



16428 - Keep It Simple: Massive Two-Body Mergers at $z \sim 0.6$

Cycle: 28, Proposal Category: GO

(Availability Mode: SUPPORTED)

INVESTIGATORS

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|---|---|-------------------------------|
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VISITS

| <i>Visit</i> | <i>Targets used in Visit</i> | <i>Configurations used in Visit</i> | <i>Orbits Used</i> | <i>Last Orbit Planner Run</i> | <i>OP Current with Visit?</i> |
|--------------|------------------------------|-------------------------------------|--------------------|-------------------------------|-------------------------------|
| 01 | (1) EMACSJ0502.9-2902 | ACS/WFC | 1 | 25-Aug-2020 12:00:14.0 | yes |

1 Total Orbits Used

ABSTRACT

Major mergers are pivotal events in the formation of large-scale structure that mark the creation of the most massive galaxy clusters of their epoch. At $z > 0.5$, they are signposts of the first such systems to have formed in the Universe. We propose an exploratory Chandra/HST study of two massive mergers at $z > 0.5$, discovered by the eMACS project and carefully selected to feature a simple, two-body geometry, in order to determine the merger phase (pre- or post-collision), global X-ray properties, and strong-lensing power, thereby assessing their potential for future, in-depth lensing and structure evolution studies.

OBSERVING DESCRIPTION

Our target already has partial coverage with HST, obtained as part of a longstanding SNAPshot program on eMACS clusters (PI: Ebeling). To complete the required 4-filter coverage (from the near-UV to 1 micron in the cluster restframe) eMACSJ0502 still needs critically important imaging with ACS in the F814W passband. A single orbit will suffice to allow the secure confirmation and further identification of multiple-image lensing features based on their matching morphology and matching colors. The F814W passband lies fully redward of the D4000A break at the cluster redshift, thus providing critical color information to distinguish between cluster members and lensed background galaxies. The requested one-orbit F814W observation of eMACSJ0502 (dithered to allow the removal of cosmic rays and to fill in the ACS chip gap) matches the depth of the F606W data already in hand for our target. The full 4-filter data set will not only facilitate the identification of lensing features, but will also provide valuable information on the galaxy population of the cluster, highlighting ram-pressure stripping events as well as star formation and dust in the BCGs.

Proposal 16428 - e0502-f814w (01) - Keep It Simple: Massive Two-Body Mergers at z~0.6

Tue Aug 25 16:00:14 GMT 2020

| | | | | | |
|--------------|--|--|--|--|--|
| Visit | Proposal 16428, e0502-f814w (01) | | | | |
| | Diagnostic Status: No Diagnostics | | | | |
| | Scientific Instruments: ACS/WFC | | | | |
| | Special Requirements: (none) | | | | |

| Patterns | # | Primary Pattern | Secondary Pattern | Exposures | |
|-----------------|-----|--|--|--|--|
| | (1) | Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=3.034 Line Spacing= | Coordinate Frame=POS-TARG Pattern Orientation=85.29 Angle Between Sides= Center Pattern=false | Pattern Type=ACS-WFC-DITHER-LINE Purpose=DITHER Number Of Points=2 Point Spacing=0.262 Line Spacing= | Coordinate Frame=POS-TARG Pattern Orientation=18.39 Angle Between Sides= Center Pattern=false |

| Fixed Targets | # | Name | Target Coordinates | Targ. Coord. Corrections | Fluxes | Miscellaneous |
|--|-----|-------------------|---|--------------------------|--------|---------------|
| | (1) | EMACSJ0502.9-2902 | RA: 05 02 54.4000 (75.7266667d) Dec: -29 02 22.00 (-29.03944d) Equinox: J2000 | | | V=21 |
| <i>Comments:</i> Category=CLUSTER OF GALAXIES Description=[GRAVITATIONAL LENS, RICH CLUSTER] | | | | | | |

| Exposures | # | Label | Target | Config,Mode,Aperture | Spectral Els. | Opt. Params. | Special Reqs. | Groups | Exp. Time (Total)/[Actual Dur.] | Orbit |
|------------------|---|-------------|-----------------------|----------------------|---------------|--------------|---------------|--------|--|----------------------|
| | 1 | 0502-29_814 | (1) EMACSJ0502.9-2902 | ACS/WFC, ACCUM, WFC | F814W | CR-SPLIT=NO | | | Pattern 1, Exps 1-1 in e0502-f814w (01) (1) | 520 Secs (2080 Secs) |
| | | | | | | | | | [=>(Pattern 1,1)] [=>(Pattern 1,2)] [=>(Pattern 2,1)] [=>(Pattern 2,2)] | [1] |

