DICOM Tractography Converter

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Learning Objectives

The aim is to convert between DICOM TrackSet and Slicer-style VTK tractography.

Following this tutorial, you'll be able to:

1) Save DICOM format tractography files in 3D Slicer
2) Load DICOM format tractography files into 3D Slicer
3) Convert between VTK format tractography files and DICOM format using command line

For more information about Tractography Supplement DICOM standard, please visit this website: http://www.dclunie.com

The tutorial uses the 3D Slicer (Version 4.10, Stable Release) software available at:

http://download.slicer.org

Disclaimer:
It is the responsibility of the user of 3DSlicer to comply with both the terms of the license and with the applicable laws, regulations and rules. Slicer is a tool for research, and is not FDA approved.

Slicer dMRI

An open-source project to improve and extend diffusion magnetic resonance imaging software in 3D Slicer:

http://dmri.slicer.org

Please visit the following website to install Slicer dMRI:
http://dmri.slicer.org/download/

Tutorial Data

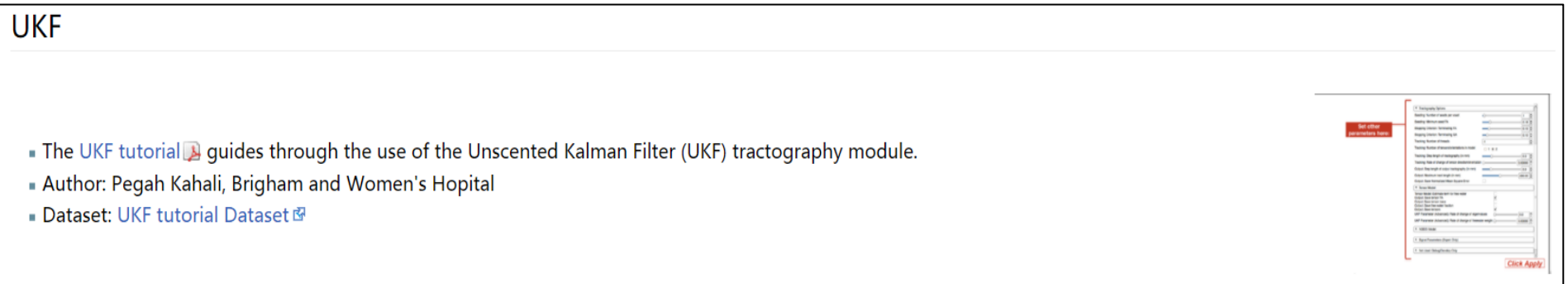
Download sample data, at:
https://www.na-mic.org/Wiki/images/f/fc/Example_data.zip

The following data are provided:

- DICOM image
- Whole brain tractography (conducted using UKF tractography from the same data) in VTK format.

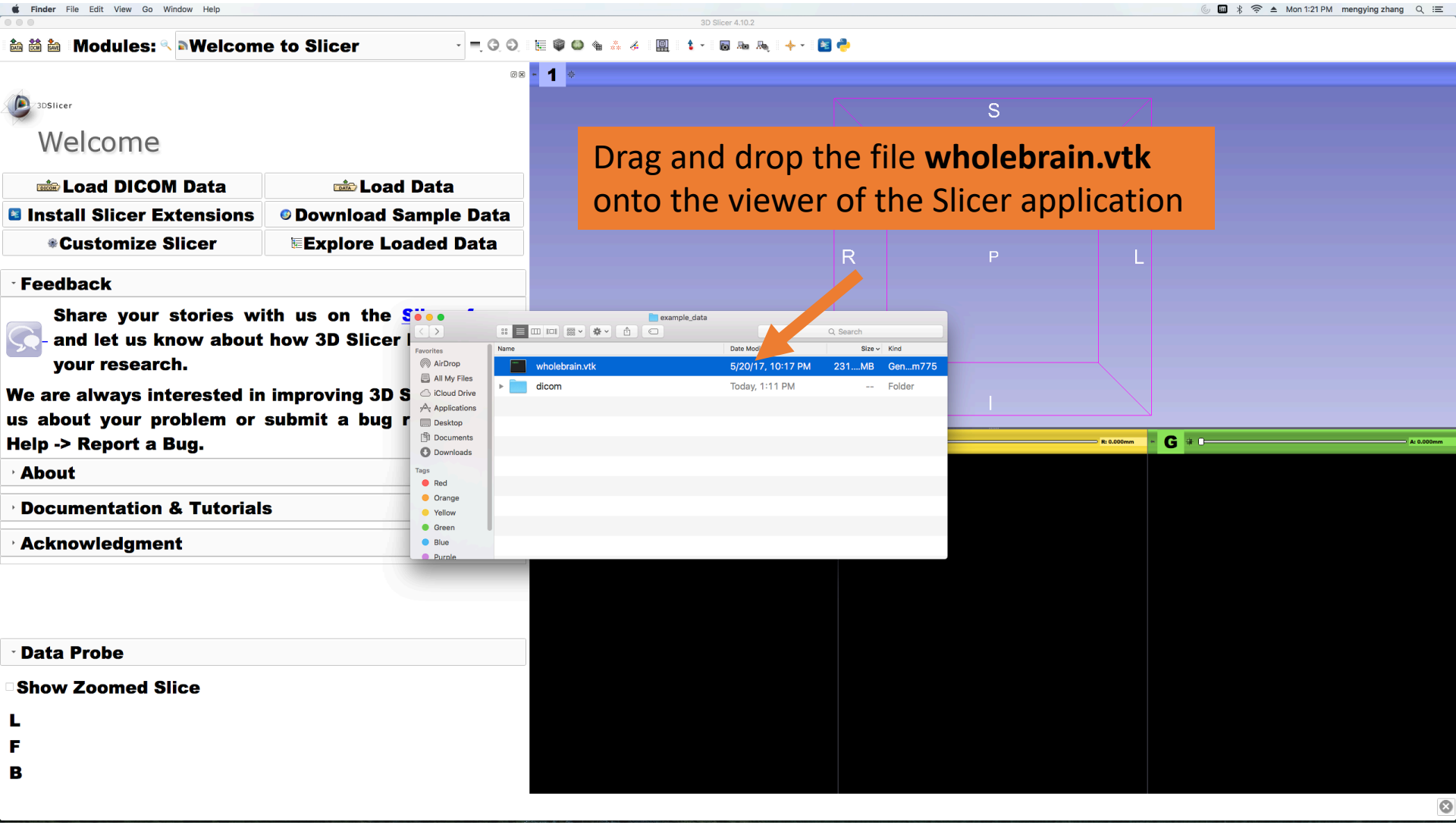
NOTE: *Both use cases require a reference diffusion-weighted MRI DICOM scan. The reference scan must be the DICOM data from which the tractography was created.*

For more information about UKF tractography, please follow this tutorial:
https://dmri.slicer.org/docs/tutorials/UKFTractography.pdf



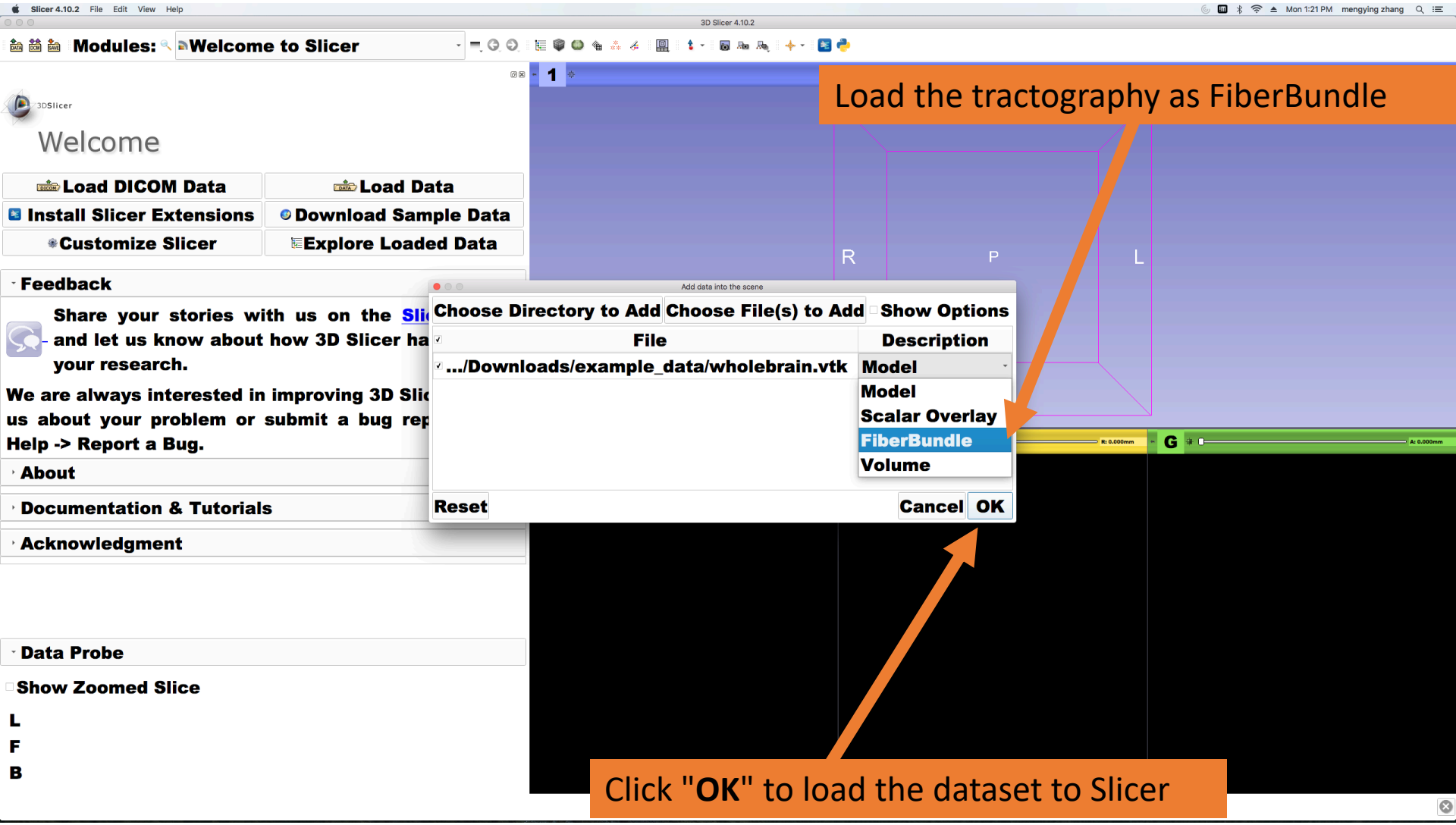
Tractography DICOM Save

Load VTK file



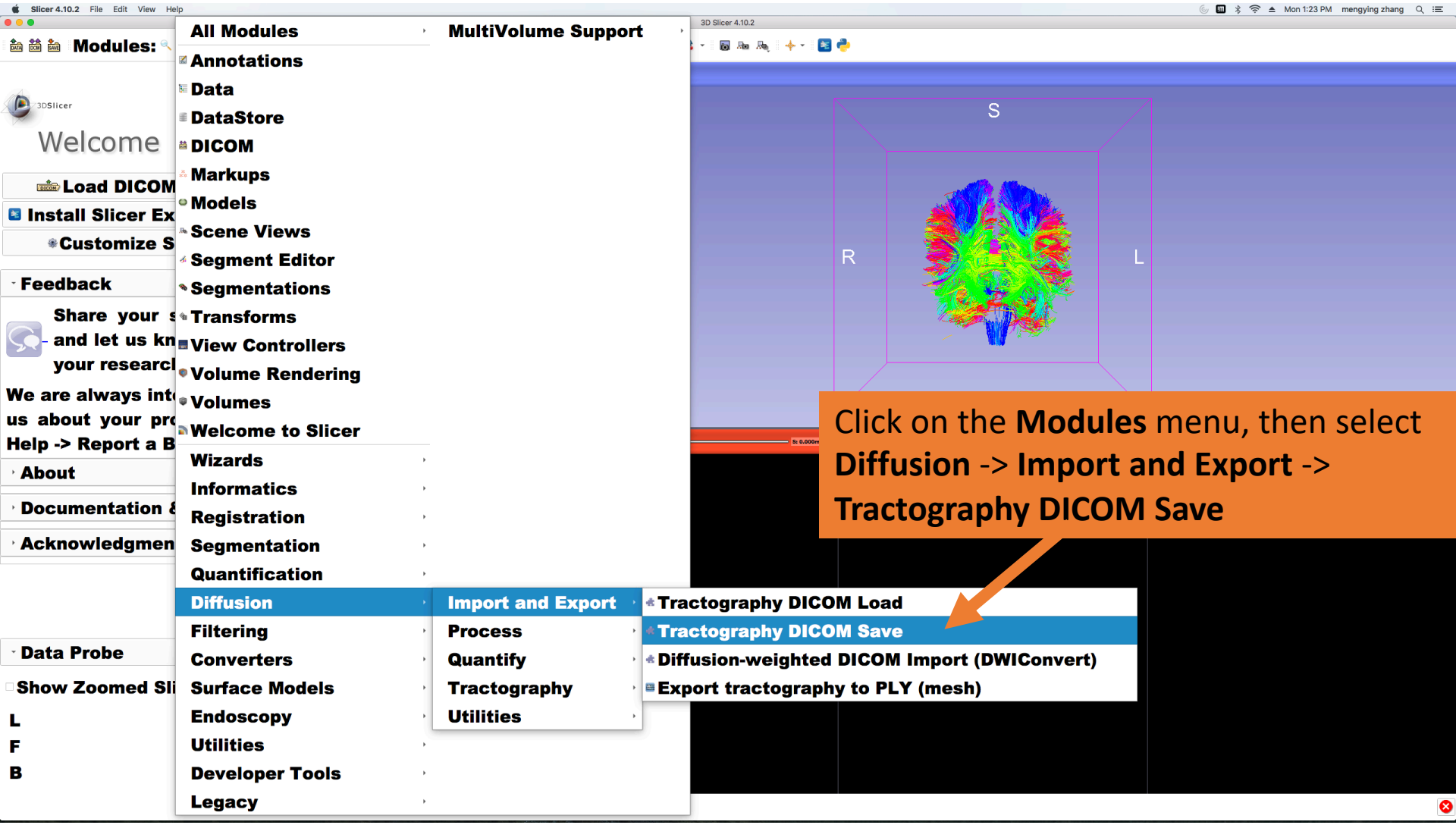
Tractography DICOM Save

Load VTK file



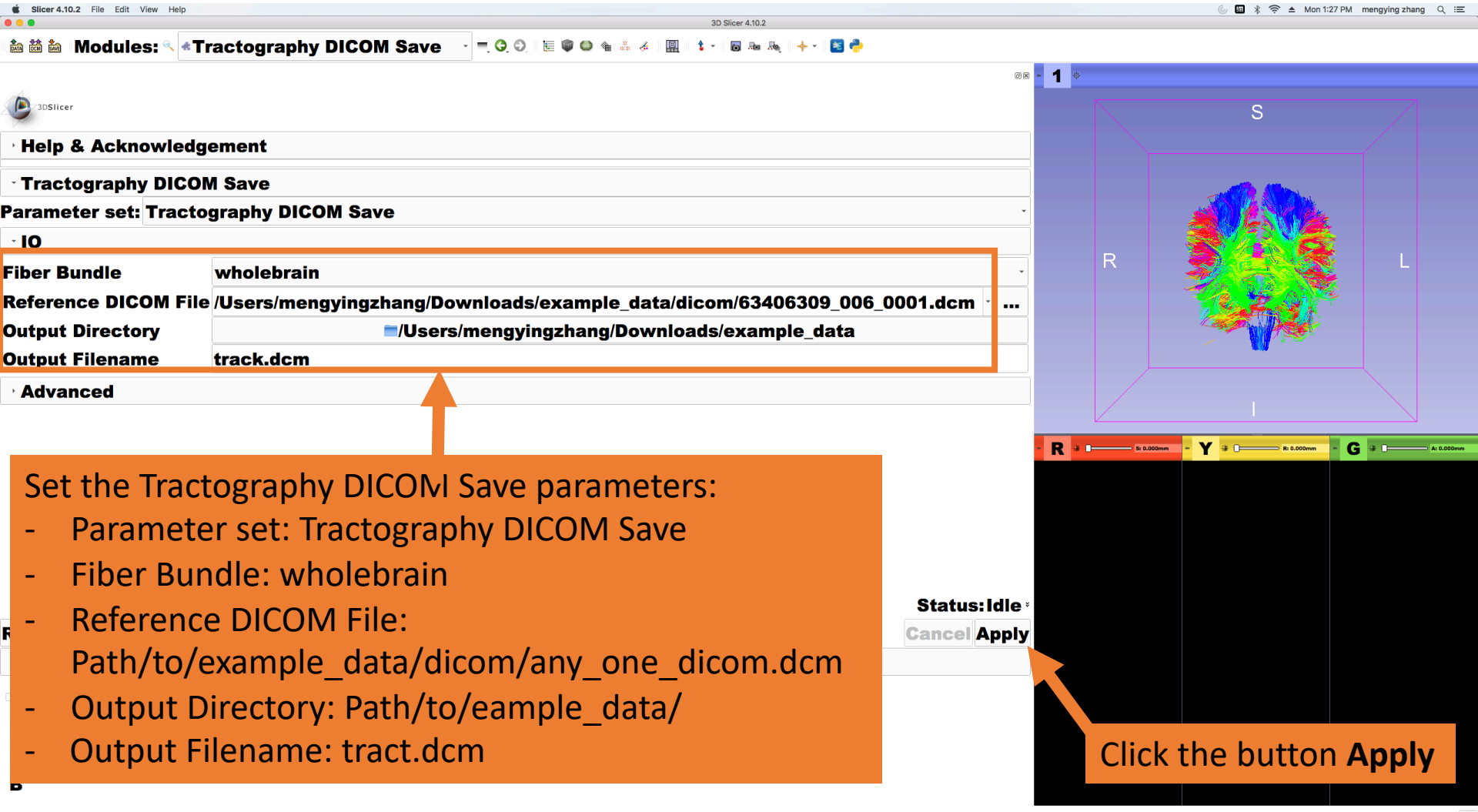
Tractography DICOM Save

Select the module



Tractography DICOM Save

Set parameters



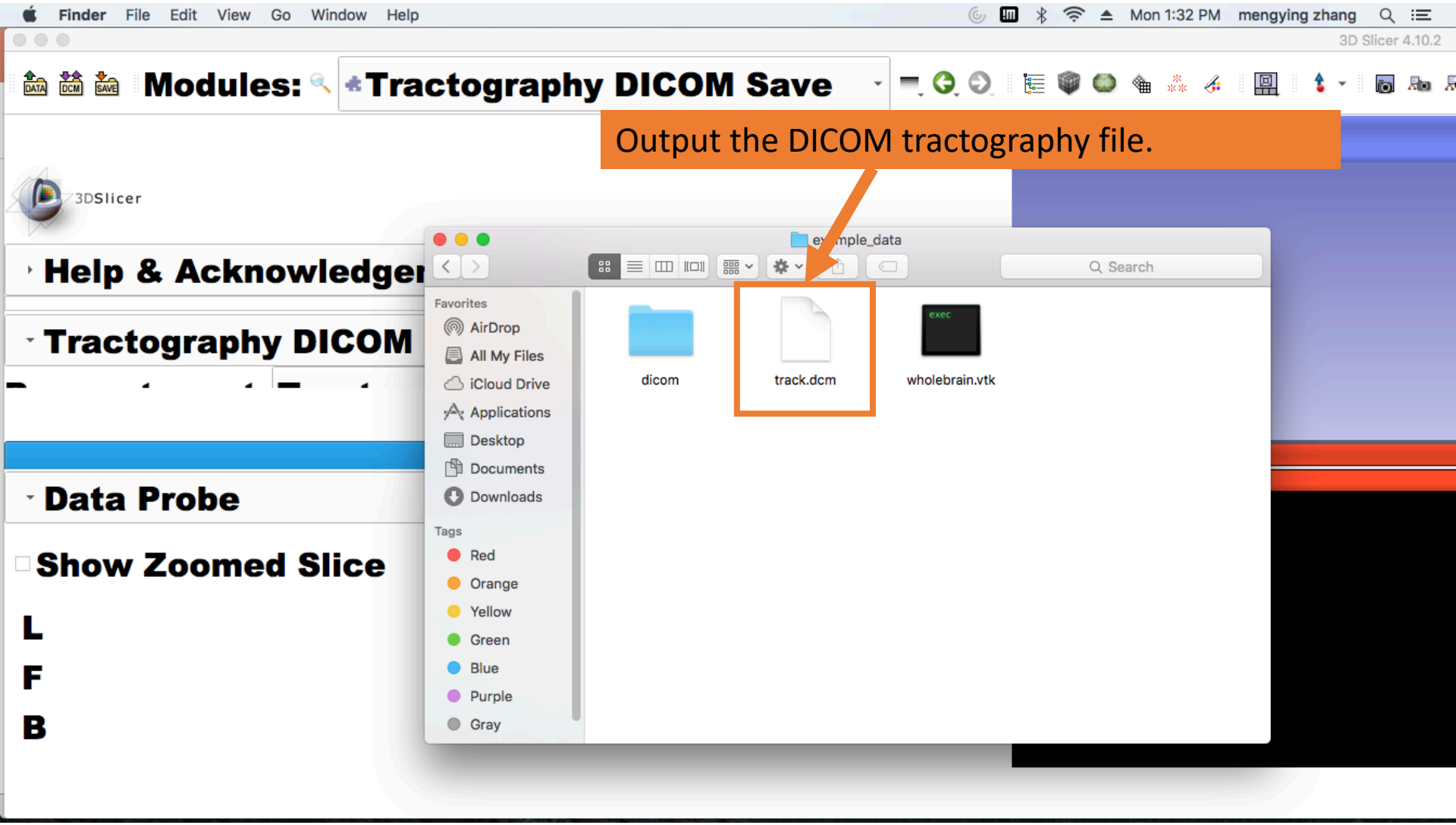
Set the Tractography DICOM Save parameters:

- Parameter set: Tractography DICOM Save
- Fiber Bundle: wholebrain
- Reference DICOM File: Path/to/example_data/dicom/any_one_dicom.dcm
- Output Directory: Path/to/eample_data/
- Output Filename: tract.dcm

Click the button **Apply**

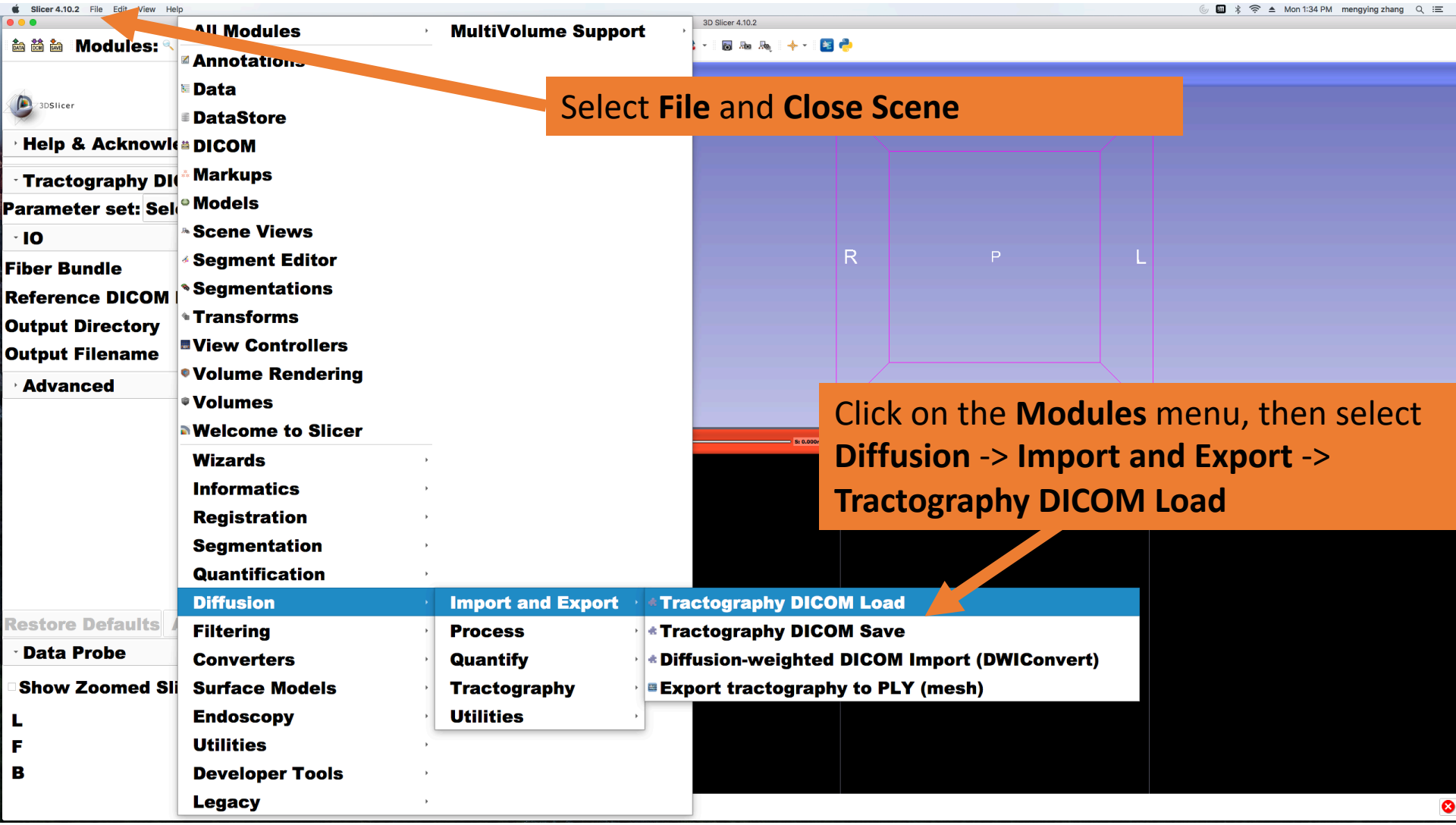
Tractography DICOM Save

Output



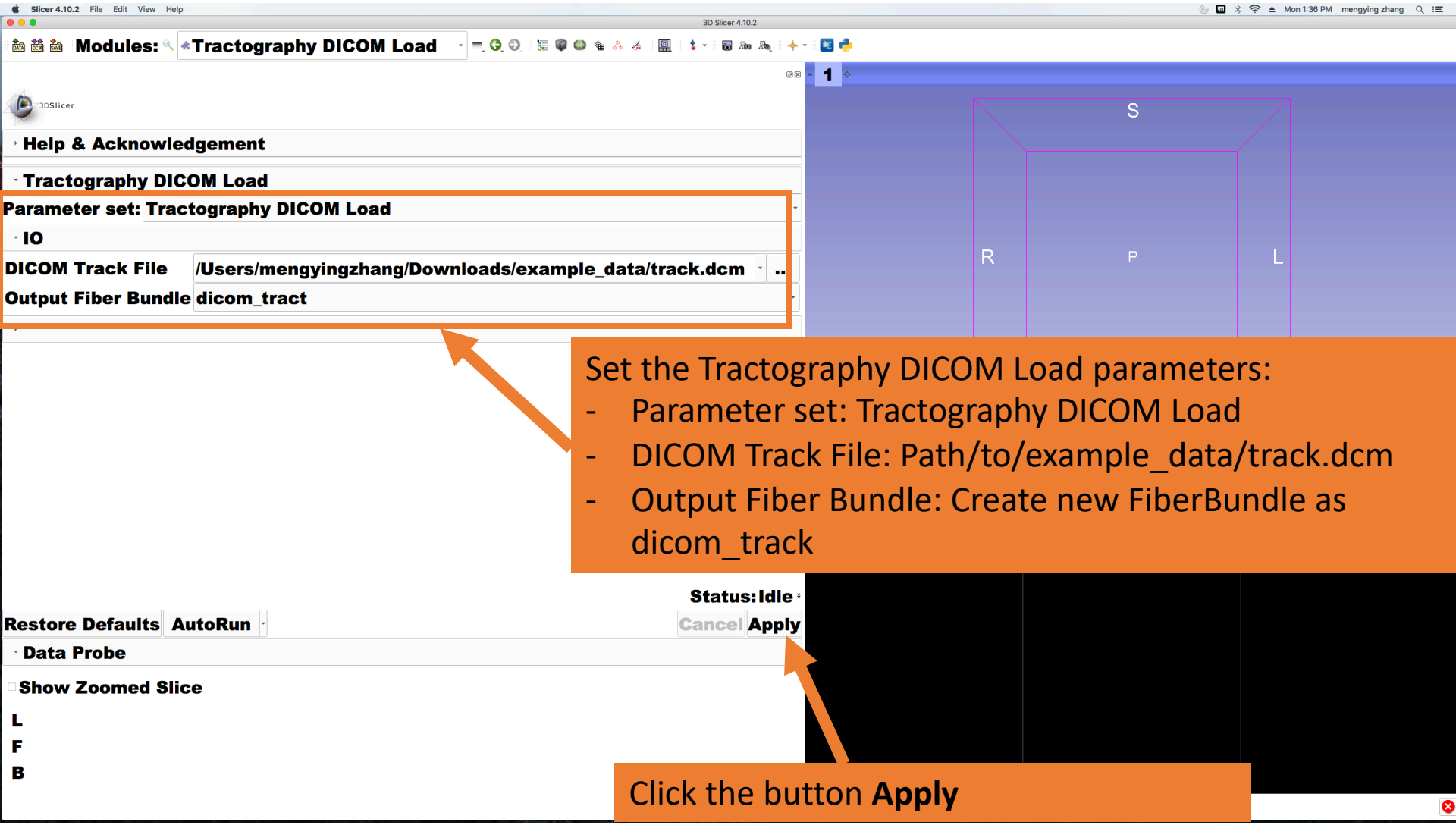
Tractography DICOM Load

Select the module



Tractography DICOM Load

Set parameters



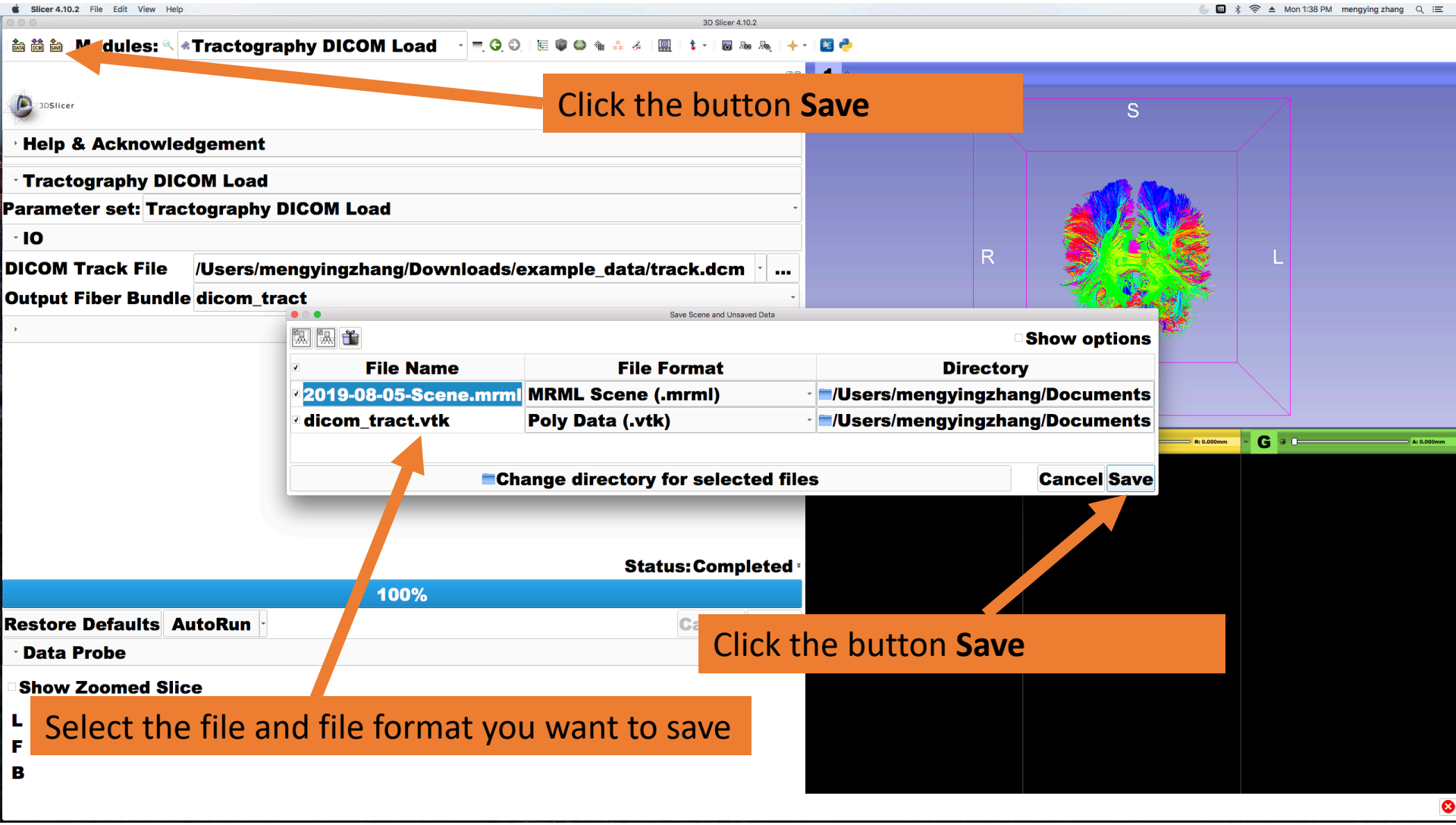
Set the Tractography DICOM Load parameters:

- Parameter set: Tractography DICOM Load
- DICOM Track File: Path/to/example_data/track.dcm
- Output Fiber Bundle: Create new FiberBundle as dicom_track

Click the button **Apply**

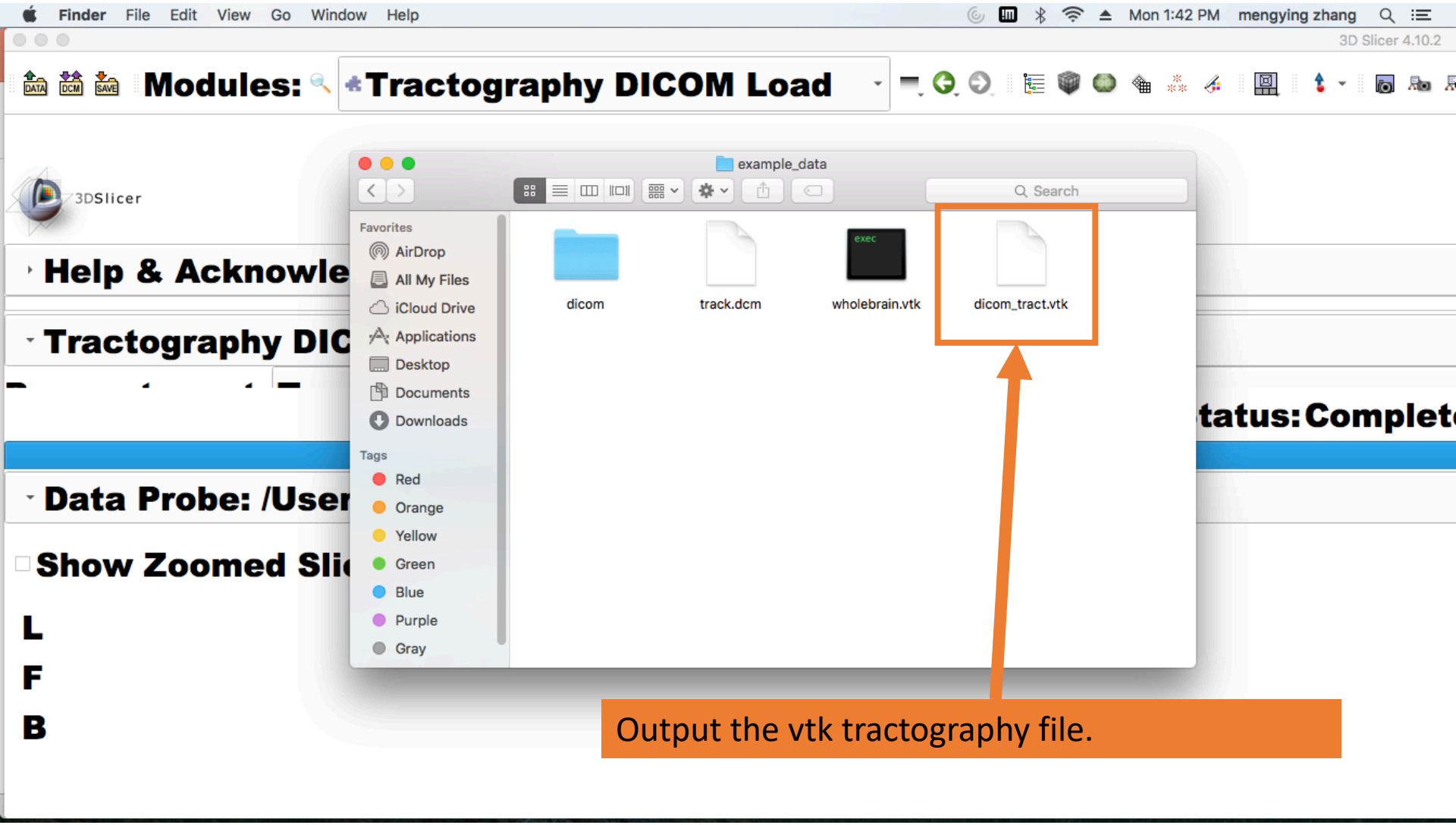
Tractography DICOM Load

Save tractography as VTK



Tractography DICOM Save

Output



Command Line Interface (CLI)

Convert between DICOM TrackSet and Slicer-style VTK tractography in CLI mode.

```
SlicerDMRI_CLI_FOLDER=/Applications/Slicer.app/Contents/Extensions-26813/SlicerDMRI/lib/Slicer-4.8/cli-modules/

EXAMPLE_DATA_FOLDER=/Users/fan/Desktop/example_data/

# help information
${SlicerDMRI_CLI_FOLDER}/VTK_to_DICOMTract -h
```

Command for Tractography DICOM Save:

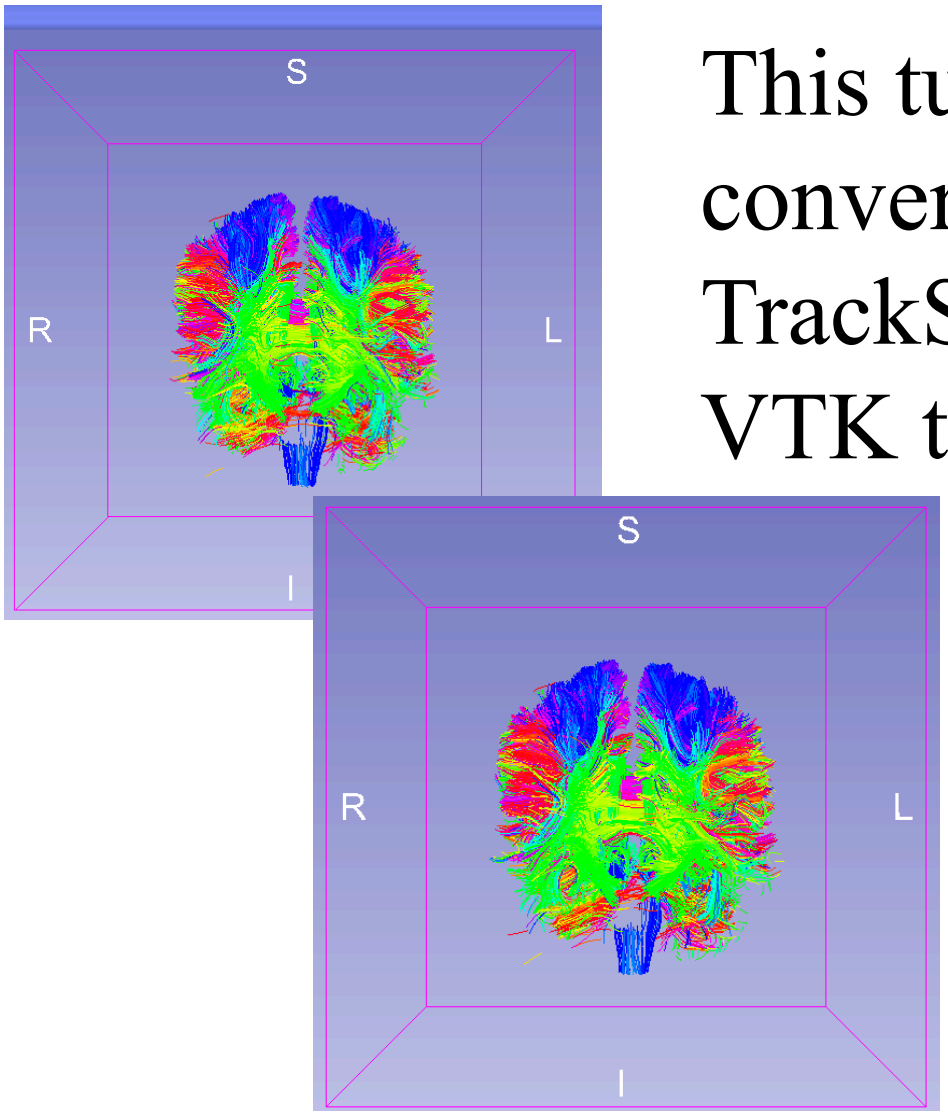
```
# Tractography DICOM Save
${SlicerDMRI_CLI_FOLDER}/VTK_to_DICOMTract --vtk_fiberbundle ${EXAMPLE_DATA_FOLDER}/dicom_tract.vtk --reference_dicom ${EXAMPLE_DATA_FOLDER}/dicom/63406309_006_0001.dcm --output_dicom ${EXAMPLE_DATA_FOLDER}/ --output_filename ${EXAMPLE_DATA_FOLDER}/track.com

# help information
${SlicerDMRI_CLI_FOLDER}/DICOMTract_to_VTK -h
```

Command for Tractography DICOM Load:

```
# Tractography DICOM Load
${SlicerDMRI_CLI_FOLDER}/DICOMTract_to_VTK --input_track_dicom ${EXAMPLE_DATA_FOLDER}/track.dcm --output_vtk ${EXAMPLE_DATA_FOLDER}/dicom_tract.vtk
```

Conclusion



This tutorial guided you to convert between DICOM TrackSet and Slicer-style VTK tractography.

Support: https://discourse.slicer.org

Acknowledgments

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