

Astronomer's Proposal Tool Hands-On

Introduction

In this activity, you'll become familiar with the features and functions of the JWST Astronomer's Proposal Tool (APT). You will need this to submit any proposal for time with JWST. The goals of these activities are:

- Get familiar with the APT interfaces
- Look at your target in the Aladin view window of the APT
- Create an observation in APT using one of the templates and the information from the ETC

Case I: Near and Mid-infrared spectroscopy of a Y dwarf

Background

Before starting this activity please complete the ETC activity and refer to those instructions for a background on the type of observations.

Target information

The target we use in this activity is based on the Y Dwarf [WISE J035000.32-565830.2](#). RA, Dec = **03:50:00.328, -56:58:30.23**

Spectral type = Y1

F140W (HST/WFC3) = 22.3 ± 0.20 (Vega mag)

APT Activity I: Create new JWST Proposal

1. File → New → New JWST Proposal
2. Investigate the Proposal Information Tab (you can leave this for the end and focus on the more technical part of the proposal first)
3. Under the Targets Tab add a "fixed target" and add the coordinates
4. Fill in the information about the target. Specify if the target is extended or not.

APT Activity II: Set up MIRI Observations

5. Under the Observations tab: Create a New Observation Folder. This will be always needed for each set of instruments/observing modes/configurations.
6. Now fill in the fields for the LRS observation from your previous ETC calculations
7. Also complete the Target Acquisition fields
8. Run smart accounting and find out what your overheads are

APT Activity III: Add NIRSpec Observations

We would like to get the spectrum of the Brown Dwarf over the entire NIR and MIR spectrum. For this we would also set up a NIRSpec Fixed Slit observation in the same proposal. (If you also finished the ETC activity on the NIRSpec FS, then use the numbers from there, otherwise you can use the numbers provided here).

1. Create a new observation with the NIRSpec Fixed Slit spectroscopy Template
2. Use the PRISM and the G395M gratings

IMPRS Summer School, 2023

1. Hint: In order to have both PRISM and G395M done in the same observation (only one target acquisition needed) the dither pattern in APT needs to be the same for PRISM and G395M.
 2. For PRISM use: NGROUP=140 and NINTS=2
 3. For G395M use: NGROUP=600 and NINTS=2
 4. Consider which nodding/dither pattern to use (look [here](#) if you are unsure)
3. Set up a WATA target acquisition using Subarray: FULL, Filter: F140X and Readout Pattern NRSRAPID.

Case II: NIRSpec IFU Observations of SN1987A

Background

Before starting this activity please complete the ETC activity and refer to those instructions for a background on the type of observations.

Target information

RA, Dec = 05 35 28.3900, -69 16 15.6025

APT Activity I: View source in ESA Sky

1. Go to ESA Sky (<https://sky.esa.int/esasky>)
2. Search for SN1987A
3. Select Optical and HST for the Sky to get a higher resolution image
4. Select NIRSpec IFU as an overlay and compare the size of the target with the FoV
 - a. Also have a look where the four quadrants of the MSA fall (by selecting a different sky that shows you all the bright stars). Is there a position angle where there are less bright stars/objects falling in the FoV of the MSA?

APT Activity II: Create new JWST Proposal

1. File → New → New JWST Proposal
2. Investigate the Proposal Information Tab (you can leave this for the end and focus on the more technical part of the proposal first)
3. Under the Targets Tab add a “fixed target” and search for SN1987A. Fill in the information about the target. Pay attention to the “Extended” target field.
4. Then specify a background target:
 - a. RA: 05 35 28.3900
 - b. DEC: -69 16 15.6025
5. Go back to the SN1987A target. Click on the box “Observation Requires companion background obs.” Select the background target.

APT Activity III: Add NIRSpec Observations

1. Under the Observations tab: Create a New Observation Folder. This will be always needed for each set of instruments/observing modes/configurations.
2. When submitting your proposal, the observation summary should be filled in. For the sake of this exercise that step is not needed.
3. Click on the Observation and fill in all the information:
 - a. Instrument, template to use, target.
 - b. TA method: VERIFY ONLY
 - c. Select the science parameters (gratings, filters, readout pattern, dithers and exposure times should be consistent with those defined in the ETC exercise).
 - d. Duplicate each grating/filter combination and flag it as Leakcal. This takes an exposure with the MSA closed. It is done to correct for the MSA leakage that, in the presence of extended sources, affects the IFU data.
4. Use the Aladin visualization tool with the NIRSpec footprint

APT Activity IV: Define Background Observations

1. The Background observation folder can be created by duplicating the science target observation folder, and changing the target. Click on the Observation and fill in all the information.
2. Think about whether you want to dither the background observations.
3. Also, think about whether the background observations needs extra leakage
4. observations? How much more overheads would that bring?
5. Go to the Special Requirements tab and add a Time Constraint Explicit Requirement. Link the SN1987A and SN1987A background observations to be executed in a **non-interruptible sequence** (if you get an error on this you probably have not selected “sequence”). This is to ensure data are taken in the exact same conditions.

APT Activity V: Constraints and Observability

Special requirements: Constrain the position angle so the SN1987A can be observed avoiding the bright star in the FOV (see figure in page 1). Check adequate PA range with Aladin and add a special requirement. Use the provided HST (*hst_10263_10_acs_hrc_f435w_drz.fits*) image to display in APT.

⇒ **Hint:** Verify whether you may want to modify the telescope pointing to optimize your strategy.

Visit planner: Highlight the Observation folders and run the Visit Planner. Verify the schedulability of the program. Go to the visit planner menu and run smart accounting to remove potential unnecessary overheads.

Review the program: Do you have errors or warnings? If yes, are they expected? Can you “fix” any?