



## HLA news in the last year

- New interface features and capabilities
- New delivery process
- New data and revamped pipelines
- New data formats
- Prototype spectra
- Outreach and collaborations
- Future plans



## New interface capabilities

- Completely redesigned footprint interface
  - Allows panning, zooming, direct user interactions
  - Fully integrated with the rest of the interface
    - Selections and filters valid across views
    - Uniform table view
- Clickable sources in image overlay
  - Brings up table with source properties
- Augmented table of product data
  - Includes release date, source list availability
- Improved plotting tool
  - To be interfaced with upcoming spectral data prototypes
- Source lists stored only in database; files generated on-the-fly
  - Tables filtered for abnormal values
  - Enables future user-selected output options
  - Multi-band source lists now available
    - Collate photometry across filters (for each visit)



## Hubble Legacy Archive

M101

[Search](#)

[Reset](#)

[advanced search](#)

Examples: M101, 14 03 12.6 +54 20 56.7 r=0.2d, more...

Requires Firefox, Safari, IE, or compatible browser

[Inventory](#)

[Images](#)

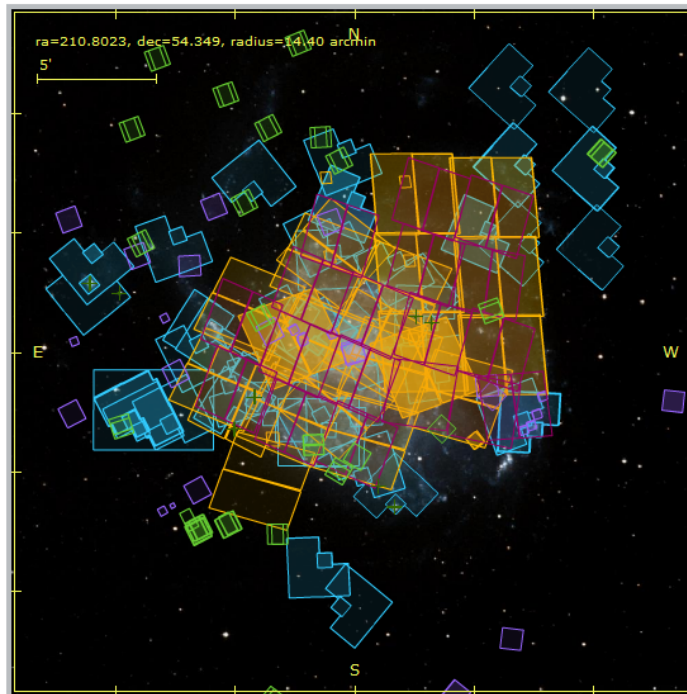
[Footprints](#)

[Cart, 0 kB](#)

[Grism Spectra \(ST-ECF\)](#)

[Help Center](#)

Instruments	#Footprints
<input checked="" type="checkbox"/> ALL	1293
<input checked="" type="checkbox"/> ACS	205
<input checked="" type="checkbox"/> ACSGrism	0
<input checked="" type="checkbox"/> WFPC2	363
<input checked="" type="checkbox"/> WFPC2-PC	355
<input checked="" type="checkbox"/> NICMOS	122
<input checked="" type="checkbox"/> NICGrism	0
<input checked="" type="checkbox"/> WFC3	18
<input checked="" type="checkbox"/> COS	0
<input checked="" type="checkbox"/> STIS	170
<input checked="" type="checkbox"/> FOS	60
<input checked="" type="checkbox"/> GHRS	0

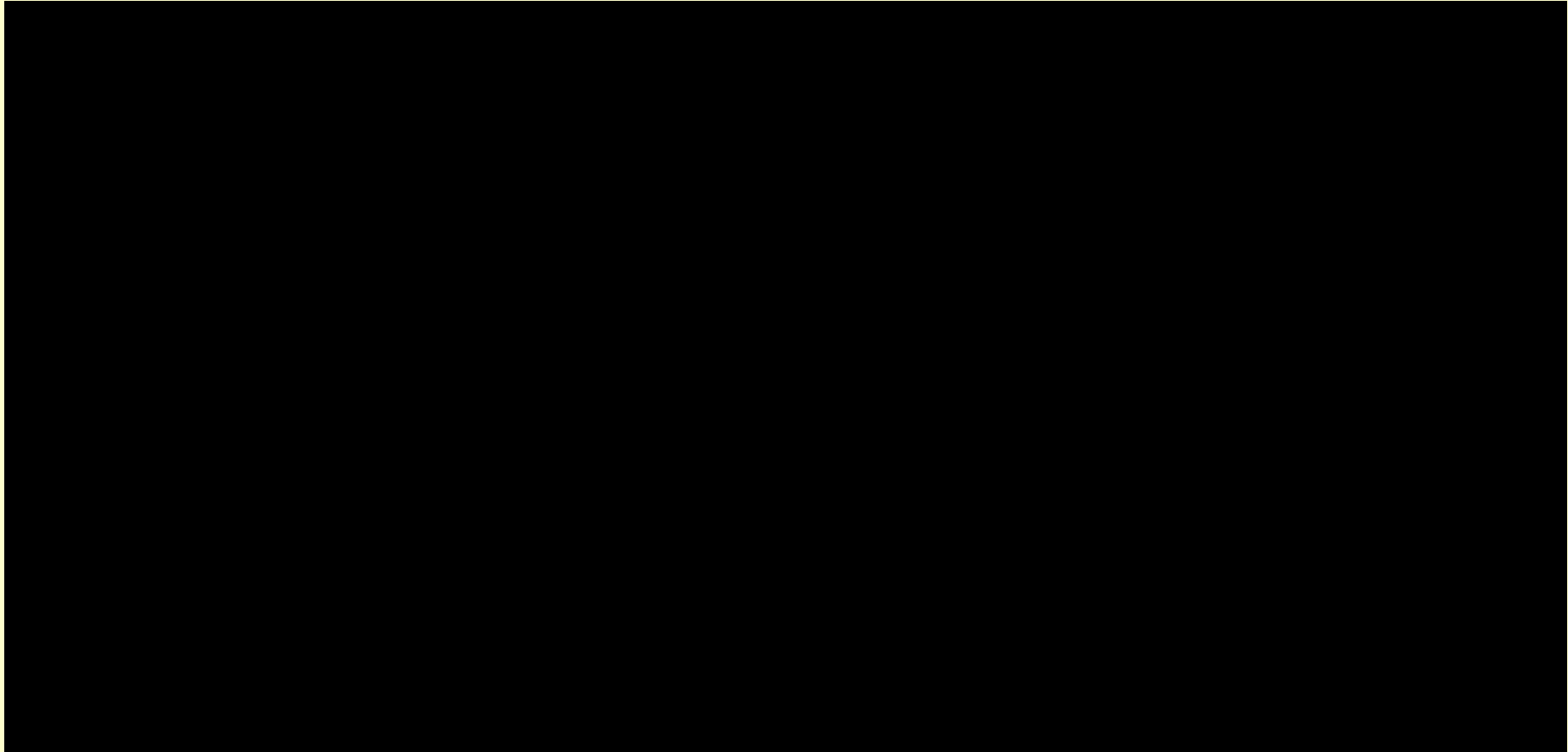


Click to select the interactive footprint graphic: you can then zoom in using the = or + keys, or zoom out using -.



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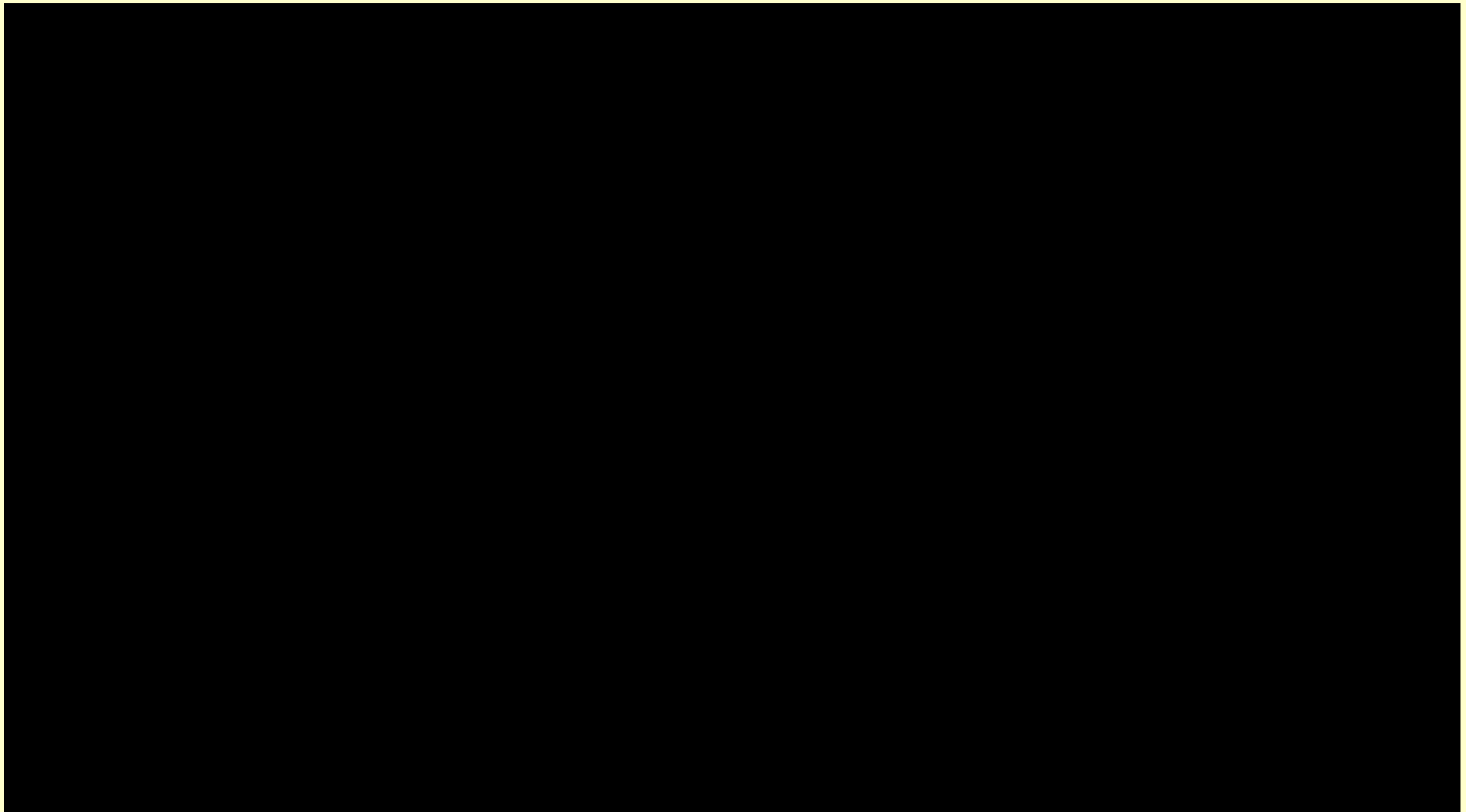
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# New data delivery process

- Incremental deliveries
  - New data processed as they become available (public)
  - Releases on a regular (~biweekly) basis
  - Goal is to make data products available shortly after release
    - Currently time scales are ~6 months or longer
- Separate instance of database for new data processing
  - New data products are stored separately
  - Ensures that data processing does not impact database response
  - Facilitates data review and generation of reports for users
  - Publication date included in database to identify new deliveries
  - Database propagation streamlined to minimize user impact
- Approval process instituted
  - New data products are reviewed to identify processing issues
  - Products can be approved, slated for reprocessing, or rejected
  - Once data products are mature, approval becomes automatic
  - Separate instance of database for data processing
  - New approval interface undergoing testing with WFC3 data





# New data and revamped pipelines

- The new WFC3 pipeline is complete
  - Includes both processing and source list generation
  - Highly modular design; almost all key functions in compact definitions
  - Pyraf/IRAF dependencies minimized; use Numpy, Pyfits where practical
  - Over 100 visits processed and ingested, products undergoing internal testing
  - Designed to be easily modified for other instruments, mosaics
- Algorithms very similar to ACS, NICMOS pipelines with some significant differences
  - Sky not subtracted
    - Sky matching routine ensures continuity in partial overlap regions
    - Sky adjustment value included in header
    - Avoids discontinuities in regions with diffuse background
  - Invalid pixels assigned obvious zero value
    - Previously assigned value from first image per multidrizzle default
  - Improved registration algorithms
    - Expected to work even in the presence of heavy cosmic ray contamination
    - Refinements and tests ongoing
    - Necessary for future expansion to mosaics
  - New data format



## New data and revamped pipelines (2)

- Updated and/or completed processing for ACS, NICMOS, WFPC2
  - All WFPC2 science images reprocessed at CADC with latest calibration
  - NICMOS images now include SAAClean correction
  - ACS processing brought up to date
  - Source lists generated for ACS and WFPC2 images
- Migrated ACS, NICMOS grism products to STScI
  - ST-ECF shutdown 12/31/2010
  - Pipeline software migrated for archival purposes
    - Currently no specific plan to run on additional data
    - May form basis for future WFC3 grism processing software
  - Data files served from STScI HLA servers
  - Database loaded in local database
  - Web content ported to STScI servers
    - One remaining web page being ported, currently accesses ESO servers
    - Functionality transparent to users
  - HLA search uses local grism data





hst\_11570\_23\_wfc3\_uvis\_f350lp

Lighter Darker Invert advanced contrast controls

DAOPhot  SExtractor  SDSS  2MASS  GSC2  FIRST  GALEX

698 3543  
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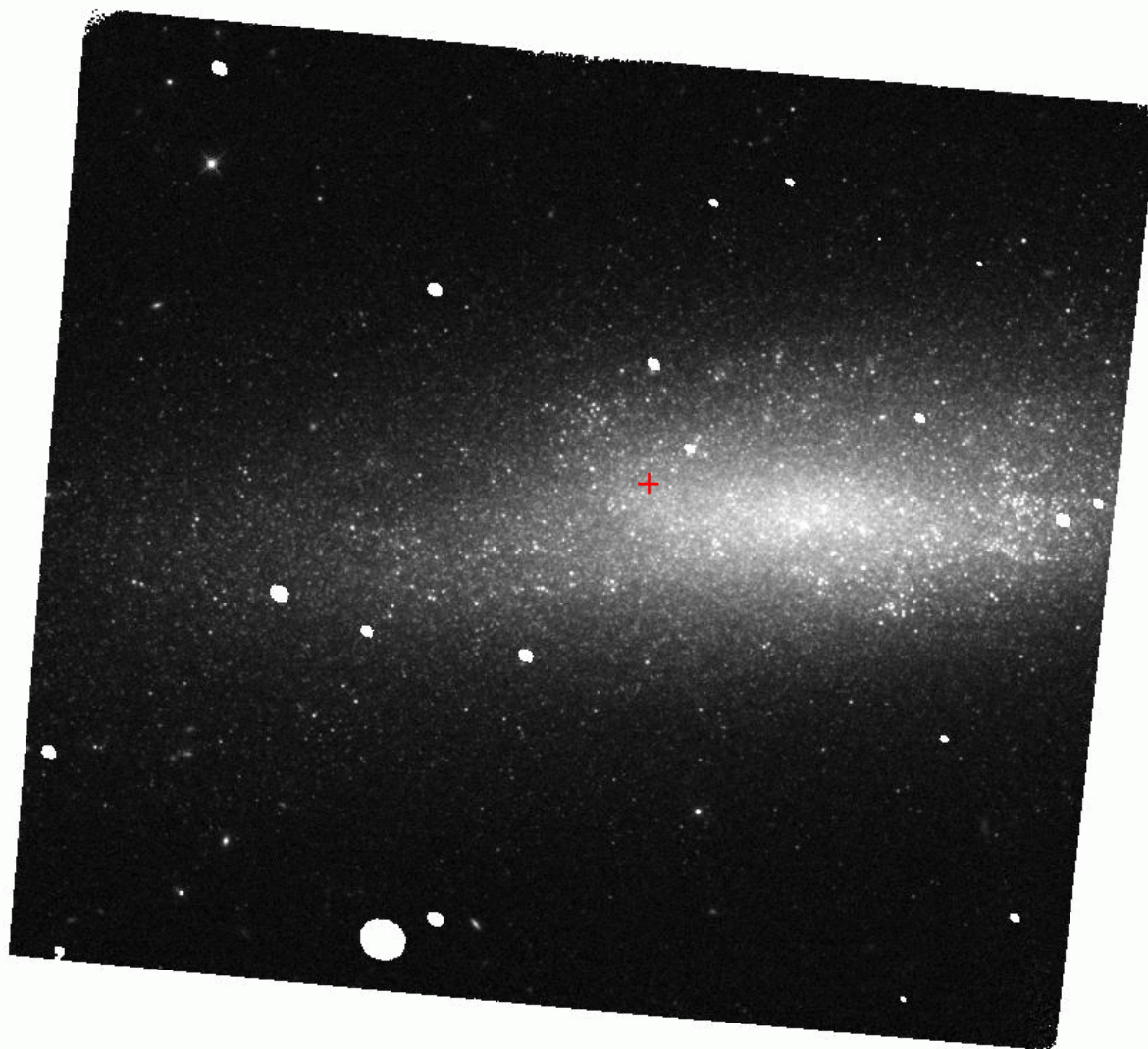
- [ ] +

Type 'L' for line plot  
'C' for column plot  
'S' to search  
Click on sources

Help

based on [fits2web](#)

The image shows a dark field of stars and a galaxy. A white line is drawn across the field, and a red crosshair is positioned on a bright star. The interface includes various controls for image manipulation and navigation.



Combined WFC3\_IR image of NGC 4562 (F160W). Note the areas with invalid pixels.



## New data formats

- The WFC3 data products are in the modified data format agreed upon in 2010
  - Adds an exposure time extension to improve the noise model fidelity
    - With inverse variance, both background and shot noise are included
  - Removes many header keywords derived from input images
    - Only keywords applicable to combined image should remain in the header
  - Replaces the cumbersome MultiDrizzle mechanism to store input image parameters
    - MultiDrizzle stores input image properties as DXXXYYYY keywords in the primary header
      - XXX is the input image number (001 to 999), YYYY a short keyword name
      - Requires each keyword name to be explicitly translated
      - Primary header can become very large for mosaics
    - The new format uses a table extension with one row per input image
      - Keyword names are preserved, and much more information can be stored
      - Retrieval is straightforward
      - Same mechanism is used to record processing information (e.g., shifts)
- Eventually the new format (with the new pipeline) will be used for other instruments
  - Limiting the transition to WFC3 minimizes confusion and unwanted impacts
  - Time scale for transition for other instruments will depend on user feedback
  - Transition timed to coincide with other major changes? (e.g., CTE-corrected ACS products)





## Prototype Spectral Data

- Prototype combined spectral data from COS and STIS
  - Goals:
    - Provide spectroscopy archival researchers with HLA data products
    - Prototypes expected to generate comments and suggestions
    - Respond to desire to enhance spectral data presence within HLA
- Obtained IDT-processed COS data from Science Team to be ingested as HLSP
- Add STIS HLSP data (STARCAT spectral library, others)
  - Format need to be modified for consistency with VO standard (Spectral Container)
  - Data displayed with new Plotting Tool
  - Previews will be available; naming changes may be required for consistency
  - Test page available with ~10 products
    - Load times long for large spectral files
    - Some interface changes needed before spectra can be released
    - Goal is to include ~100 spectra at first release
- On longer term, motivate the development of enhanced HLA pipelines for spectra



## HLA Outreach and Collaborations

- AAS Winter 2011 (Seattle)/ Summer 2011 (Boston)
  - MAST/HLA presence :
    - ~ 40 interactions per meeting
    - Education centric interest (High School and above)
    - Over all excellent
    - Slated to attend 2012 meetings
- ADASS 2010/2011(November)
  - Held meeting with HLA tripartite ST,CADC and EFC to review work status and future work.
  - Will do demonstrations and poster at the November meeting
- HLA footprint work with Chandra
  - Chandra used our footprint service to display their own data  
<http://cxc.cfa.harvard.edu/cda/footprint/>
  - Chandra visited ST (T. Dower) to collaborate on service and new technologies (html5)



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## HLA - Future Plans

- Current and future baseline product generation:
  - Process all public WFC3 data
  - Extend new pipeline and data formats to other imaging instruments
  - Develop robust mosaic pipeline
  - Produce mosaics for more pointings, instruments
  - Retrofit absolute astrometry enhancement to pre-Cycle 15 data
  - Develop source lists and produce uniform metadata for HLSP
  - Enhance presence of spectral data in HLA
    - Include more existing products
    - Encourage teams to provide HLSP whenever possible
    - Foster development of spectral pipeline
  - Consider feasibility of WFC3 grism analysis tools
  - Revisit ACS products in light of CTE, bias striping corrections
  - Develop tools to combine moving-target images



## HLA - Future Plans (2)

- Other products and features
  - Produce all-sky HST catalog
  - Develop tools to investigate time-domain data
  - Search for solar system targets
  - Expand capabilities of image display
  - Further enhance plotting tool capabilities
  - Integrate HLA interface into upcoming MAST portal
    - Enable user-specific preferences
    - Facilitate operations that require validation
    - Common look-and-feel for seamless navigation
    - Adopt VO tools where possible