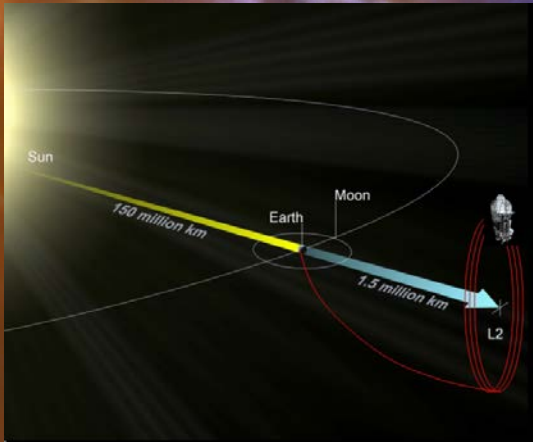


Herschel – The Legacy in the Making



The Universe Explored by Herschel

15-18 October 2013, ESA/ESTEC, Noordwijk

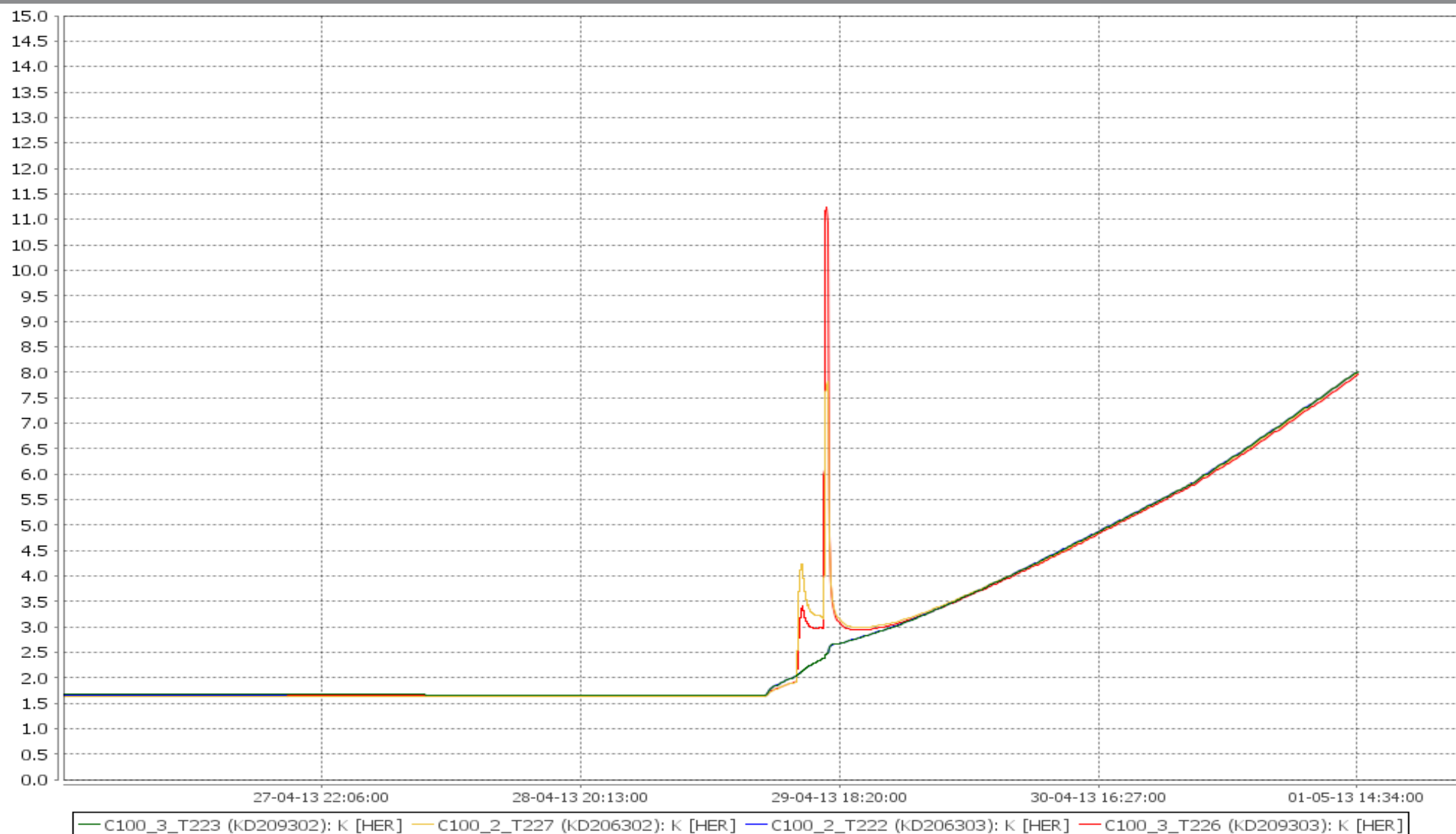
Göran Pilbratt, Herschel Project Scientist

Launch on 14 May 2009 ...

... EoHe in DTCP#1447 on 29 April 2013



29 April 2013 – EoHe (level 0)

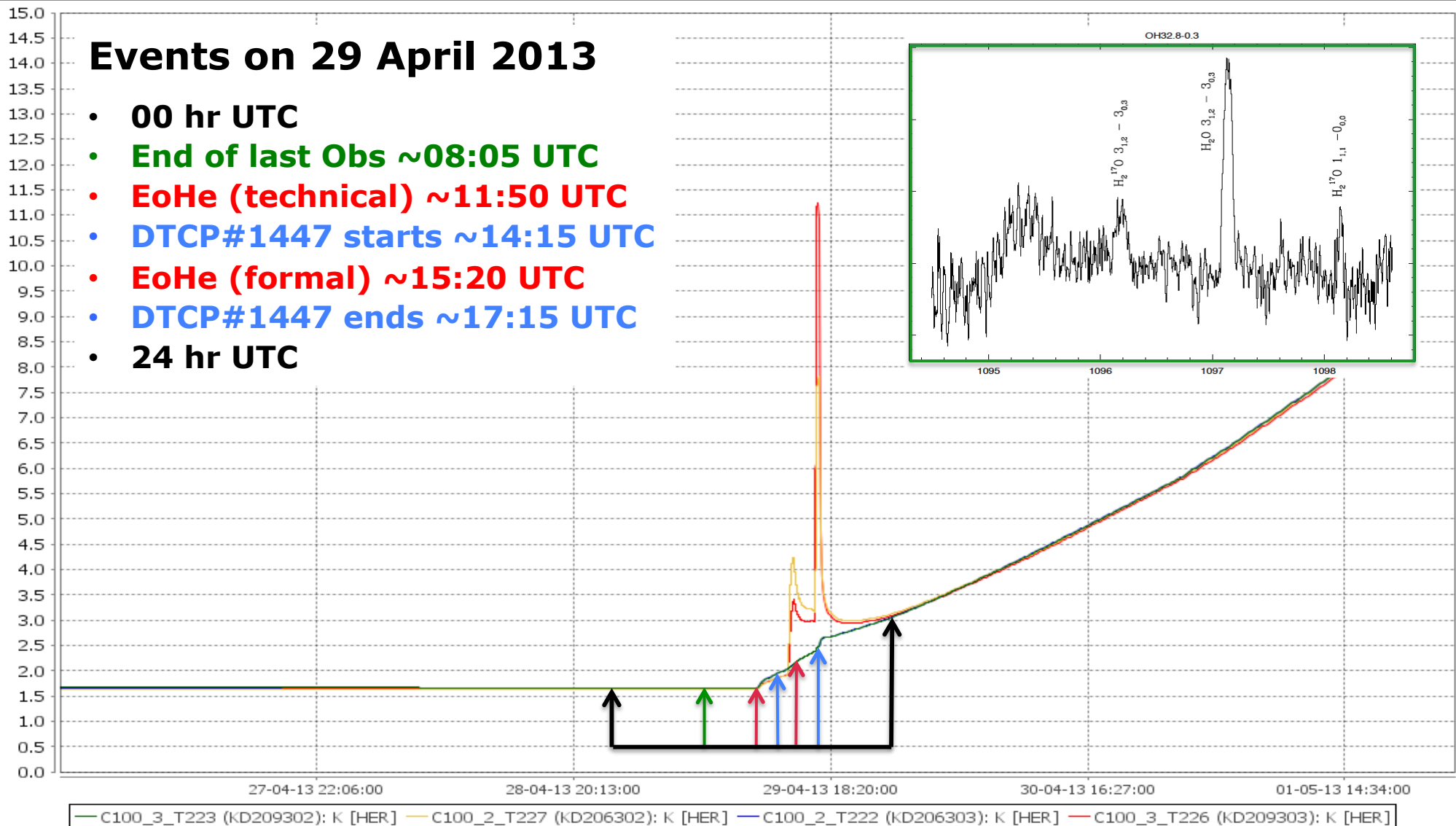


29 April 2013 – EoHe (level 0)



Events on 29 April 2013

- 00 hr UTC
- End of last Obs ~08:05 UTC
- EoHe (technical) ~11:50 UTC
- DTCP#1447 starts ~14:15 UTC
- EoHe (formal) ~15:20 UTC
- DTCP#1447 ends ~17:15 UTC
- 24 hr UTC



Launch on 14 May 2009 ...

... EoHe in DTCP#1447 on 29 April 2013

... 4 year launch celebration on 14 May 2013



HST#52 – (13-)14 May 2013



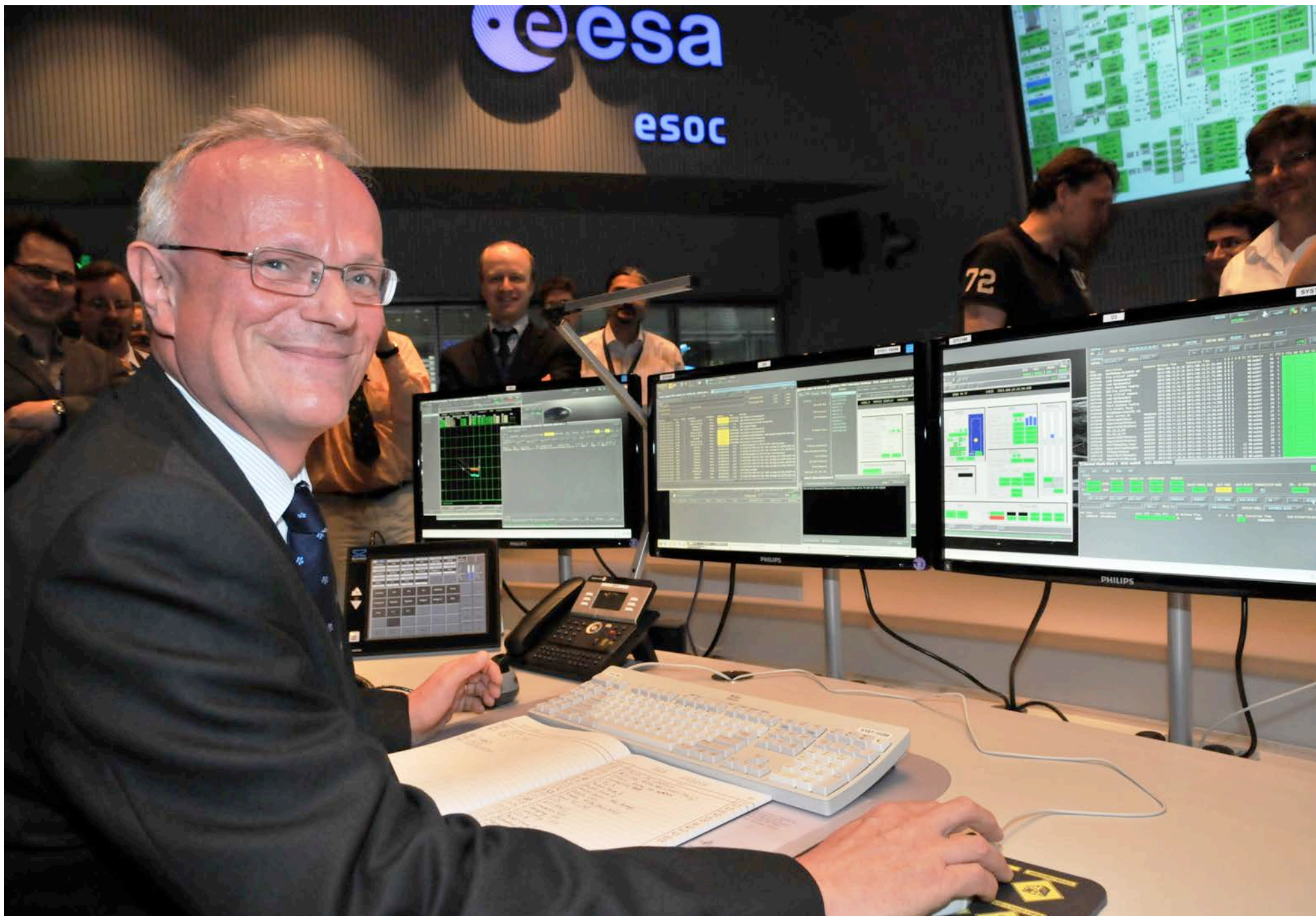
Launch on 14 May 2009 ...

... EoHe in DTCP#1447 on 29 April 2013

... 4 year launch celebration on 14 May 2013

... last telecommand event on 17 June 2013





Launch on 14 May 2009 ...

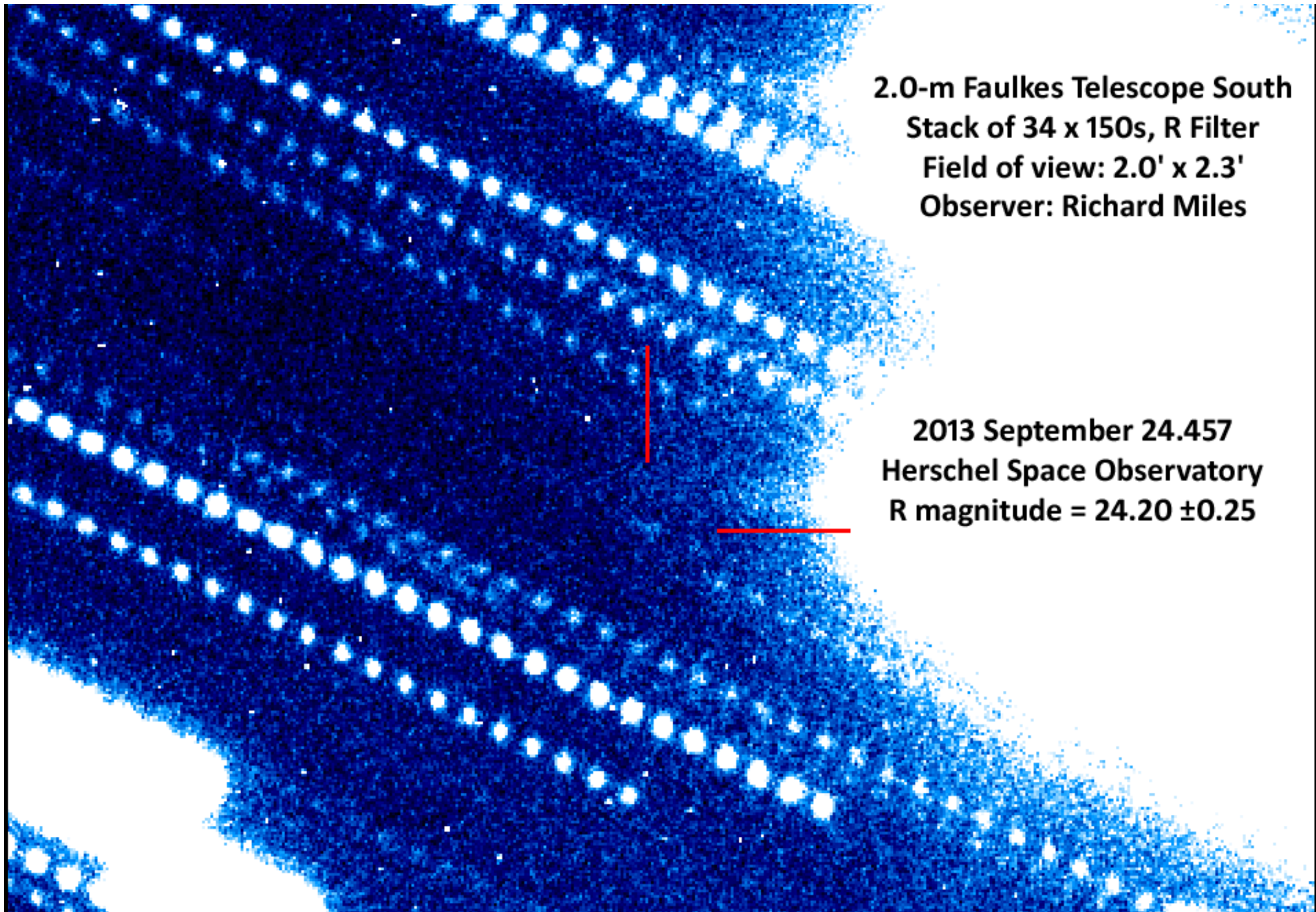
... EoHe in DTCP#1447 on 29 April 2013

... 4 year launch celebration on 14 May 2013

... last telecommand event on 17 June 2013

... now in “parking” (aka “disposal”) orbit



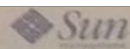


2.0-m Faulkes Telescope South
Stack of 34 x 150s, R Filter
Field of view: 2.0' x 2.3'
Observer: Richard Miles

2013 September 24.457
Herschel Space Observatory
R magnitude = 24.20 ± 0.25

SUN307

D2



DESK-10356

Cryocover opening on 14 June 2009



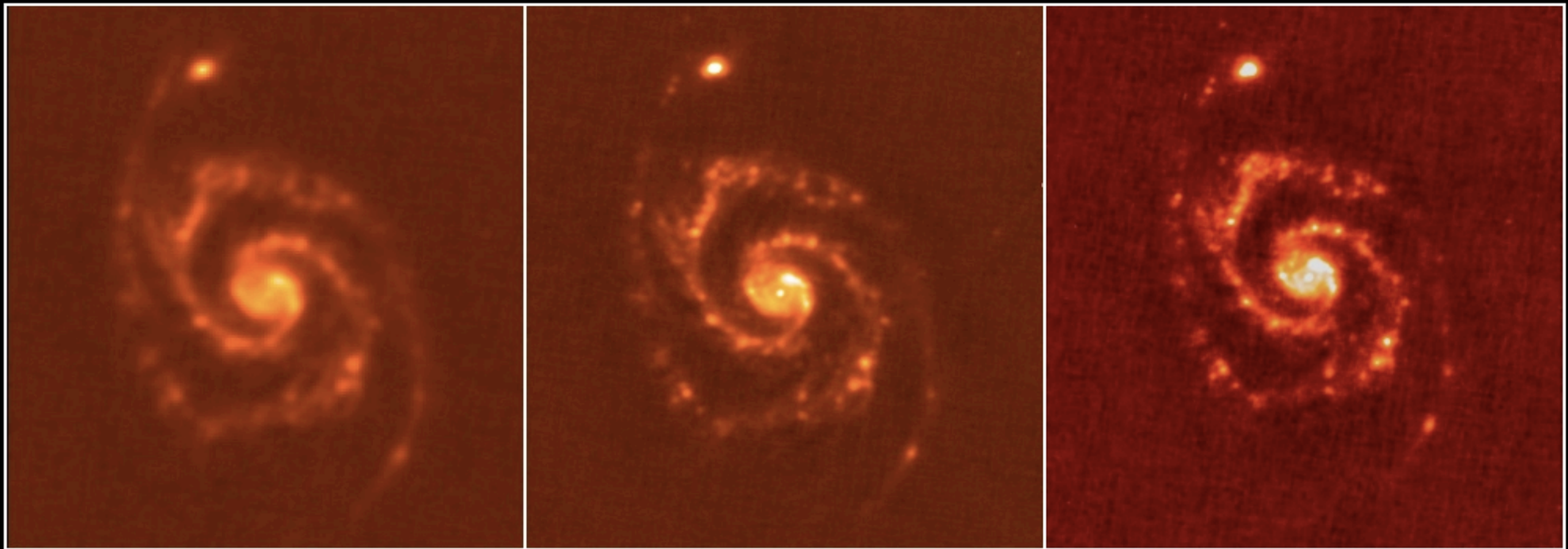


... the evening the day after

First observation – the M51 ‘sneak preview’



Herschel/PACS Images of M51 (“Whirlpool Galaxy”)

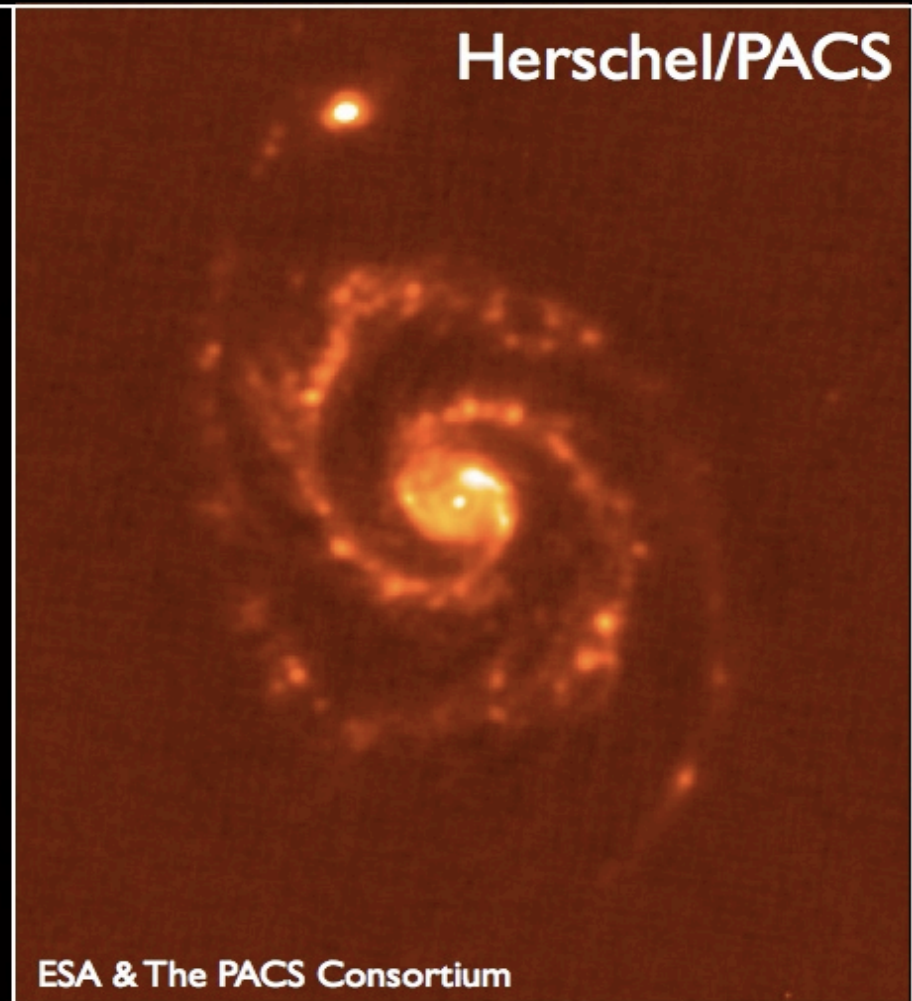


160 μm

100 μm

70 μm

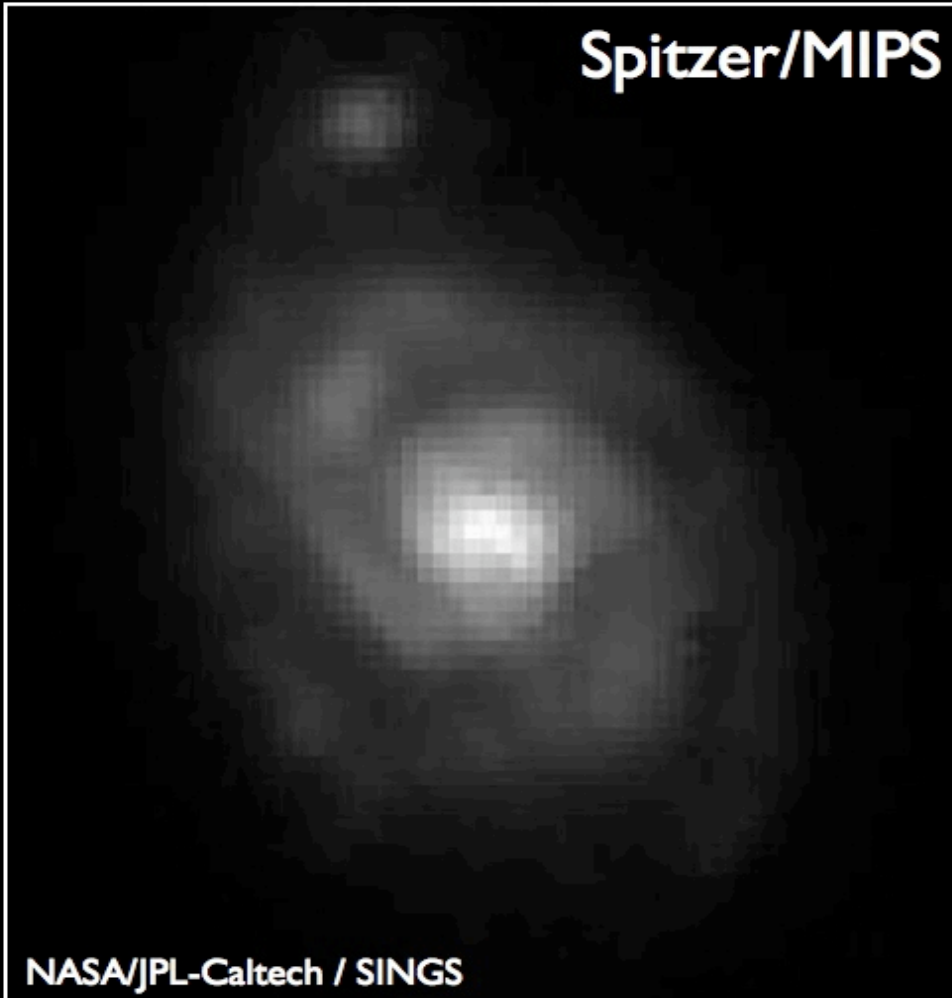
Spitzer 24 μm and Herschel 100 μm



Spiral Galaxy M51 (“Whirlpool Galaxy”) at 24 μm (MIPS) and 100 μm (PACS)

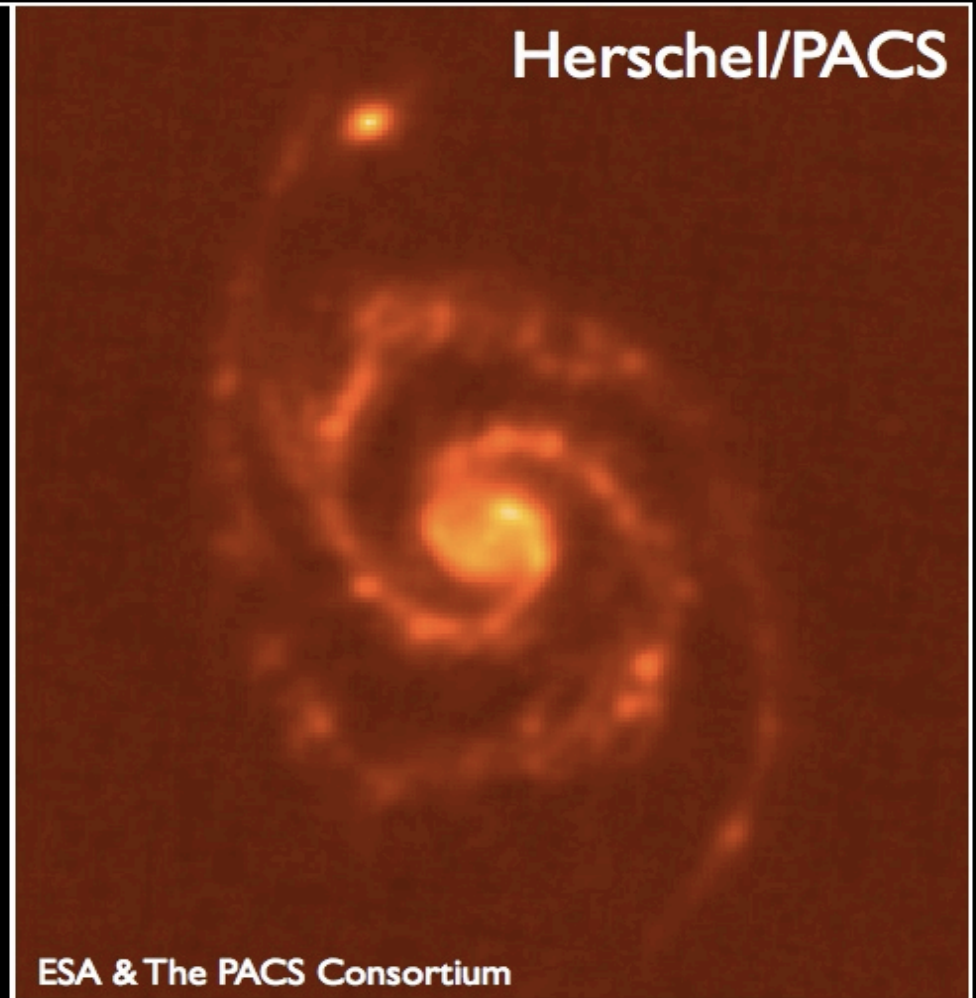
Spitzer/MIPS & Herschel/PACS at 160 μm esa

Spitzer/MIPS



NASA/JPL-Caltech / SINGS

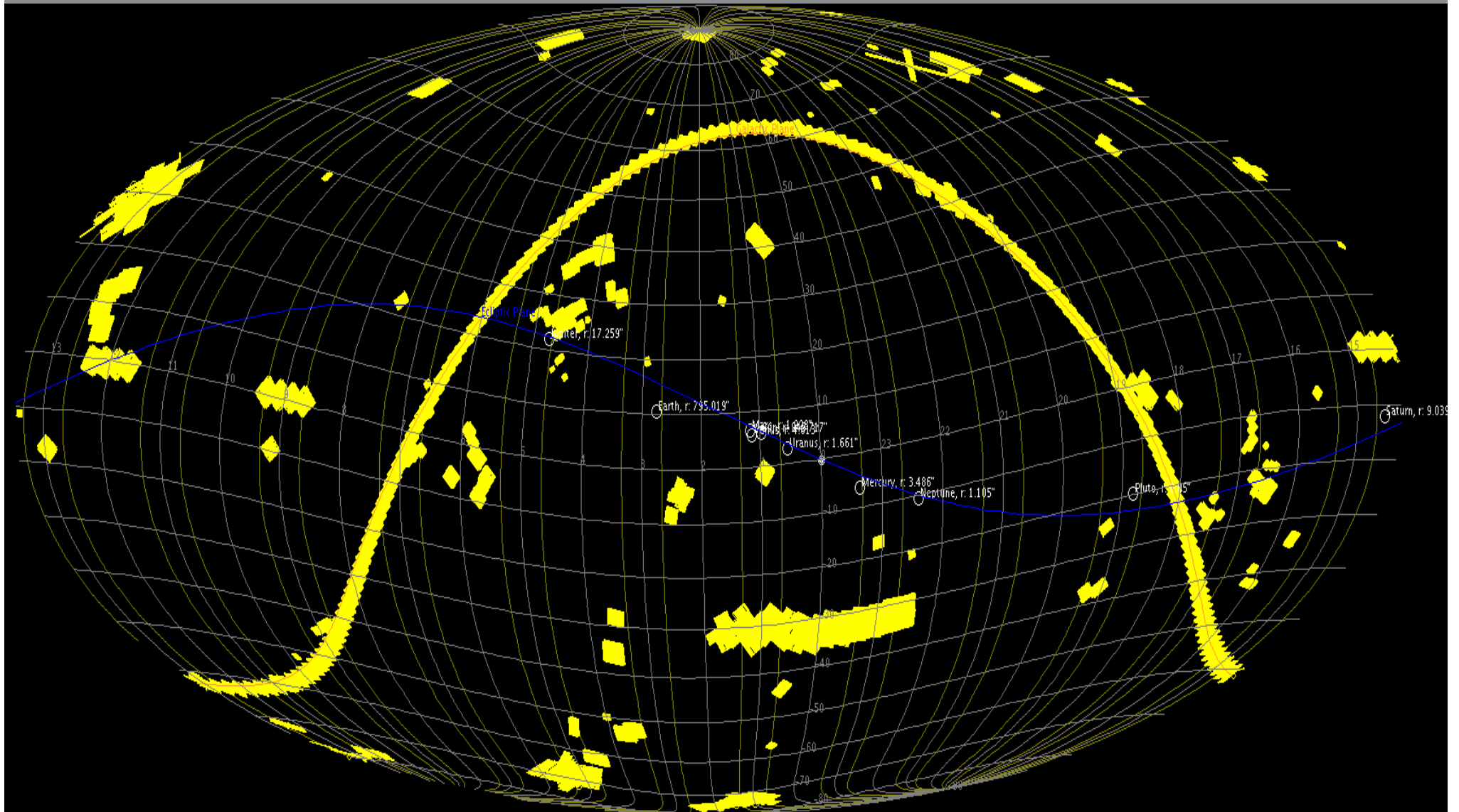
Herschel/PACS



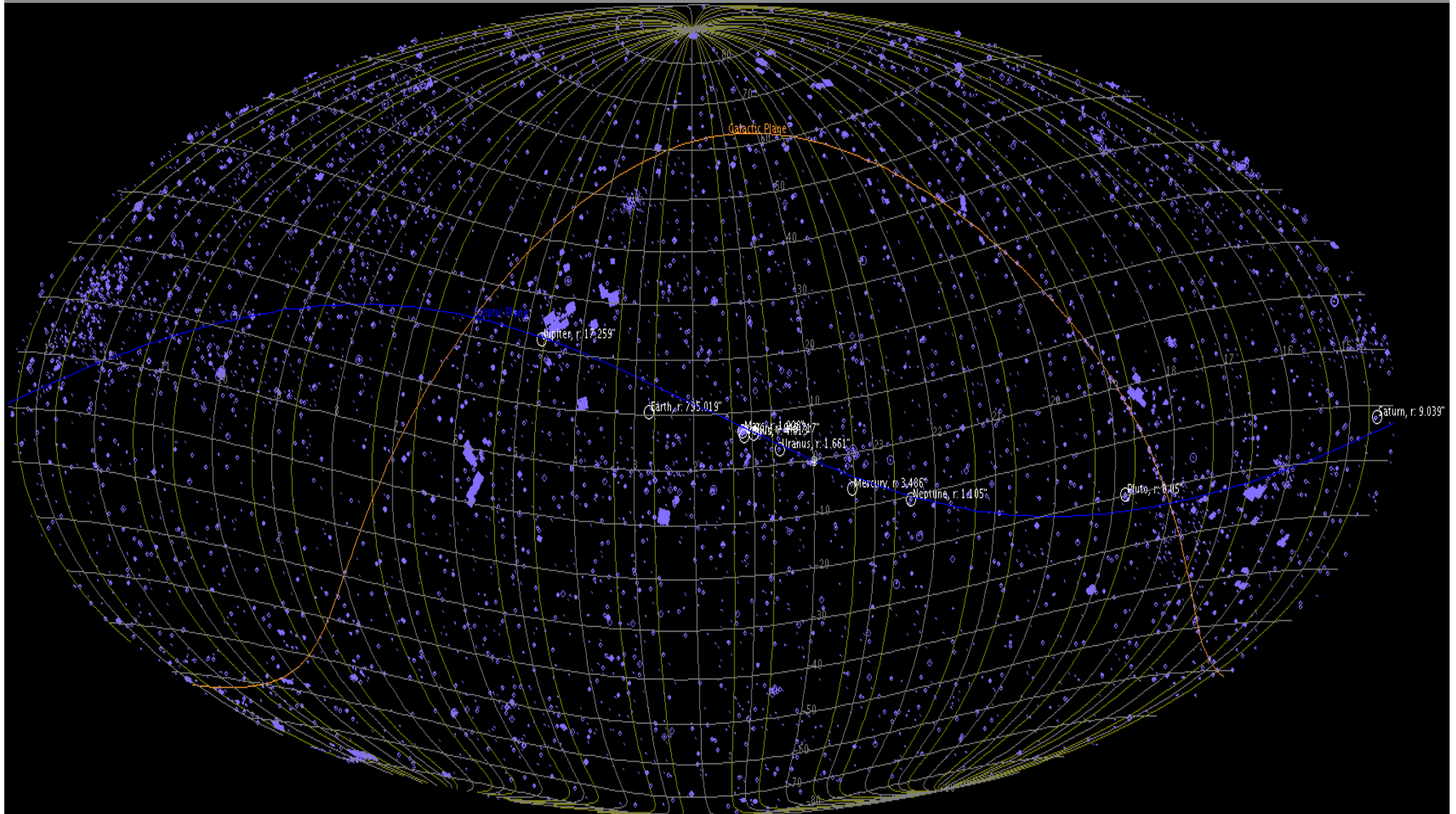
ESA & The PACS Consortium

Spiral Galaxy M51 (“Whirlpool Galaxy”) in the Far Infrared (160 μm)

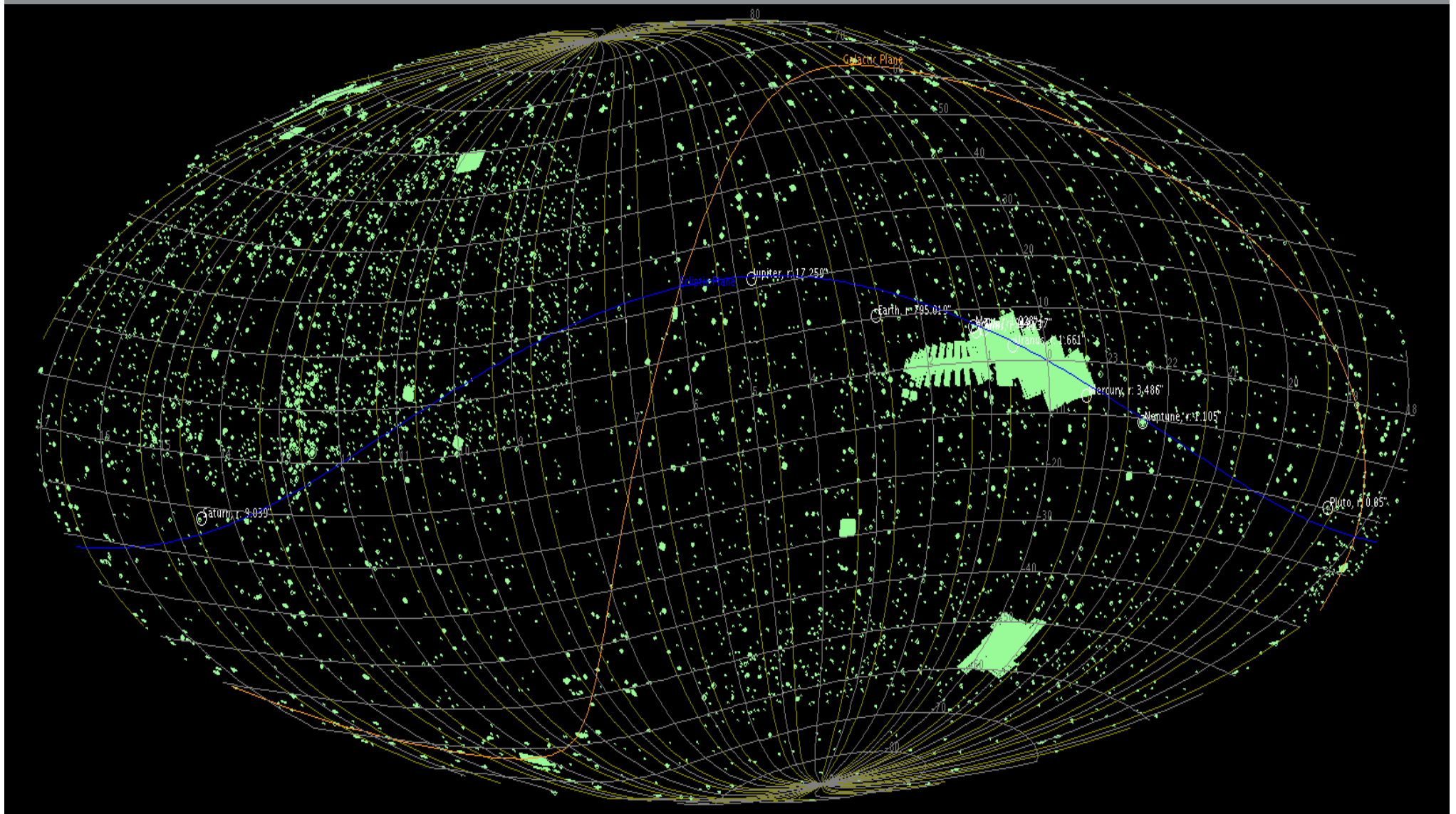
SPIRE/PACS parallel mode observing



PACS photometry observing



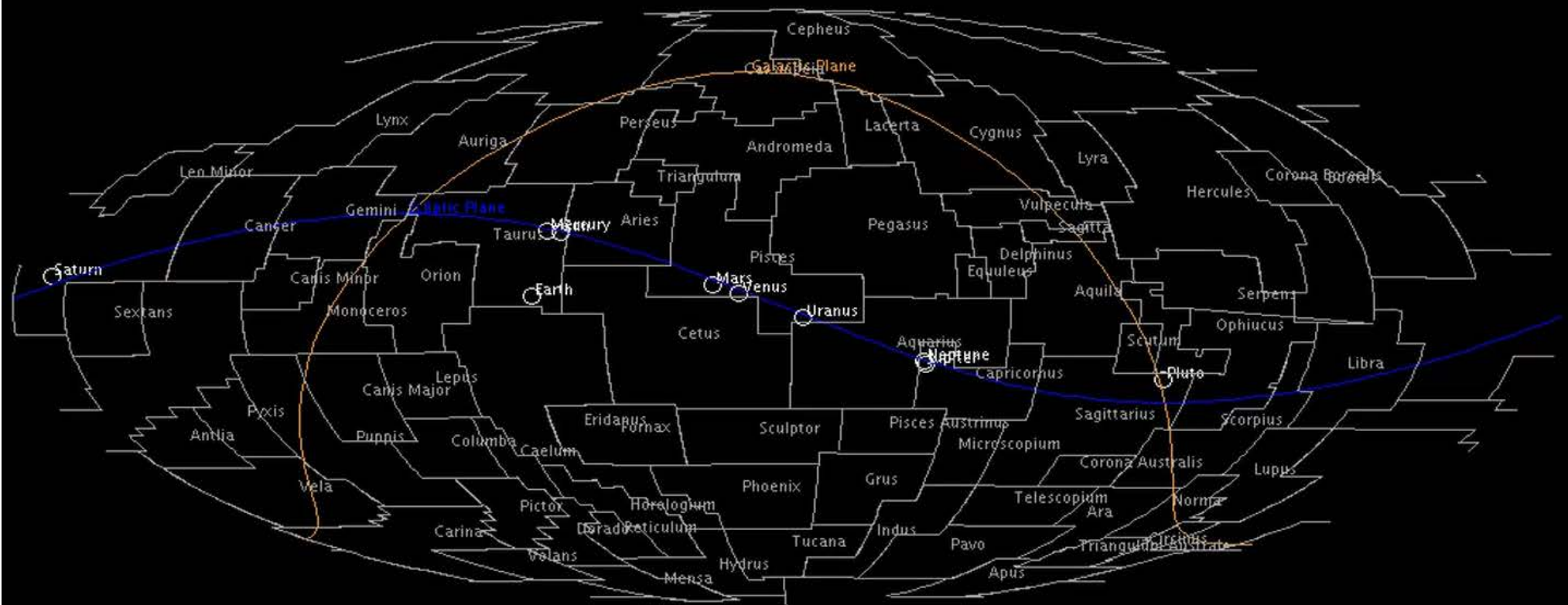
SPIRE photometry observing



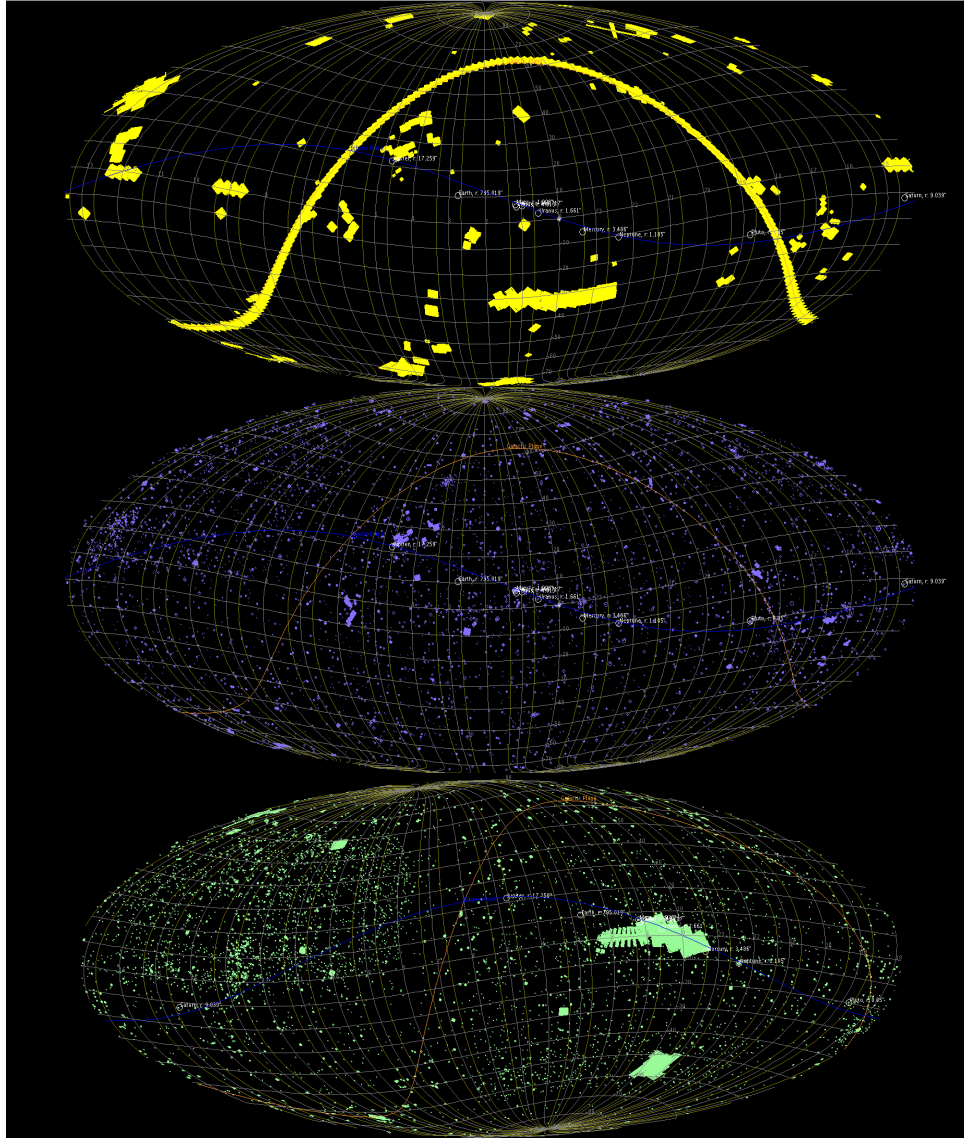
Herschel mission: **impossible**

OD: 2

Epoch: 2009-05-16T10:51:28Z



Preliminary total sky coverage



Totals (uncert +/- 5%)

- S/P parallel 6.44
- PACS phot 0.67
- SPIRE phot 2.28
- PACS spec <0.01
- SPIRE spec <0.01
- HIFI 0.06
- Total Herschel 9.45

These numbers are %-ages of the entire sky (~41,000 sq deg)

Herschel has observed almost 1/10 of the entire sky!

By performing ~23,500 hr of HOTAC approved observing!



HERSCHEL SPACE OBSERVATORY

herschel 



→ EXPLORING THE COOL UNIVERSE

herschel 



→ EXPLORING THE COOL UNIVERSE

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→ EXPLORING THE COOL UNIVERSE

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→ EXPLORING THE COOL UNIVERSE

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→ EXPLORING THE COOL UNIVERSE



Search

Query Panels

Main Query Panel

Observation Id Obs. List Proprietary Status

Geometry Panel

Target

Shape

☒ Circle☒ Resolve Name☐ Equatorial☐ Galactic☐ Ecliptic

Centre Coordinates

Target Radius

Instruments Query Panel

Instrument

All
HIFI
PACS
SPIRE
SPIREPACS

Obs. Type

HIFI

Single Point
Mapping
Spectral Scan

☒ Standard Data

PACS

Pacs Photometer
Range Spectroscopy
Line Spectroscopy

SPIRE

Photometer
Spectrometer

SPIREPACS

Parallel Mode

Proposal Query Panel

Timing Constraints Query Panel

User Provided Data Products Panel (UPDP)

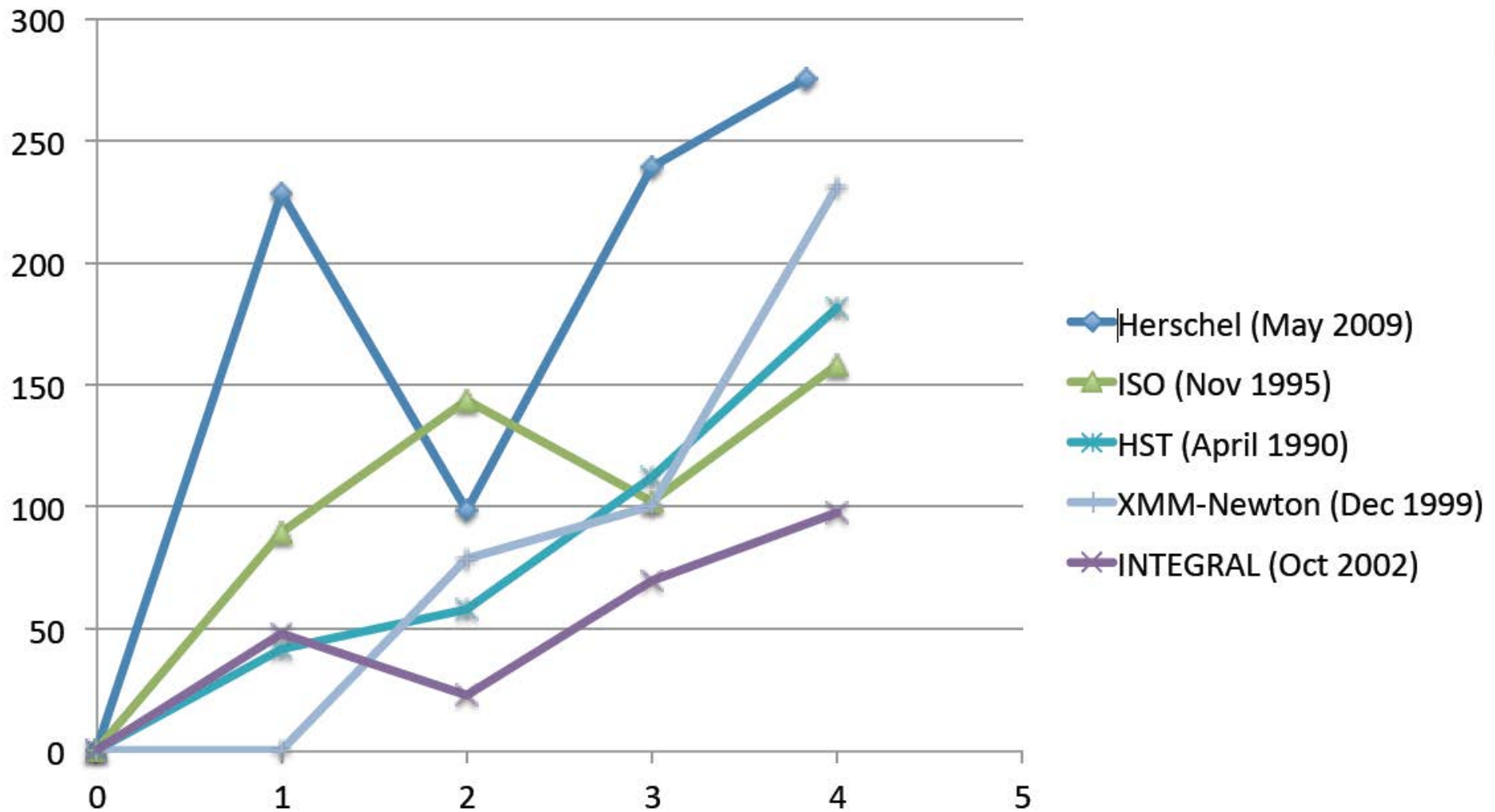
UPDP Search UPDP

- ☐ HERITAGE: PACS and SPIRE images and catalogues of the Magellanic Clouds
- ☐ HIFISTARS: HIFI spectroscopy of molecular lines in evolved stars
- ☐ HOP: Herschel Oxygen Project
- ☐ PEP_PACS: PACS images of six cosmological blank fields, ten lensing clusters and two z~1 clusters and

Log Console

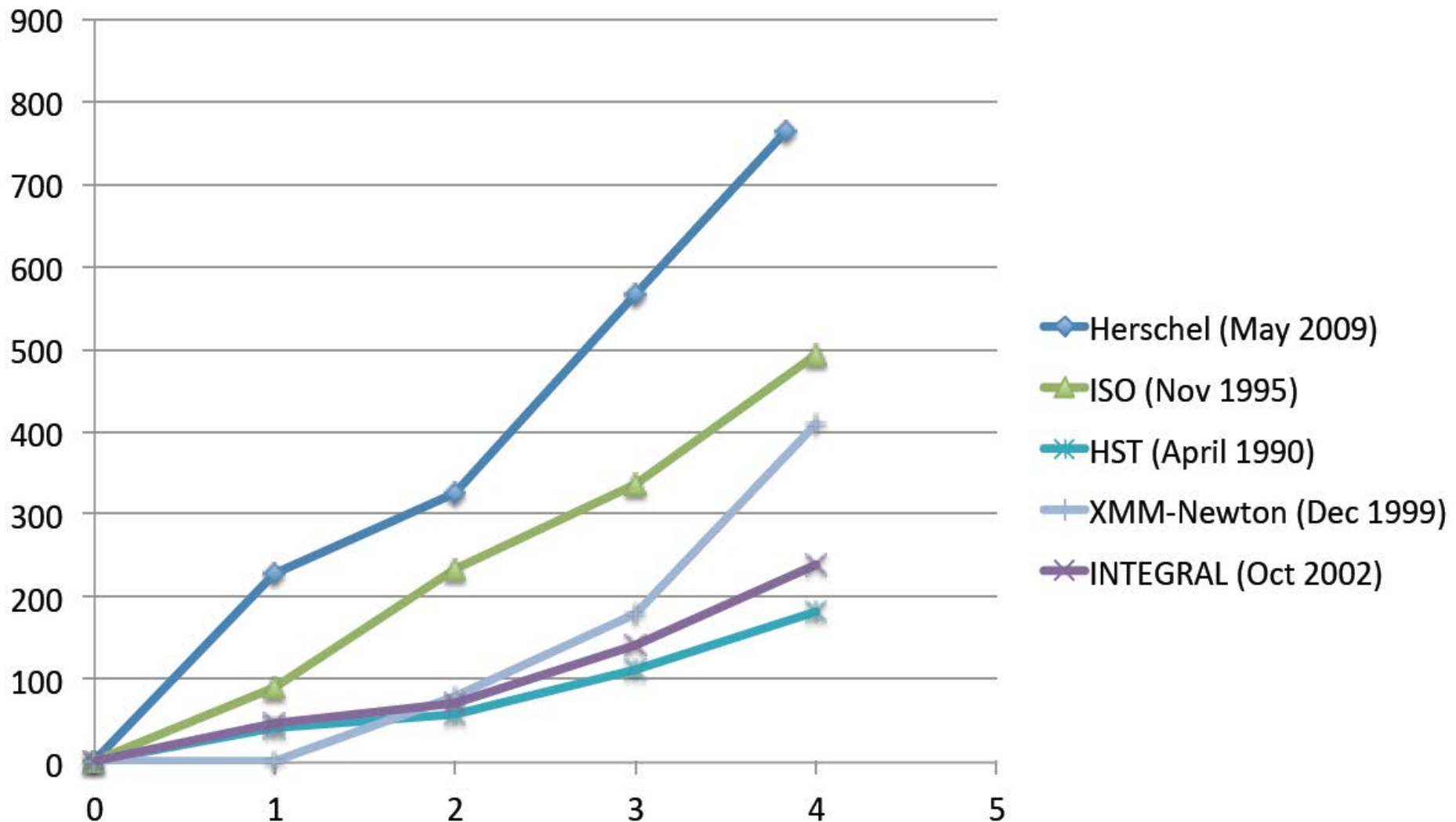
Not Logged In

#Pubs/yr vs calendar yr after launch











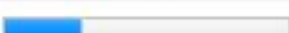


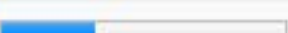
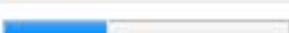
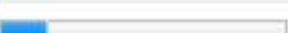








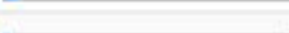
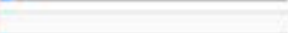
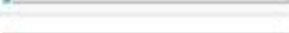
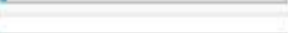
HERSCHEL SPACE OBSERVATORY

#Pubs vs calendar yr after launch



HERSCHEL SPACE OBSERVATORY

Simpleminded: OBSIDs linked to publ

Name	Executed obs	Executed time (h)	Published obs	Published number %	Published time (h)	Published time %
SDP	549	570.33	452	 82.33	521.79	 91.49
KPOT	6565	5,298.61	3957	 60.27	2,918.81	 55.09
TOO	210	34.90	86	 40.95	19.11	 54.77
KPGT	7441	5,156.38	3190	 42.87	2,761.01	 53.55
TOTAL	38533	22,651.06	8491	 22.04	6,967.70	 30.76
GT1	1151	517.92	203	 17.64	153.28	 29.59
AOTVAL	72	65.18	21	 29.17	9.46	 14.51
OT1	11652	5,527.24	452	 3.88	480.06	 8.69
DDT	664	282.02	32	 4.82	14.68	 5.21
Calibration	12178	4,633.80	145	 1.19	149.88	 3.23
GT2	461	347.12	16	 3.47	10.08	 2.91
OT2	9667	4,791.03	82	 0.85	79.42	 1.66
OBS	101	60.33	0	 0.00	0.00	 0.00



HERSCHEL SPACE OBSERVATORY

Making the most of Herschel



**End-of helium means end of observations, not end of mission
Herschel is in post-operations phase until end 2017!**



User support for ongoing data exploitation

- Helpdesk, documentation, web
- Workshops – also over internet
- **Visit the “HSC desk” in this meeting!**
- Talk to members of the Herschel Science Team and Users’ Group

Herschel Science Archive, products, & HIPE

- Calibration and data processing activities continue
- Annual releases of HIPE followed by bulk reprocessing
- Improvements to HSA itself and its products – UPDP & “standalone” products

Communication

- This meeting is a celebration of Herschel science, emphasize its achievements
- We will have ESA science writers in the audience
- For science-driven ESA web-releases I am your contact point

HERSCHEL SPACE OBSERVATORY

ESA News & Press Releases related to Herschel



Herschel helps find elusive signals from the early Universe

ESA Space Science News - also in-depth on [ESA SciTech News](#)
1 October 2013



Embracing Orion

ESA Space Science News
26 August 2013



Goodbye Herschel

ESA Space Science News
1 July 2013



Final command: Herschel ends operations as orbiting testbed

ESA Operations News
17 June 2013



There is more gas in the Galaxy than is dreamt of by astronomers

ESA SciTech News
11 June 2013



Rare merger reveals secrets of galaxy evolution

ESA Space Science News - also in-depth on [ESA SciTech News](#)
22 May 2013



Herschel finds hot gas on the menu for Milky Way's black hole

ESA Space Science News - also in-depth on [ESA SciTech News](#)
7 May 2013



Herschel closes its eyes on the Universe

ESA Press Release N° 11-2013
See also the ESA [Space Science](#) and [SciTech](#) web releases
29 April 2013



Herschel links Jupiter's water to comet impact

ESA Space Science News - also in-depth on [ESA SciTech News](#)
23 April 2013



Herschel and Hubble see the Horsehead in new light

ESA Space Science News - also in-depth on [ESA SciTech News](#)
19 April 2013



Star factory in the early Universe challenges galaxy evolution theory

ESA Space Science News - also in-depth on [ESA SciTech News](#)
17 April 2013



Retired star found with planets and debris disc

ESA Space Science News - also in-depth on [ESA SciTech News](#)
9 April 2013



Hunting high-mass stars with Herschel

ESA Space Science News - also in-depth on [ESA SciTech News](#)
27 March 2013



Herschel gets to the bottom of black-hole jets

ESA SciTech News
12 March 2013



Herschel to finish observing soon

ESA Space Science News - also in-depth on [ESA SciTech News](#)
5 March 2013



A cool discovery about the Sun's next-door twin

ESA Space Science News - also in-depth on [ESA SciTech News](#)
20 February 2013



Stars can be late parents

ESA Space Science News - also in-depth on [ESA SciTech News](#)
30 January 2013



Cool Andromeda

ESA Space Science - Image of the Week
28 January 2013



Betelgeuse braces for a collision

ESA Space Science News
22 January 2013



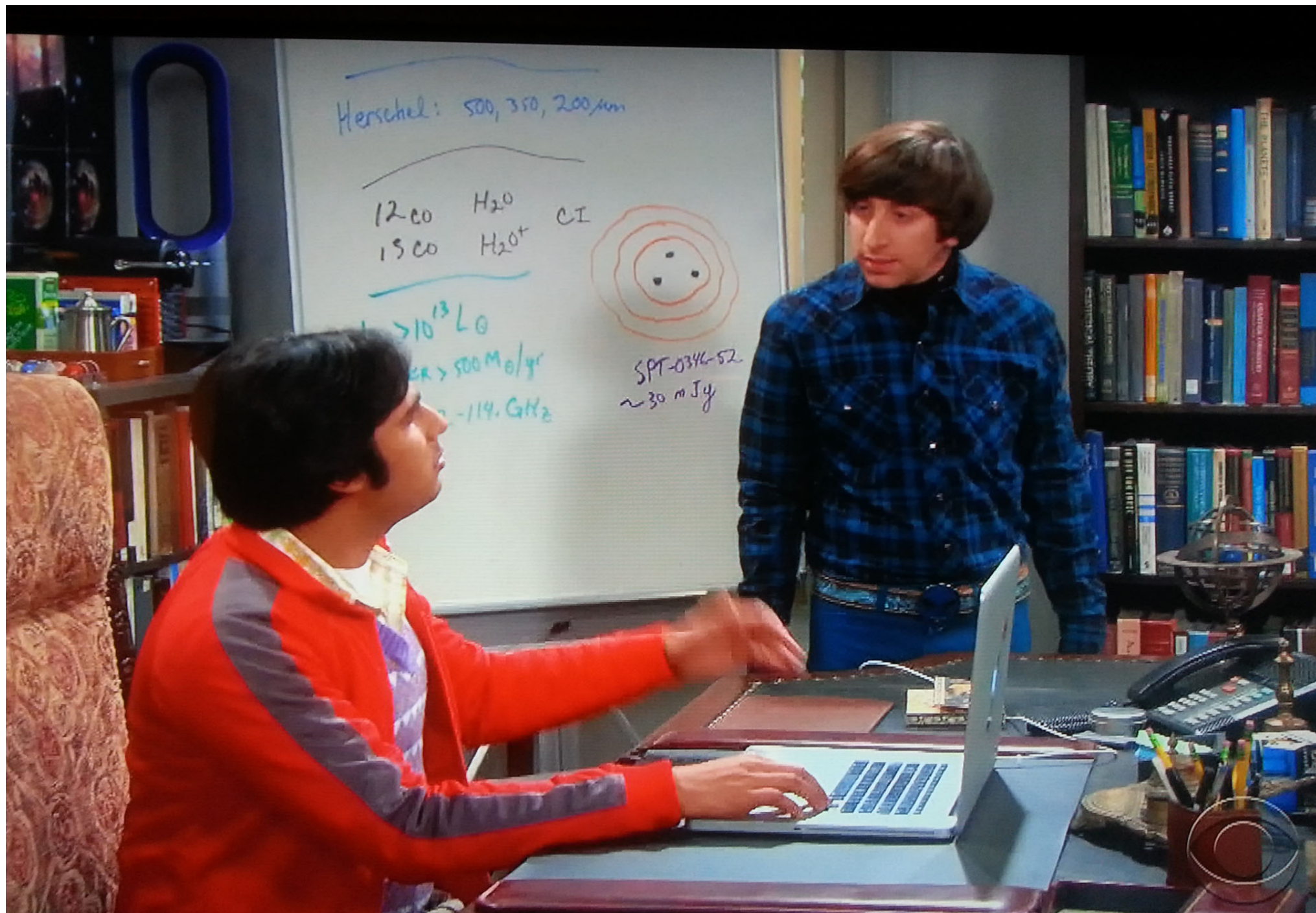
Herschel intercepts asteroid Apophis

ESA Space Science News
9 January 2013



A Cradle of Stars

ESA Space Science - Image of the week
7 January 2013





A large collage of 15 photographs showing various groups of people, mostly in white lab coats, posing in front of large satellite dishes and industrial equipment. The word "THANK YOU!" is overlaid in large, white, 3D block letters across the center of the collage. The photos depict different stages of the project, from initial assembly to final testing and celebration.

The Universe Explored by Herschel

Programme Overview

Day 01 15 October 2013	Day 02 16 October 2013		Day 03 17 October 2013		Day 04 18 October 2013
Plenary Newton 1&2, streamed to Einstein	Parallel Newton 1, streamed to Einstein	Parallel Newton 2	Parallel Newton 2	Parallel Newton 1, streamed to Einstein	Plenary Newton 1&2, streamed to Einstein
08:00 On-site Registration	08:00 Registration Desk Opens		08:30 Registration Desk		08:30 Registration Desk
09:00 Welcome	08:50 LOC announcements		08:50 LOC announcements		08:50 LOC announcements
09:50 Session 1: Galaxy Formation & Evolution 1: Plenary A	09:00 Session 6a: Galaxy Formation & Evolution 2: Evolutionary	09:00 Session 6b: Water, astrochemistry & ISM physics 2	09:00 Session 10a: Large scale galactic structure & nearby galaxies 2	09:00 Session 10b: Star & planetary system formation & evolution 2	09:00 Session 14: Galaxy Formation & Evolution 6: Plenary B
11:00 Coffee break / Poster session A1	11:00 Coffee break / Poster session A1	11:00 Coffee break / Poster session A1	11:00 Coffee break / Poster session B1	11:00 Coffee break / Poster session B1	10:00 Session 15: Large scale galactic structure & nearby galaxies 5: Plenary B
11:50 Session 2: Large scale galactic structure & nearby galaxies 1: Plenary A	11:40 Session 7a: Galaxy Formation & Evolution 3: Deepest searches	11:40 Session 7b: Water, astrochemistry & ISM physics 3	11:40 Session 11a: Large scale galactic structure & nearby galaxies 3	11:40 Session 11b: Star & planetary system formation & evolution 3	10:40 Coffee break / Poster session B4
13:00 Lunch	13:00 Lunch	13:00 Lunch	13:00 Lunch	13:00 Lunch	12:00 Session 16: Water, astrochemistry & ISM physics 6: Plenary B
14:00 Session 3: Water, astrochemistry & ISM physics 1: Plenary A	14:00 Session 8a: Galaxy Formation & Evolution 4: Spectroscopy	14:00 Session 8b: Water, astrochemistry & ISM physics 4	14:00 Session 12a: Large scale galactic structure & nearby galaxies 4	14:00 Session 12b: Star & planetary system formation & evolution 4	13:00 Lunch
15:10 Session 4: Star & planetary system formation & evolution 1: Plenary A	16:00 Coffee break / Poster session A5	16:00 Coffee break / Poster session A5	16:20 Coffee break / Poster session B2	16:20 Coffee break / Poster session B2	14:00 Session 17: Star & planetary system formation & evolution 6: Plenary B
16:20 Coffee break / Poster session A2	17:00 Session 9: Galaxy Formation & Evolution 5: Galaxy formation, AGN, star formation, ISM physics	17:00 Session 9: Galaxy Formation & Evolution 5: Galaxy formation, AGN, star formation, ISM physics	17:00 Session 13: Star & planetary system formation & evolution 5	17:00 Session 13: Star & planetary system formation & evolution 5	15:00 Session 18: Beyond Herschel: SPICA
16:50 Session 5: The Solar System & its evolution 1: Plenary A	18:00 Posters B to be displayed	18:00 Posters B to be displayed	18:20 Wine & cheese / Poster session B3	18:20 Wine & cheese / Poster session B3	15:20 Session 19: Wrap-up session
18:00 Welcome Drink / Poster session A3	18:30 Buses to Conference Dinner & Noordwijk at 18:30	18:30 Buses to Conference Dinner & Noordwijk at 18:30	19:00 Buses to Noordwijk from 19:00 to 20:30	19:00 Buses to Noordwijk from 19:00 to 20:30	16:35 Close of symposium / Farewell
19:00 Buses to Noordwijk from 19:00 to 20:30					16:40 Coffee / Posters B down

Let's have
a great
meeting!