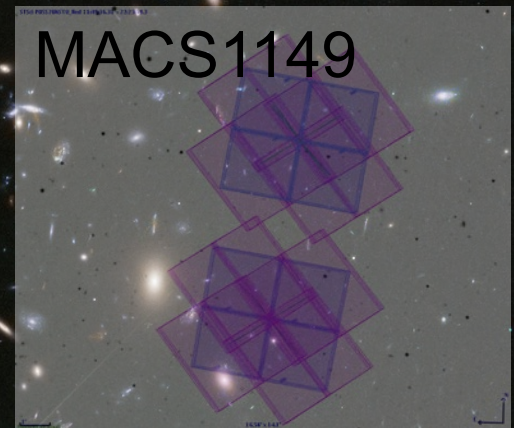
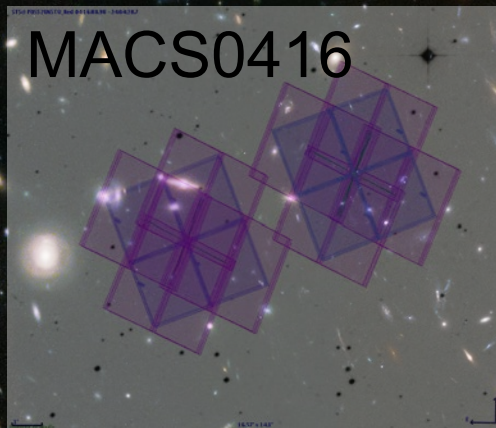
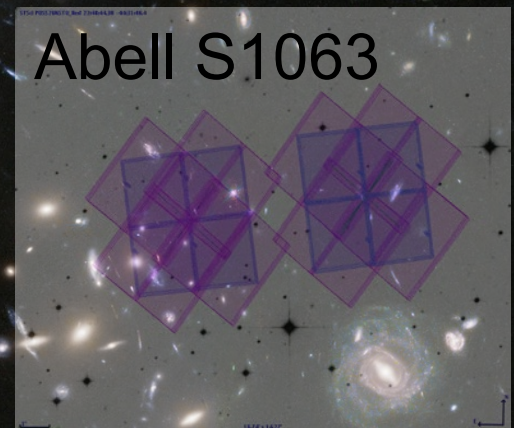
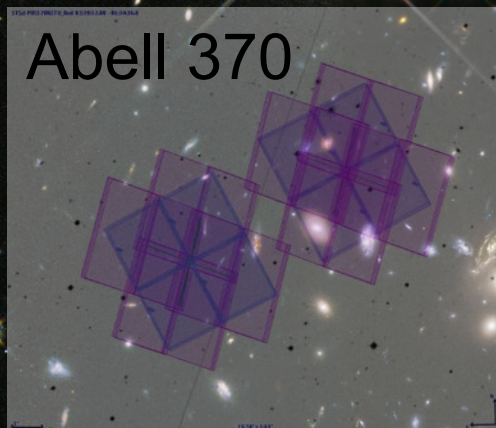


BUFFALO HST Observations

Anton M. Koekemoer

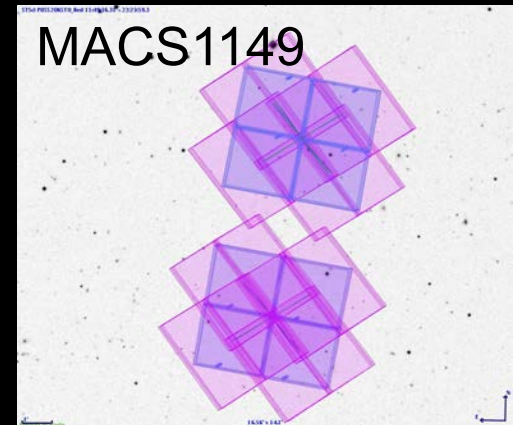
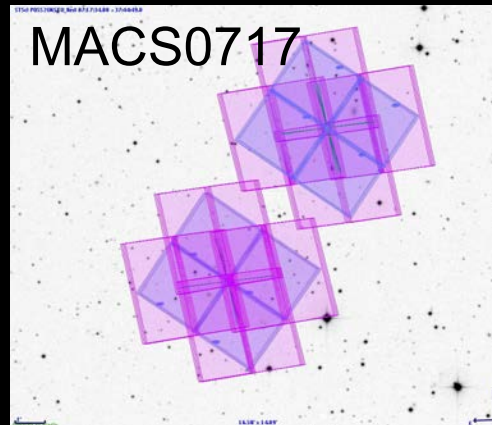
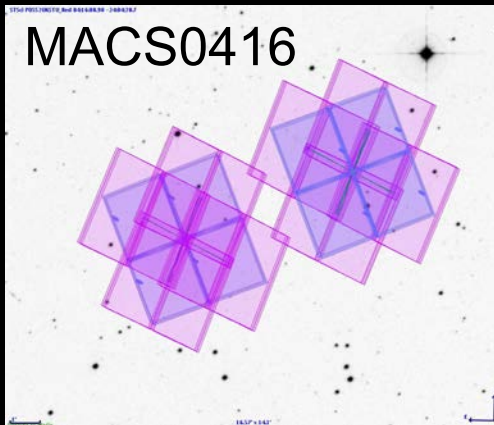
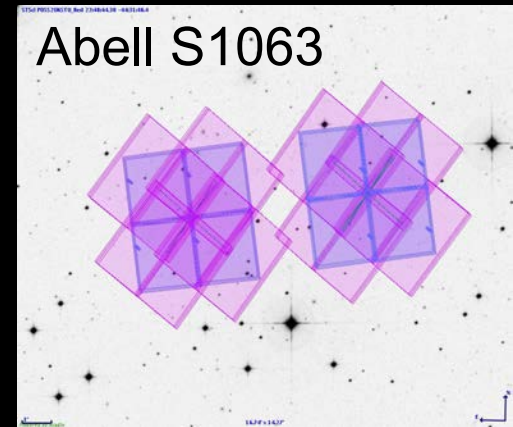
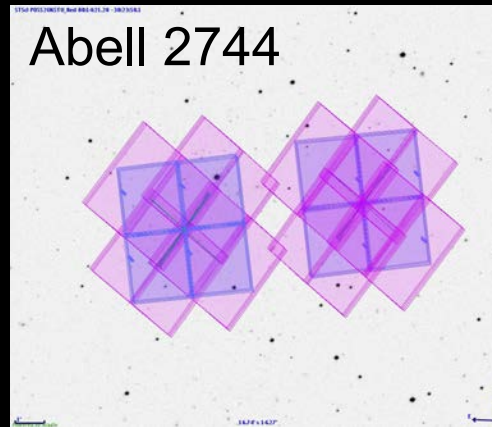
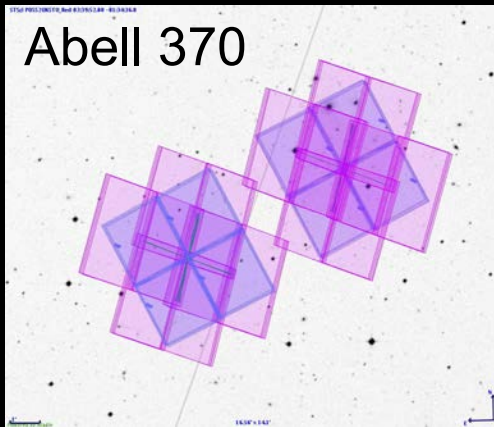
(Space Telescope Science Institute)



BUFFALO Team Meeting, 12-13 July 2021

BUFFALO HST— expand HFF area 3-4x

- All 6 HFF clusters, main + parallel fields



BUFFALO HST mosaics 2018-19 releases

- Initial data releases: BUFFALO-only mosaics
- 2 orients per cluster
- each orient had 2 epochs

Field	Orient 1	Orient 2
Abell 370	2018 Jul-Aug	2018 Dec-Jan 2019
MACS 0717	2018 Oct-Nov	2019 Feb-Apr
MACS 0416	2019 Jan-Feb	2019 Jul-Sep
Abell S1063	2019 Apr-Jun	2019 Oct-Nov
Abell 2744	2019 May-Jul	2019 Oct-Dec
MACS 1149	2019 Nov-Dec	2020 Apr-May

BUFFALO HST mosaics 2020 release

- Full-depth HFF+BUFFALO on all clusters
- 936 orbits prime (per cluster: 140+16)

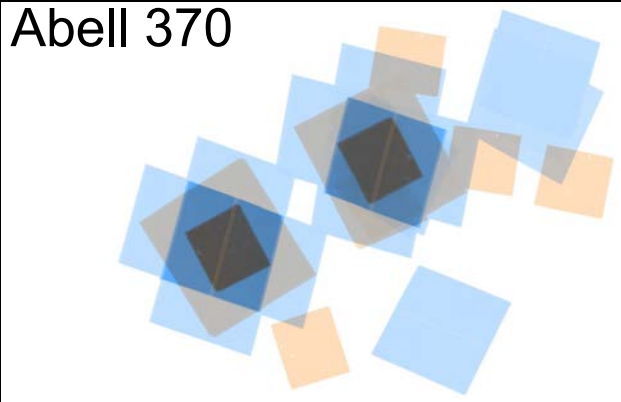
Filter	HFF	BUFFALO	Total HFF+BUFFALO
ACS F435W	20+20		40
ACS F606W	10+10	4+4	28
ACS F814W	40+40	4+4	88
WFC3/IR F105W	24+24	2+2	52
WFC3/IR F125W	12+12	3+3	30
WFC3/IR F140W	10+10		20
WFC3/IR F160W	24+24	3+3	54

- Mosaics total ~1872 orbits (prime + parallel)

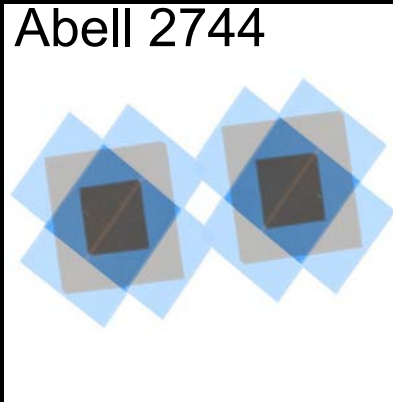
Mosaic releases: HFF+BUFFALO

- All 6 HFF clusters, main + parallel fields

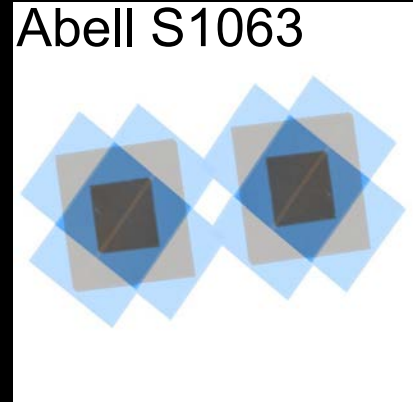
Abell 370



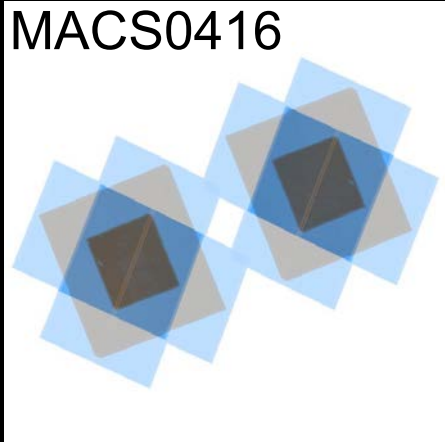
Abell 2744



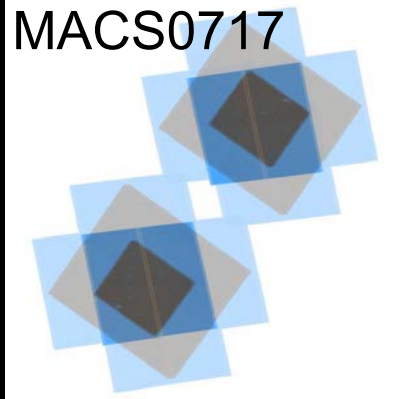
Abell S1063



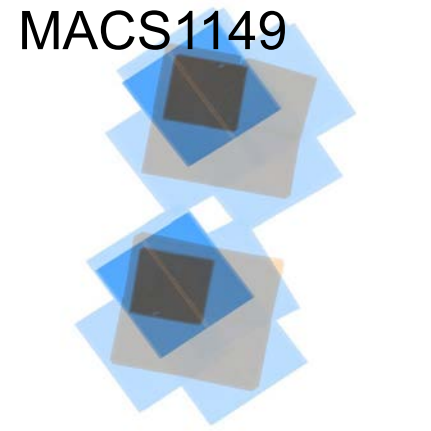
MACS0416



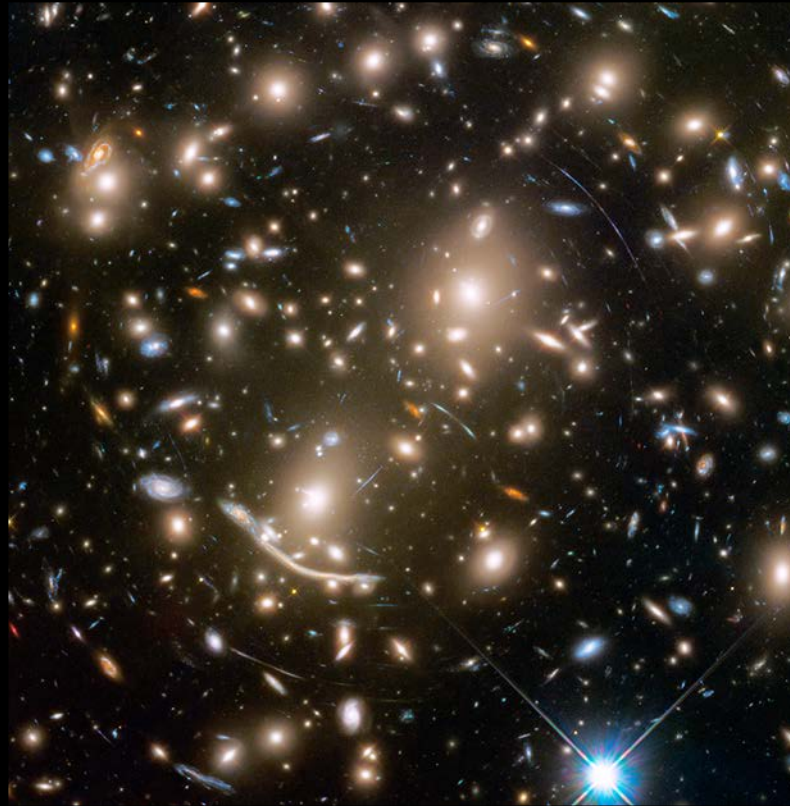
MACS0717



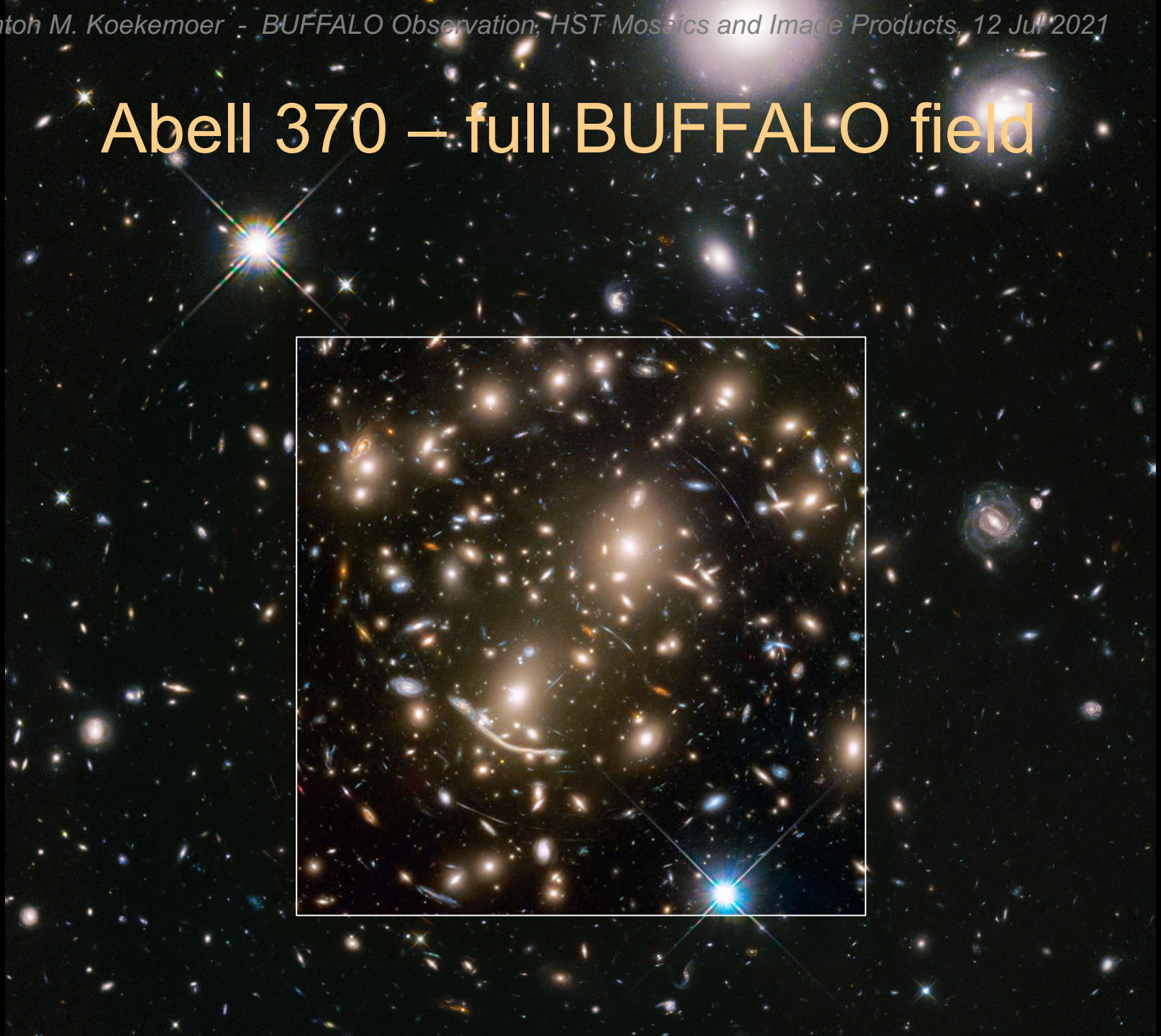
MACS1149



Abell 370 - Original HFF field



Abell 370 – full BUFFALO field

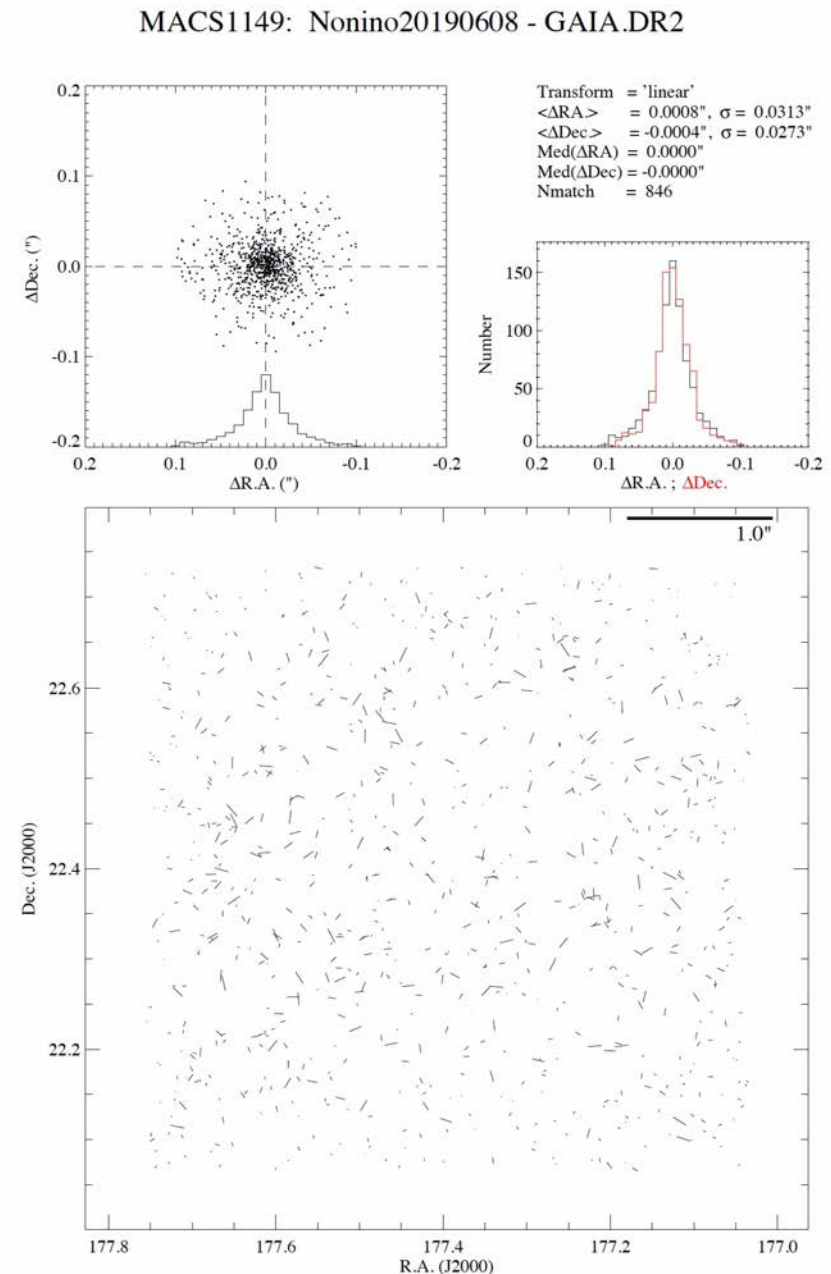


BUFFALO HST mosaics, 2021 release

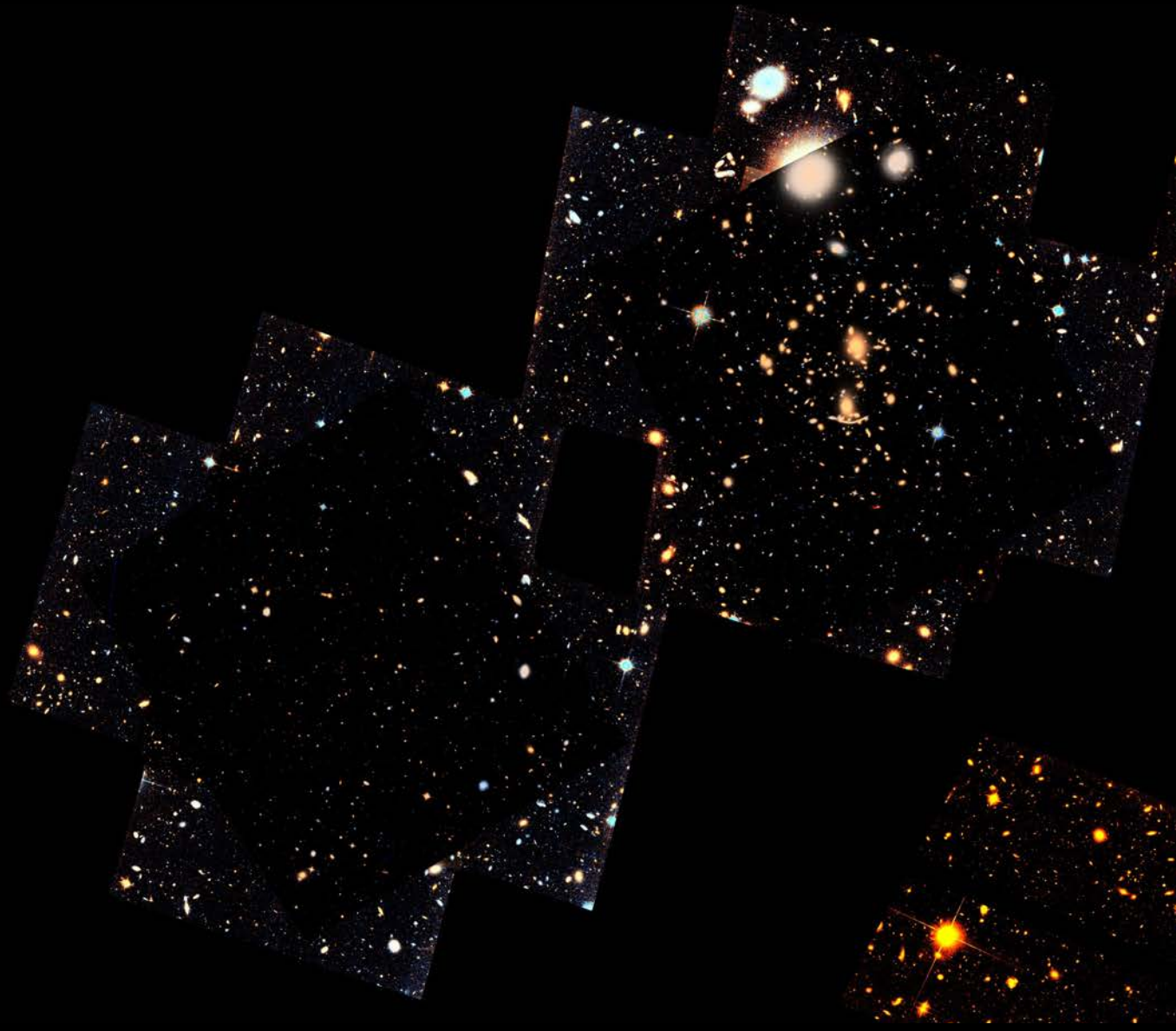
- Add all additional filters, data from other HST
 - mostly smaller programs
 - inhomogeneous WFC3/UV, IR, ACS coverage
 - additional depth is general incremental compared to the >1800-orbit 2020 release; mostly additional filters and area coverage
- Improved calibrations: backgrounds/ flatfields, other low-level improvements
- Astrometry tied to Gaia-DR2/3, via the deep ground-based catalogs from Mario Nonino

Astrometry

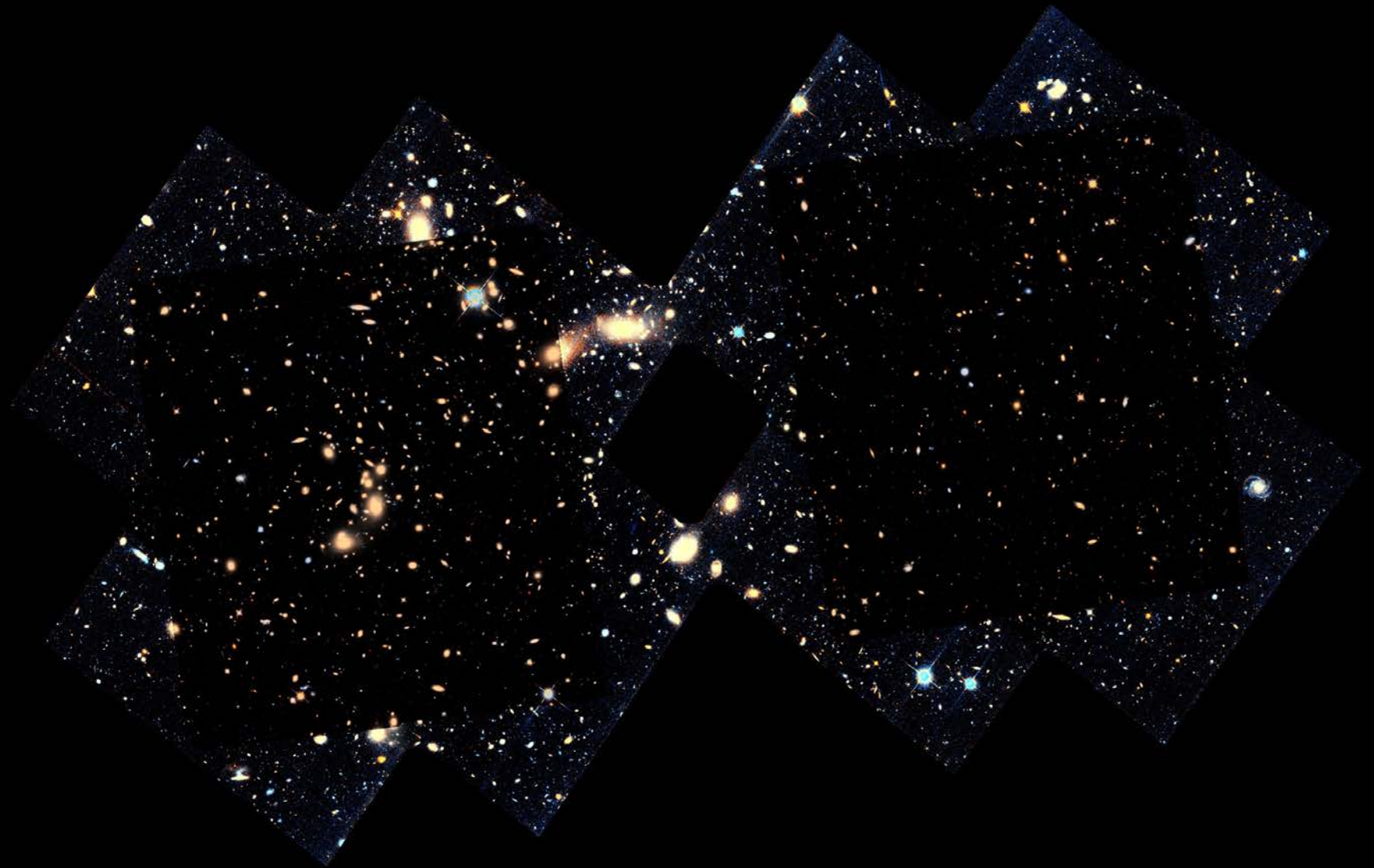
- Tied to ground-based Gaia catalogs (from Mario Nonino)
- Typical registration
HST/ground has ~20-30mas rms
- Relative (HST) astrometry ~1 mas



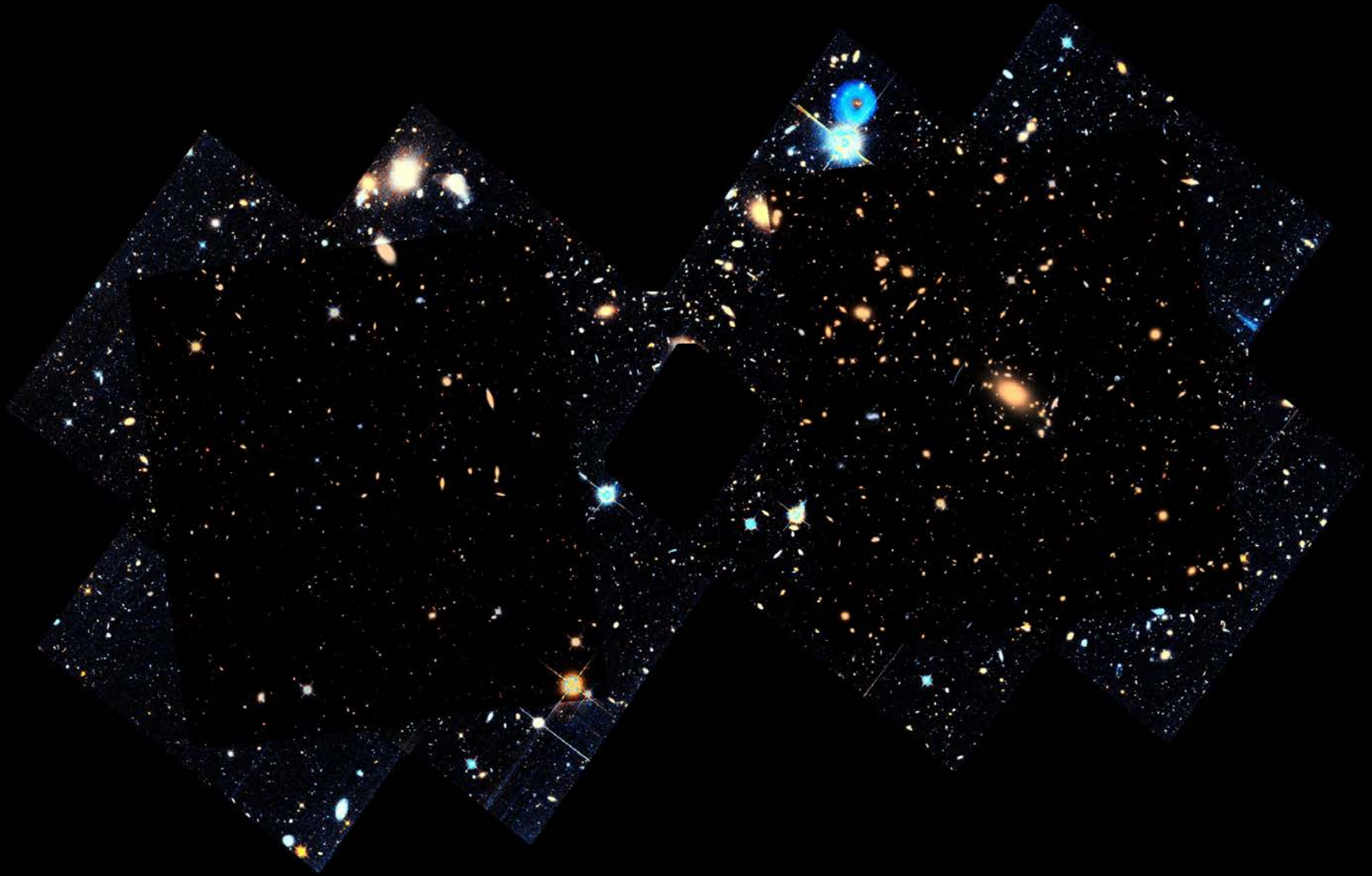
Abell370



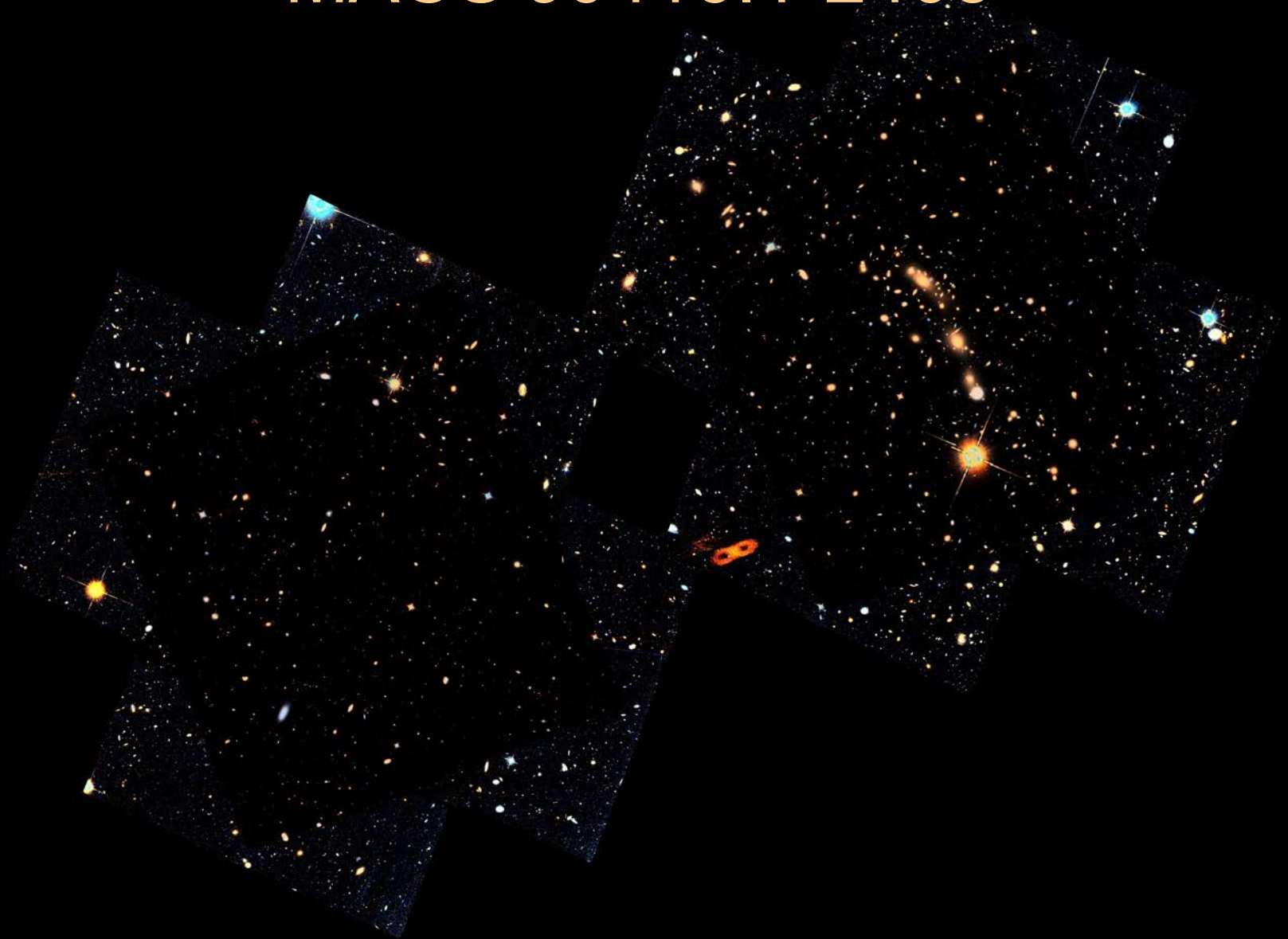
Abell2744



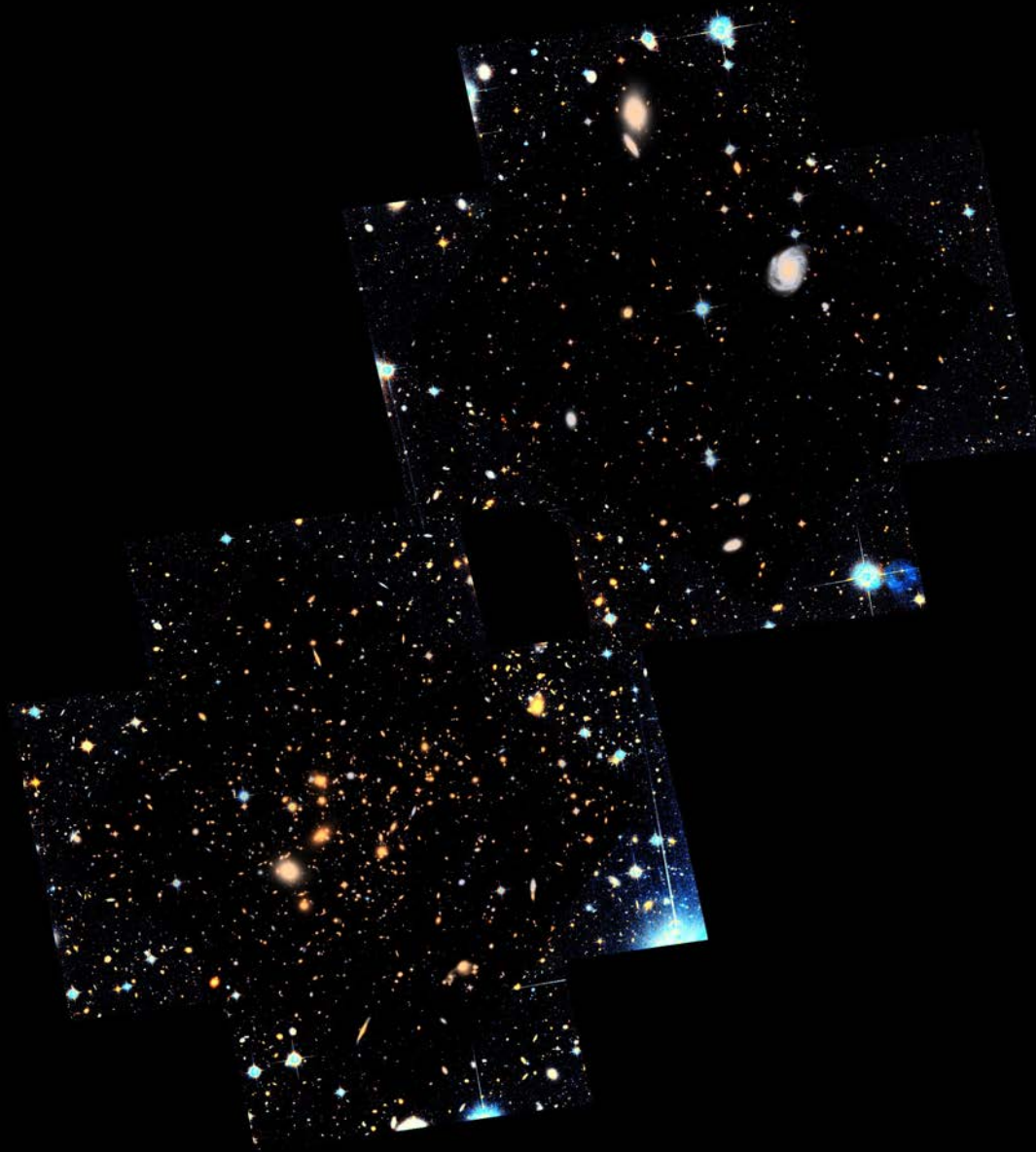
AbellS1063



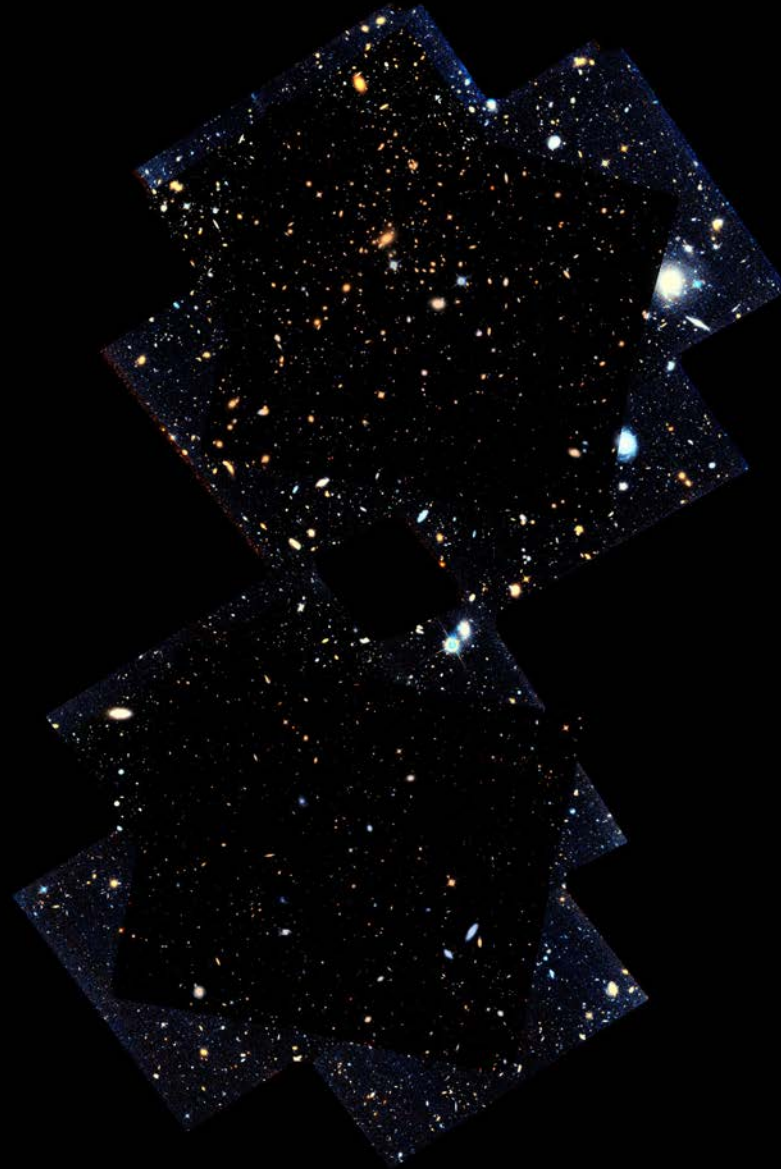
MACS J0416.1-2403



MACS J0717.5+3745



MACS J1149.5+2223



Mosaic Pipelines Overview:

- Specialized pipelines use Astrodrizzle to create combined mosaics for each field:
 - astrometrically registered to existing data, GAIA
 - full-depth mosaics (drz, ivm)
- Also single-exposure files (for lensing):
 - undrizzled (ie, in the distorted detector frame)
 - also versions drizzled to match mosaic scale
- Collecting all other ancillary data as well:
 - incl other HST ACS, WFC3/IR, UVIS

Data distribution

- Internal access area for the team:
 - <http://www.stsci.edu/~koekemoer/buffalo/internal>
(username "buffalo", password "Wings2018!")
 - Then click the link that says:
"Click here for BUFFALO internal data access"
and this goes to the STScI Archive internal area
- Public release: mosaics+catalogs+lens-models
- For more information:
 - BUFFALO TWG2 - Observations & Data
(contact co-chairs Anton Koekemoer & Mario Nonino)
 - Let us know what data you need (or would like to share)

archive.stsci.edu/pub/hlsp/buffa X

https://www.stsci.edu/~koekemoer/buffalo/internal/

STScI Mail Mail - Quarantine STScI ListServ Google Timecard! NIRCam - JWST - S... ADS Abstracts STScI | Mikulski Arc... Wolfram|Alpha Other Bookmarks

BUFFALO Internal HST Data Release

Anton M. Koekemoer (STScI)

Terms of use:

NOTE: This is a **private internal** data release to the BUFFALO team, for early access and initial science projects, papers, and proposals, under the following conditions:

- All uses of this data are subject to the [BUFFALO Team Policies](#)
- Any project using these data needs to be listed on the [BUFFALO Project Abstracts](#) page using the [Abstract form](#) (being sure to select at a minimum "TWG Observations/Data", also "TWG Catalogues", "TWG Lensing Mass Modeling", and any other datasets used).

All the data directories for all the clusters:

Cluster Target	Mosaics (30mas/pix)	Mosaics (60mas/pix)	Difference images	Weak Lensing images	Catalogs	Lens Models
Abell 370	mosaics-30mas/	mosaics-60mas/	sn-diff/	weak-lensing/	catalogs/	models/
Abell 2744	mosaics-30mas/	mosaics-60mas/	sn-diff/	weak-lensing/	catalogs/	models/
Abell S1063	mosaics-30mas/	mosaics-60mas/	sn-diff/	weak-lensing/	catalogs/	models/
MACS J0416.1-2403	mosaics-30mas/	mosaics-60mas/	sn-diff/	weak-lensing/	catalogs/	models/
MACS J0717.5+3745	mosaics-30mas/	mosaics-60mas/	sn-diff/	weak-lensing/	catalogs/	models/
MACS J1149.5+2223	mosaics-30mas/	mosaics-60mas/	sn-diff/	weak-lensing/	catalogs/	models/

Data access to all HST mosaics:

All the data in the table above are also oaccessible here:

<https://archive.stsci.edu/pub/hlsp/buffalo/internal/data/>

or ftp to [archive.stsci.edu/pub/hlsp/buffalo/internal/data/](ftp://archive.stsci.edu/pub/hlsp/buffalo/internal/data/)

(log in using your STScI/"MyST" archive account username and password)

