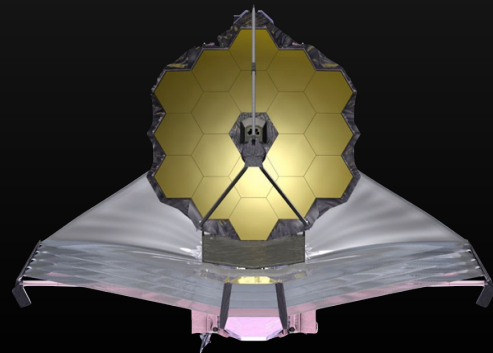# JWST USER TOOLS
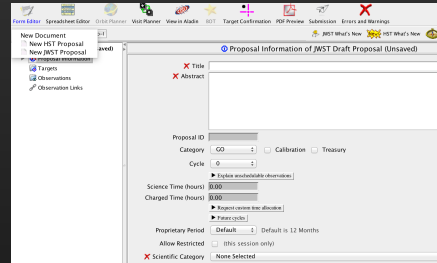
Klaus Pontoppidan
Deputy Project Scientist, JWST
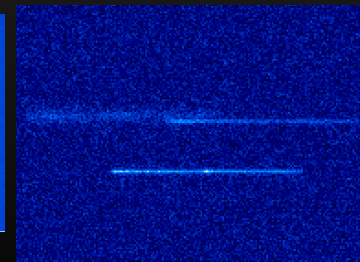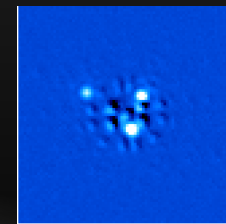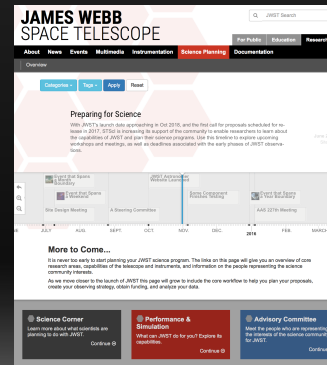
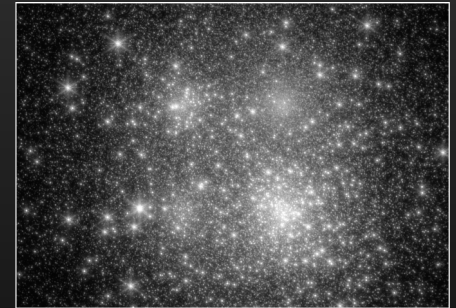JWST Town Hall, January 6, 2016

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

JWST Simulator

ASTRONOMER'S PROPOSAL TOOL (APT)

- Familiar to HST u...

- To be used to def... proposals.

- Development rele...
  - http://www.sts...

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

#	Name	Load	Description	Options
1024	Imaging workbook	[Load]	Imaging observations of a 1 microJy flat spectrum source.	[Copy][Remove] [Sharing]
1025	High-resolution spectroscopy workbook	[Load]	High-resolution spectroscopy observations of a 1 mJy flat spectrum source.	[Copy][Remove] [Sharing]
1026	Medium-resolution spectroscopy workbook	[Load]	Medium-resolution spectroscopy observations of a 1 mJy flat spectrum source.	[Copy][Remove] [Sharing]
1027	Multiple extended source workbook	[Load]	Multiple extended sources observed in imaging and spectroscopy.	[Copy][Remove] [Sharing]
1028	Sample NIRSpec MSA Calculations	[Load]	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.	[Copy][Remove] [Sharing]
1029	Example Source Flux Distributions	[Load]	Example imaging calculations for each of the supported source geometries: point, flat, 2D gaussian, and sersic	[Copy][Remove] [Sharing]
1030	Sample Coronagraphy Calculations	[Load]	Coronagraphy calculations using three faint sources, one central star, and one reference source	[Copy][Remove] [Sharing]
1031	Sample NIRISS WFSS Calculations	[Load]	Sample NIRISS WFSS Calculations	[Copy][Remove] [Sharing]
1032	Sample backgrounds	[Load]	Same calculation for five different background options	[Copy][Remove] [Sharing]
1033	IFU starter sample workbook	[Load]	Modified, to be edited	[Copy][Remove] [Sharing]

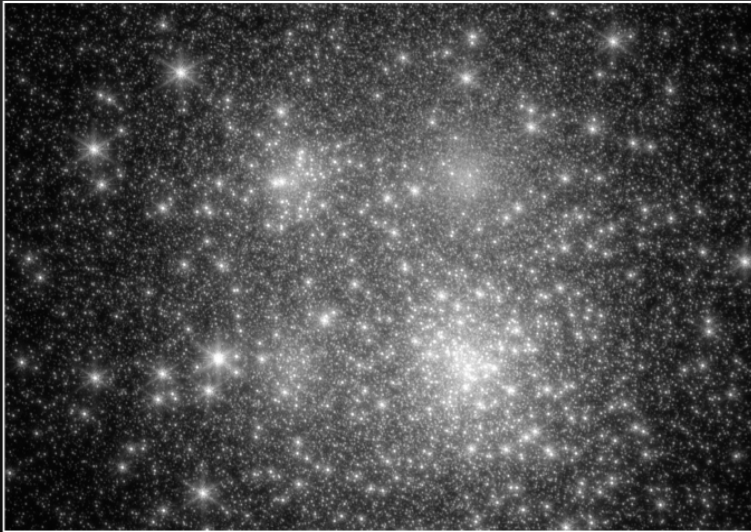Create New Workbook   Get a Copy of the Sample Workbooks

User Access Permissions for ???

User	Read	Write	Grant	Revoke

JWST SIMULATOR (*STIPS*)

Space Telescope Image Project Simulator

JWST Simulator

- 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.

NEW WEBSITE AND DOCUMENTATION

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
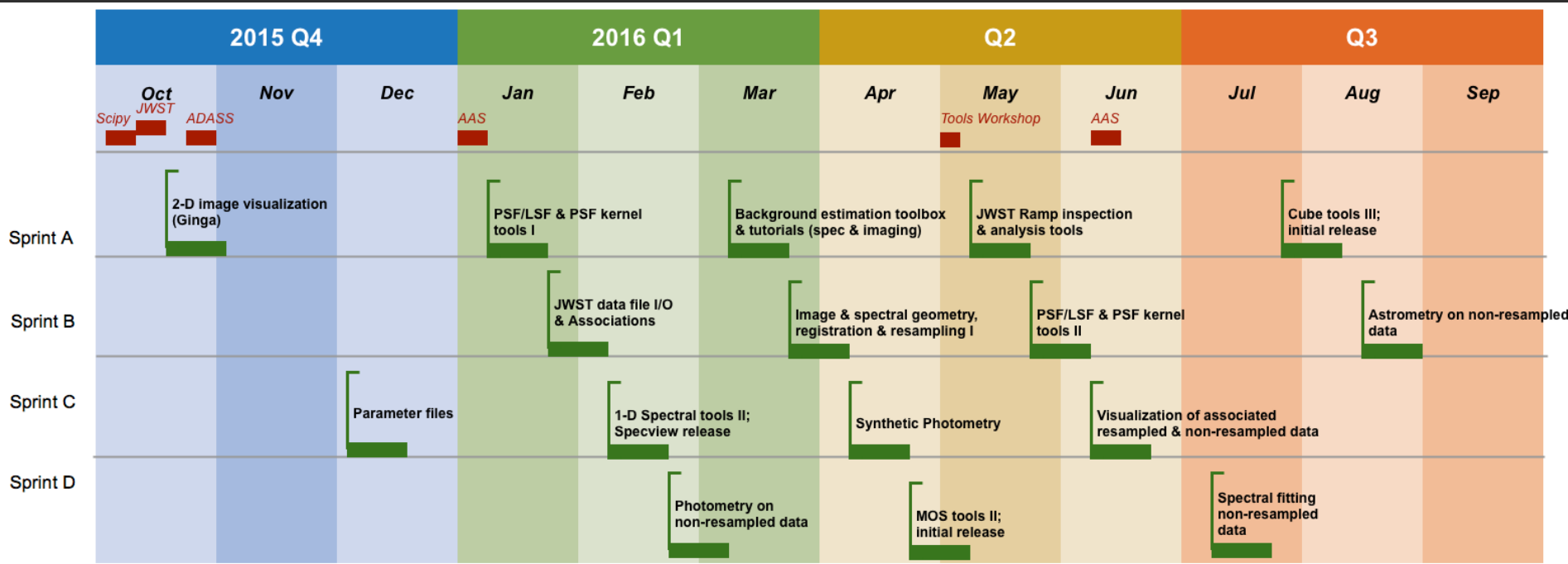
Data Collection

Data
Subsets

Link Data   IPy

Plot Layers

Plot Options

Tab 1

Drag Data To Plot

USER TOOLS TIMELINE SUMMARY

ETC Engine release (development)

ETC WebApp flight release

Early Release science deadline

Cycle 1 Call for Proposals

Launch!

2016   2017   2018   2019

227th AAS

First incremental user documentation release

229th AAS

APT flight release

Cycle 1 deadline

JWST TOWN HALL, 227TH AAS
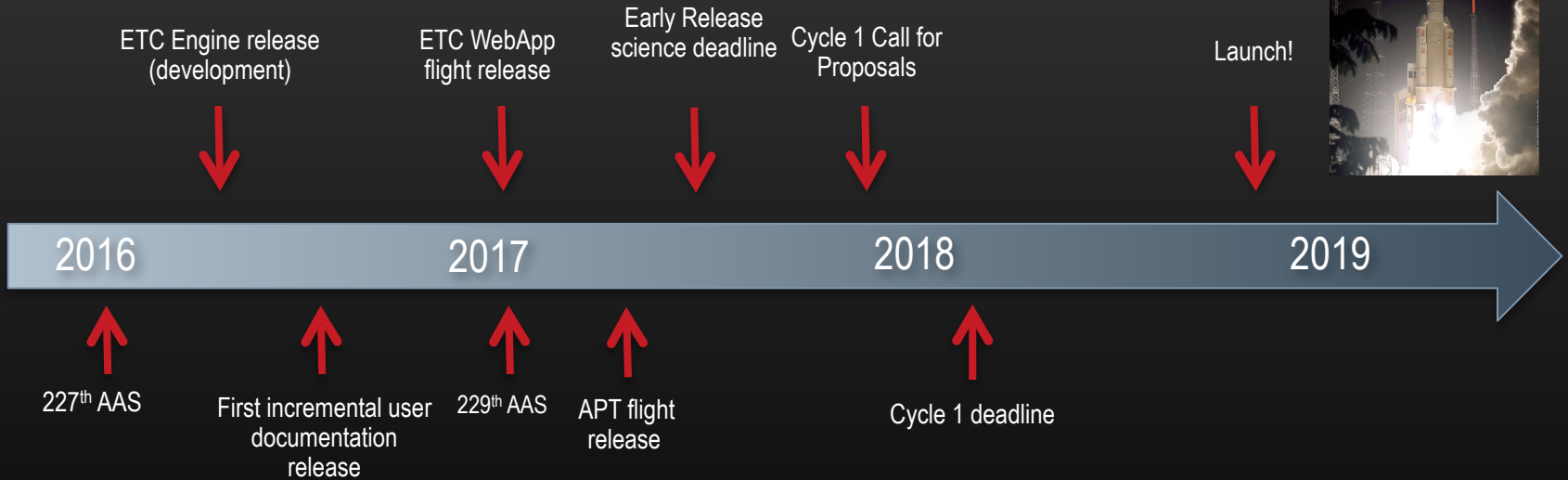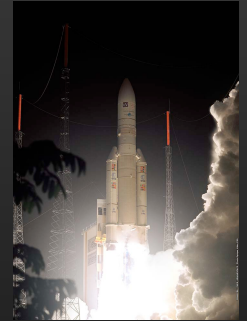
Upcoming JWST Science Meetings and Preparation Workshops

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