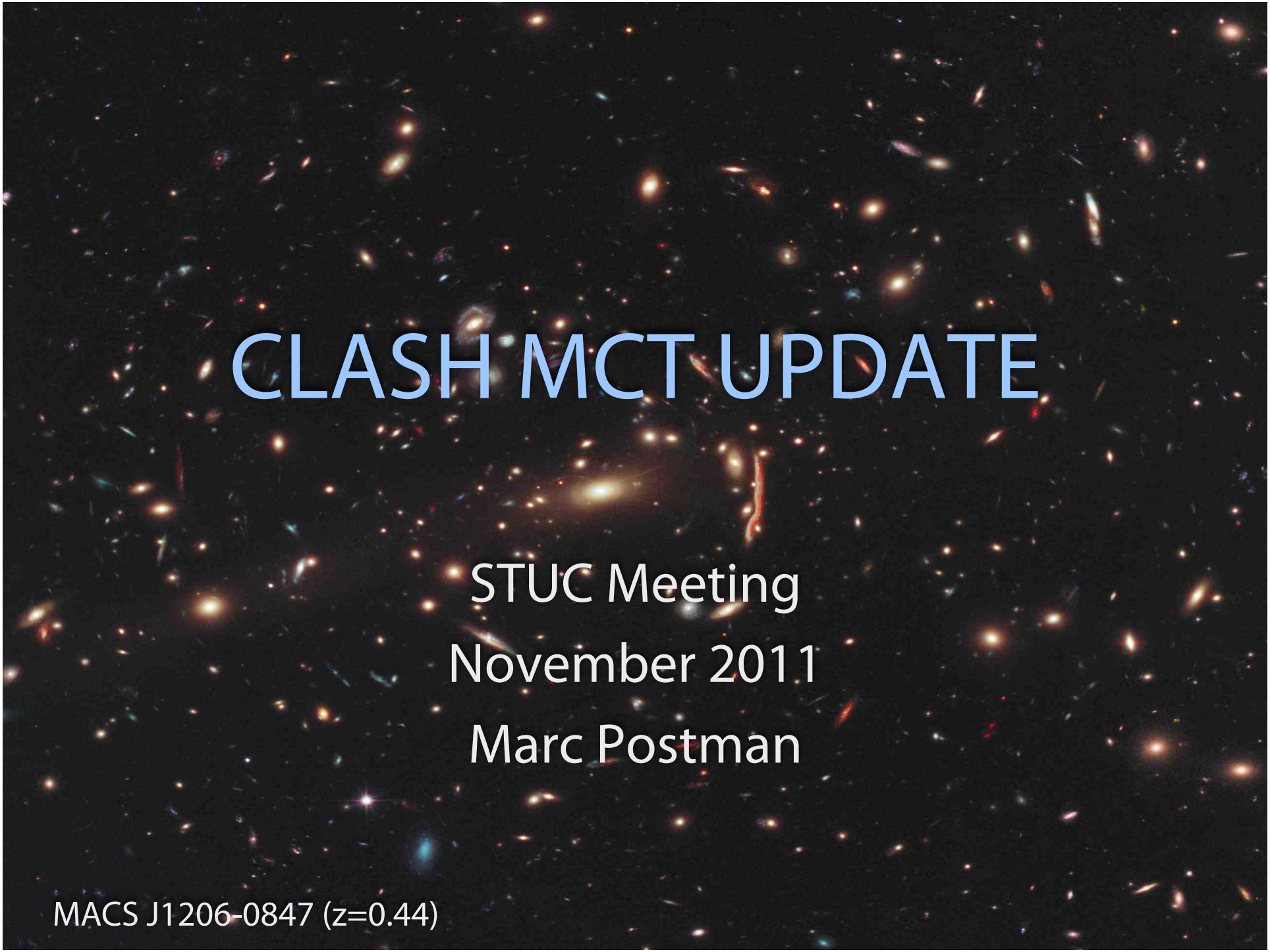

CLASH MCT UPDATE
STUC Meeting
November 2011
Marc Postman
MACS J1206-0847 (z=0.44)

Quick Status

- CLASH program is 39% complete (185 orbits out of 474). No observing anomalies to date.
- 8 clusters fully observed, 3 in progress. 11 clusters fully observed by end of 2011. Another 9 clusters to be observed in cycle 19 and 5 in cycle 20.
- High-level science product data releases for 6 clusters have been delivered to MAST by CLASH team. One science tool released: *Trilogy* color image creator.
- CLASH team has submitted 4 science papers to date. Community has submitted at least 3 papers to date. CLASH team aiming to have another 3 papers submitted by end of this year.
- CLASH Cycle 8 Spitzer program underway. The IRAC data are also public immediately upon ingest into the Spitzer archive. 8 CLASH clusters being observed.

CLASH Team Meeting in Heidelberg Oct 2011

CLASH Data Release Content

- 1st Release: 2 months after last obs for a cluster:
  - Co-added, mosaic-drizzled images for each of the 16 CLASH filters (65 mas/pixel)
  - ACS+WFC3/IR combined detection image
  - WFC3/IR combined detection image
- 2nd Release: 6 months after last obs for a cluster:
  - Co-added, mosaic-drizzled images (30 mas/pixel)
  - Source list for each filter, using ACS+IR detection image
  - Source list for IR filters using IR-only detection image
  - Source lists include preliminary photo-z estimates

CLASH Observation and Data Release Schedule

Cluster	Obs. Begin	Obs. End	1st Data Release (Plan)	1st Release (Actual)	2nd Data Release (Plan)	2nd Release (Actual)
Abell 383	**11/18/2010**	**03/01/2011**	**05/01/2011**	**05/01/2011**	**09/01/2011**	**11/02/2011**
MACS1149	**12/04/2010**	**03/09/2011**	**05/09/2011**	**05/06/2011**	**09/09/2011**	**11/02/2011**
Abell 2261	**03/09/2011**	**05/20/2011**	**07/20/2011**	**07/20/2011**	**11/20/2011**	**11/02/2011**
RXJ1347	**04/19/2011**	**07/11/2011**	**09/11/2011**	**09/15/2011**	01/11/2012	
MACS2129	**05/15/2011**	**07/11/2011**	**09/11/2011**	**09/15/2011**	01/11/2012	
MACS1206	**04/03/2011**	**07/19/2011**	**09/19/2011**	**09/30/2011**	01/19/2012	
MS2137	**08/21/2011**	**10/27/2011**	12/27/2011		04/27/2012	
MACS0329	**08/18/2011**	**11/01/2011**	01/01/2012		05/01/2012	
MACS0647	**10/05/2011**	11/26/2011	01/26/2012		05/26/2012	
MACS0717	**08/31/2011**	12/07/2011	02/07/2012		06/07/2012	
MACS0744	**09/22/2011**	12/27/2011	02/27/2012		06/27/2012	
MACS1115	12/11/2011	02/19/2012	04/19/2012		08/19/2012	
RXJ1532	01/30/2012	04/10/2012	06/10/2012		10/10/2012	
Abell 611	01/26/2012	05/14/2012	07/14/2012		11/14/2012	
MACS1720	03/23/2012	05/30/2012	07/30/2012		11/30/2012	
MACS1931	04/09/2012	06/30/2012	08/30/2012		12/30/2012	
RXJ2129	04/03/2012	07/15/2012	09/15/2012		01/15/2013	
Abell 209	06/25/2012	09/19/2012	11/19/2012		03/19/2013	
MACS0416	07/23/2012	09/25/2012	11/25/2012		03/25/2013	
RXJ2248	08/29/2012	10/30/2012	12/30/2012		04/30/2013	

Schedule for Cycle 20 not yet known (5 additional clusters)

Community Usage of CLASH HLSP

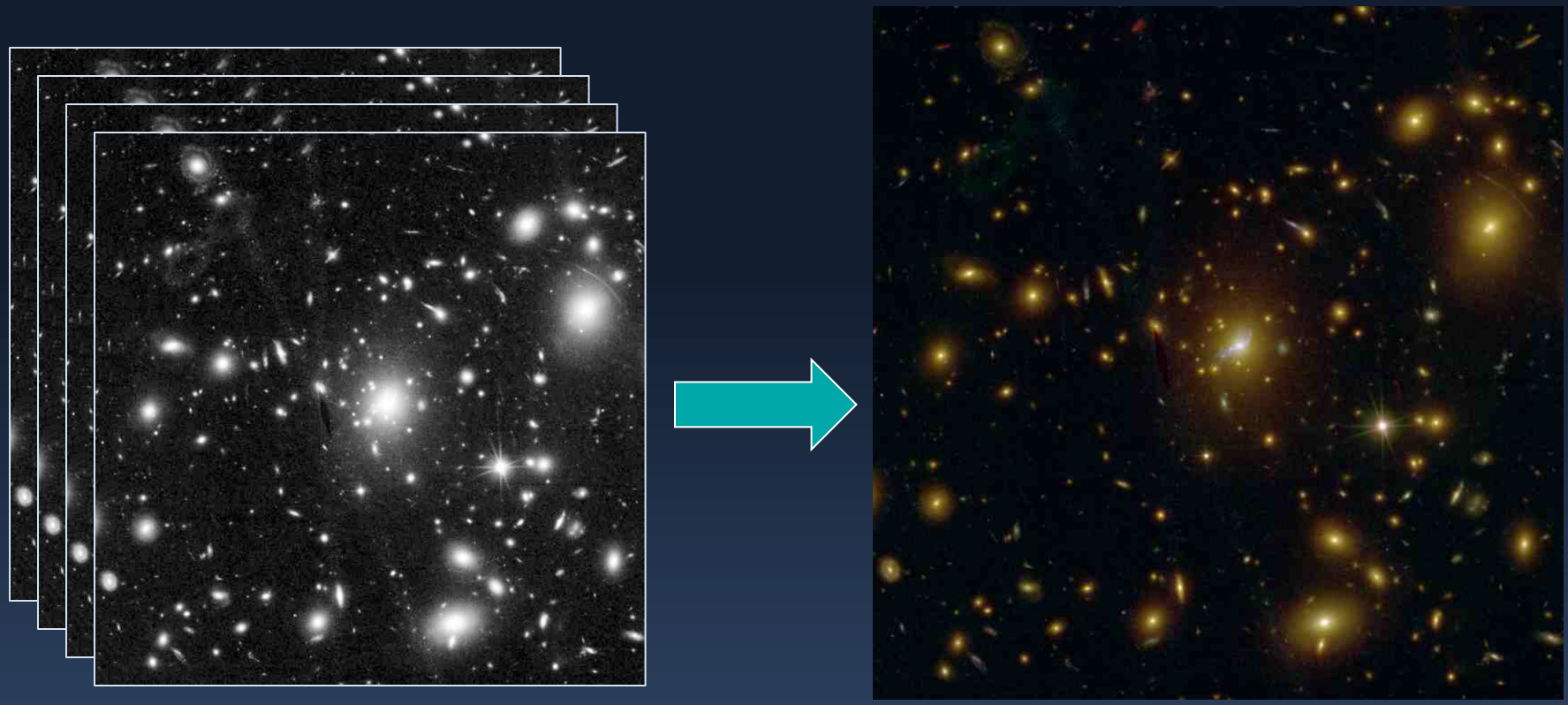
- Stats from Oct 20, 2011:
  - 20.7 GB of HLSP for CLASH available (more now)
  - 181 GB retrieved (~9:1 ratio)
  - 353 distinct IP addresses, over 20 distinct countries
  - China is largest user of CLASH HLSP data, followed by U.S. and Europe.
  - Detection images are the most popular deliverable.

Future Data Products

- Level 4 Data product releases will be synced with paper submissions. These include:
  - Mass models and magnification maps for each cluster
  - Spectroscopic redshifts
  - Spitzer photometry
  - SZE maps
  - Best-fit SED parameters, including constraints on total stellar masses and ages from full HST + SST data.

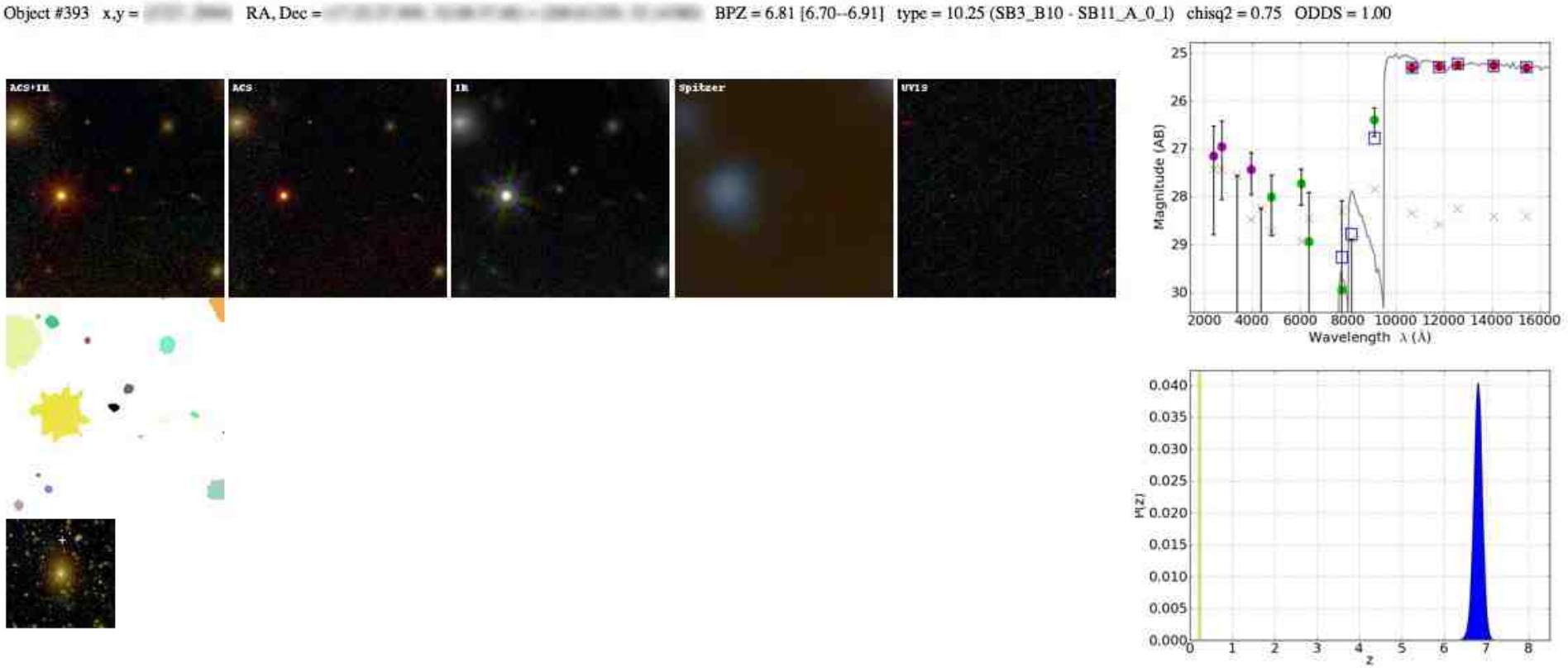
CLASH Science Tool Release

- Color image tool: *Trilogy* – python-based tool to create log-scaled RGB images from any number of input FITS files. **It was released in January 2011 for general use by the public and is available for download at** http://www-int.stsci.edu/~dcoe/trilogy/Intro.html



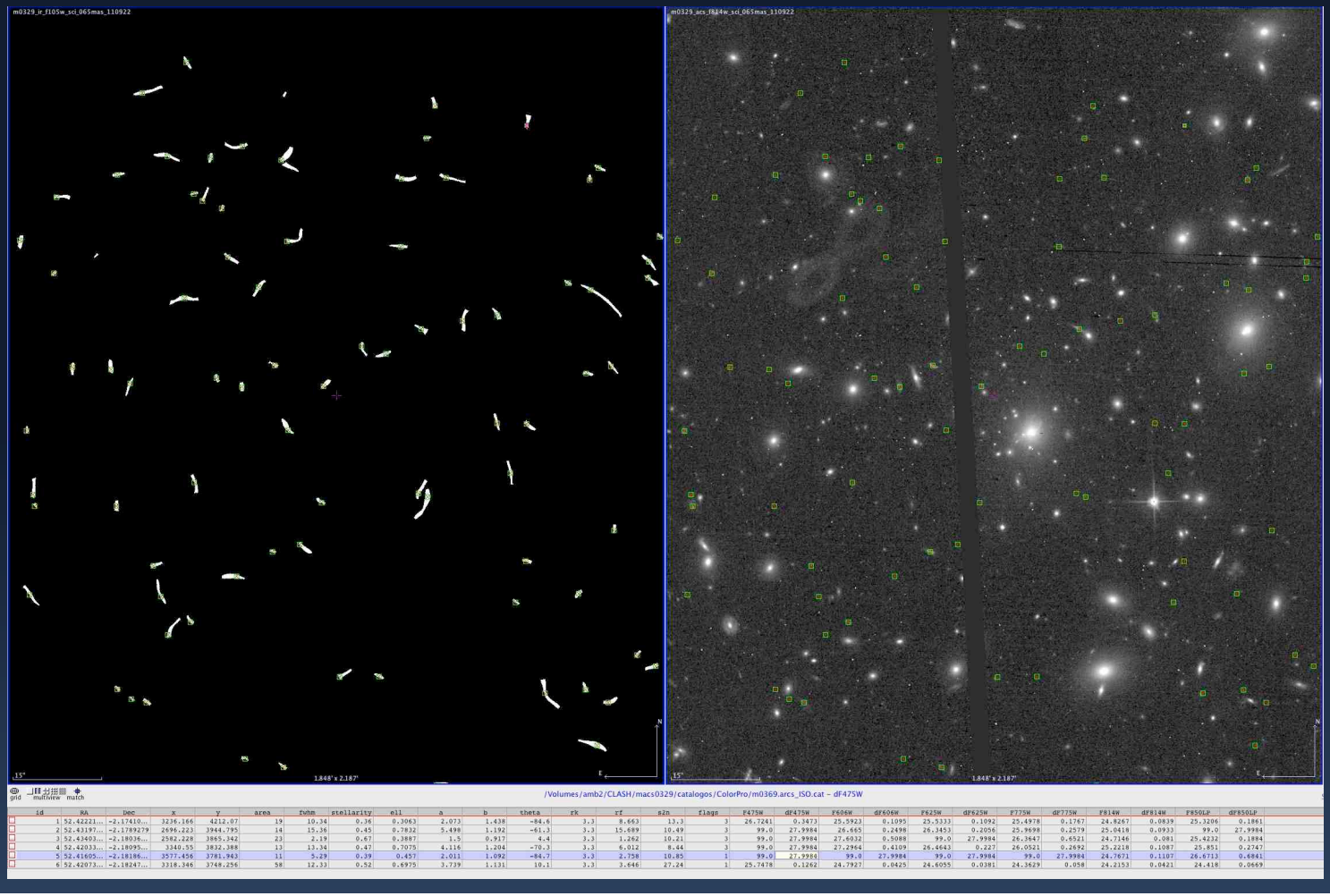
CLASH Science Tools Under Development

- CLASH Source Catalog Web-accessible Database: a web-based interface for displaying the full information about the photometric redshift estimates derived for each object in a CLASH image. The web page shows a cutout of the color image, the segmentation map used, the photometric data points, the best fit SED derived by the photo-z algorithm, and the full redshift probability function. **Release: Fall 2012.**



CLASH Science Tools Under Development

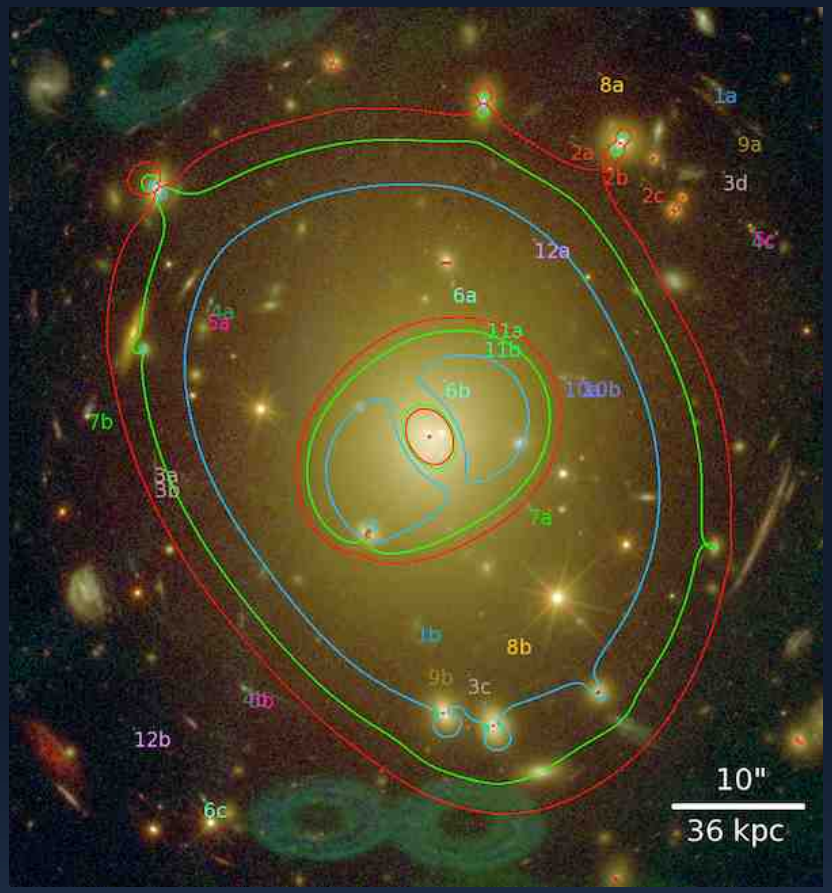
- Automated Multiply Lensed Arc Finder: Optimizes detection parameters of highly magnified galaxies. Work in progress. Goal is to combine the auto arc finder, the photo-z data, and mass modeling tool into an integrated analysis tool. Right now – all three steps are separate and labor intensive.



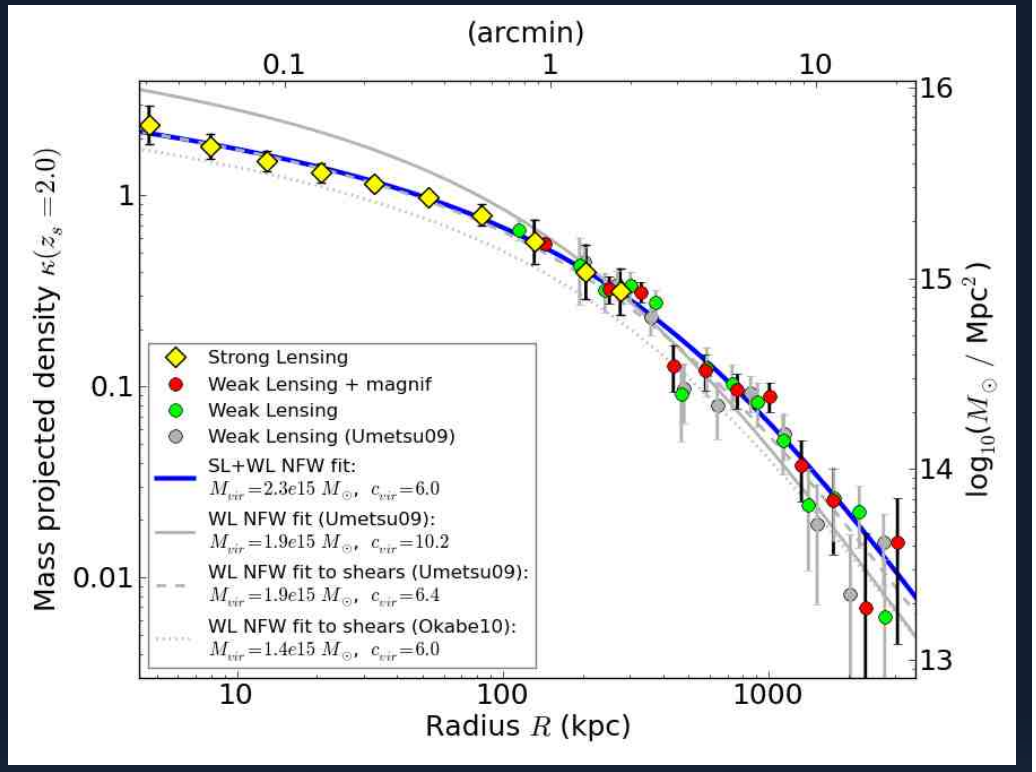

CLASH SCIENCE

MASS Model for Abell 2261

(Coe et al., in preparation)



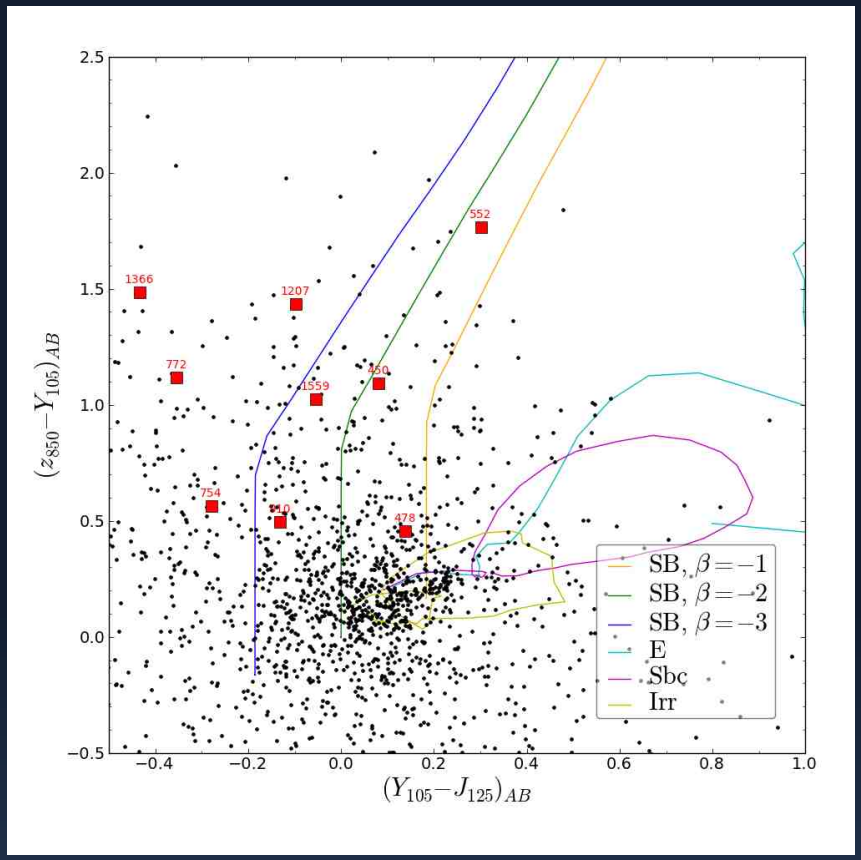
Non-parametric and parametric mass models, using 30 newly discovered arcs (from 12 distinct sources), are combined with weak lensing results to provide robust constraints on the mass profile of A2261.



Mass density profile

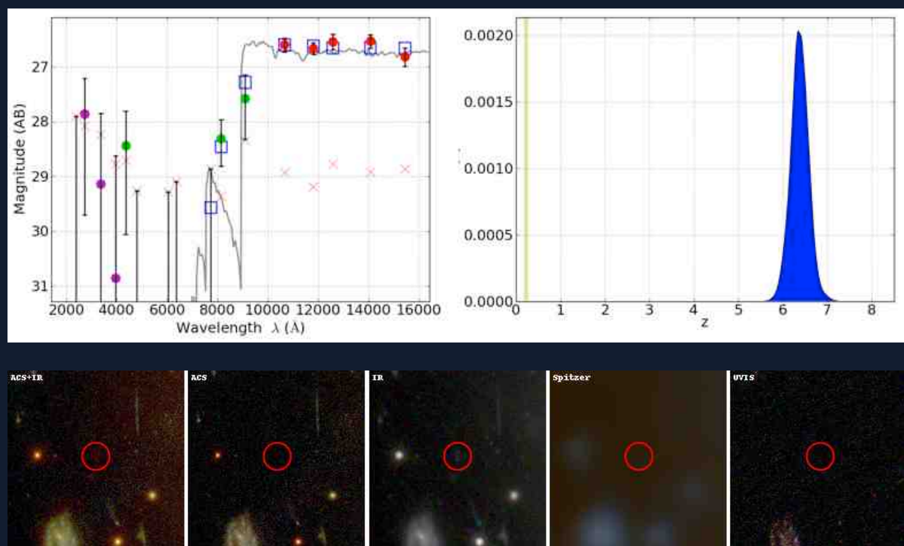
A2261 central concentration and mass now firmly constrained:

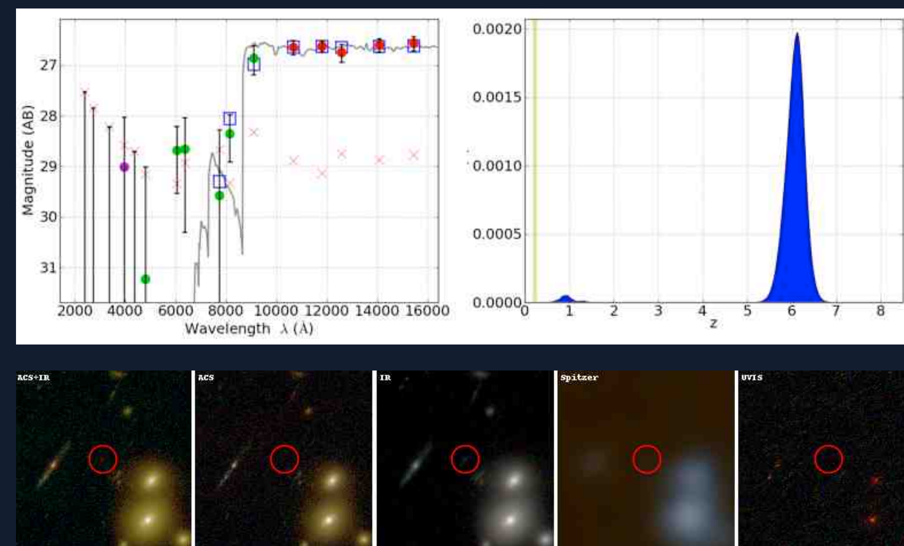
z > 6 Candidates in Abell 2261

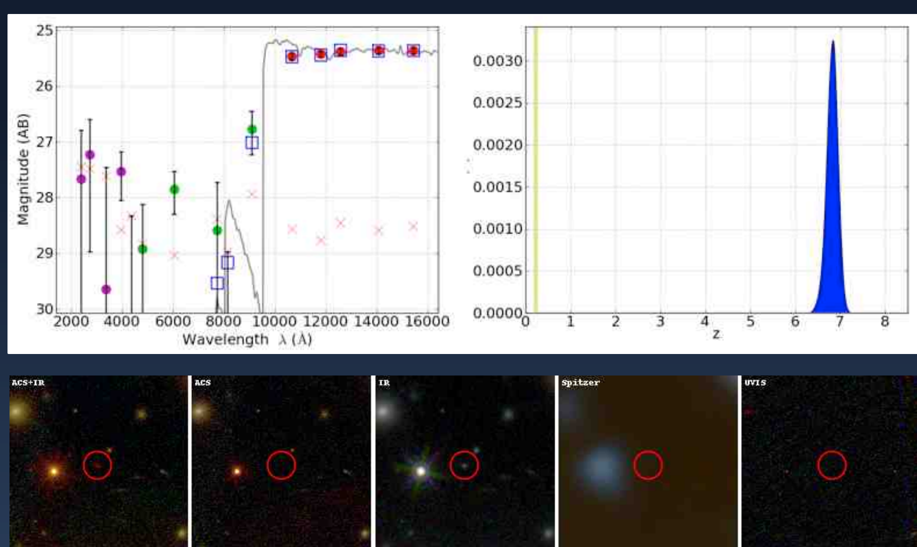


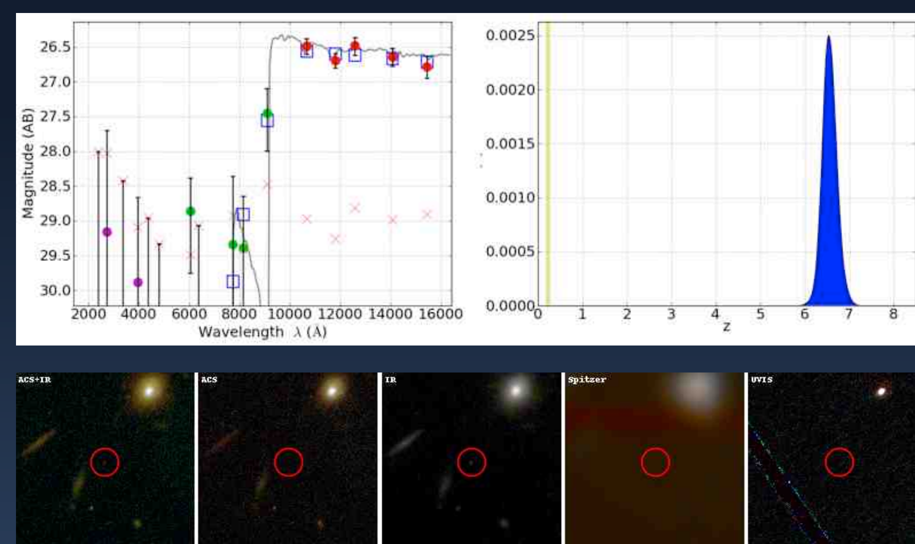
Bradley et al. (in prep)

z > 6 Candidates in Abell 2261

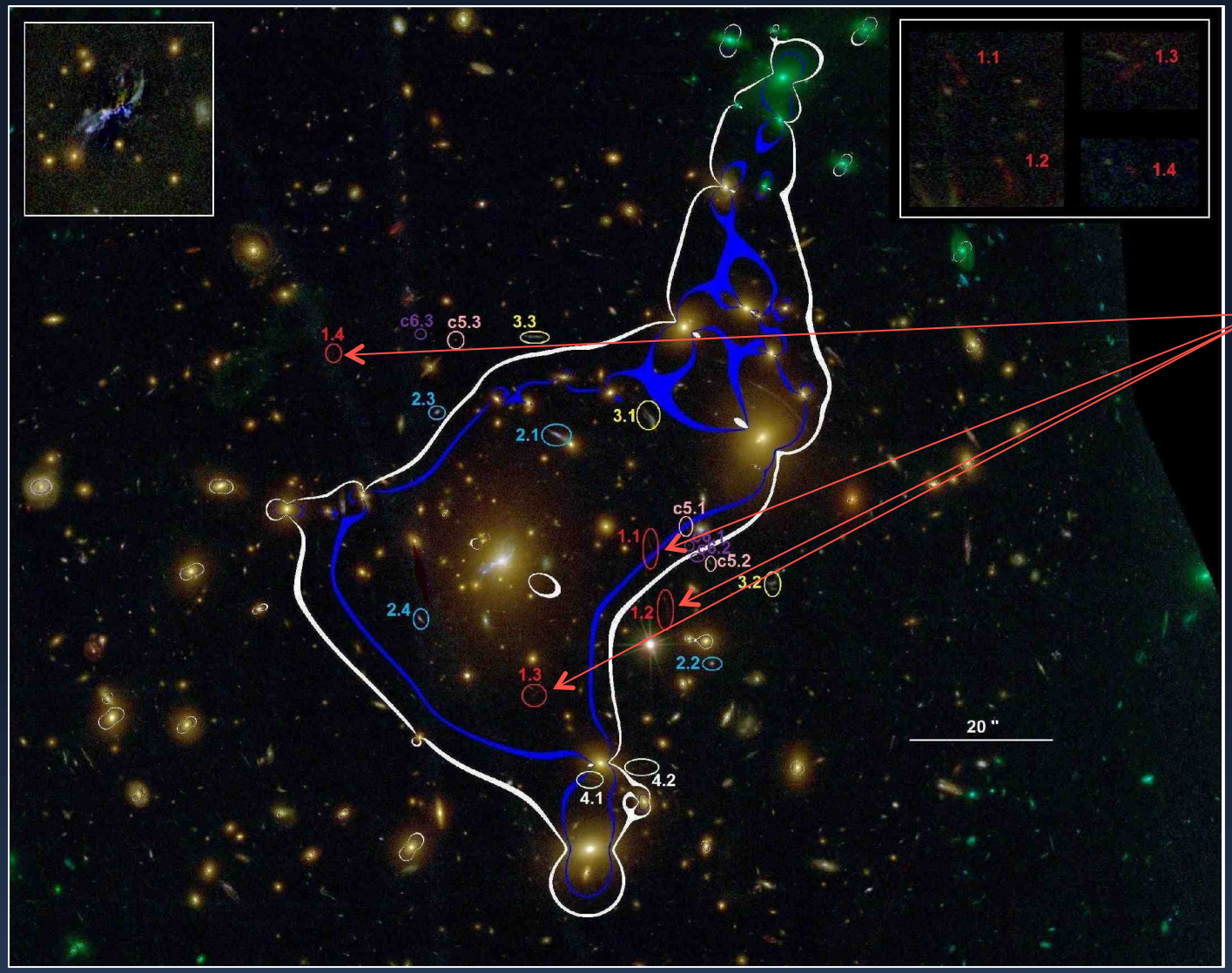








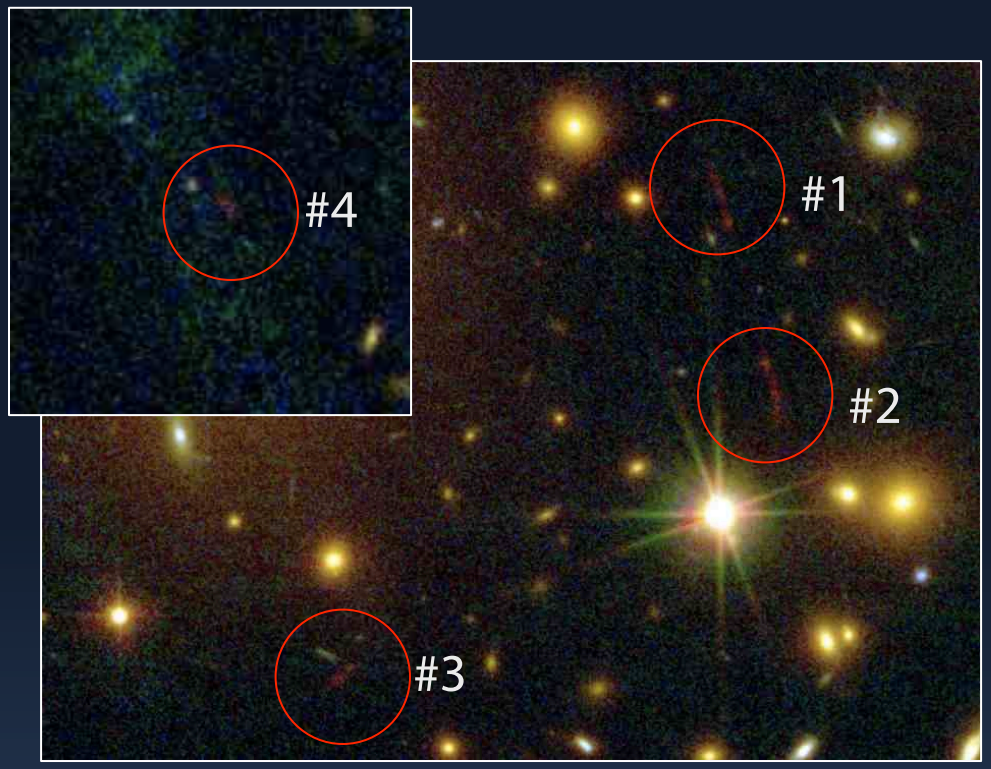
MACS J0329-02



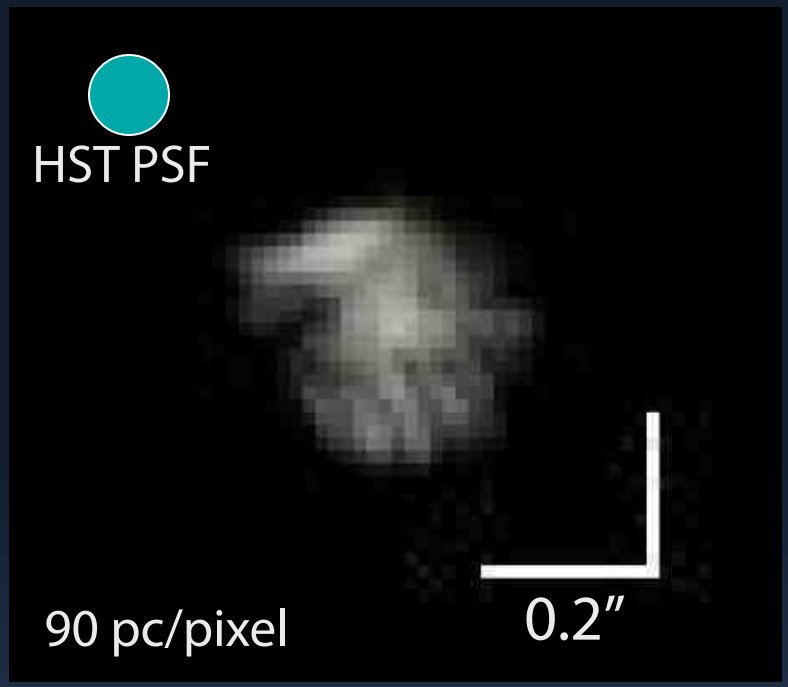
Quadruply-lensed red arc at zph ~ 6.15

Zitrin et al. (in prep)

MACS J0329-02: Quadruply-lensed Galaxy at z_{ph}= 6.15

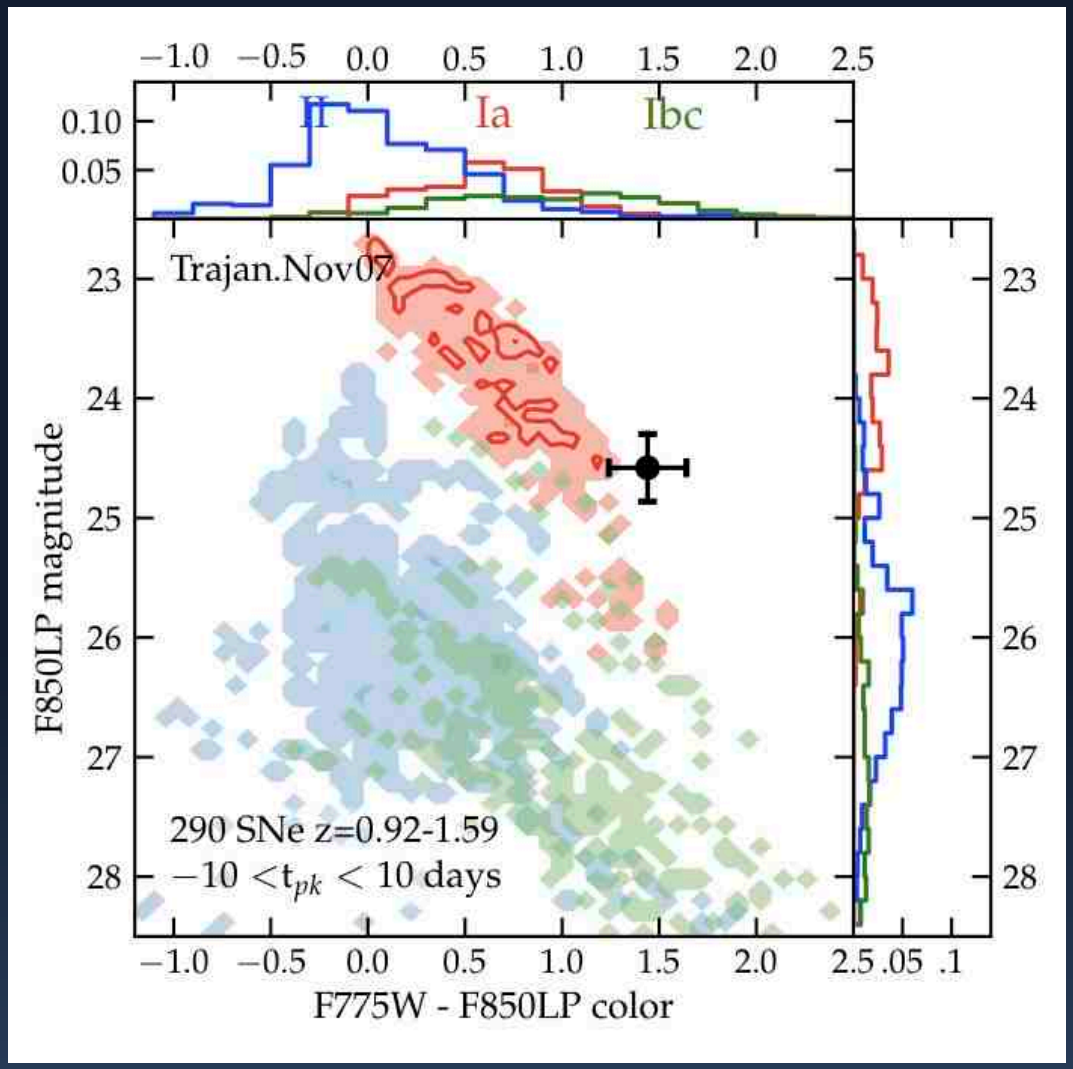


Magnifications: #1 = 11.6, #2 = 17.6, #3 = 3.9, #4 = 3.7



Delensed view (source plane)

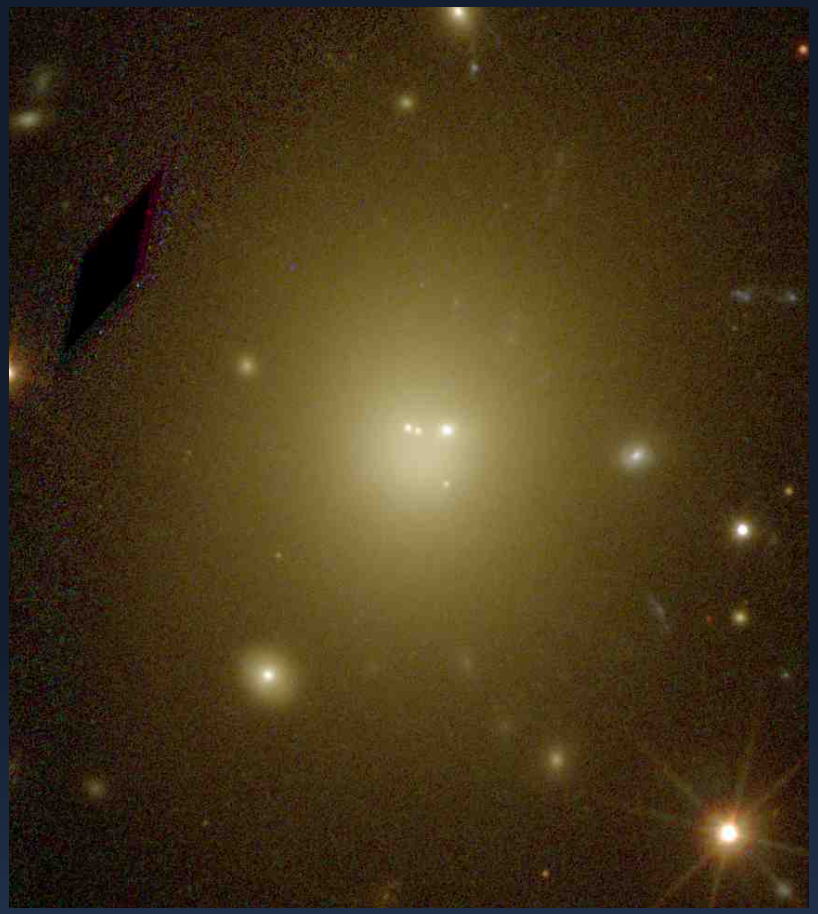
SN Candidate "Trajan" (z ~ 1.4) in parallel field of CLASH cluster MS2137



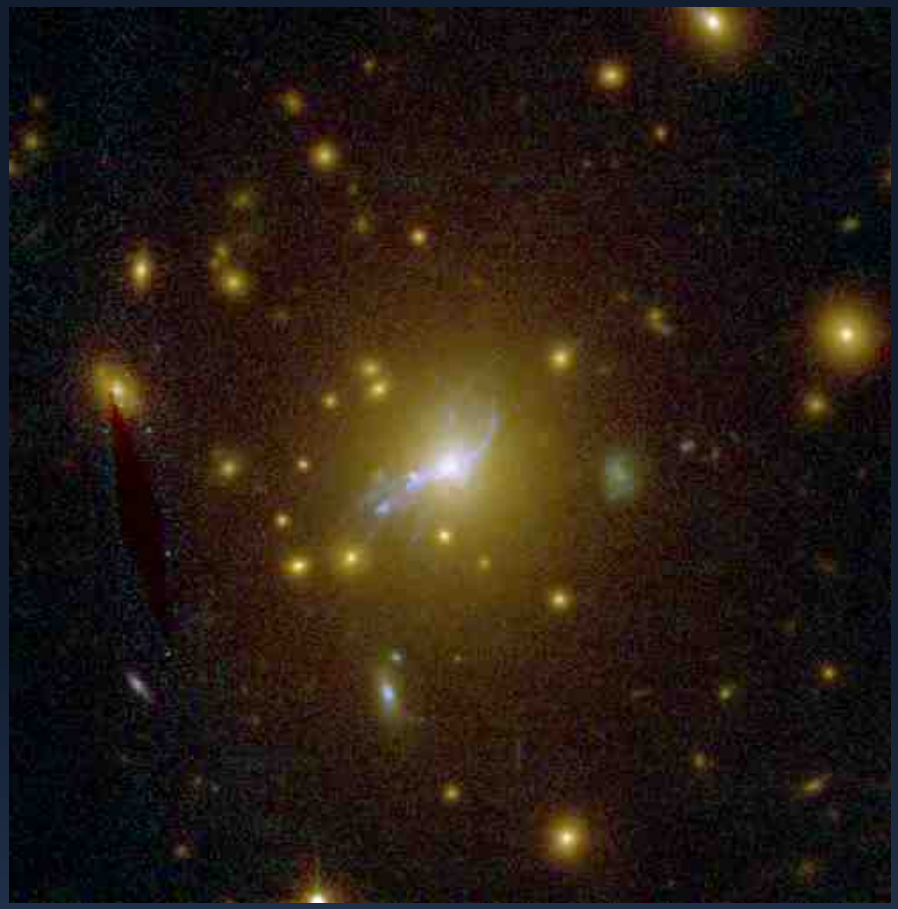
Host appears to be an early type galaxy. Photometry is consistent with a Type Ia SN. Follow up in progress.

Trajan was the Roman Emperor from 98 to 117 AD

CLASH Brightest Cluster Galaxies



Abell 2261



MACS J0329-0211

Science Paper Publication Status

Community Papers:

- Feb 2011: Richard et al., *"Discovery of a possibly old galaxy at z=6.027, multiply imaged by the massive cluster Abell 383", MNRAS in press.*
- July 2011: Schenker et al., *"Keck Spectroscopy of Faint 3 < z < 8 Lyman Break Galaxies: Evidence for a Declining Fraction of Emission Line Sources in the Redshift Range 6 < z < 8", ApJ in press.*
- Aug 2011: Morandi & Limousin, *"Triaxiality, principal axis orientation and non-thermal pressure in Abell 383",* MNRAS in press.

CLASH Team Papers:

- March 2011: Zitrin et al., *"The Cluster Lensing and Supernova Survey with Hubble (CLASH): Strong Lensing Analysis of Abell 383 from 16-Band HST WFC3/ACS Imaging"*, ApJ in press.
- June 2011: Postman et al., "CLASH: An Overview", ApJS, submitted.
- June 2011: Lemze et al., "*Profiles of Dark Matter Velocity Anisotropy in Simulated Clusters",* ApJ, submitted.
- July 2011: Zitrin et al., "CLASH: New Multiple Images Constraining the Inner Mass Profile of MACS J1206.2-0847", ApJ, submitted.

Science Paper Publication Status

Papers in Preparation (next 3 - 4 months or sooner):

- Coe et al., *"Mass Profile of Abell 2261 from Multiple Probes"*
- Bradley et al., *"High Redshift (z ~ 7) Candidates Magnified by Abell 2261"*
- Zitrin et al., *"A z=6.2 Galaxy Multiply Lensed Four Times by MACSJ0329-0211"*
- Medezinski et al., *"Galaxy Substructures around MACSJ1206-0847"*
- Umetsu et al., *"Evidence for Filamentary Structure Around CLASH Clusters"*
- Jouvel et al., *"Photometric Redshift Methods and Accuracy in the CLASH Program"*
- Postman et al., *"Flat Core BCG in Abell 2261"*
- Lemze et al., *"Mass Profiles of CLASH Clusters from Galaxy Dynamics"*

Issues Being Worked

- One CLASH Cluster - Abell 963 – will have to be replaced with a new target as there are no usable guide stars available. A963 is currently a cycle 20 target. We will make the replacement in advance of the cycle 20 CP.
- CTI effects in UVIS are non-negligible below 390 nm. Working with STScI to test UVIS CTI corrections for faint source photometry and to test mitigation of CTI using charge-injection (Abell 611 will be used as part of a charge injection calibration test this spring).