http://asc.harvard.edu/ciao/documents_threads.html

CIAO 2.1 Threads

"Threads" are processing recipes. They are designed to teach users by leading, step-by-step, through a procedure. These threads range from basic (downloading data), to more complex (multi-chip exposure map), but each thread describes the process in the same easy-to-use manner. The threads are organized by subject and instrument. If you do not find what you are looking for below, try using CIAO's ahelp system (e.g. while running CIAO, type "ahelp -k " and the subject you are interested in) or the "CXC Search" at the page top.

Some threads have been made more automated in the form of 'scripts'. Visit the scripts page for a more complete description and the complete list of scripts. The threads below also contain cross-links to the relevant scripts. As always, we invite you to email us with suggestions for new threads and scripts.

A Note on CIAO 2.1: Increased tool functionality in CIAO 2.1 made certain steps in the existing threads unnecessary and/or redundant; in some cases, entirely new tools are utilized. The "Updates" section of each thread details how it has been changed. The CIAO 2.0 threads are still available online, but are no longer being maintained.

The following threads are designed to work with **reprocessed** data. If you have "old" data (i.e. processed with ASCDSVER below R4CU5UPD8), we strongly suggest to check the Chandra Archive for an updated version of it. Users forced to work with *non*-reprocessed data (check the schedule) may find the new Standard Data Processing Release Notes page helpful. This page gives detailed descriptions of changes to the SDP, helping users of CIAO 2 to work with non-reprocessed data. Alternatively, the old CIAO 1.1 threads page discusses the analysis of non-reprocessed data.

- Introduction (beginners should start **HERE**)
  - How to Download Chandra Data from the Archive
  - Introduction to CIAO
    - Starting CIAO
  - Introduction to the Data Model
  - Introduction to *Firstlook*
  - Introduction to *Prism*
  - Introduction to *ChIPS*
  - Introduction to *FilterWindow*
  - A **Complete List** of CIAO tools can be found at the Introduction to Tools page.

If you are looking for a general topic, try the **CXC Search**, at the top of the page.

- Data preparation
  - General
    - Has your data been reprocessed?
    - Use Observation-specific Bad Pixel Files
    - Correction for Aspect Offsets
    - Data Filtering
    - Filtering Light Curves (see also the analyze_ltcrv.sl S-Lang script)
    - How to Restore WCS Info To Images (see also the wcscopy script)
    - Creating Accurate RA, Dec Coordinates for src2 Files
  - ACIS
    - ACIS Gain Map Correction (with option to remove pixel randomization)
    - ACIS Blank-Sky Files
  - HRC
    - HRC-I Degap Correction

- Imaging
  - How To Match the Binning of an Image (see also the get_sky_limits script package)
  - Merging Data from Multiple Imaging Observations (see also the combine_obsid script)
  - Create True Color Image (see also the color_image script)
  - Detecting Sources in Imaging Observations
  - Estimating Source Counts in Imaging Observations
  - Obtain and Fit a Radial Profile
  - Create a PSF
  - Exposure Maps
    - Compute an HRC-I Exposure Map and Build Fluxed Image
    - Compute an ACIS Exposure Map (Single Chip) and Build Fluxed Image
    - Compute an ACIS Exposure Map (Multiple Chips) and Build Fluxed Image
    - Calculating Spectral Weights (see also the spectrum.sl S-Lang script)
  - Calculating Statistics of Images (see also the sstats.sl S-Lang script)
  - Reprojecting Coordinates of a Solar System Object

- Imaging Spectroscopy
  - Extract ACIS Spectra for Pointlike Sources and Make RMFs and ARFs (see also the imagspec.tar file)
  - Displaying the FEF Regions Covered by a Source (see also the regions.sl S-Lang script)

- Grating Spectroscopy
  - Correcting PHA2 Header Keywords
  - ACIS
    - Obtain Grating Spectra from HETG/ACIS-S Data
    - Obtain Grating Spectra from LETG/ACIS-S Data
    - Compute HETG/ACIS-S Grating ARFs (see also the mkgarf_acis script)
    - Compute LETG/ACIS-S Grating ARFs (see also the mkgarf_acis script)
  - HRC
    - Obtain Grating Spectra from LETG/HRC-S Data
    - Compute LETG/HRC-I Grating ARFs (see also the mkgarf_hrci script)

        - Compute LETG/HRC-S Grating ARFs (see also the mkgarf_hrcs script)
    - Examining PHA2 Files
    - GUIDE: Fitting and Identifying Spectral Lines
    - Extract Coadded and Grouped Nth-Order Source & Background Spectra and ARFs(see also the add_grating_orders script)

- *Sherpa*
    - Getting Started With *Sherpa*
    - Introducing *Sherpa*: ASCII Data & Errors and Single-Component Source Models
    - Fitting Spectral Data: FITS Data & Responses and Multi-Component Source Models
    - Simulating 1-D Data: The *Sherpa* `FAKEIT` Command
    - *Sherpa* Data Visualization
    - Fitting Grating Data
    - GUIDE: Fitting and Identifying Spectral Lines