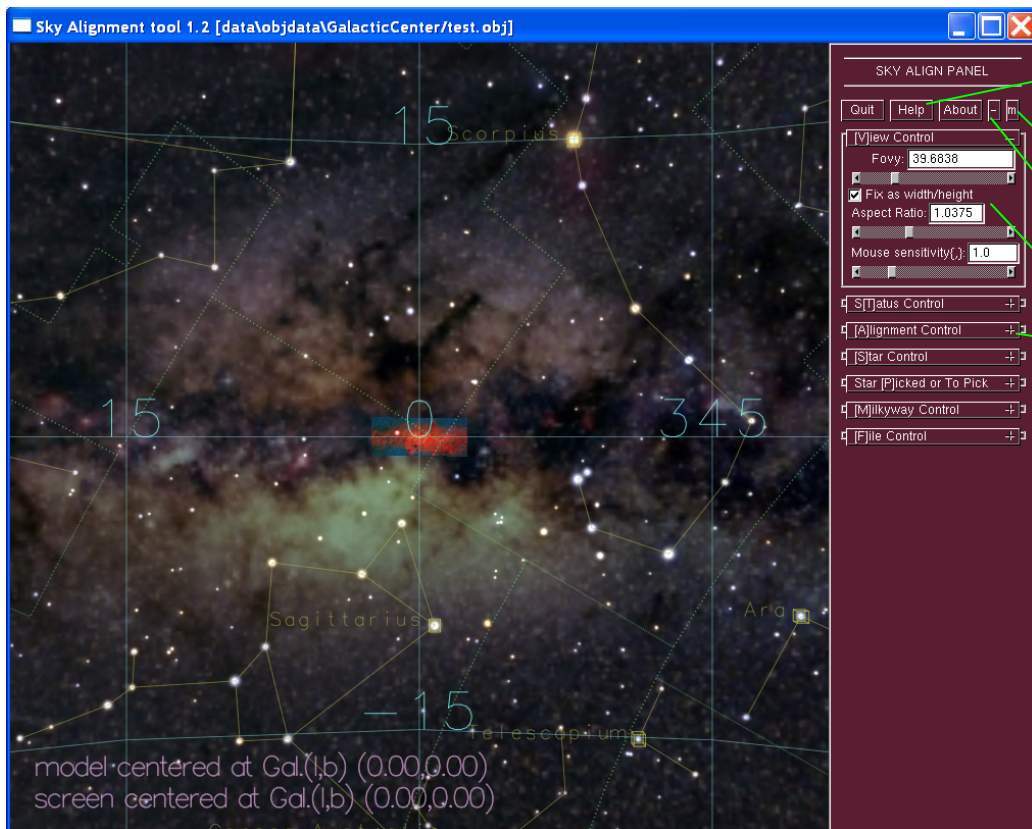


skyAlign REFERENCE SHEET

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skyAlign is a tool that provides accurate interactive alignment of images, photographs and 3D gas cloud models against sky coordinates.



INTERFACE

- **Help:** To access information on the skyAlign, including mouse and keyboard control
- **m** : Rotate order of drop-down control lists
- **--** : Collapse all opened drop-down control lists
- **Opened control dialog** : click '+' to collapse.
- **Collapsed control dialog** : click '+' to expand/open.

WORK FLOW

Step one : **skyAlign** aligns images as Wavefront obj format models. To prepare such model for a specific image:

1. Convert image to ppm format.
On Linux : `>convert image.jpg image.ppm`
On Windows : use PhotoShop with ppm plugin
2. Then generate wavefront obj model from the converted image using one of the two provided perl scripts in **skyAlign** "data" folder. The two perl scripts "galimgobj.pl" and "galimgobj2.pl" both can generate a rectangle obj model with input image as texture. The horizontal and vertical dimension of rectangle model will span a certain field of view of `<fovL>` and `<fovB>` in Galactic L and B degrees, which will correspond to the FOVs of the real image on the sky.

The first example shows how to generate an obj model named imageModel.obj from input image image.ppm. The horizontal field-of-view(FOV) of input image is known to span 0.2 degree along Galactic L, and the vertical FOV spans 0.1 degree along Galactic B.

```
>galimgobj.pl imageModel image.ppm 0.2 0.1
```

```
//syntax: galimgobj.pl <obj name> <texture file> <fov of image along L > <fov of image along B>
```

Or

The usage of galimgobj2.pl is as same as above except for the way FOVs are specified. In the next example, the lower left corner of input image is 0.1 degree along Galactic L from the image center, -0.05 degree along Galactic B from the image center; (-0.1 -0.05) for lower right corner; (0.1 0.05) for upper left corner, and (-0.1 0.05) for upper right corner.

```
>galimgobj2.pl imageModel image.ppm 0.1 -0.05 -0.1 -0.05 0.1 0.05 -0.1 0.05
```

```
//syntax: galimgobj2.pl <obj name> <texture file> <4 pairs of L, B at lower-left, lower-right, upper-left, upper-right corners>
```

Step two : After the model is ready, you can pass it to **skyAlign** either from command line:

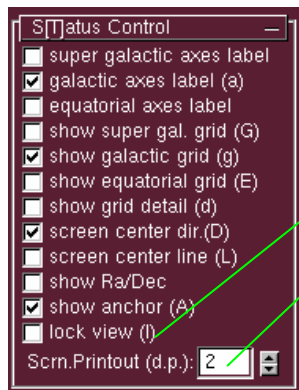
- On Linux `>skyAlign.linux imageModel.obj`
On Windows `>skyAlign.exe imageModel.obj`

Or import the model obj file through "File Control" dialog on skyAlign interface (see "Controls" section for detail)

Step three: Align the model in skyAlign. Refer to "Controls" section for detail.

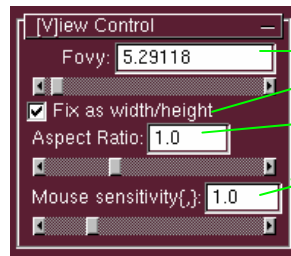
Step four : Export aligned model through "Alignment Control" dialog. The exported model is now properly aligned against sky coordinate chosen for visualization.

CONTROLS



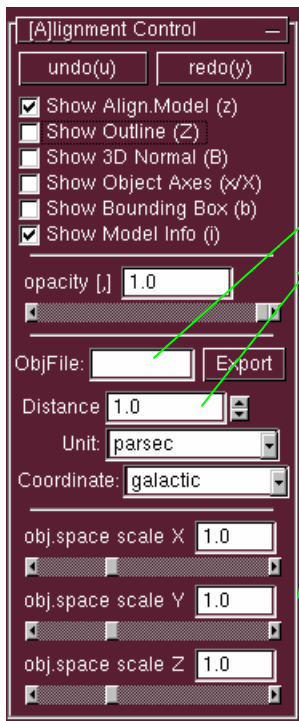
Status Control

- Check boxes toggle showing various onscreen information
- Anchor is an onscreen point about which model-to-be-aligned can rotate
- When view is locked, all view changing capability will be disabled.
- (d.p.) scroll counter sets up display precision of decimal number.



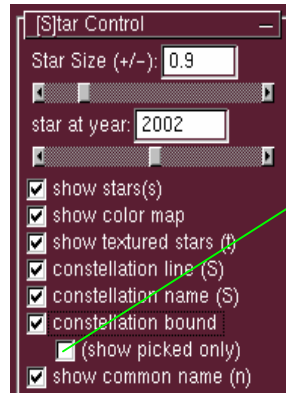
View Control

- Change Fov to Zoom In/Out
- Dimension ratio of model can be fixed
- Aspect ratio of sky shown in skyAlign is adjustable
- Adjust mouse sensitivity to achieve high precision adjustment



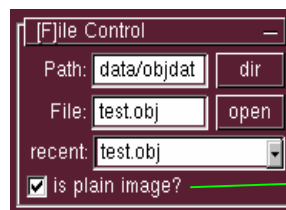
Alignment Control

- Alignment operation can be redone/undone
- Allows showing 3D normals specified in obj model.
- Opacity of model allows model see through
- Aligned model is exported to ObjFile
- Units of model distance from the origin. Model centers at (0,0) of the chosen coordinate system.
- Model scaling



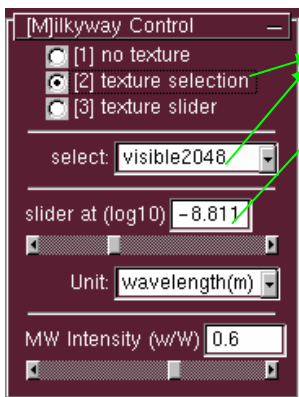
Star Control

- Tune star size for better visualization
- Display of stars, constellations in background for cross-reference
- Allows display of picked star's constellation only



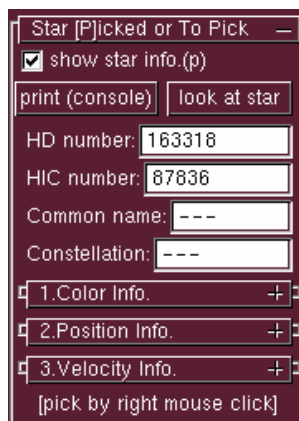
File Control

- Specify model file to be loaded into skyAlign
- History of recent aligned model
- Plain image can be rotated about axis perpendicular to image plane



Milkyway Control

- Milkyway background can be shown as texture by selection
- Or texture at a specified wavelength using slider
- Tune MW intensity stronger/weaker



Star Picking Control

- Use right mouse to pick star
- Allow display of picked star information on screen, console or dialog here
- Change view to the picked star