JWST USER TOOLS

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JWST Town Hall, January 6, 2016
THE JWST USER TOOL STABLE

• Astronomer’s proposal tool (APT)
• Exposure time calculator (ETC)
• Data simulators
• Calibration pipelines
• User documentation (handbooks, etc.)
• Archives
• Data analysis tools
ASTRONOMER’S PROPOSAL TOOL (APT)

- Familiar to HST users
- To be used to define JWST observing programs and submit JWST proposals.
- Development releases of JWST APT available together with HST APT
  - http://www.stsci.edu/hst/proposing/apt
APT TEMPLATES

- Similar to Spitzer, Herschel and Chandra (but unlike HST) JWST observations are defined by templates.
- Observing modes/strategies define the templates
  - e.g., MIRI imaging, NIRSpec IFU, NIRCam coronagraphy,...
- Requires only necessary information
- Automatically splits observations into visits (sequences using a single guide star) and exposures.
JWST Exposure Time Calculator (Pandeia)

**Reference files**
throughput, PSFs, noise parameters

**Engine**
General Python library

**Server**
Stores your calculations

**User interface**
Web application accessed through your browser

**RELEASE SCHEDULE**
ETC engine development release: Spring 2016
ETC WebApp release: January 2017
# Available Workbooks

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<tr>
<th>#</th>
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<tr>
<td>1024</td>
<td>Imaging workbook</td>
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<td>Imaging observations of a 1 mJy flat spectrum source.</td>
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<td>Multiple extended sources observed in imaging and spectroscopy.</td>
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<td>Sample NIRSpec MSA Calculations</td>
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<td>Sample of NIRSpec MSA calculations showing the effects of shutter location, source location within the shutter, and the impact of multiple sources within a scene.</td>
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<tr>
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<td>Example Source Flux Distributions</td>
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<td>Example imaging calculations for each of the supported source geometries: point, flat, 20 gaussian, and sercic</td>
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<tr>
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<td>Sample Coronagraphy Calculations</td>
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<td>Coronagraphy calculations using three faint sources, one central star, and one reference source</td>
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<tr>
<td>1031</td>
<td>Sample NIRISS WFSS Calculations</td>
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<tr>
<td>1032</td>
<td>Sample backgrounds</td>
<td>[Load]</td>
<td>Same calculation for five different background options</td>
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<tr>
<td>1033</td>
<td>IFU starter sample workbook</td>
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[Create New Workbook] [Get a Copy of the Sample Workbooks]

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## User Access Permissions for ???

<table>
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<th>User</th>
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• Not all tasks are best done with the ETC.
• Simulators are needed to model full fields of view, complex observing sequences, dithers, and simulated data products.
• STIPS
  • Web tool
  • Initial release includes JWST imaging modes
  • Different astrophysical models: stellar populations, galaxy populations
  • Full FOV, WebbPSFs
• Initial release in 2016.
A New Paradigm for JWST User Documentation (coming 2016)

New JWST website will contain higher level mission information and JWST science content

New documentation system: “Every page is page one” (Mark Baker)
- Short articles
- Self-contained, one-level information
- Hyperlinked network rather than monolithic handbook

Think Wikipedia (but it’s not a wiki)

Multiple conceptual spaces: Background articles, planning cookbooks, science policy, engineering specs

Incremental releases (as articles are written and reviewed), beginning with instruments, APT, ETC articles
DATA ANALYSIS AND VISUALIZATION TOOLS

- JWST users need to inspect, manipulate, and model their data
- JWST data analysis will be in Python/Astropy
- Basic capabilities familiar with users of IRAF, STSDAS, and IDL will be available (many already are)
- Visualization will be in Ginga & Glue
- Tools understand JWST data structures, including uncertainties, data associations, and data quality flags
- Extensible visualization tools are being developed for interactive workflows
- Up-to-date development code and discussion available via: bit.do/jwst
# Data Analysis Tools Development Plan

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<tr>
<td>2-D image visualization (Ginga)</td>
<td>PSF/LSF &amp; PSF kernel tools I</td>
<td>Background estimation toolbox &amp; tutorials (spec &amp; imaging)</td>
<td>JWST Ramp inspection &amp; analysis tools</td>
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<td>JWST data file I/O &amp; Associations</td>
<td>Image &amp; spectral geometry, registration &amp; resampling I</td>
<td>PSF/LSF &amp; PSF kernel tools II</td>
<td>Visualization of associated resampled &amp; non-resampled data</td>
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<td>Spectral fitting non-resampled data</td>
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USER TOOLS TIMELINE SUMMARY

- **2016**
  - ETC Engine release (development)
  - First incremental user documentation release
  - 227th AAS

- **2017**
  - ETC WebApp flight release
  - 229th AAS
  - APT flight release

- **2018**
  - Early Release science deadline
  - Cycle 1 Call for Proposals
  - Cycle 1 deadline

- **2019**
  - Launch!
Upcoming JWST Science Meetings and Preparation Workshops

Major International Science Conferences (~Annually)
Oct 2015 at ESTEC; “Exploring the Universe with JWST”
Fall 2016 in Canada; Exploring the Universe with JWST II
2017 in Venice; HST + JWST Conference

Topical Science Meetings
2-3 day workshops on major JWST science themes will be organized at STScI throughout 2016-2018
- meetings will include a component to introduce users to software and systems

User Training
Annual workshops at STScI and AAS on JWST data analysis tools
2017 - workshops on JWST planning tools (ETCs, simulators)
2017-2018 - workshops on APT, single stream, documentation
Annual workshops in Europe on JWST capabilities, proposal tools, and data analysis tools

JWST “Colloquium Series”
Contact us if you would like a holistic presentation about JWST and user preparation at your institution

JWST “Community Days” (Coming Soon)
Open call to US institutions to host hands-on JWST 1-2 workshops (w/ optional science meeting)
- ERS program planning, JWST modes and flight capabilities, observing techniques, etc.

*All meeting/workshops at STScI will have significant remote connectivity*