
ACS Survey Workshop:

Motivation

Steven Beckwith
March 22, 2001

The Astrophysical Journal

nature

- The highest impact programs on HST
- Peer review and the balance of program size
- Exploratory science
- Proprietary science vs. open source



"All the News That's Fit to Print"

The New York Times

VOL. CLXVI . . . No. 58,608 NEW YORK, SUNDAY, FEBRUARY 9, 1997 \$2.50

Despite Critics, New U.N. Chief Keeps His Style

By JOHN HOBBS WILFORD

In a Golden Age of Discovery, Faraway Worlds Beckon

By JOHN HOBBS WILFORD

ALLIES WELCOME U.S. HINT AT PAUSE IN DOLLAR'S SURGE

By EDWIN L. ANDREWS

Group of Seven Ministers Back Statement That American Currency Is Now Sober

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An Alien's-Eye View of the Sun . . .

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Slows, Cautious Efforts of Reform Criticized

By BEATRICE SCHOLINO

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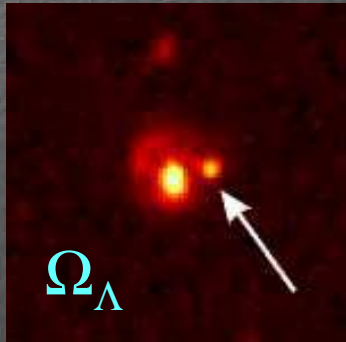
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HST Top 10 (1991-99 citations)



- ? Galaxy evolution (HDF)
- H_0 & the distance scale
- AGN & black Holes



Ω_{baryon}

A disproportionate fraction of the major discoveries came from major projects

- ◆ 3% of time and 25% of top 20, 60% of top 5.

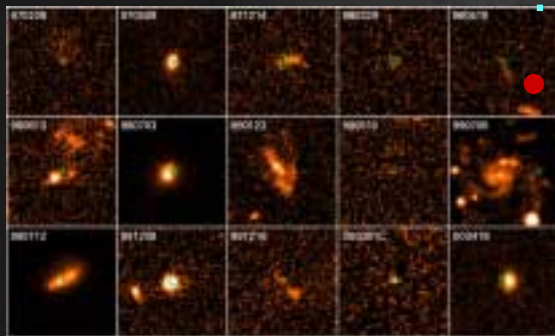
- ISM Chemistry

? Gamma Ray Bursts

? Disks around Young Stars

- Stellar deaths

E_{γ}



TAC recommendations

Cycles 1-7

	Projects	Orbits	%Orbits
Small projects, 1-30 orbits	2063	17,047	76.3%
Medium projects, 31-99 orbits	105	4,291	19.2%
Large projects, >100 orbits	5	990	4.4%

Time Allocation Committees have difficulty assigning

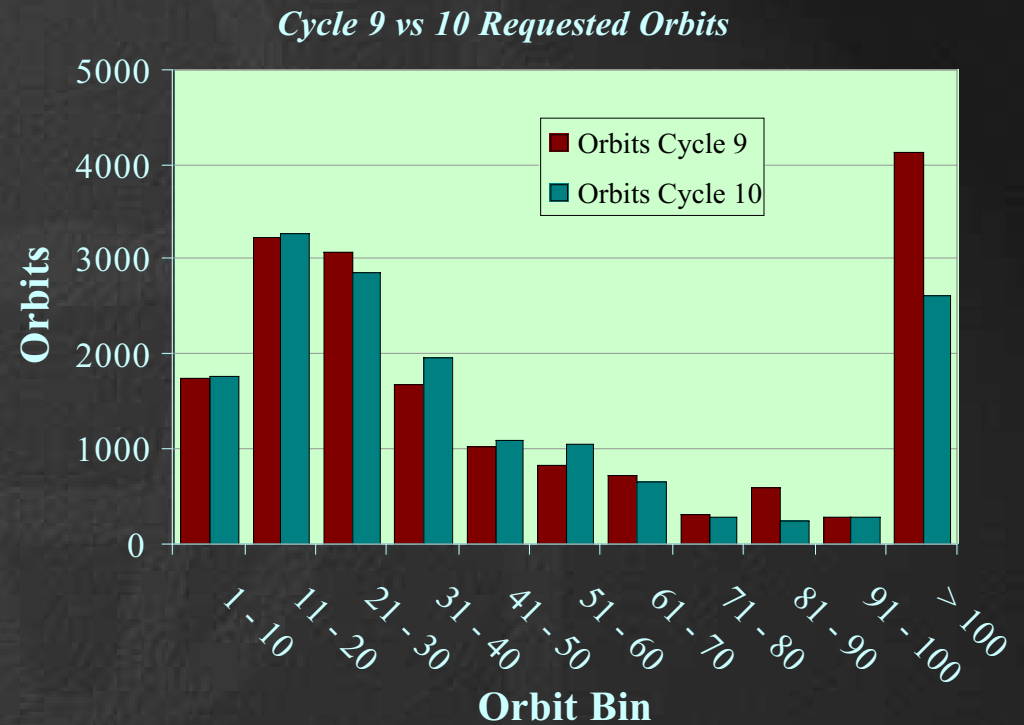
Cycle 10

time to very large programs	Projects	Orbits	%Orbits
Small projects, 1-30 orbits	109	1346	46.1%
Medium projects, 31-99 orbits	20	983	33.7%
Large projects, >100 orbits	7	589	20.2%

Public data access was an important element in making good use of the HDF.

Selection of large proposals: Cycle 10

- **Size distribution in Cycles 9 & 10**
 - Many large proposals
- **Oversubscription ratio**
 - Holding steady at 5.8
 - Flat with #orbits requested



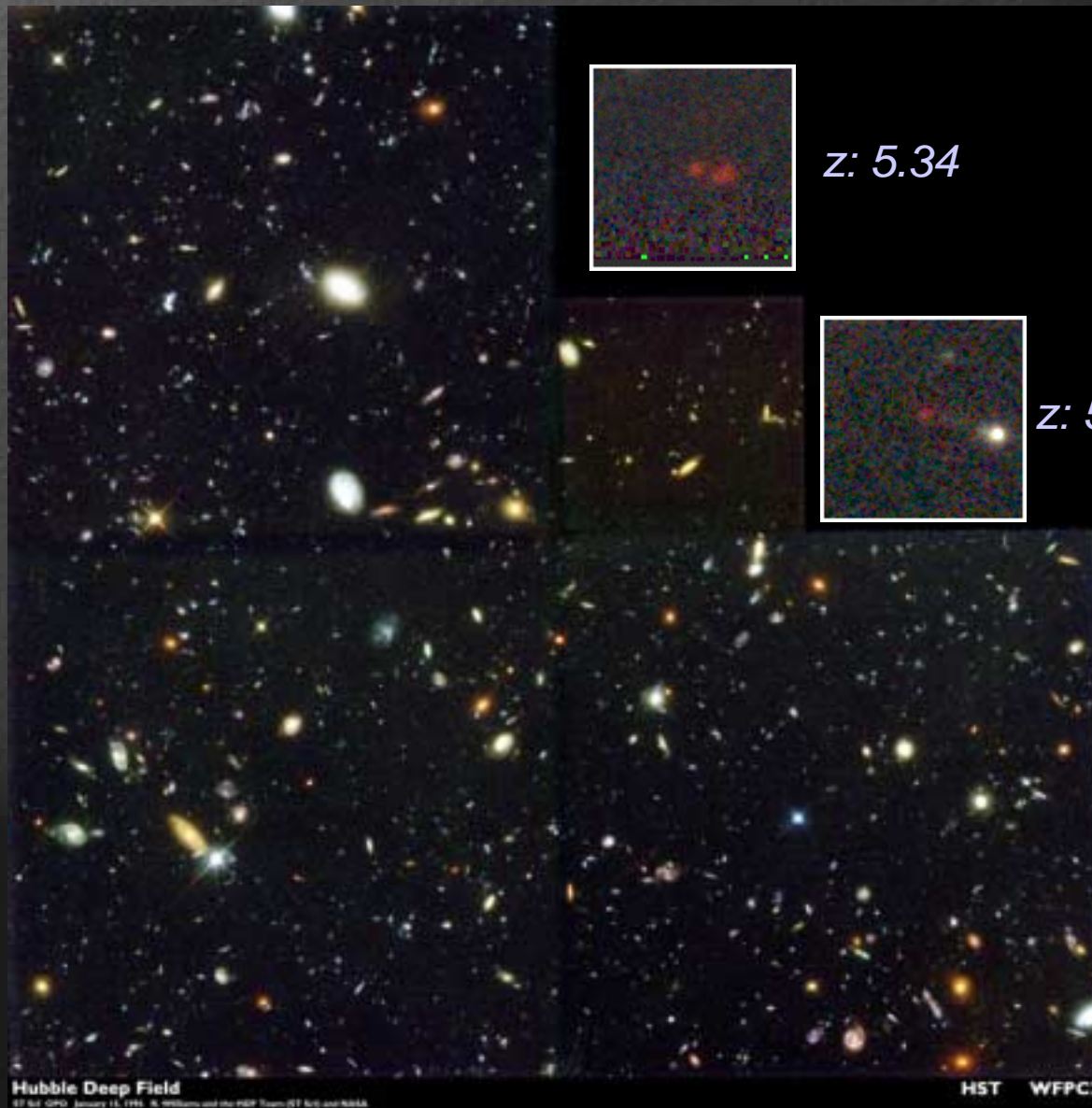
The challenge of prediction:

“Our results show that the most sensitive exposures achieved so far from the ground reveal more galaxies per unit area than will be seen by planned HST observations unless galaxy sizes decrease with the maximum rate consistent with ground-based observations. In this, the most favorable case for HST, the space exposures will show almost as many galaxy images as have been observed so far in the most sensitive ground-based data.”

**Bahcall, Guhathakurta, & Schneider 1990
Science, 248, 178.**



The Hubble Deep Field



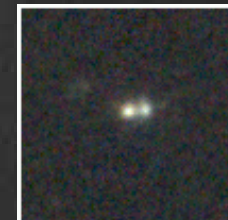
$z: 1.01$



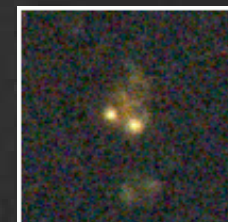
$z: 2.01$



$z: 2.93$



$z: 2.97$

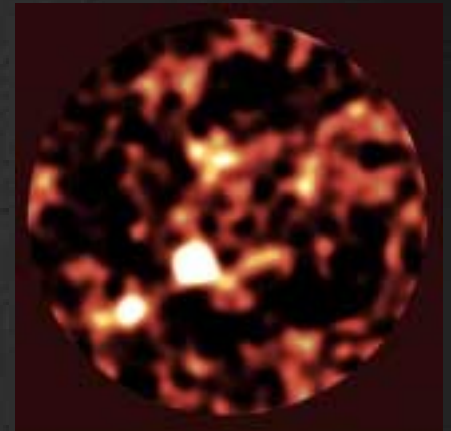
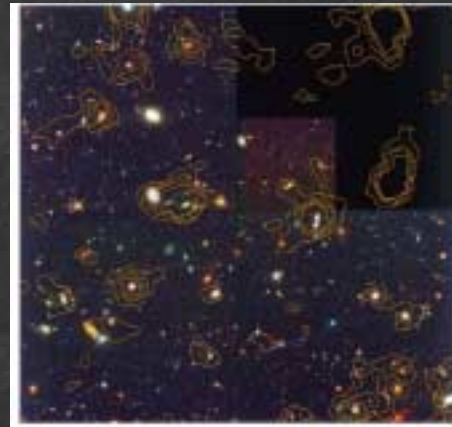


$z: 3.43$

STScI Science Project: R. Williams. et al. (1997)

The Legacy of the HDF

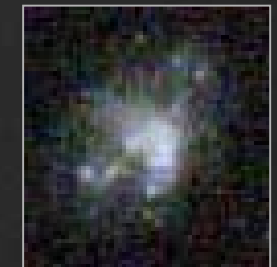
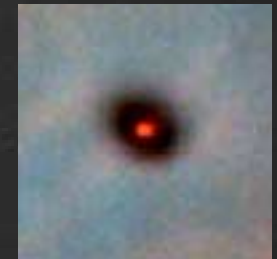
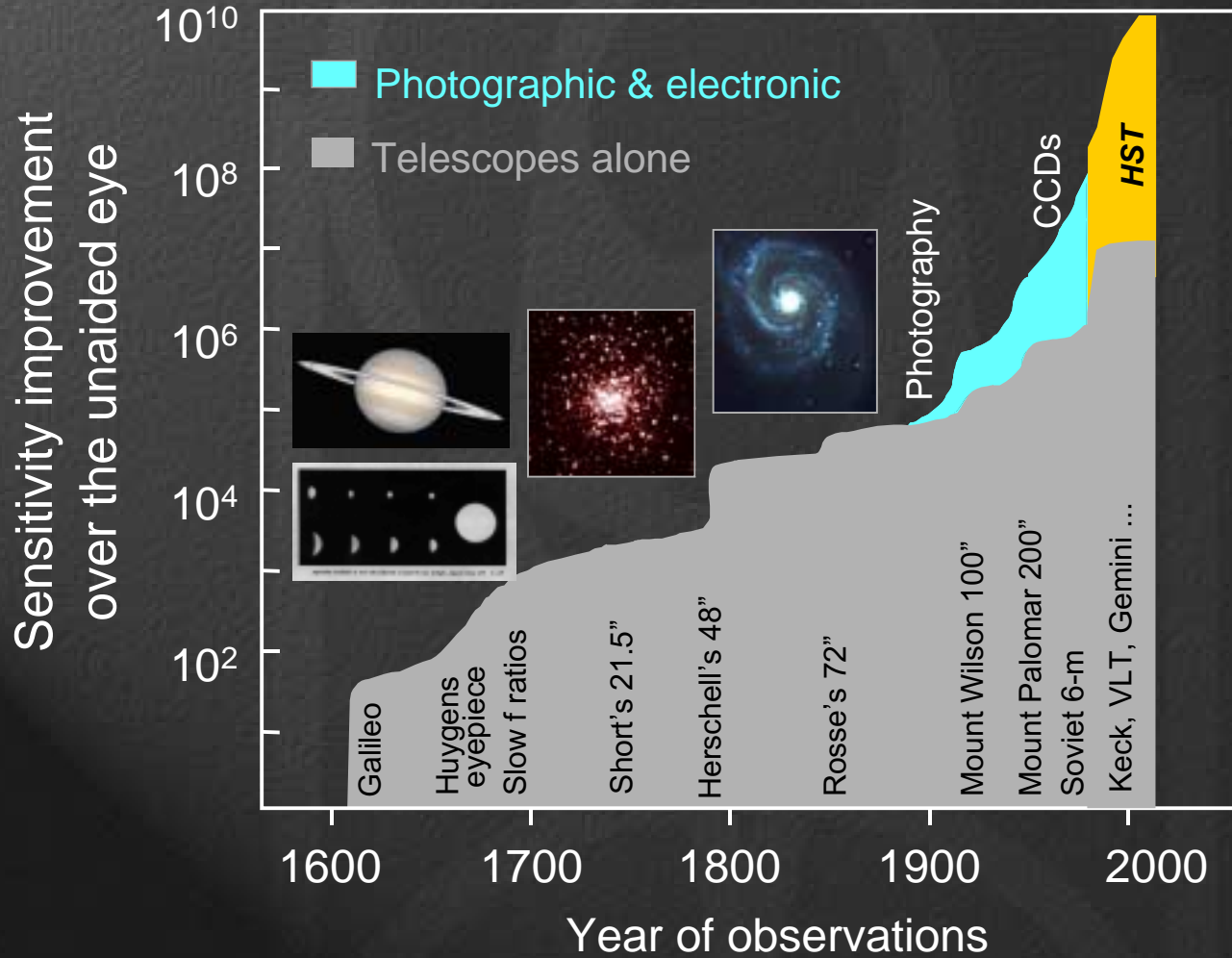
- **241 publications (cited original PASP paper)**
 - 207 from community (83%)
 - 20 STScI 1st author (10%)
 - 14 additional with at least 1 STScI co-author (7%)
- **Follow up:**
 - Radio
 - Submillimeter (SCUBA)
 - Infrared (ISO)
 - Optical (Keck)
 - X-ray (CDF-N, S; XMM)
- **\$842 k awarded science grants for HDF north**
 - \$726 k in 17 grants to non-STScI groups (86%)
 - \$116 k in 3 grants to STScI PIs for data analysis (14%)

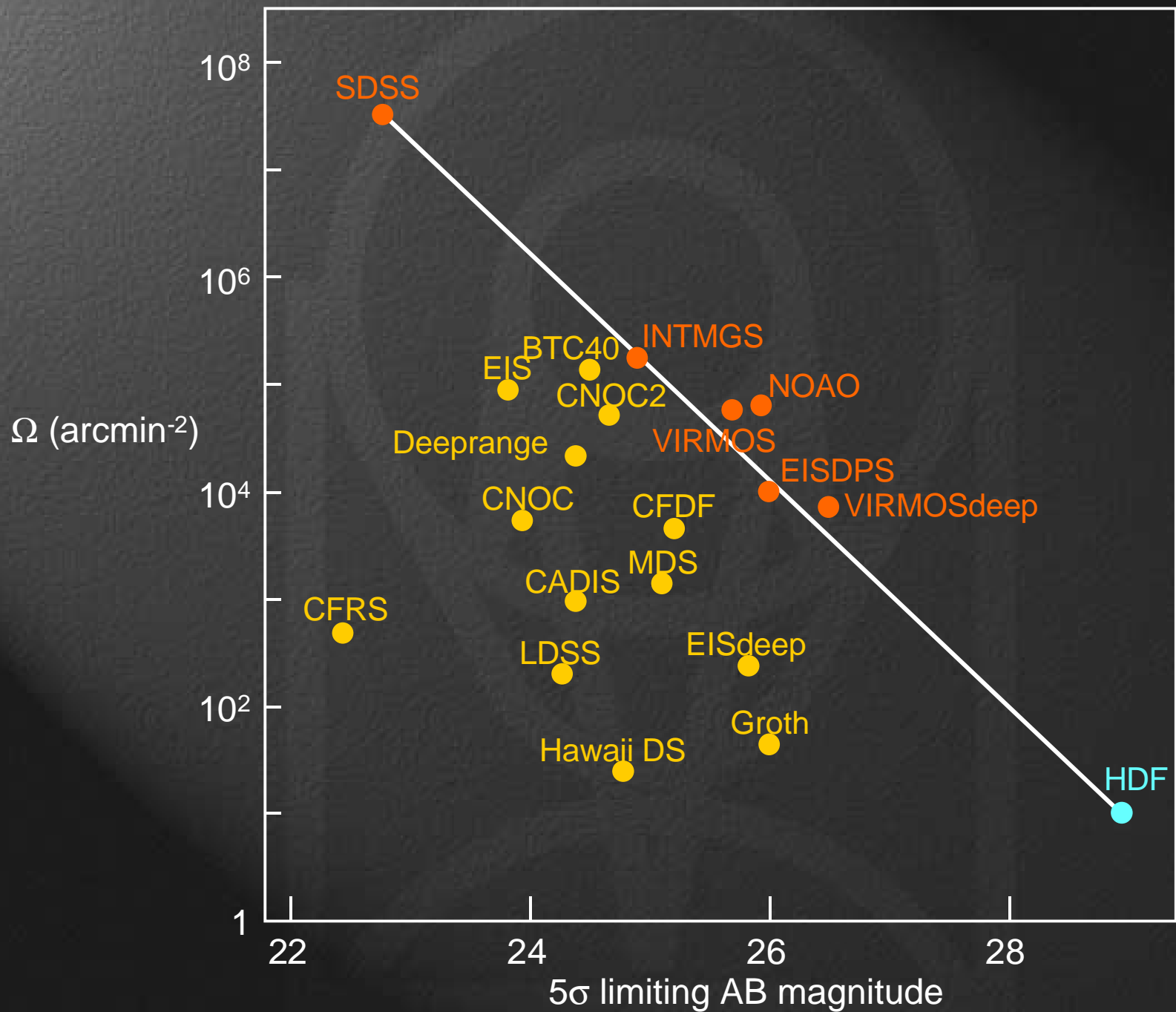


The HDF had the highest impact of any HST program as measured by citations.

Imaging & Discovery

After Fig. 3.10 in *Cosmic Discovery*, M. Harwit





Motivation for Workshop

- To determine the potential for new surveys with ACS
- To identify areas for teaming on large initiatives
- To advise on areas for a public survey with Director's Discretionary time