/3$ of the data already released)**
- ***Chandra*** **(1–2 Msec, already public) &** ***XMM–Newton*** **(225–500 ksec)**
  - **Deep X-Ray imaging**
- ***GALEX*** **2003-04**
  - **Far-UV (135-180 nm) and Near-UV (180-300 nm) imaging**
- ***VLT/FORS2*** **Large Programme, under way in P70-P72+ (10 nights)**
  - **Low resolution spectroscopy of ~ 500 red galaxies to $z_{AB} \sim 24.5$**
- ***VLT/VIMOS*** **Large Programme, P71-P74+ (14 nights)**
  - **Low resolution spectroscopy of ~ 6000 galaxies to mag~ 25**

More on GOODS

- ***VLA Radio coverage***

(almost) Unavoidably in the Future:

⋆ **APEX mm and sub-mm coverage**

⋆ **Herschel**

⋆ **ALMA**

⋆ **ELT/OWL**

⋆ **..........**

GEMS, (Crowning GOODS)

1/4 square degree around GOODS

- In addition to Chandra, XMM, GALEX, data etc:
- COMBO17: deep imaging in 17 broad and intermediate bands from 330 to 1000 nm
- HST: V (600 nm) and z (850-1000 nm) band ACS imaging, 120 orbits
- VLT Spectroscopy
- ....

COSMOS: LLS mapping over 2 Square Degrees to redshift ~ 3

~Same comoving volume as the 2dF and SLOAN surveys at $z = 0$

- I band (800 nm) HST/ACS imaging over the whole field, 600 orbits
- B band (400 nm) HST/ACS imaging *promised by TAC*, 600 orbits
- U band (330 nm) imaging at CFHT/MegaCam, 5 nights
- $BVRIz$ imaging at SUBARU with Suprime Camera, 10 nigts
- $\sim 60,000$ spectra with VLT/VIMOS, ~ 60 nights (proposal due Oct. 1)
- Near-IR Imaging at UKIRT/WFCAM
- Complementary spectroscopy at Keck/DEIMOS, Magellan/IMAX, GEMINI/GMOS ....
- Radio coverage at VLA
- Sub-mm at JCMT/SCUBA-2, later at APEX,
- X-rays: XMM/EPIC 800 Ksec
- Ultraviolet: GALEX coverage
- Thermal infrared: SIRTF/SWIRE (3.6, 4.5, 5.8, 8, 24, 70, 160 μ)

Later: Herschel, ALMA, CELT, OWL, ...

INFERENCES:

- ⋆ **A Phase Transition is fully underway in astronomy**
- ⋆ **ESA and ESO are major providers of observing facilities**
- ⋆ **New forms of coordination may have to be invented and implemented**