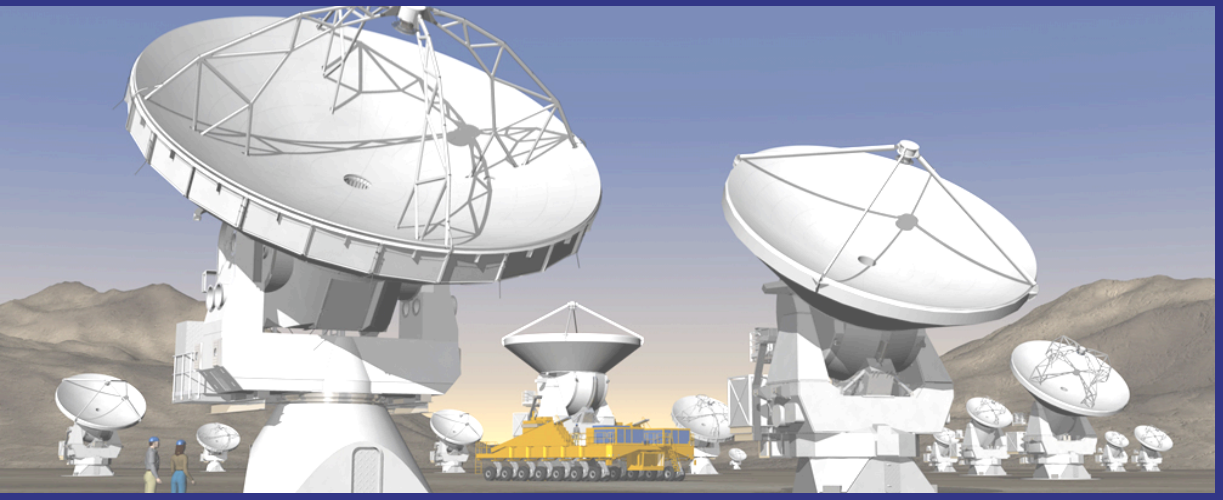


EUROPEAN ARC
ALMA Regional Centre

The ALMA Observing Tool

Liz Humphreys & Andy Biggs

European ALMA Regional Centre
ESO, Garching

Introduction

- Responsible for project Proposal Preparation and Submission (Phase I) and Accepted Program Observation Preparation (Phase II)
- Main requirements
  - Needs to run on "all" systems
  - Needs to support all observing modes
  - Needs to support "novice" and "expert" users
  - Needs to provide tools and feedback
- Implemented as a downloadable Java application
  - Connects to the ALMA system as appropriate (submission, user database, etc)
  - Version 7.1 just being released

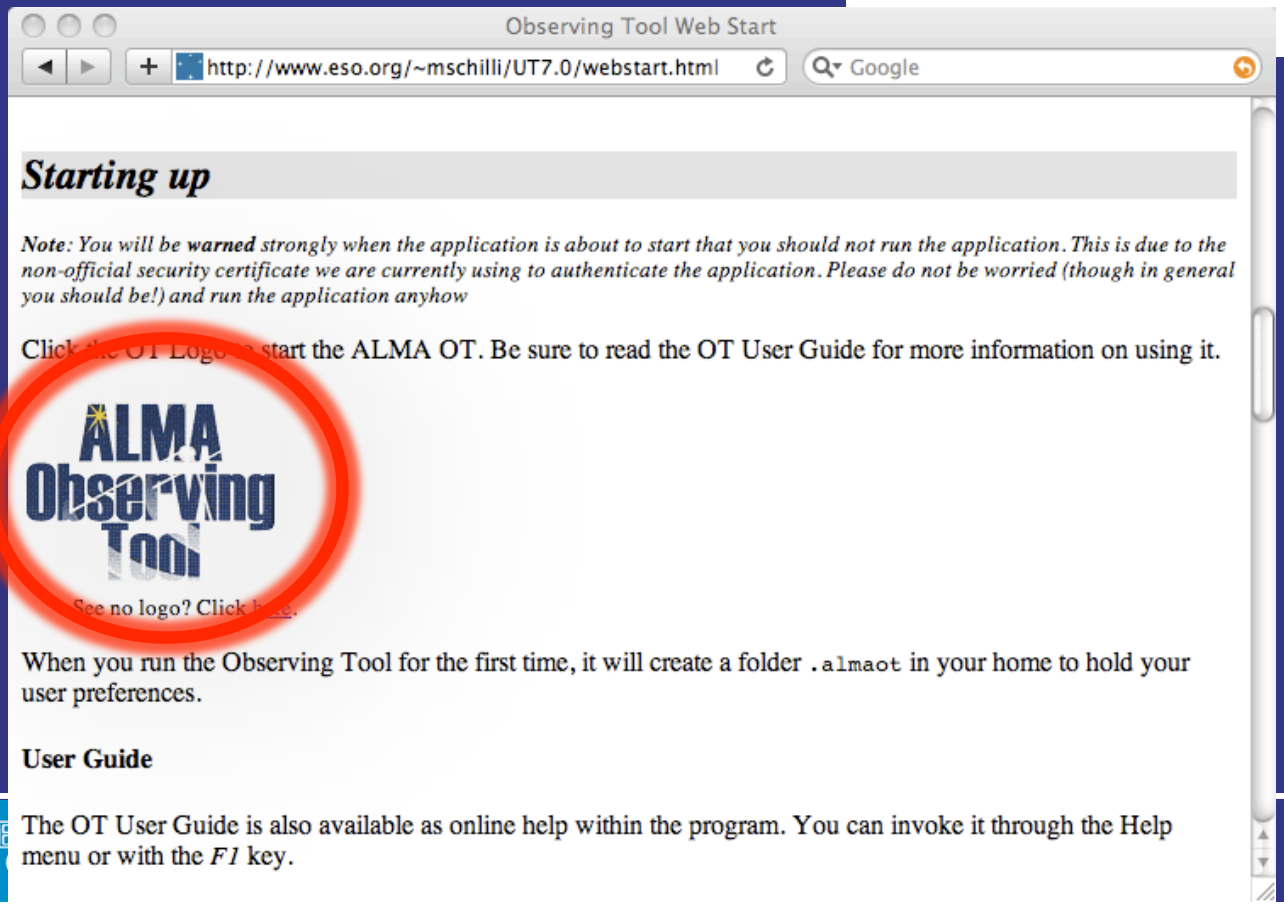
The OT Team

- Development of tool based in Edinburgh, UK
  - UK Astronomy Technology Centre (UK ATC)
  - Lead developer is Alan Bridger
- Work spread over three countries
  - 2 programmers in Edinburgh
  - 1 at ESO, Germany (50%)
  - 1 at NAOJ, Japan (20%)
  - Documentation compiled at ESO
  - ESO also provides 2 astronomers (Sub-System Scientist is Andy Biggs)

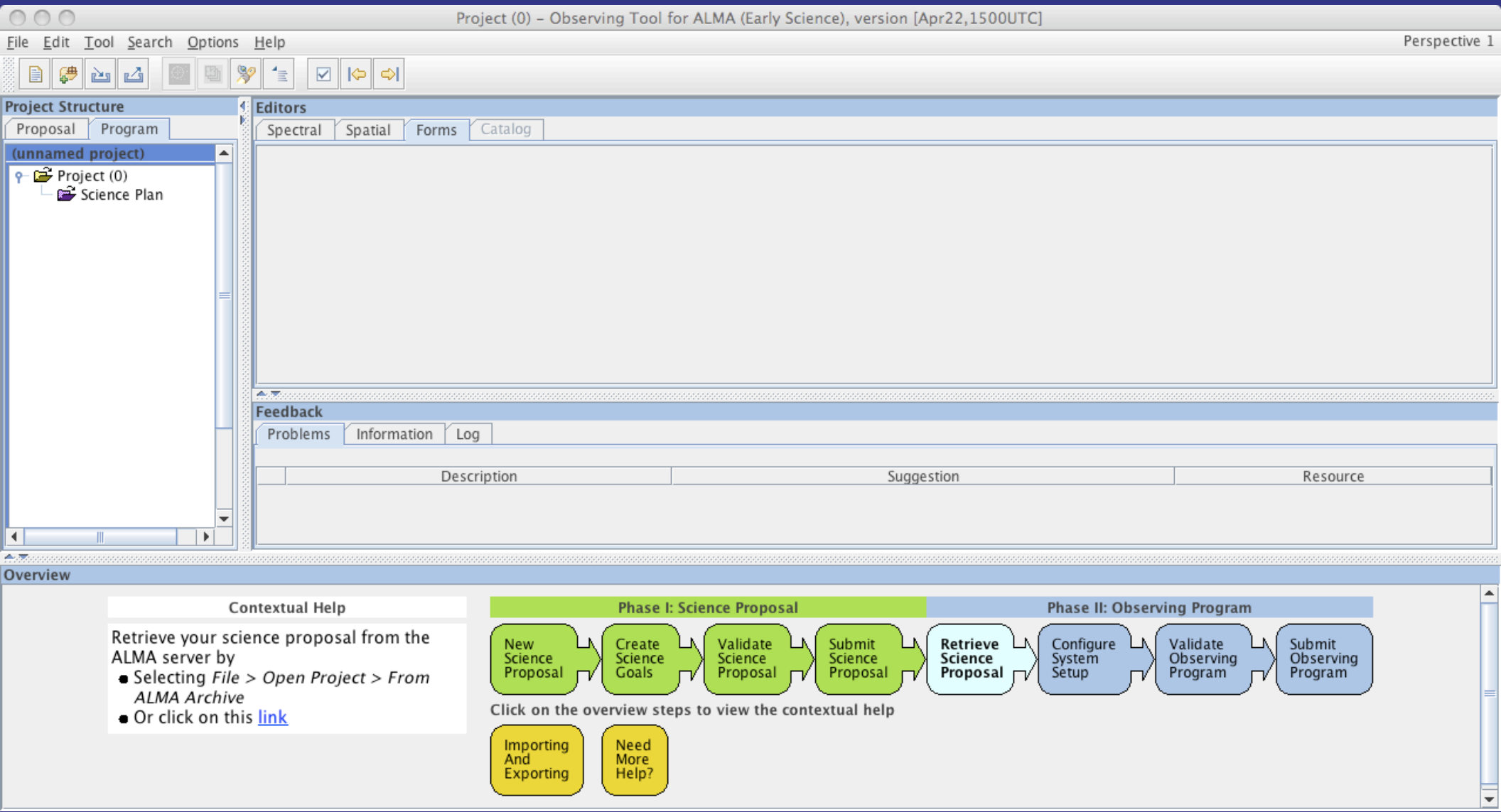
Fundamentals

- Basic unit of ALMA observations is the Scheduling Block (SB)
  - Contains all information required to run the observing scripts (modes)
  - Most observations will consist of multiple SBs
- OT will create SBs from Science Goals
  - User need only enter minimal technical information
    - Fields, line frequencies, desired sensitivity, etc.
  - The OT does the rest!
- Lots of feedback is provided – project must validate!

Installation: 2 clicks



Overview


Project (0) – Observing Tool for ALMA (Early Science), version [Apr22,1500UTC]
File Edit Tool Search Options Help
Perspective 1
Project Structure
Proposal Program
(unnamed project)
Project (0)
Science Plan
Editors
Spectral Spatial Forms Catalog
Feedback
Problems Information Log
Description Suggestion Resource
Overview
Contextual Help
Retrieve your science proposal from the ALMA server by
Selecting File > Open Project > From ALMA Archive
Or click on this link
Phase I: Science Proposal
Phase II: Observing Program
New Science Proposal
Create Science Goals
Validate Science Proposal
Submit Science Proposal
Retrieve Science Proposal
Configure System Setup
Validate Observing Program
Submit Observing Program
Click on the overview steps to view the contextual help
Importing And Exporting
Need More Help?

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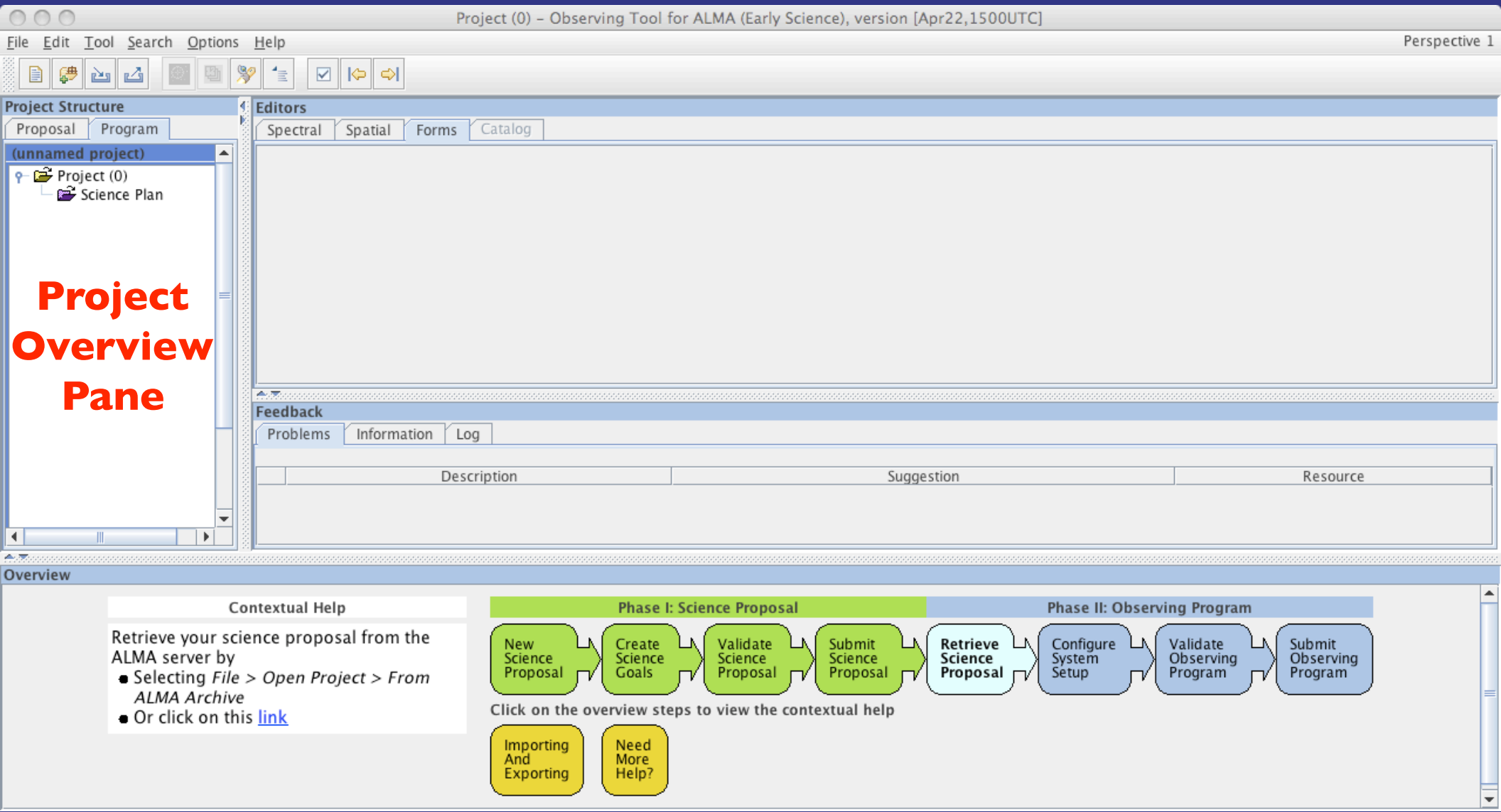
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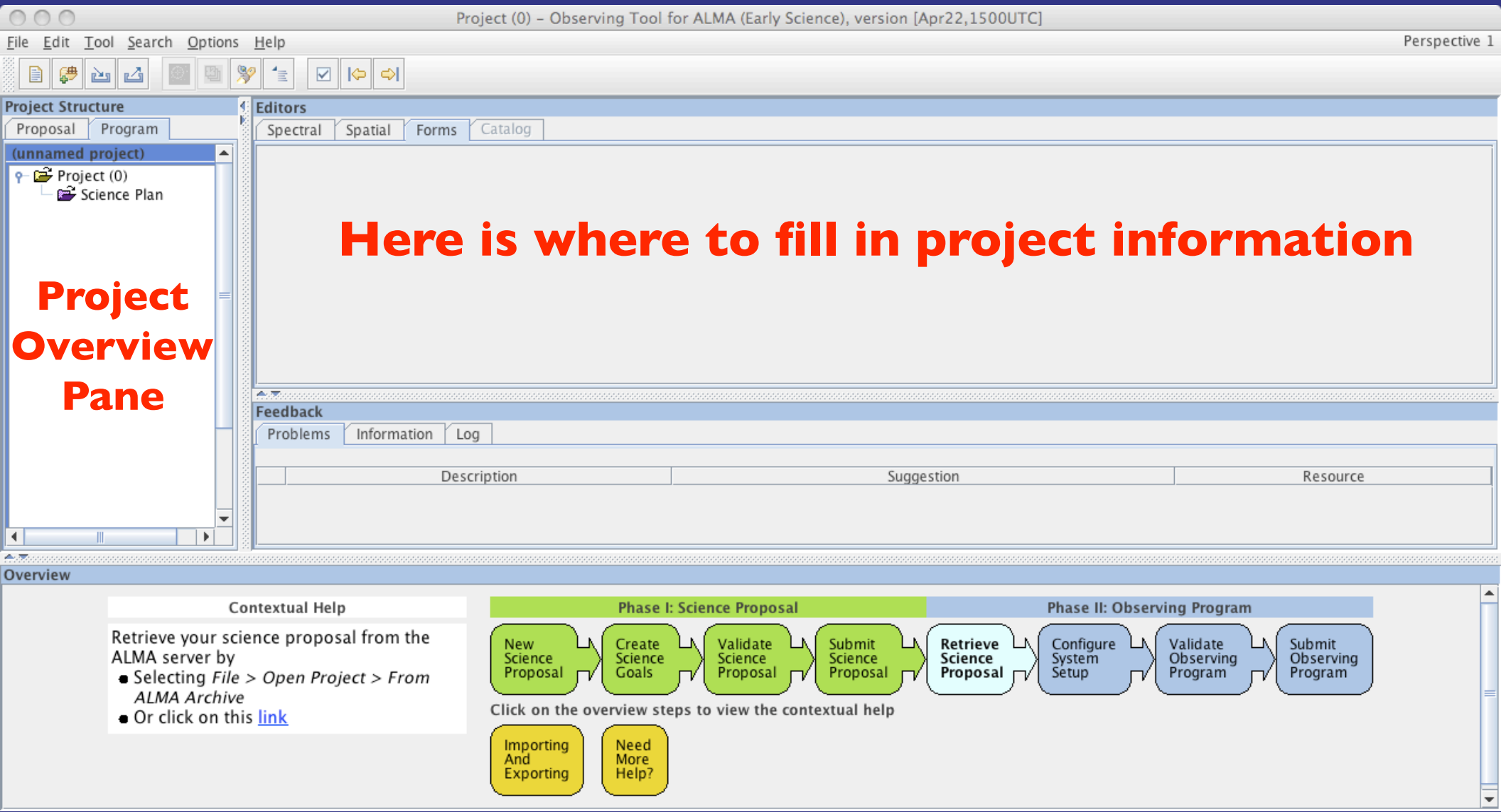
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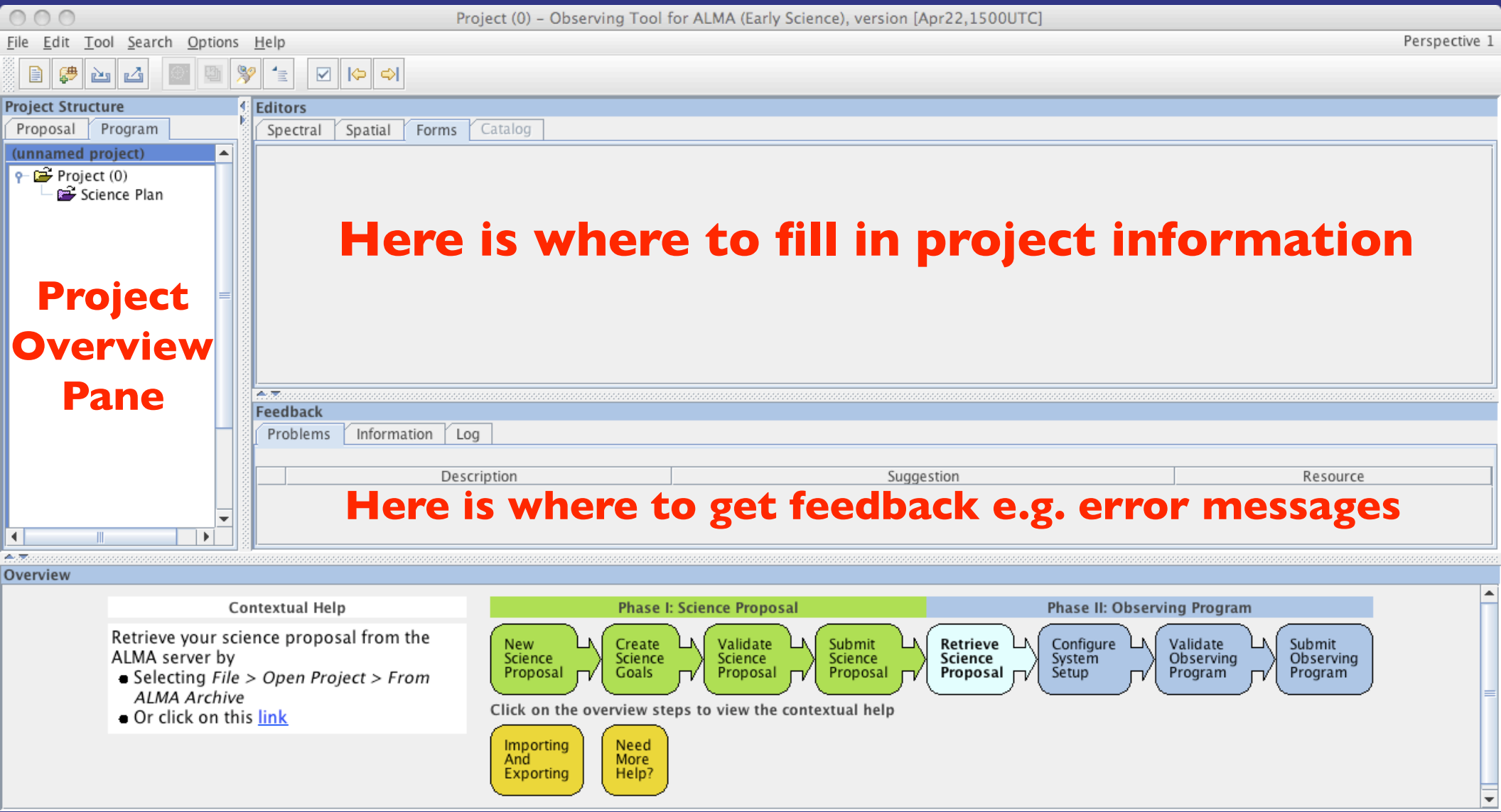
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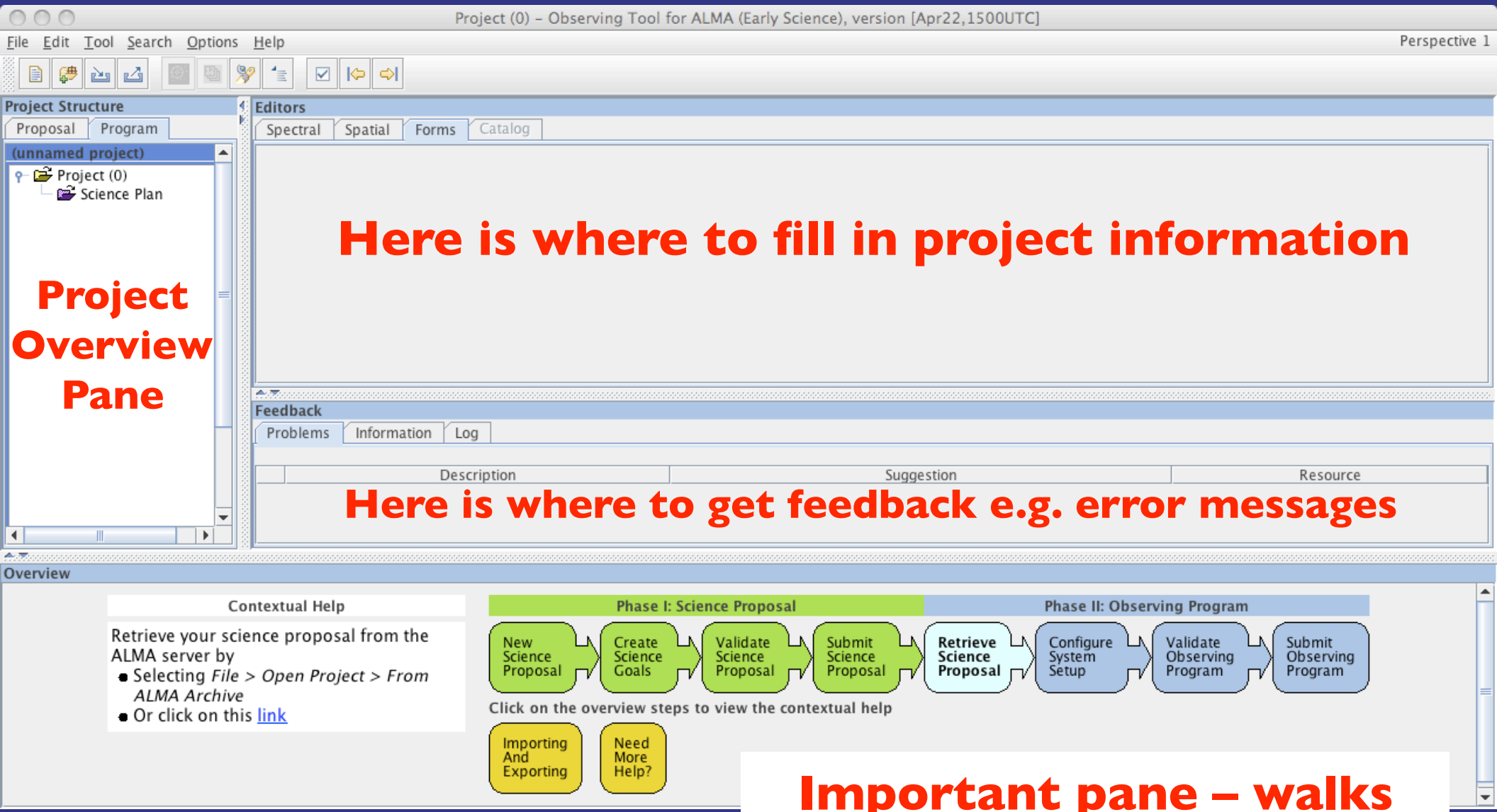
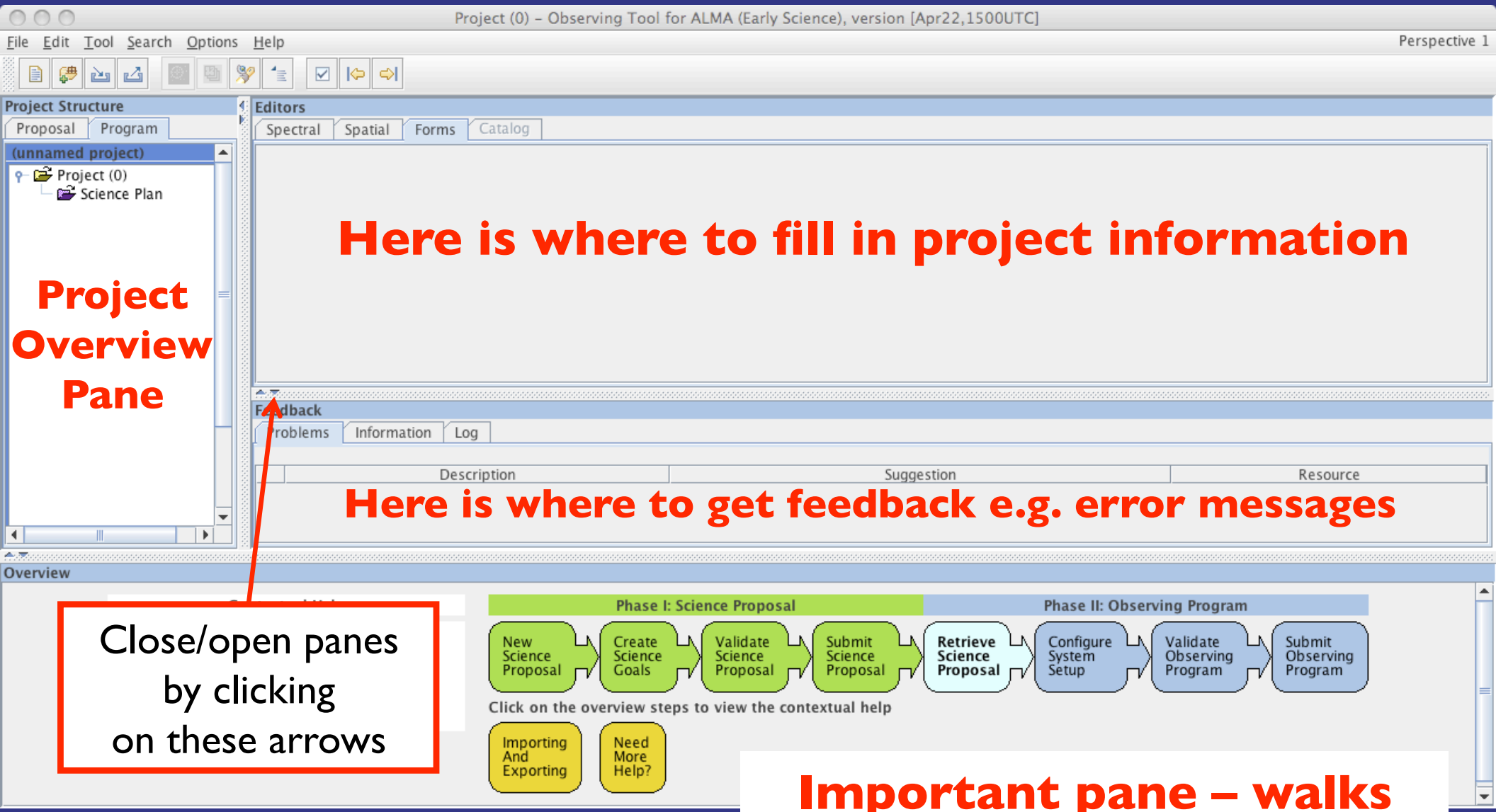


Important pane – walks through the whole process

Overview



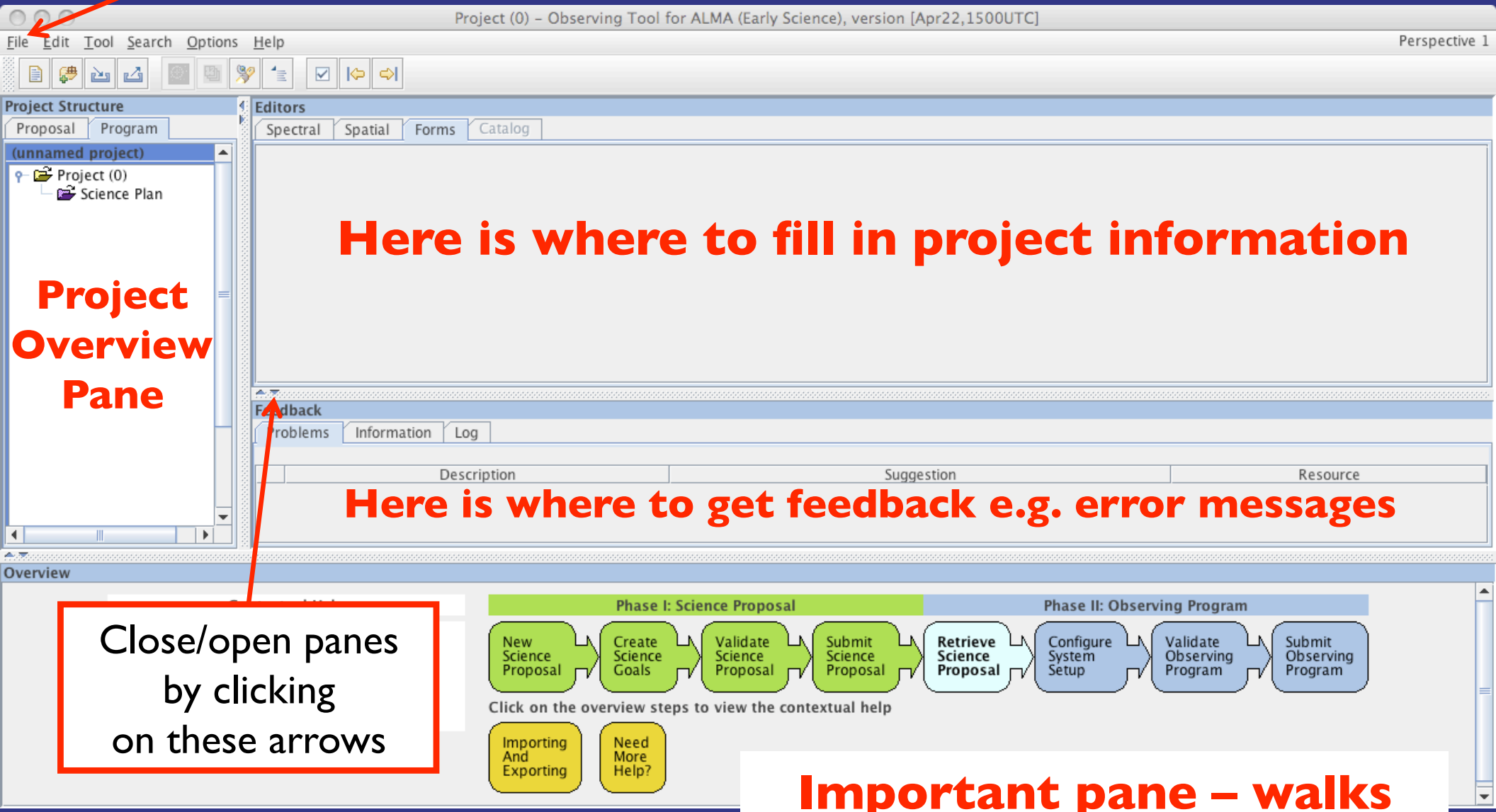
Project Overview Pane

Close/open panes by clicking on these arrows

Important pane – walks through the whole process

Overview

Save at any point



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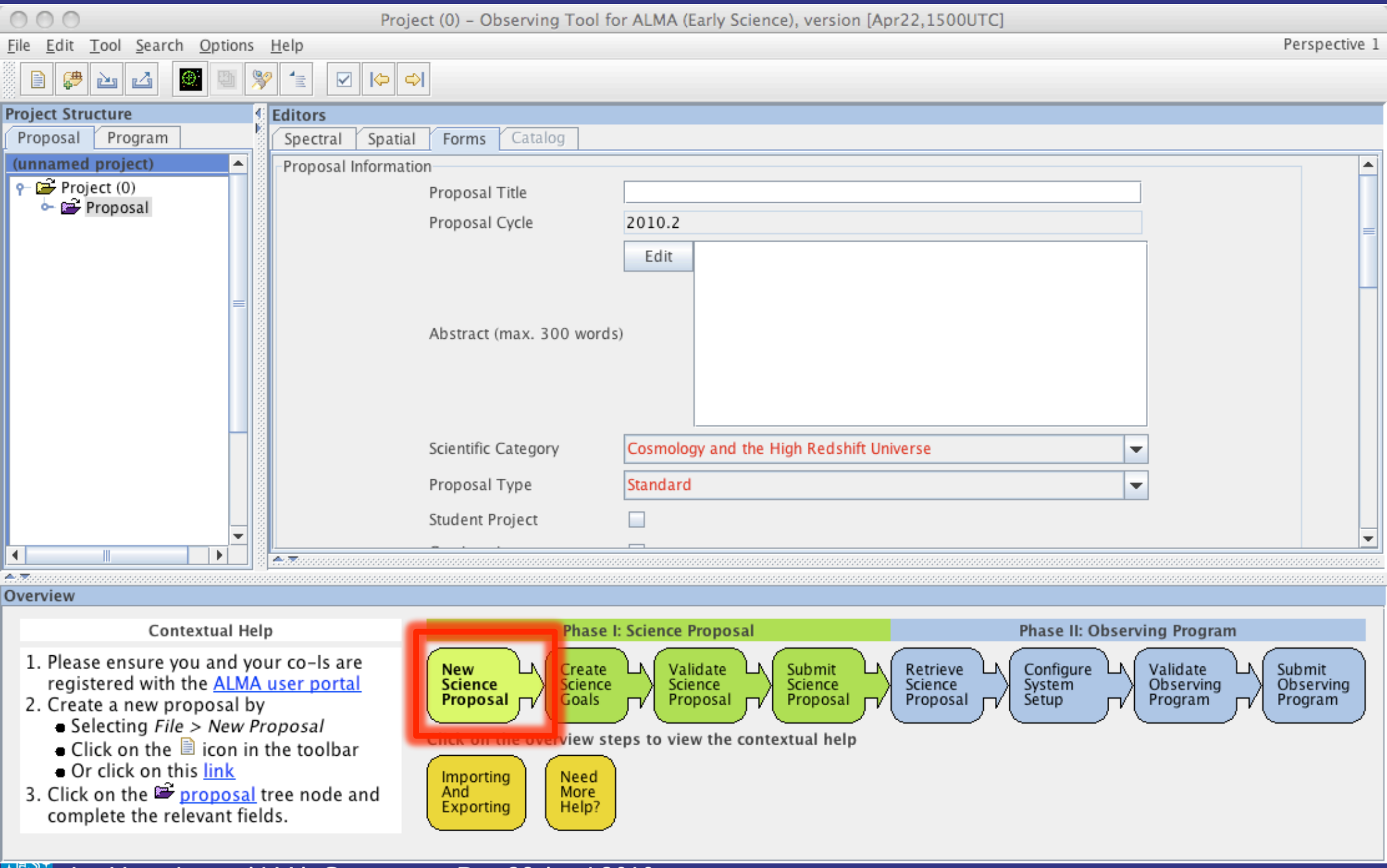

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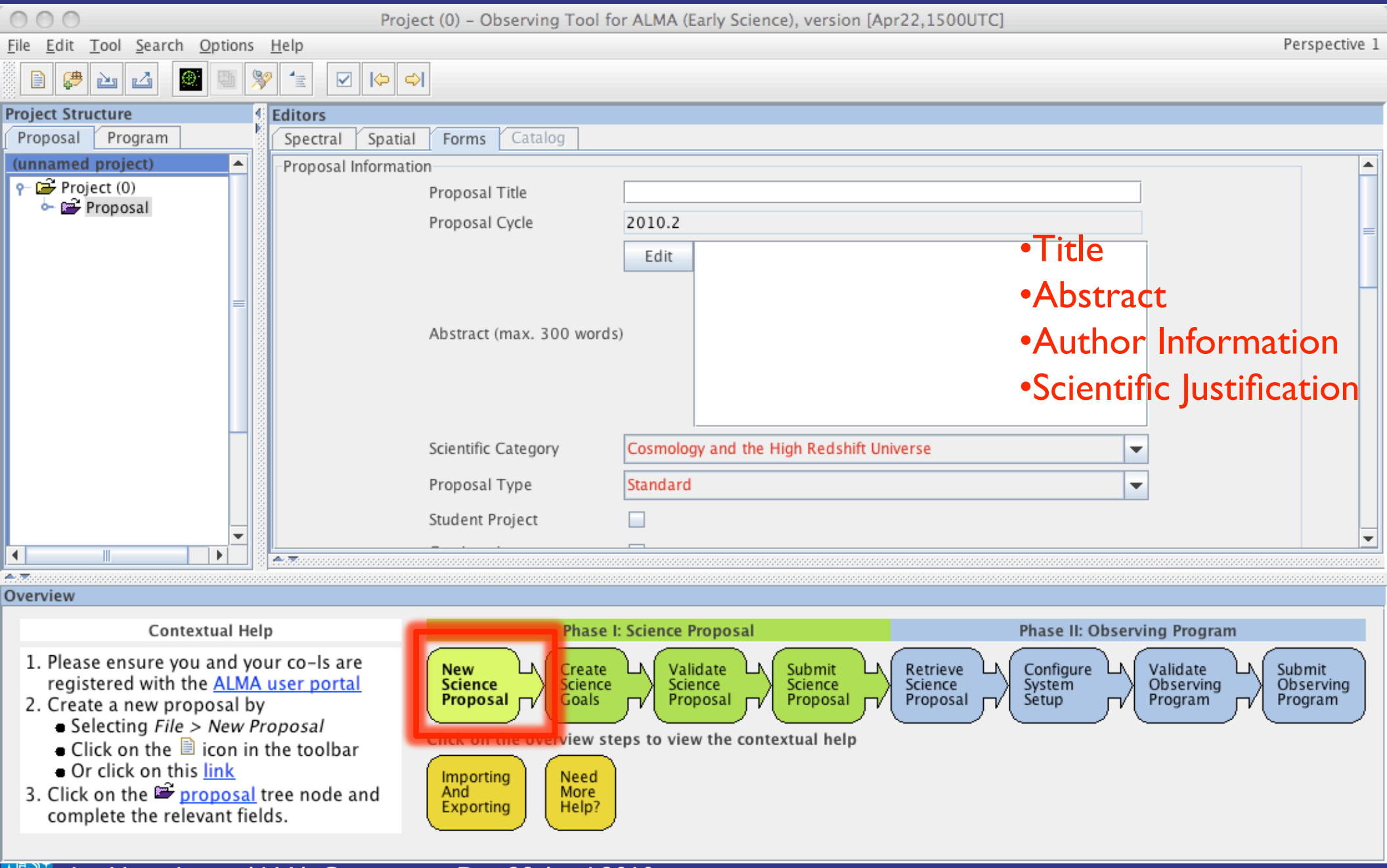
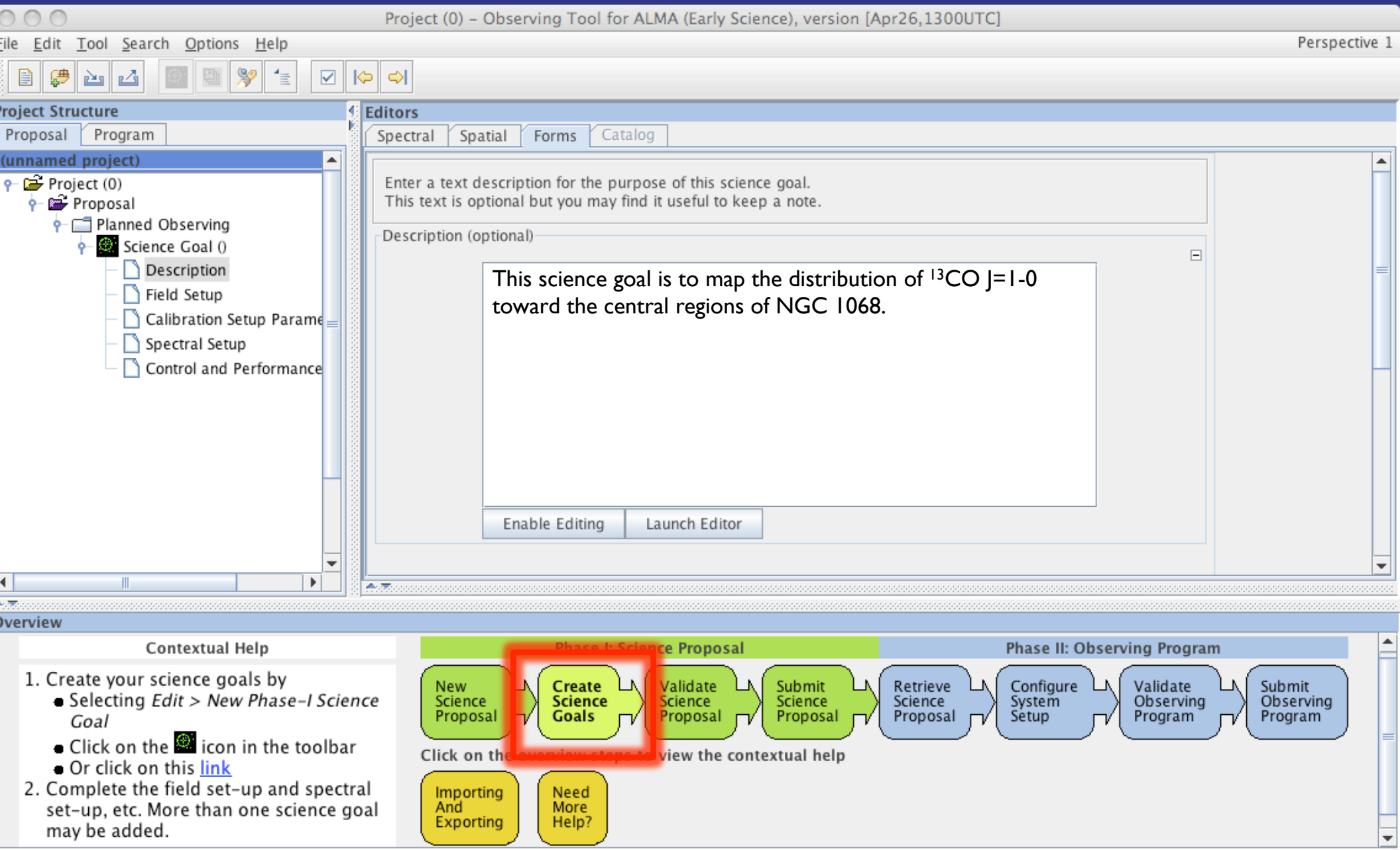
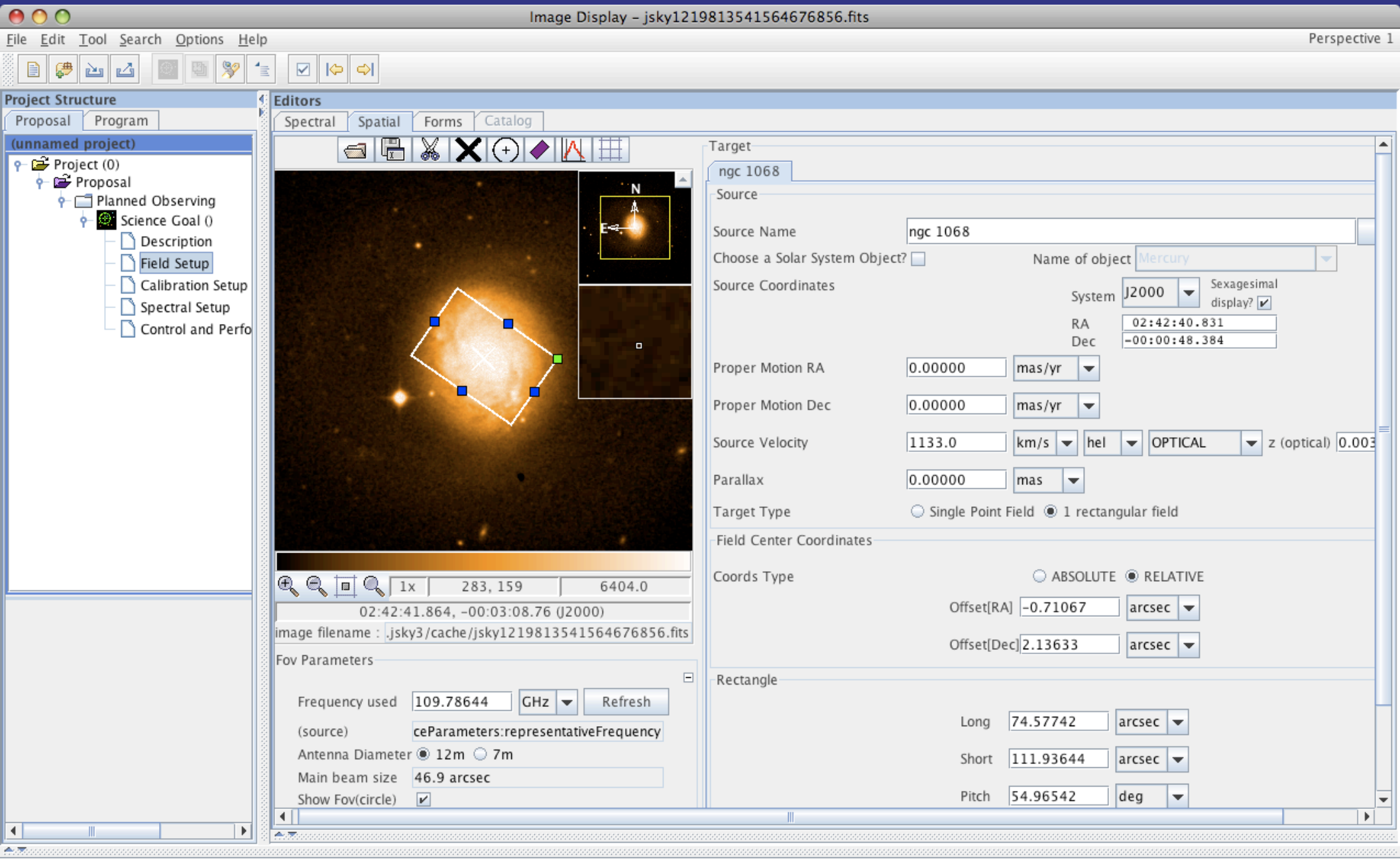


Phase 1: Create Science Goals



Create Science Goals: Field Setup



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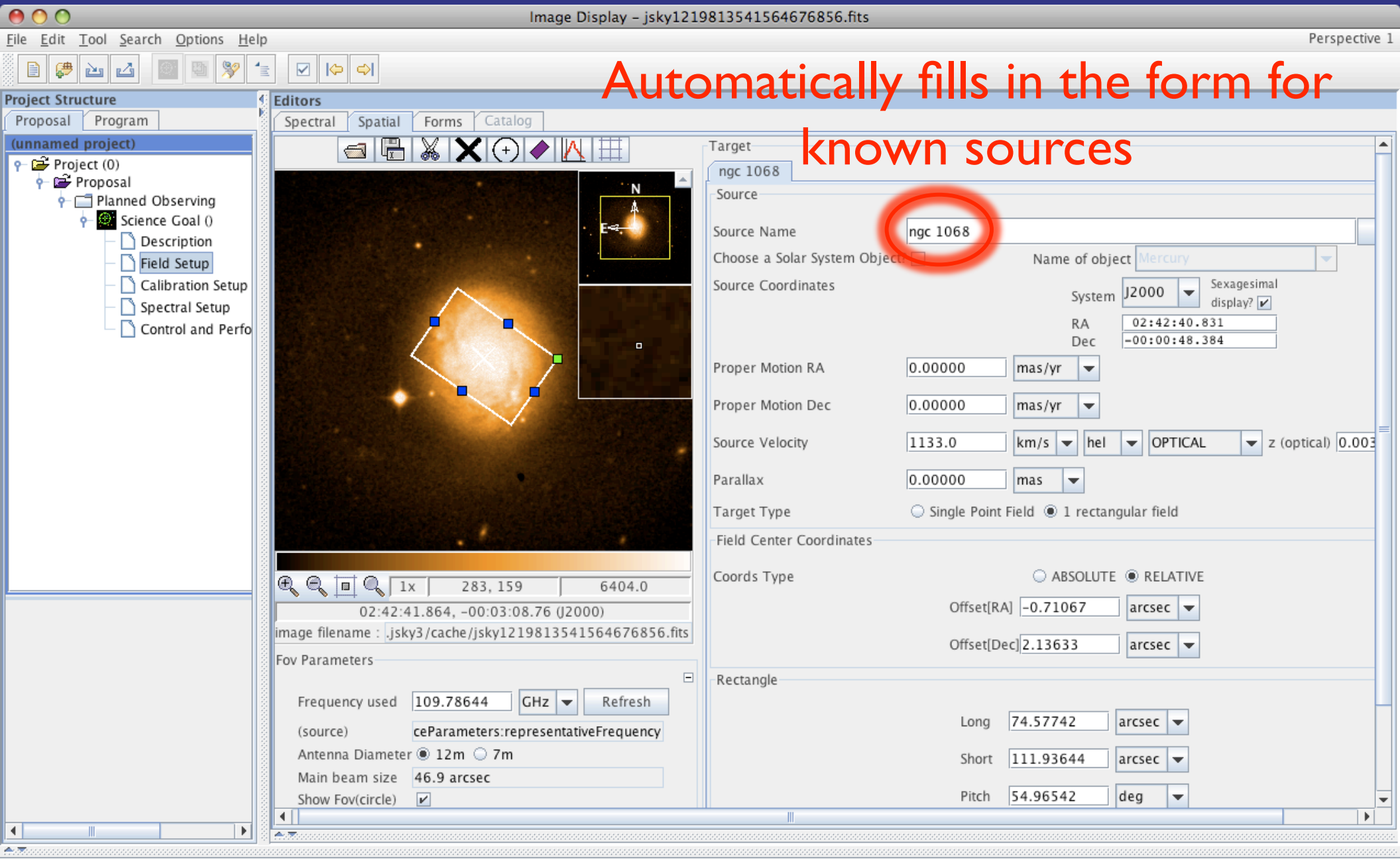

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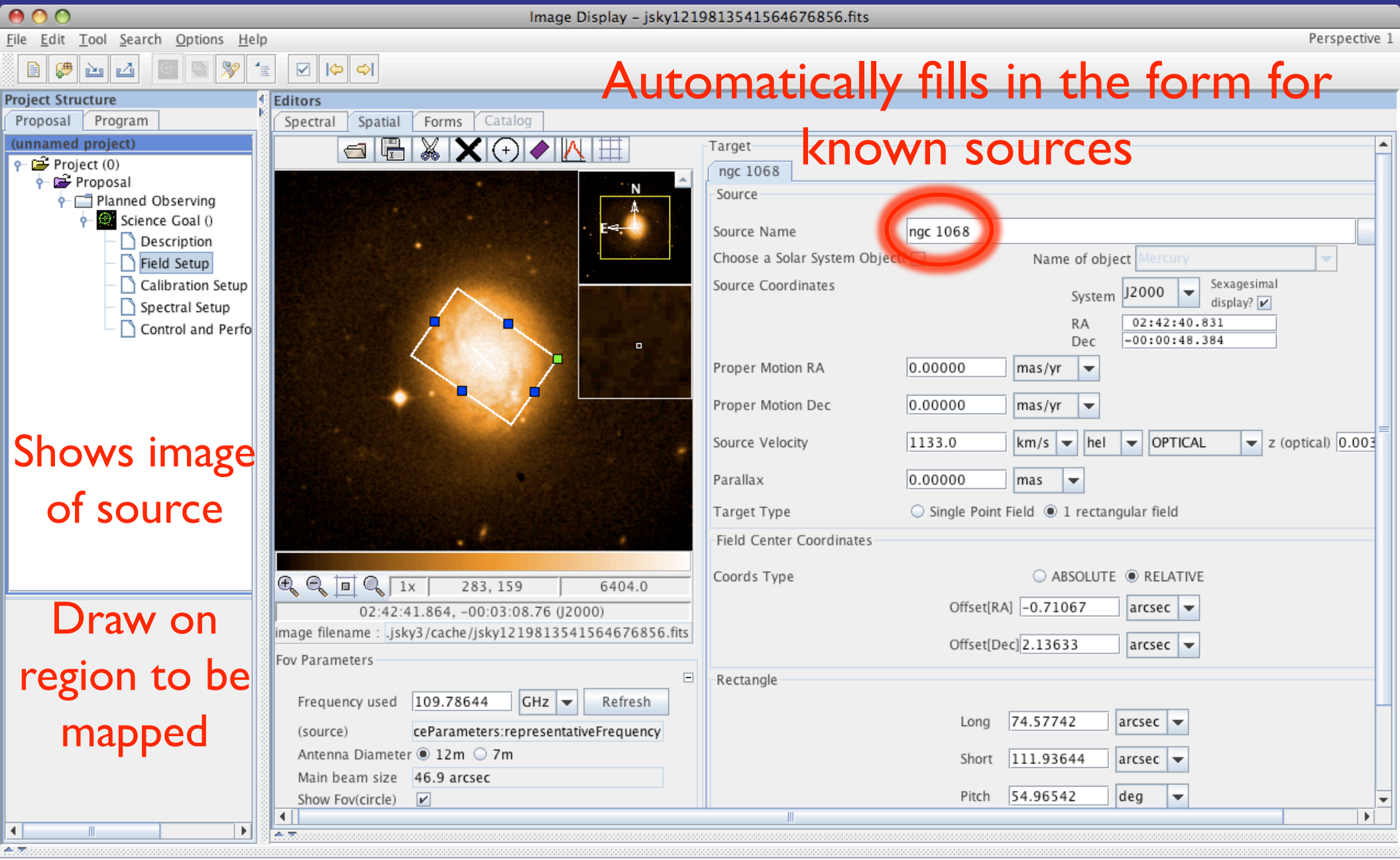
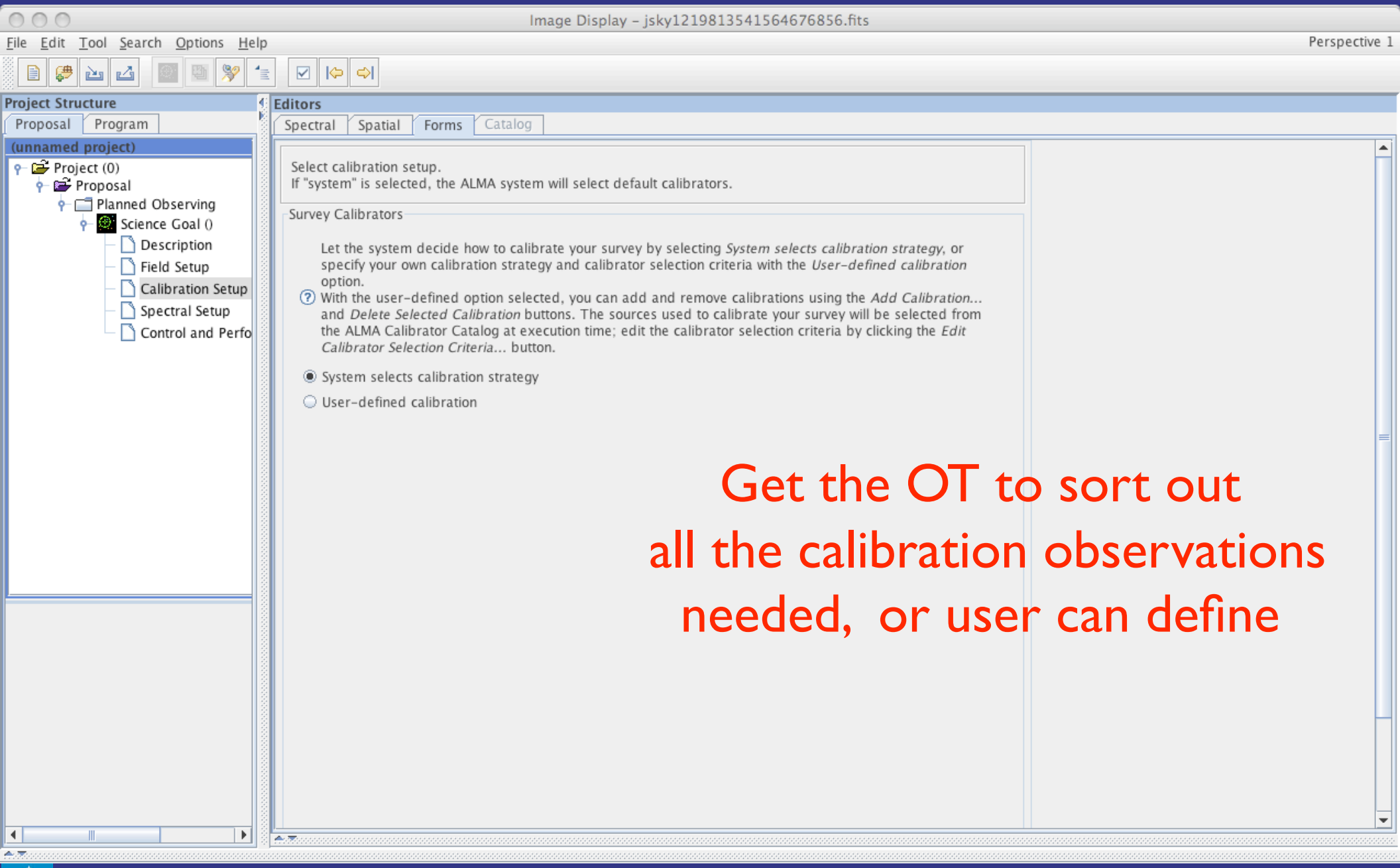


Automatically fills in the form for known sources

Shows image of source

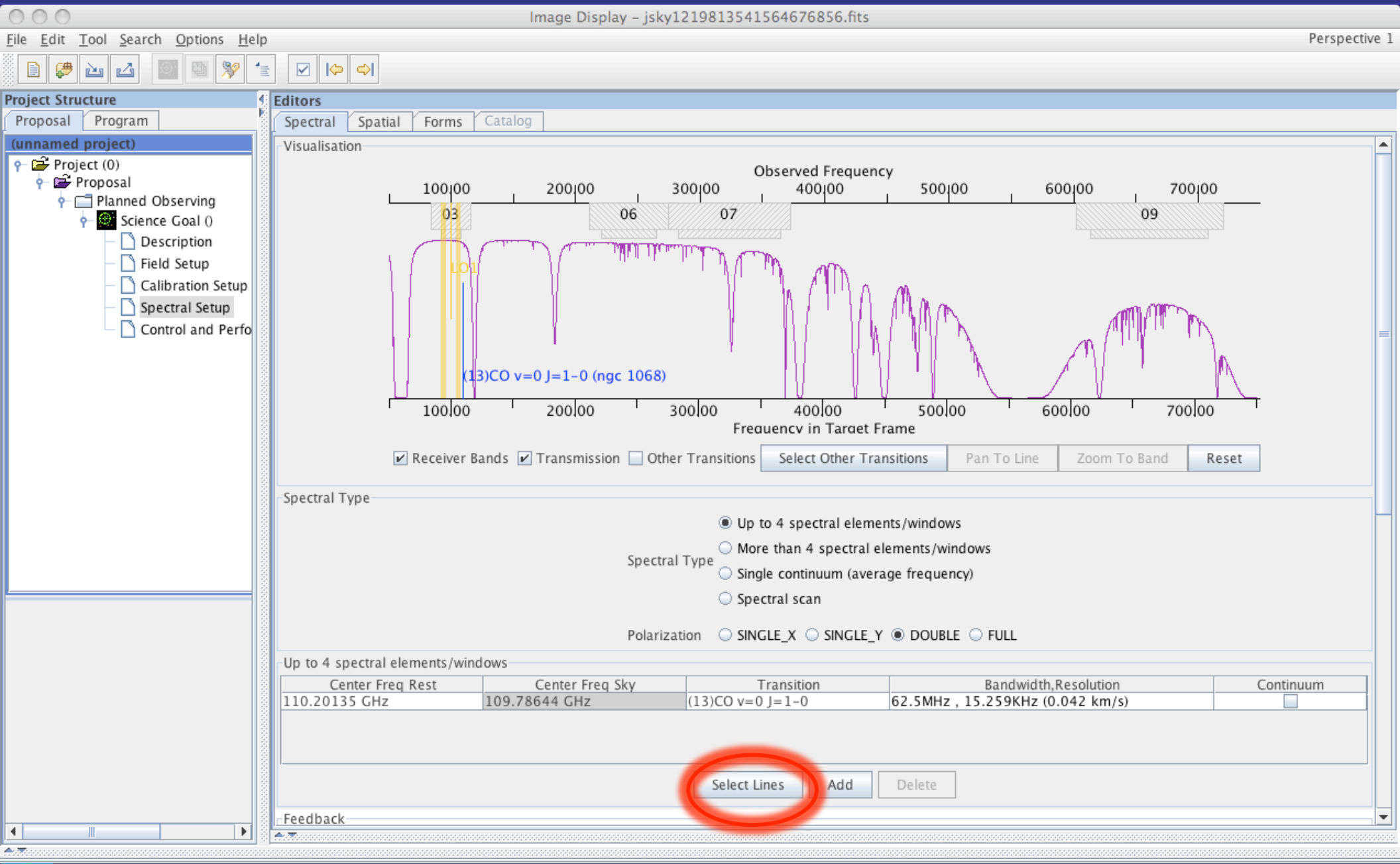
Draw on region to be mapped

Create Science Goals: Calibration Setup

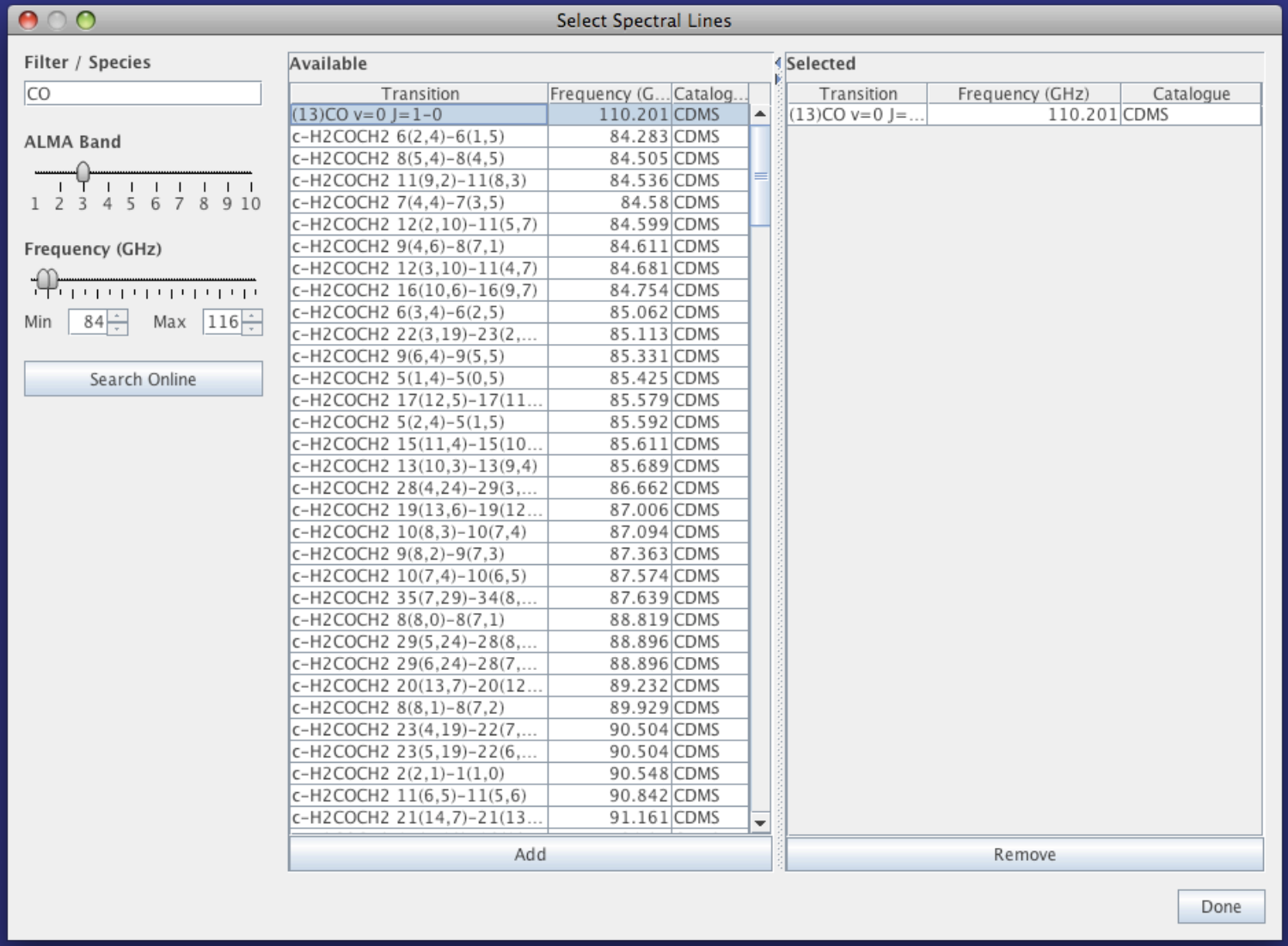


Get the OT to sort out
all the calibration observations
needed, or user can define

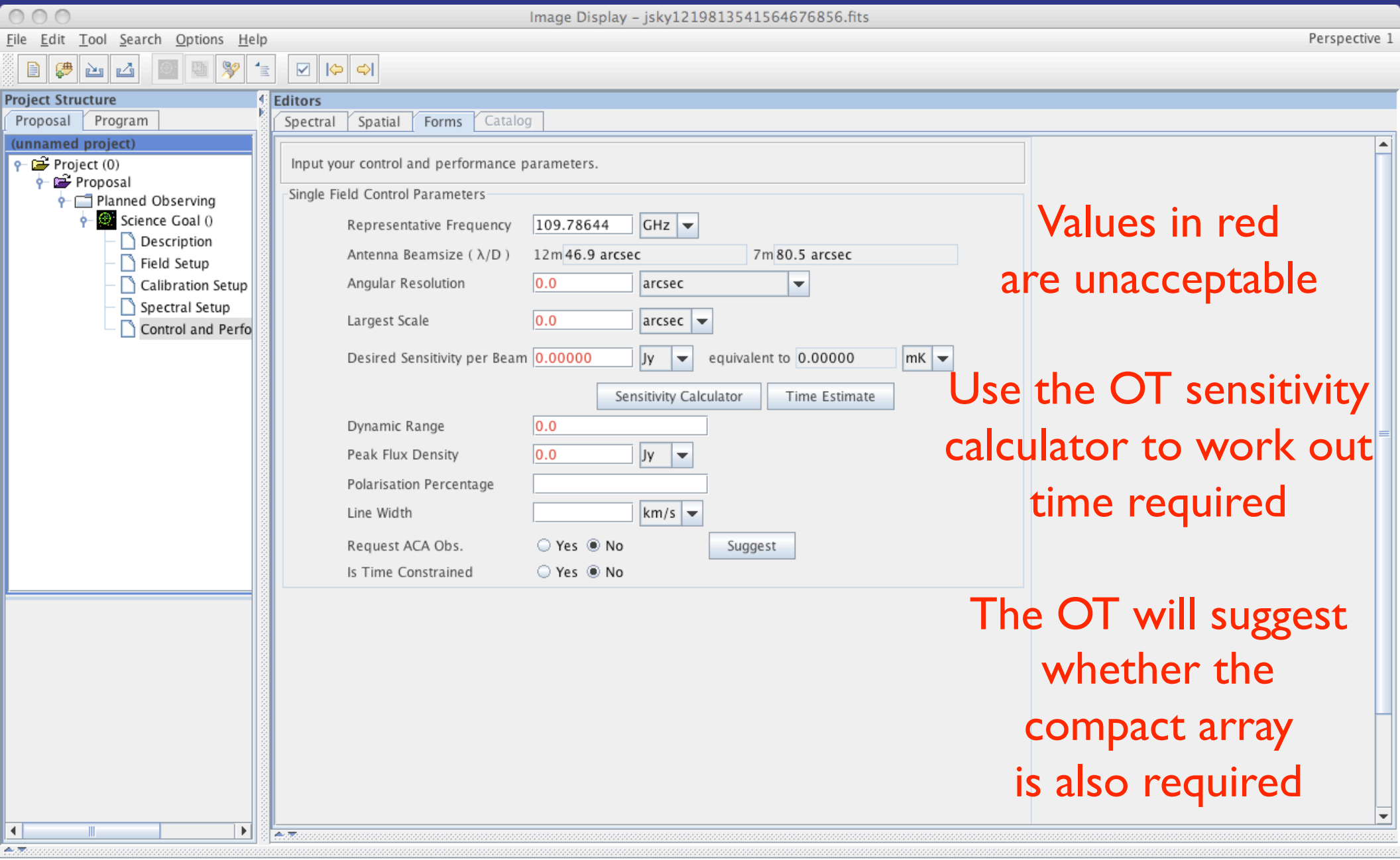
Create Science Goals: Spectral Setup



Spectral Line Tool



Science Goal: Control/Performance Setup

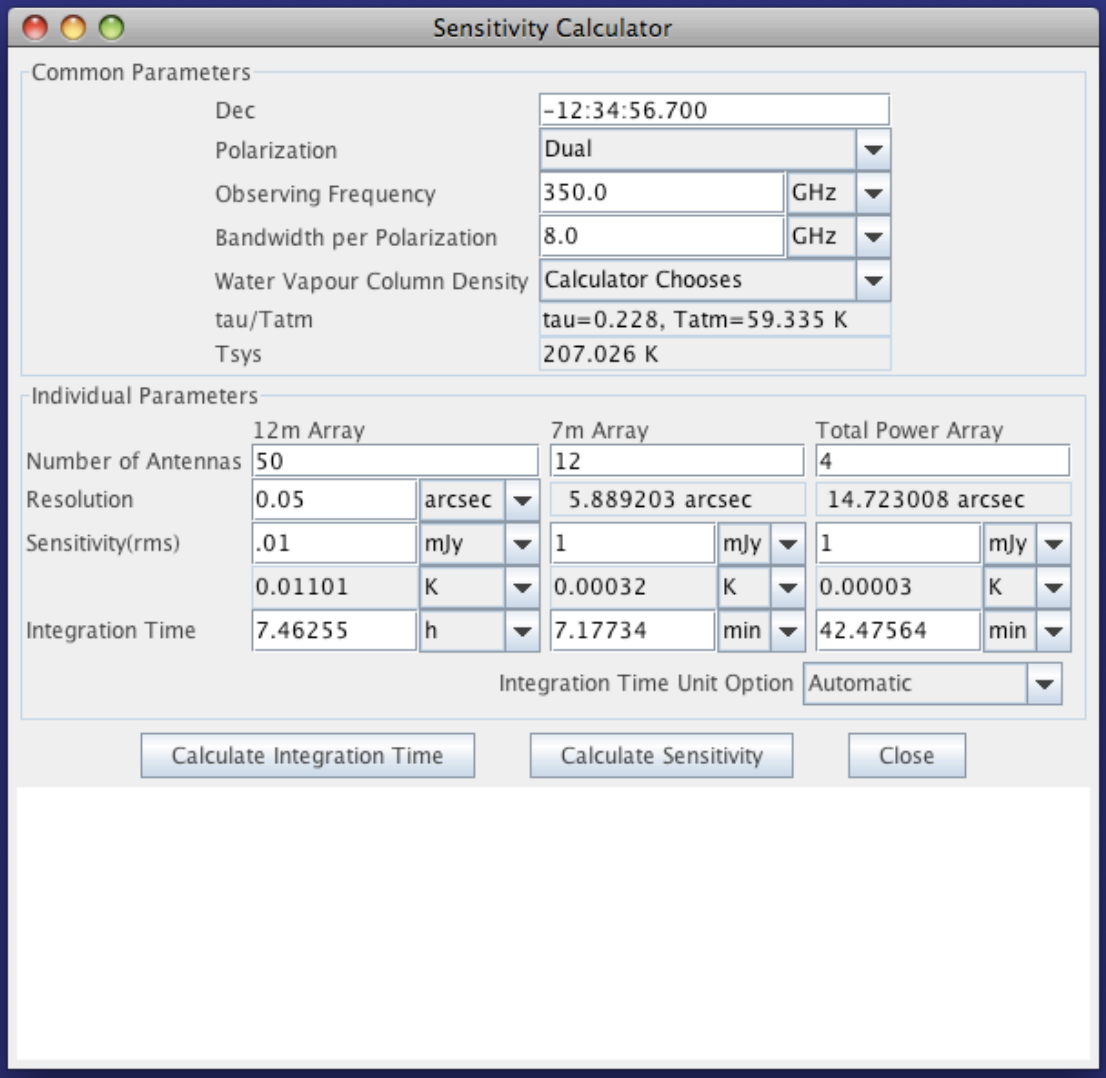


Values in red are unacceptable

Use the OT sensitivity calculator to work out time required

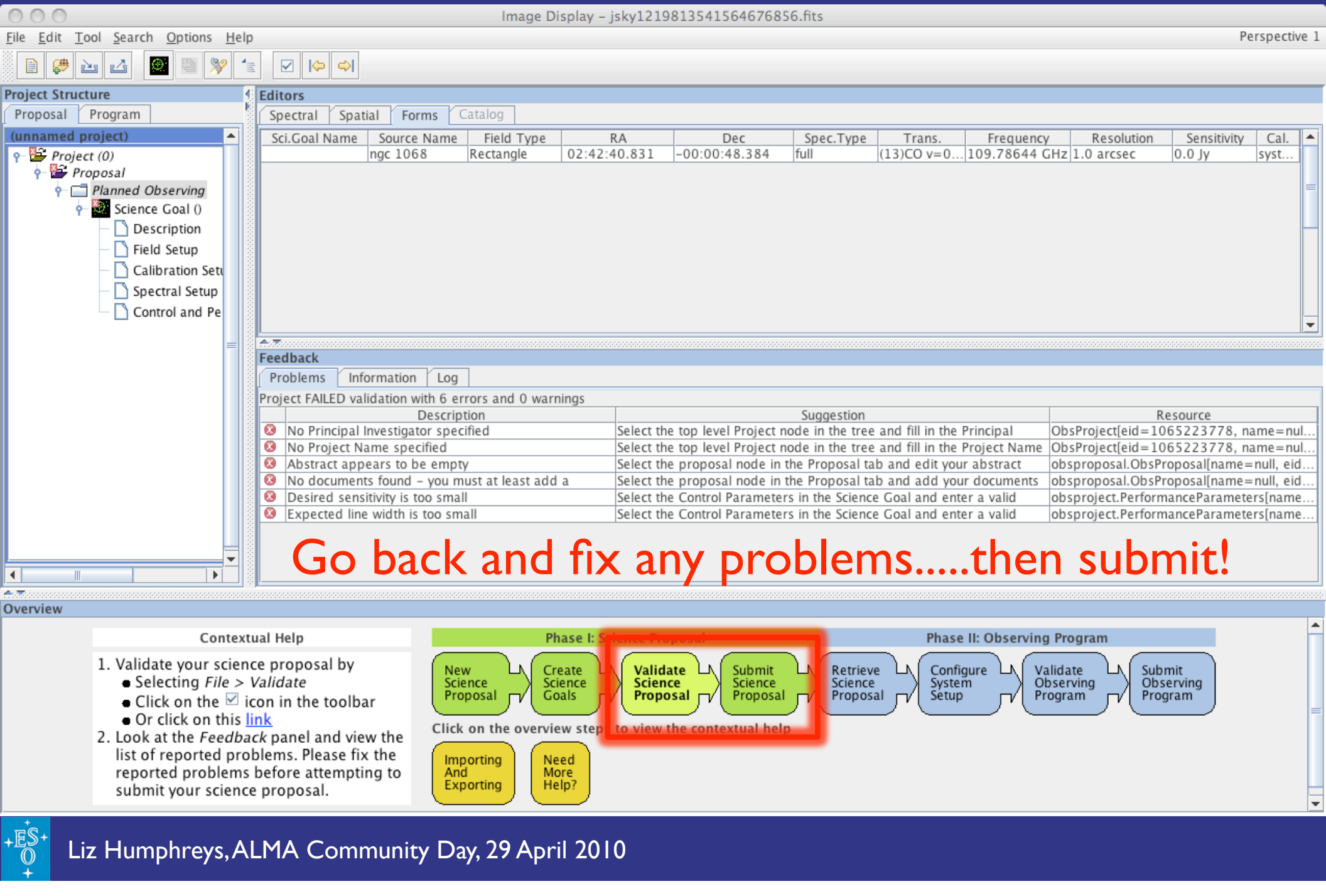
The OT will suggest whether the compact array is also required

ALMA Sensitivity Calculator



Also available as a web application at ESO ALMA pages: http://www.eso.org/sci/facilities/alma

Project Validation & Submission



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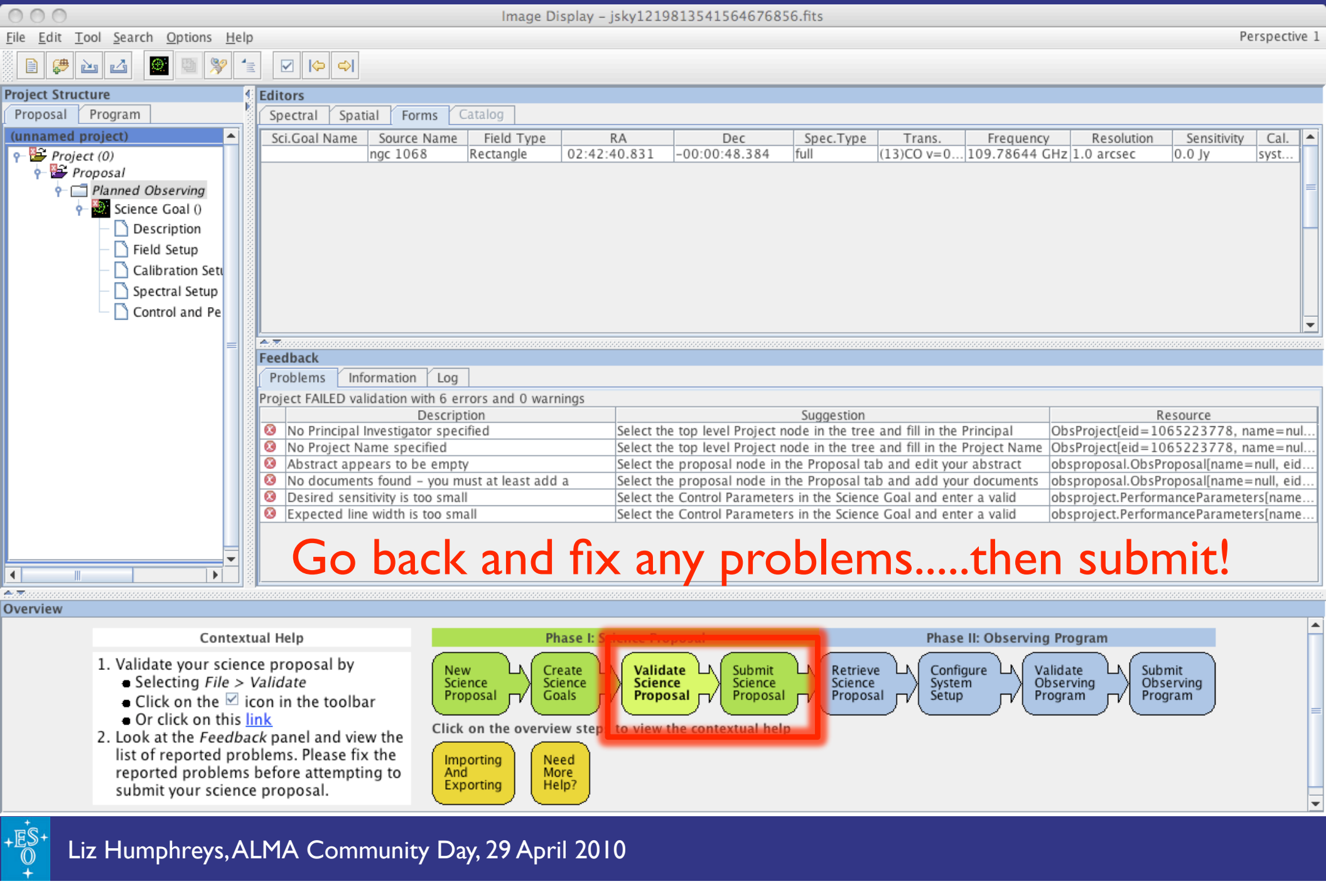
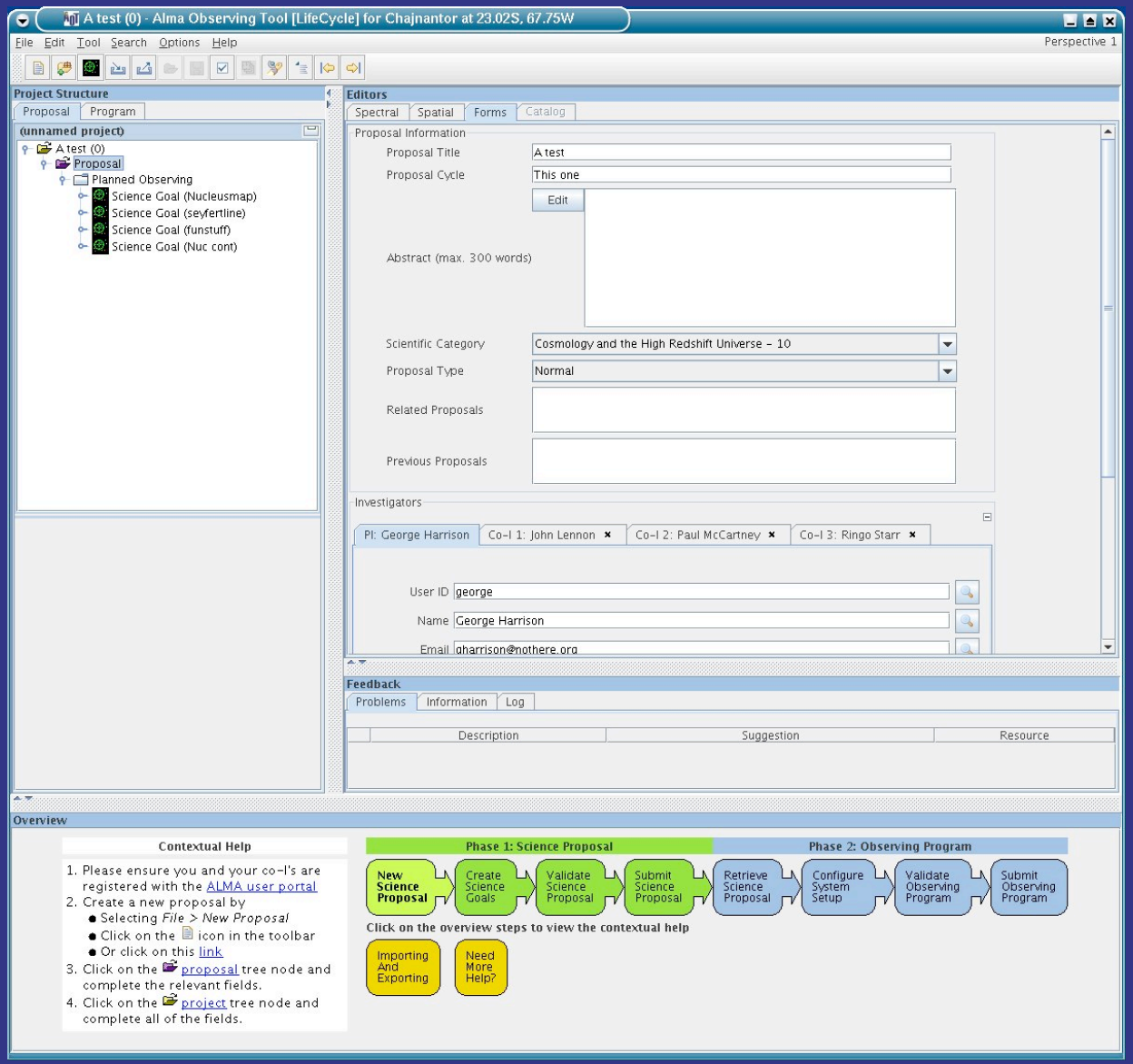


Proposal preparation (phase 1) - recap

- Captures all relevant info and submit to archive in Santiago
- Scientific justification and figures attached as pdf files
- Links to a central database for user information
- A number of tools are available
  - Sensitivity Calculator
  - Spectral Line Catalogue (Splatalog) search tool
  - Template Library
- User only needs fill in technical details as Science Goals
- Provides a complete printable record of proposal

Phase I Status



- Most required information fields present
- Ability to search a user database added
- Scientific Justification and figures can be attached
- Overview panel to guide users through steps
- Initial implementation of "Summary Panel"
- Web-based submission service tested

Phase II – observing preparation

- Re-use Science Goals from Phase I
- Observing mode scripts provided by project
  - On-the-fly, mosaicing, single-field interferometry, etc.
- Technical details/observing scripts editable by expert users/staff
- Other tools include:
  - Calibrator selection tool (OT can choose calibrators if required)
  - ACA necessity estimator (early version)
- User submits SBs to the archive in Santiago

Phase II Status

- Expert interface fully in place
- Holography and Optical Pointing supported (and used in Chile)
  - Feedback is being received from AIV/CSV teams
  - Bridger and Biggs visited Chile in January, Biggs is there now
- First user test of Phase II will be in May

Documentation

- Available on-line or within the OT are:
  - User Manual
  - Reference Guide
  - Cookbook
- ARCs will also be writing their own documentation

Preparing for Early Science

- Tests are held regularly (twice a year)
  - Testers usually come from within ALMA project
- A test using the archive in Chile was performed in Feb 2010
- Beta-testing taking place during May - some external testers
- "Public Preview" of OT this Jul
- ARCs to use OT for training and documentation May-Sep
- Version for first CfP ready Oct 2010

Demo

- Project from ALMA Design Reference Science Plan (DRSP)
- http://www.eso.org/sci/facilities/alma/science/drsp
- ^{12}CO J=2-1 observations of AGN NGC 1068 (Schinnerer)
- Single field interferometry
- Angular Scales reqd: 0.06 to 20 arcsec
- Rms 0.2 mJy/beam, 5 km/s channels, 1200 km/s linewidth
- Using OT v7.0