National Alliance for Medical Image Computing
Neuroimage Analysis Center

Leonardo da Vinci (1452-1519), Virgin and Child
Alte Pinakothek, München

Data Loading & 3D Visualization

Sonia Pujol, Ph.D.

Surgical Planning Laboratory
Harvard Medical School

Slicer3

- An end-user application for image analysis
- An open-source environment for software development
- A software platform that is both easy to use for clinical researchers and easy to extend for programmers

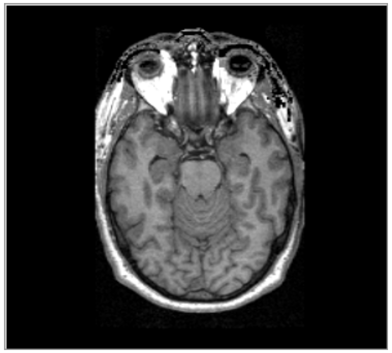
Slicer 3.4
Choose a server:
http://xnd.slicer.org:8000
Query for Scenes
Browse Query Results & Download

Slicer3

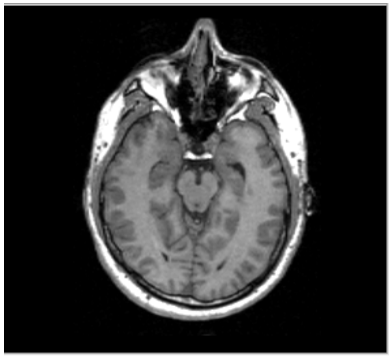
- Slicer3 is a multi-platform software that is developed and maintained on:
  - Windows XP
  - Linux x86_64
  - Linux x86
  - Mac OSX – Darwin x86-Intel
  - Mac OSX – Darwin Power PC

Download the training dataset

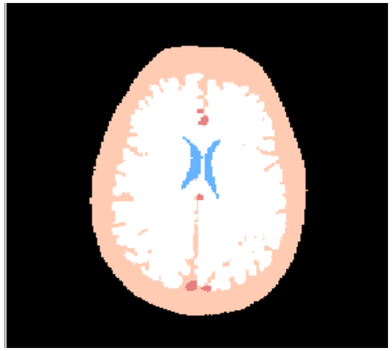
- This course is built upon three datasets of a single healthy subject brain:



MR DICOM
GRASS



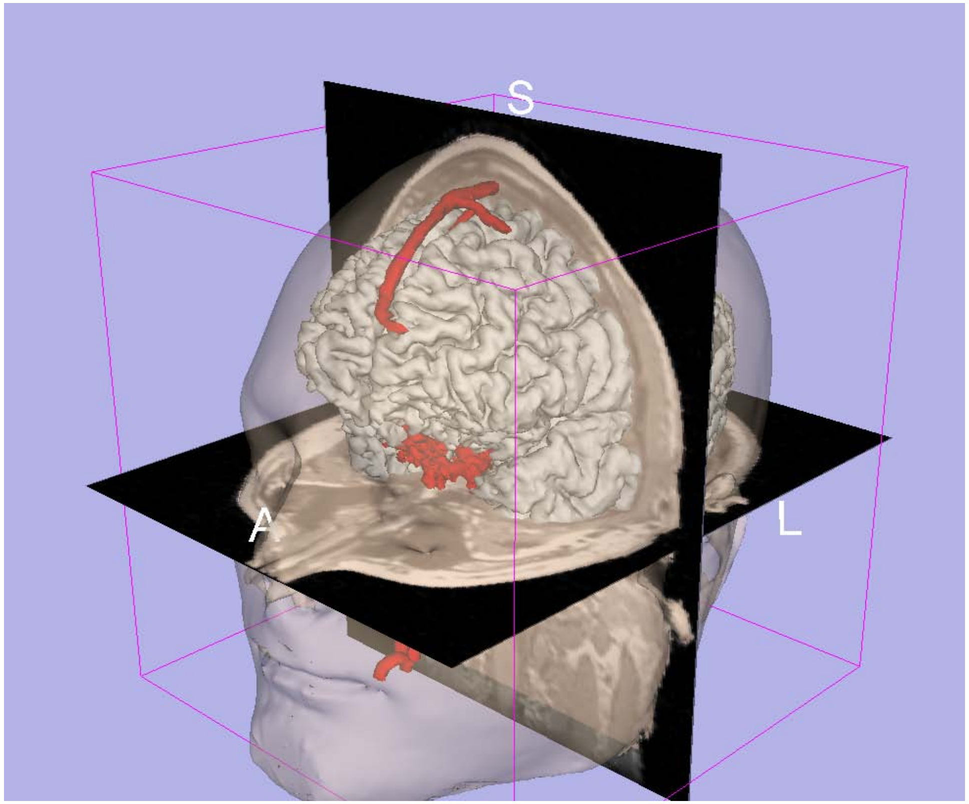
MR Nrrd
SPGR



Pre-computed
Label Map

Learning objective

Following this tutorial, you'll be able to load and visualize volumes within Slicer3, and to interact in 3D with structural images and models.



Start Slicer3

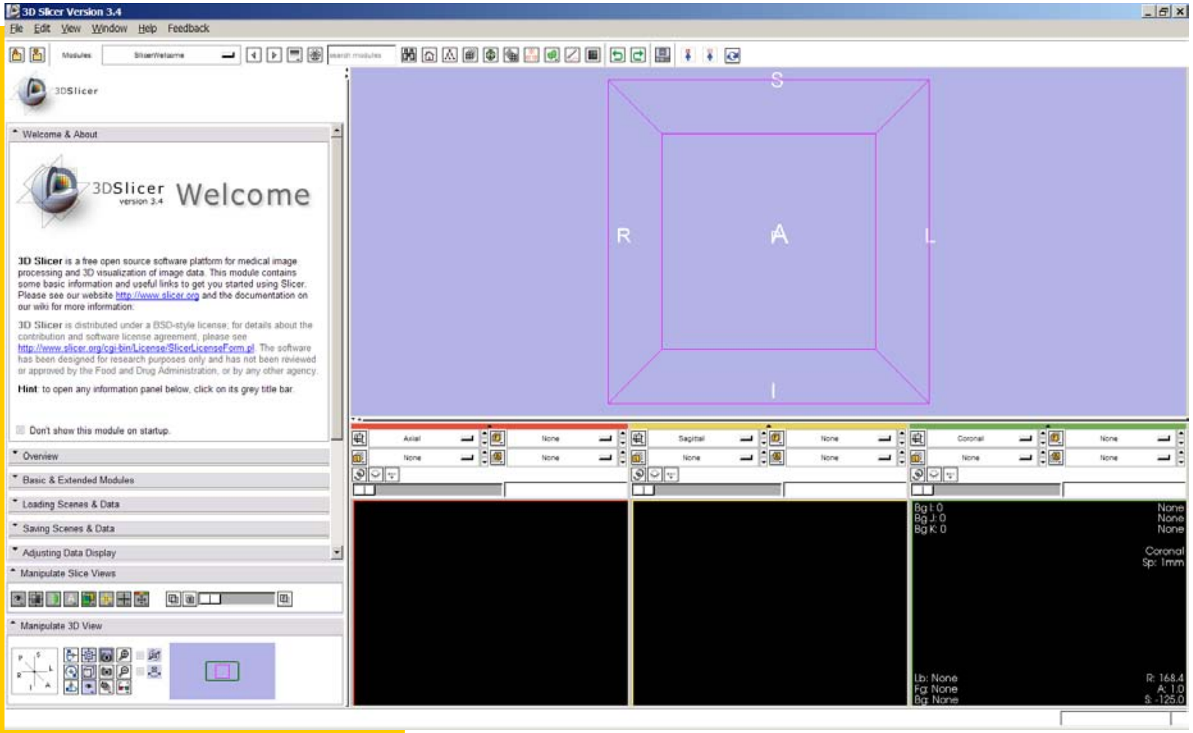
Linux/Mac users

Launch the Slicer3 executable located in the Slicer3.4 directory

Windows users

Select

Start → All Programs → Slicer3 3.4 2009-05-21→Slicer3


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: SlicerWelcome
Welcome & About
3DSlicer version 3.4 Welcome

3D Slicer is a free open source software platform for medical image processing and 3D visualization of image data. This module contains some basic information and useful links to get you started using Slicer. Please see our website http://www.slicer.org and the documentation on our wiki for more information.

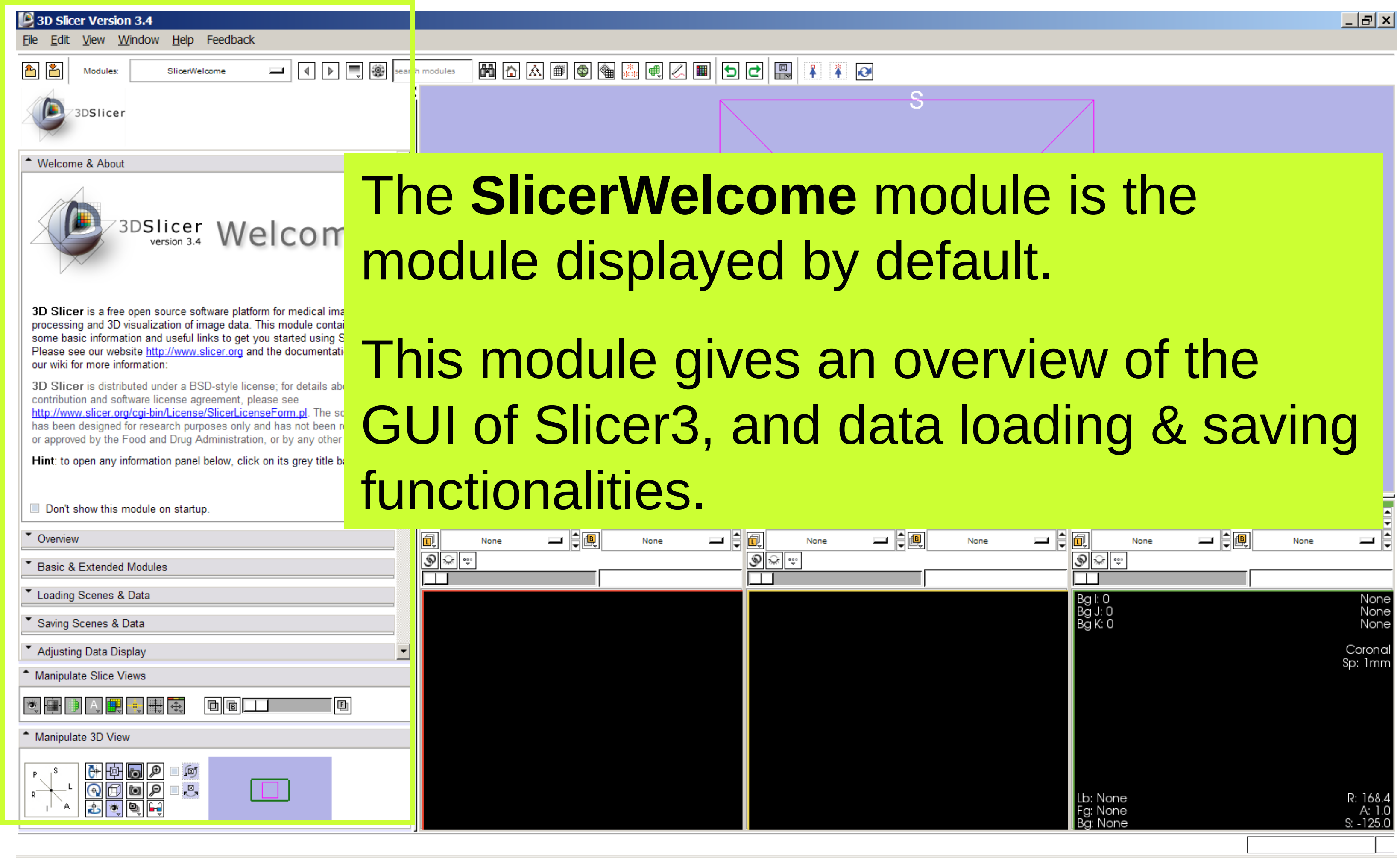
3D Slicer is distributed under a BSD-style license; for details about the contribution and software license agreement, please see http://www.slicer.org/cgi-bin/License/SlicerLicenseForm.pl. The software has been designed for research purposes only and has not been reviewed or approved by the Food and Drug Administration, or by any other agency.

Hint: to open any information panel below, click on its grey title bar.

☐ Don't show this module on startup.

Overview
Basic & Extended Modules
Loading Scenes & Data
Saving Scenes & Data
Adjusting Data Display
Manipulate Slice Views
Manipulate 3D View
S
R
A
L
I
Axial
Sagittal
Coronal
None
Bg I: 0
Bg J: 0
Bg K: 0
Coronal
Sp: 1mm
Lb: None
Fg: None
Bg: None
R: 168.4
A: 1.0
S: -125.0

Slicer Welcome


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: SlicerWelcome
search modules
3DSlicer
Welcome & About
3DSlicer version 3.4 Welcom
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3D Slicer is distributed under a BSD-style license; for details ab
contribution and software license agreement, please see
http://www.slicer.org/cgi-bin/License/SlicerLicenseForm.pl. The so
has been designed for research purposes only and has not been r
or approved by the Food and Drug Administration, or by any other

Hint: to open any information panel below, click on its grey title b

☐ Don't show this module on startup.

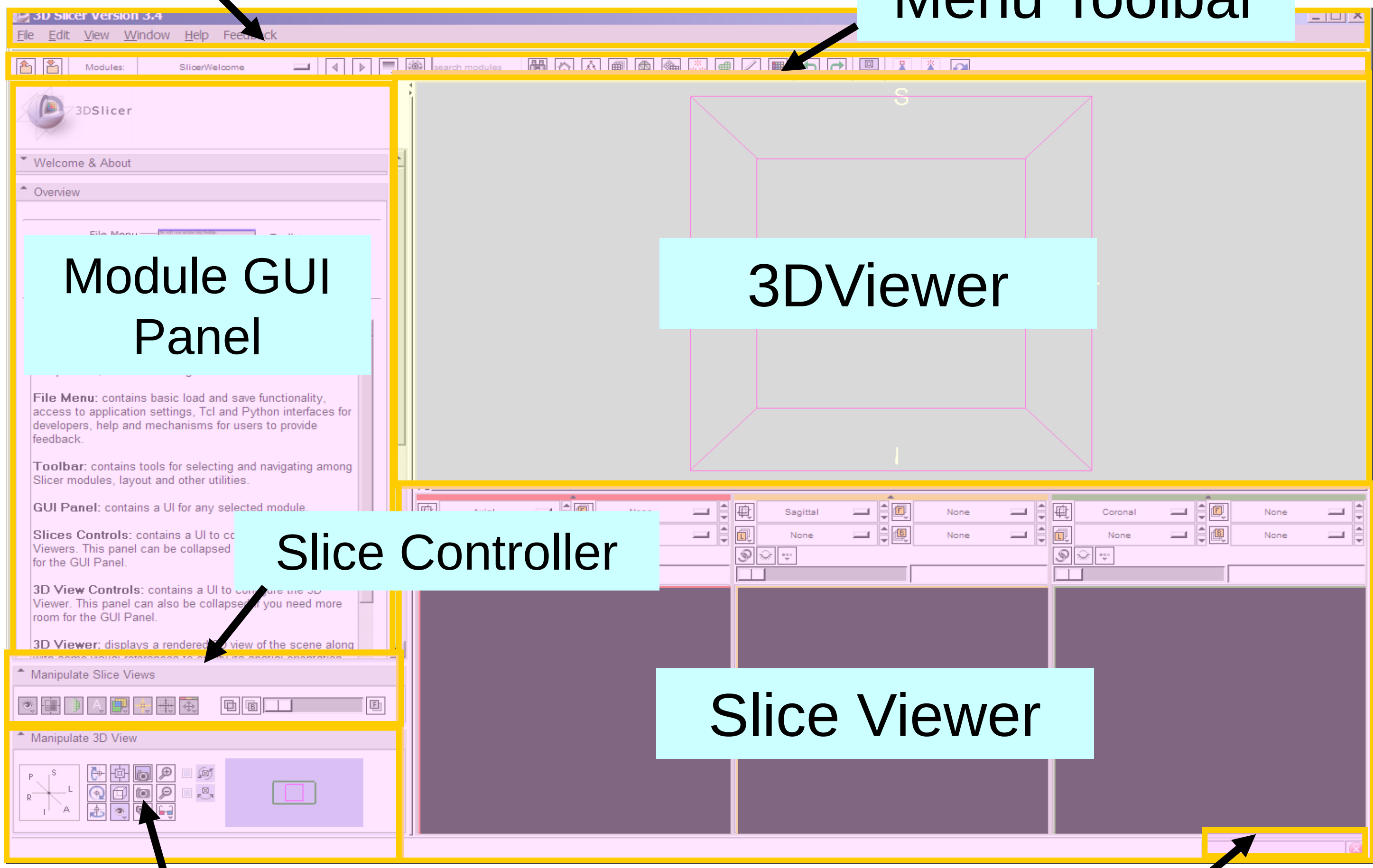
The **SlicerWelcome** module is the module displayed by default.

This module gives an overview of the GUI of Slicer3, and data loading & saving functionalities.

Slicer3 GUI

The Graphical User Interface (GUI) of Slicer3.4 integrates 8 main components:

- the File Menu
- the Menu Toolbar
- the Module GUI Panel
- the 3D Viewer
- the Slice Viewer
- the Slice Controller
- the 3D View Controller



3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: SlicerWelcome
search modules
3DSlicer
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Manipulate 3D View
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3D View Controls: contains a UI to Viewer. This panel can also be collapsed you need more room for the GUI Panel.

3D Viewer: displays a rendered view of the scene along

File Menu

Menu Toolbar

Module GUI Panel

3DViewer

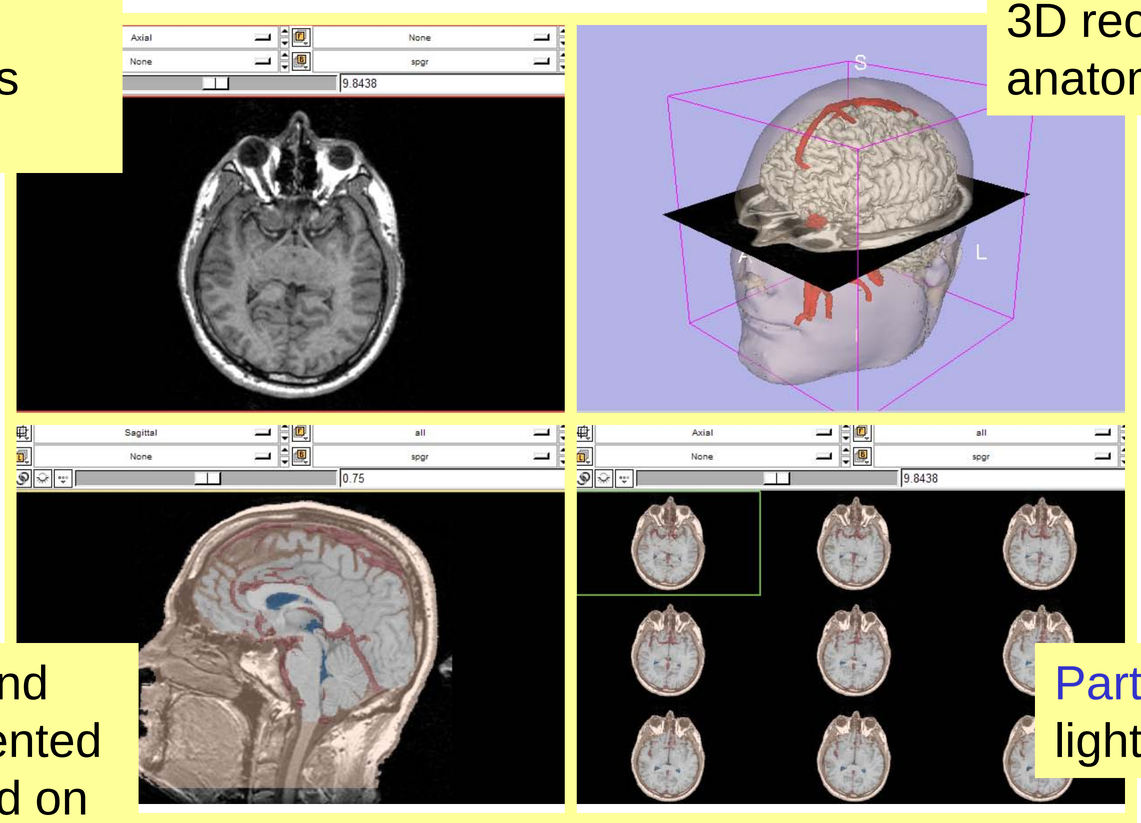
Slice Controller

Slice Viewer

3DView Controller

Progress and Error Log

Overview


Axial
None
None
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9.8438
S
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Sagittal
all
None
spgr
0.75
Axial
all
None
spgr
9.8438

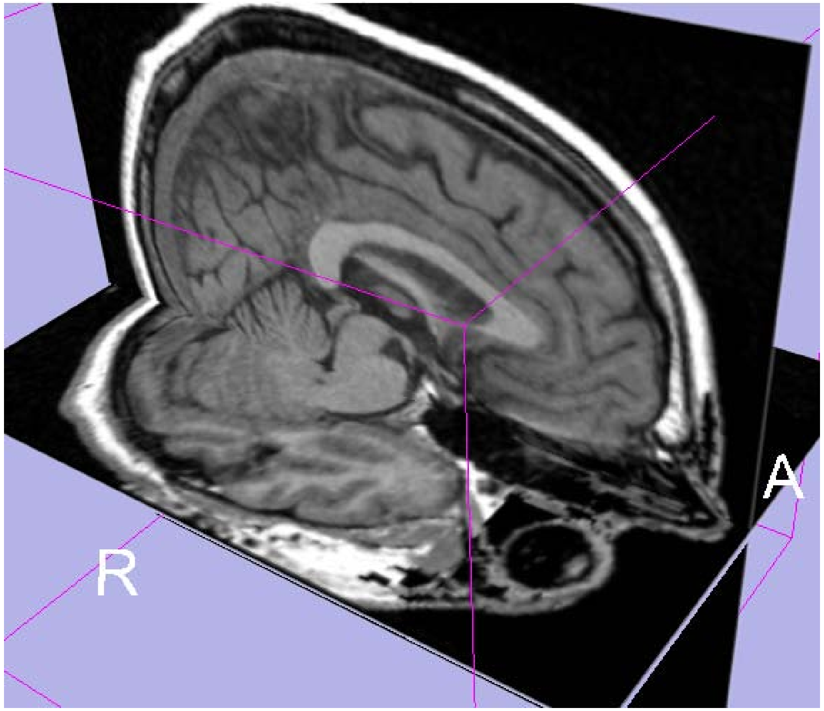
Part 1. Loading and visualizing multiple volumes simultaneously

Part 3. Visualizing 3D reconstructions of anatomical surfaces

Part 2. Loading and visualizing segmented structures overlaid on grayscale images

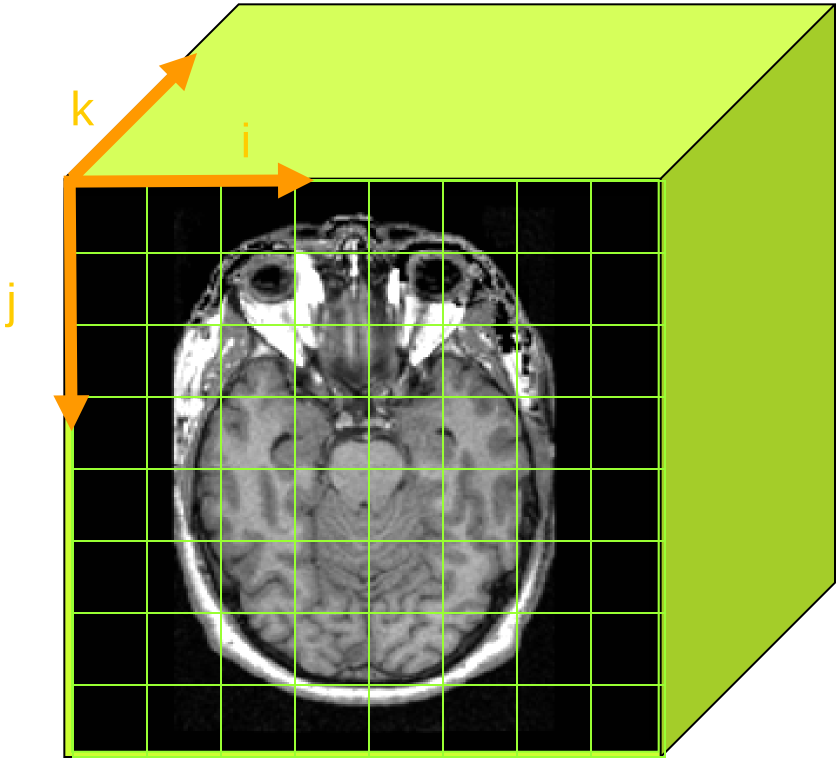
Part 4. The lightbox viewer

Part 5. Saving data



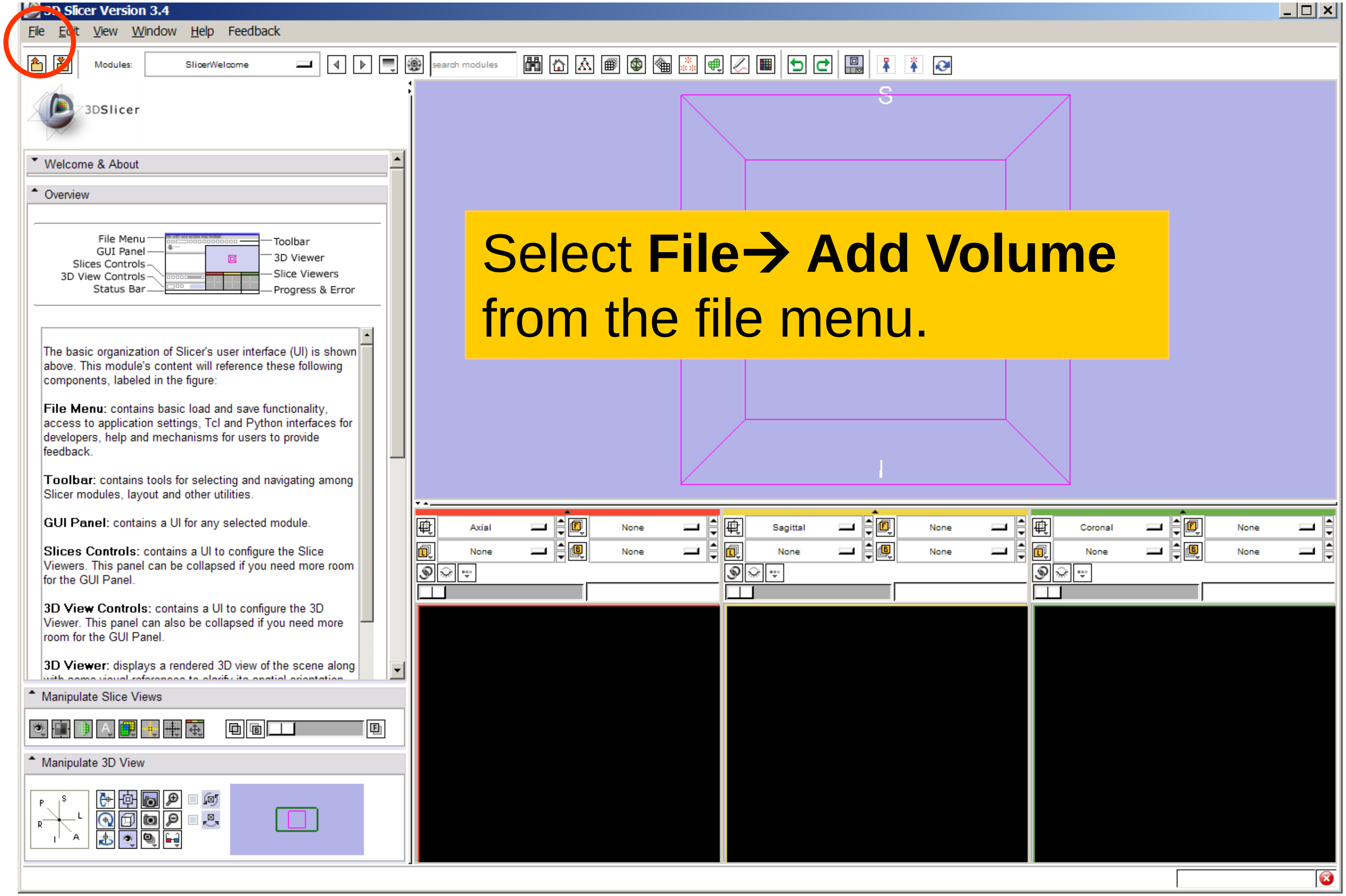
Part 1: Loading and visualizing multiple volumes simultaneously

Data Representation



- The result of a volumetric acquisition is a 3D volume of data related to the patient.
- The 3D raster dataset is sampled on a discrete grid with elements called voxels which contain the signal intensity.

Loading Volumes


3D Slicer Version 3.4
File
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Window
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Modules:
SlicerWelcome
search modules
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3DSlicer
Welcome & About
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Slices Controls
3D View Controls
Status Bar
Toolbar
3D Viewer
Slice Viewers
Progress & Error
Manipulate Slice Views
Manipulate 3D View
Axial
Sagittal
Coronal
None

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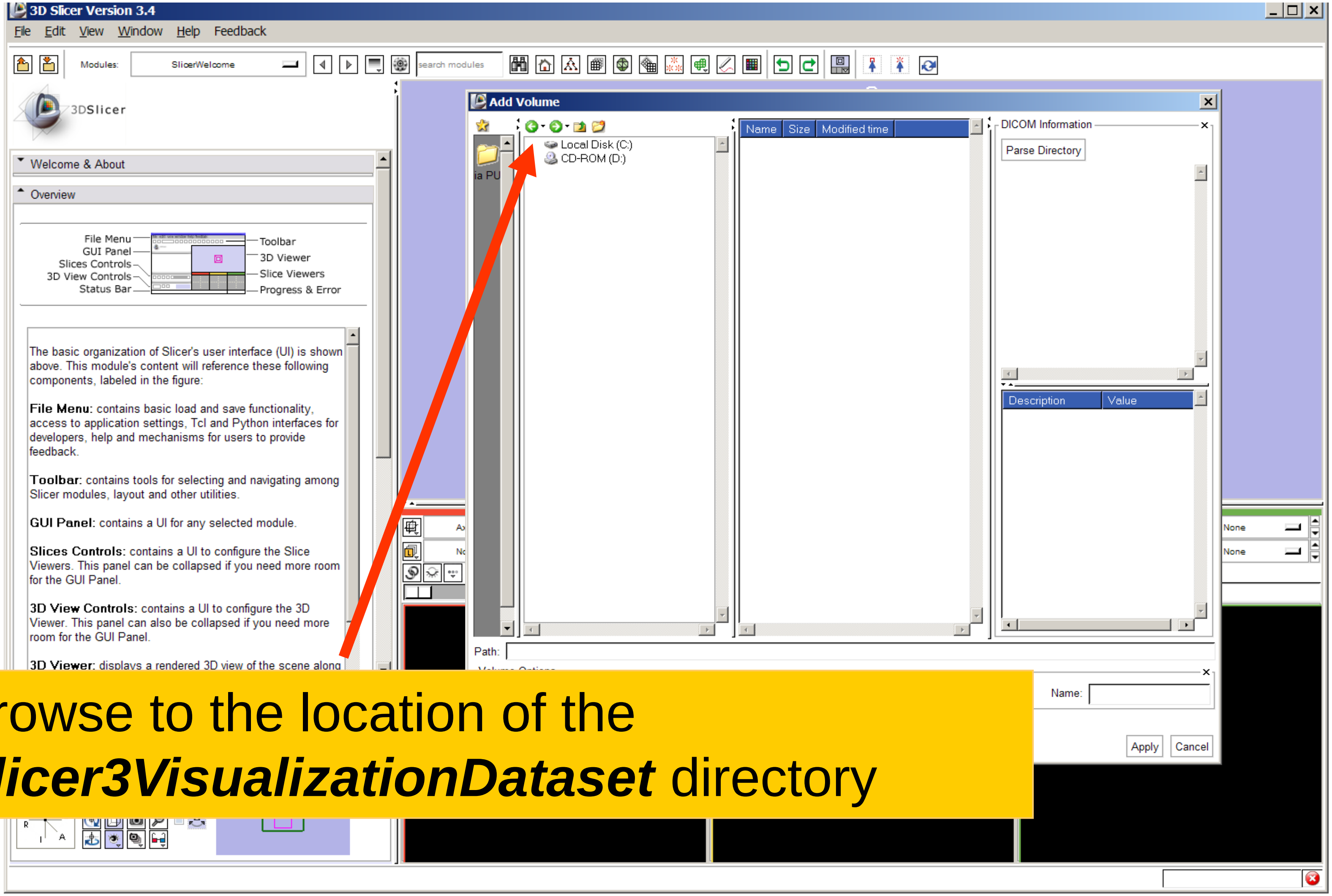
3D View Controls: contains a UI to configure the 3D Viewer. This panel can also be collapsed if you need more room for the GUI Panel.

3D Viewer: displays a rendered 3D view of the scene along

Select **File→ Add Volume** from the file menu.

Loading Volumes


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: SlicerWelcome
search modules
3DSlicer
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Slices Controls
3D View Controls
Status Bar
Toolbar
3D Viewer
Slice Viewers
Progress & Error
Add Volume
Local Disk (C:)
CD-ROM (D:)
Name
Size
Modified time
DICOM Information
Parse Directory
Description
Value
Path:
Name:
Apply
Cancel
None
None

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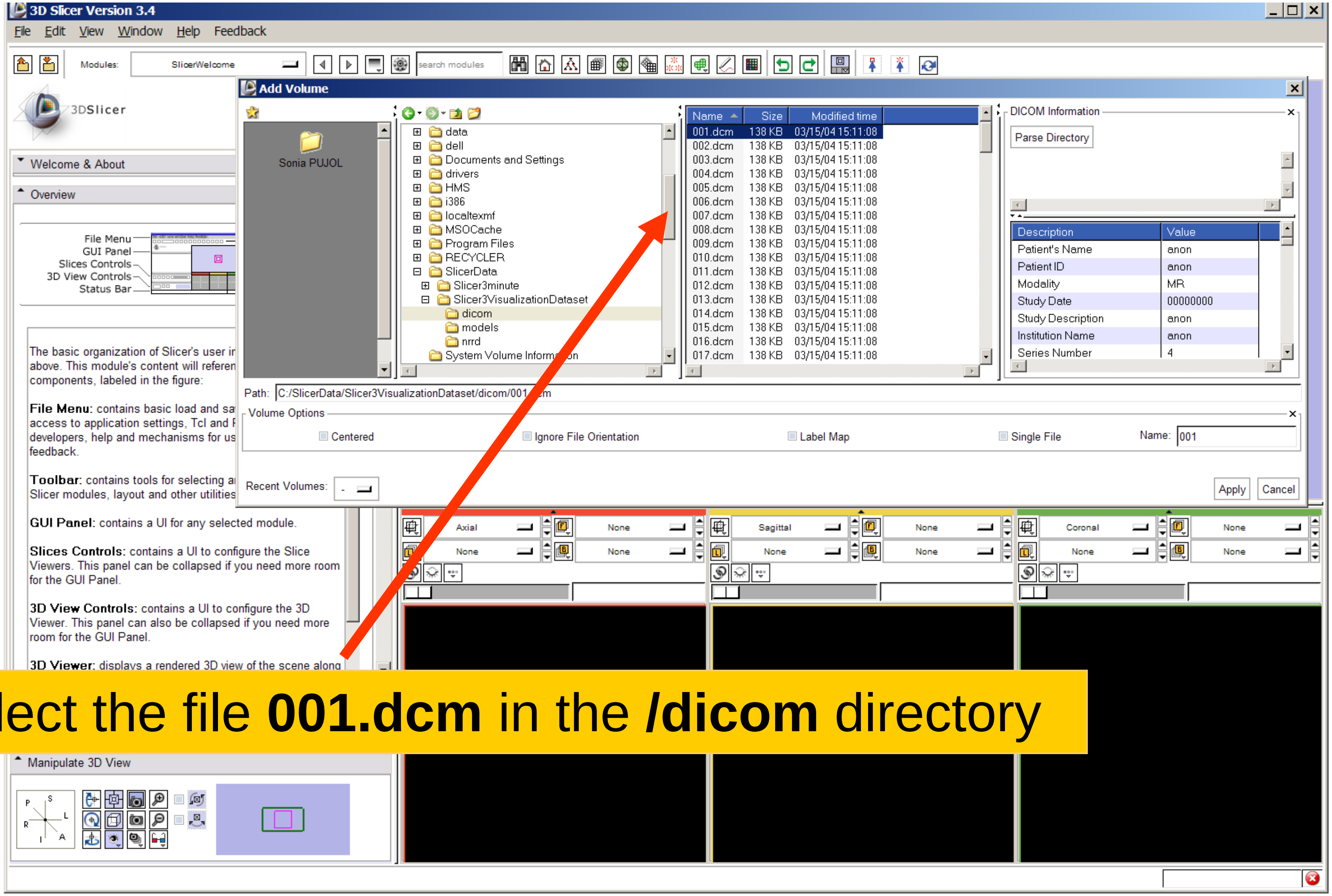
Browse to the location of the ***Slicer3VisualizationDataset*** directory

Loading Volumes


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: SlicerWelcome
search modules
3DSlicer
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GUI Panel
Slices Controls
3D View Controls
Status Bar
Add Volume
Sonia PUJOL
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Documents and Settings
drivers
HMS
i386
localtexmf
MSOCache
Program Files
RECYCLER
SlicerData
Slicer3minute
Slicer3VisualizationDataset
dicom
models
nrrd
System Volume Information
DICOM Information
Parse Directory
Volume Options
Apply
Cancel
Axial
Sagittal
Coronal
None
Manipulate 3D View

Name	Size	Modified time
001.dcm	138 KB	03/15/04 15:11:08
002.dcm	138 KB	03/15/04 15:11:08
003.dcm	138 KB	03/15/04 15:11:08
004.dcm	138 KB	03/15/04 15:11:08
005.dcm	138 KB	03/15/04 15:11:08
006.dcm	138 KB	03/15/04 15:11:08
007.dcm	138 KB	03/15/04 15:11:08
008.dcm	138 KB	03/15/04 15:11:08
009.dcm	138 KB	03/15/04 15:11:08
010.dcm	138 KB	03/15/04 15:11:08
011.dcm	138 KB	03/15/04 15:11:08
012.dcm	138 KB	03/15/04 15:11:08
013.dcm	138 KB	03/15/04 15:11:08
014.dcm	138 KB	03/15/04 15:11:08
015.dcm	138 KB	03/15/04 15:11:08
016.dcm	138 KB	03/15/04 15:11:08
017.dcm	138 KB	03/15/04 15:11:08

Description	Value
Patient's Name	anon
Patient ID	anon
Modality	MR
Study Date	00000000
Study Description	anon
Institution Name	anon
Series Number	4

Path: C:/SlicerData/Slicer3VisualizationDataset/dicom/001.dcm

☐ Centered ☐ Ignore File Orientation ☐ Label Map ☐ Single File Name: 001

Recent Volumes: -

The basic organization of Slicer's user ir
above. This module's content will referen
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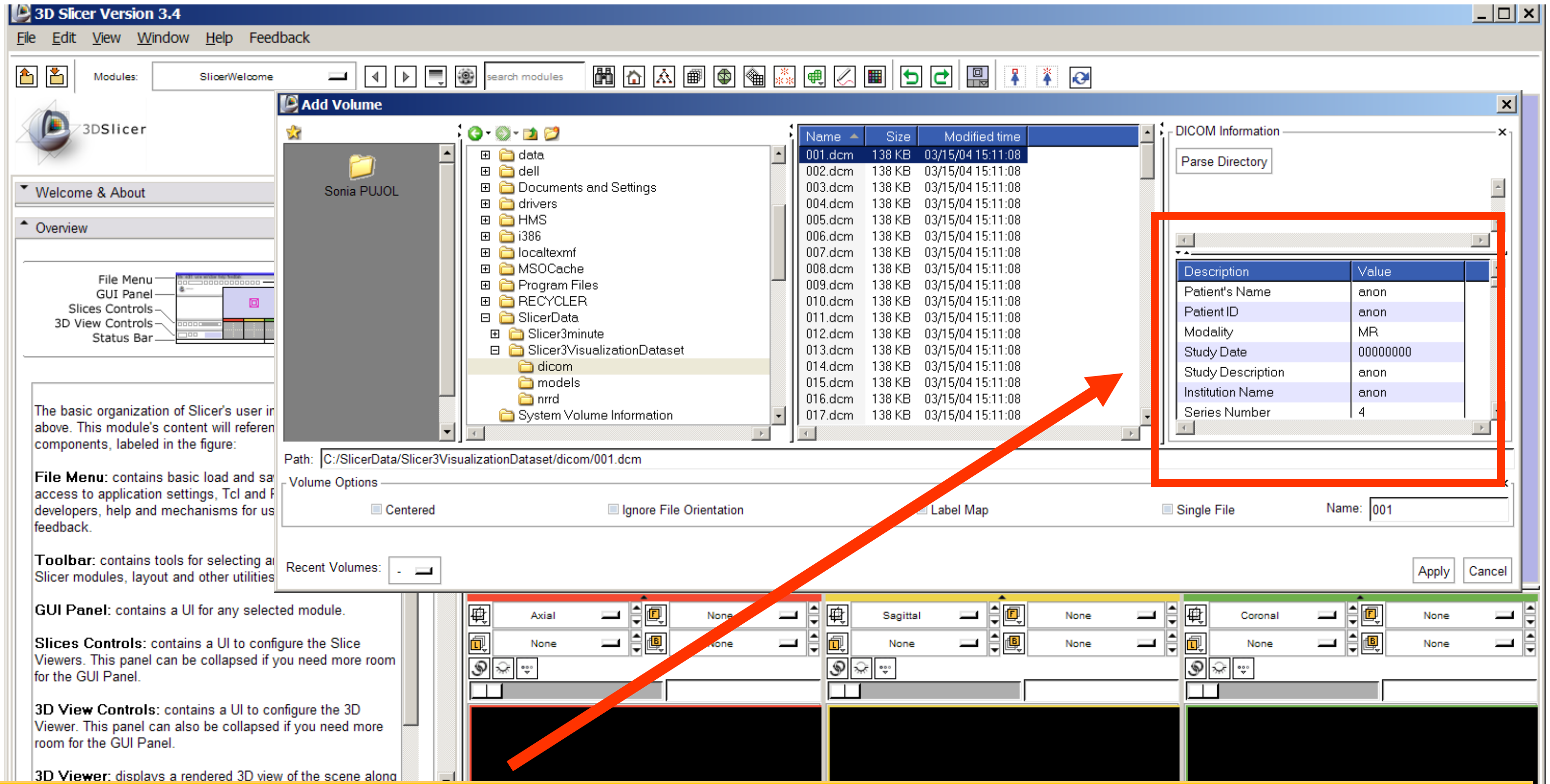
3D Viewer: displays a rendered 3D view of the scene along

Select the file **001.dcm** in the **/dicom** directory

Loading Volumes


3D Slicer Version 3.4
File
Edit
View
Window
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Feedback
Modules:
SlicerWelcome
search modules
3DSlicer
Welcome & About
Overview
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Status Bar
Add Volume
Sonia PUJOL
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localtexmf
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SlicerData
Slicer3minute
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007.dcm	138 KB	03/15/04 15:11:08
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010.dcm	138 KB	03/15/04 15:11:08
011.dcm	138 KB	03/15/04 15:11:08
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014.dcm	138 KB	03/15/04 15:11:08
015.dcm	138 KB	03/15/04 15:11:08
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Institution Name	anon
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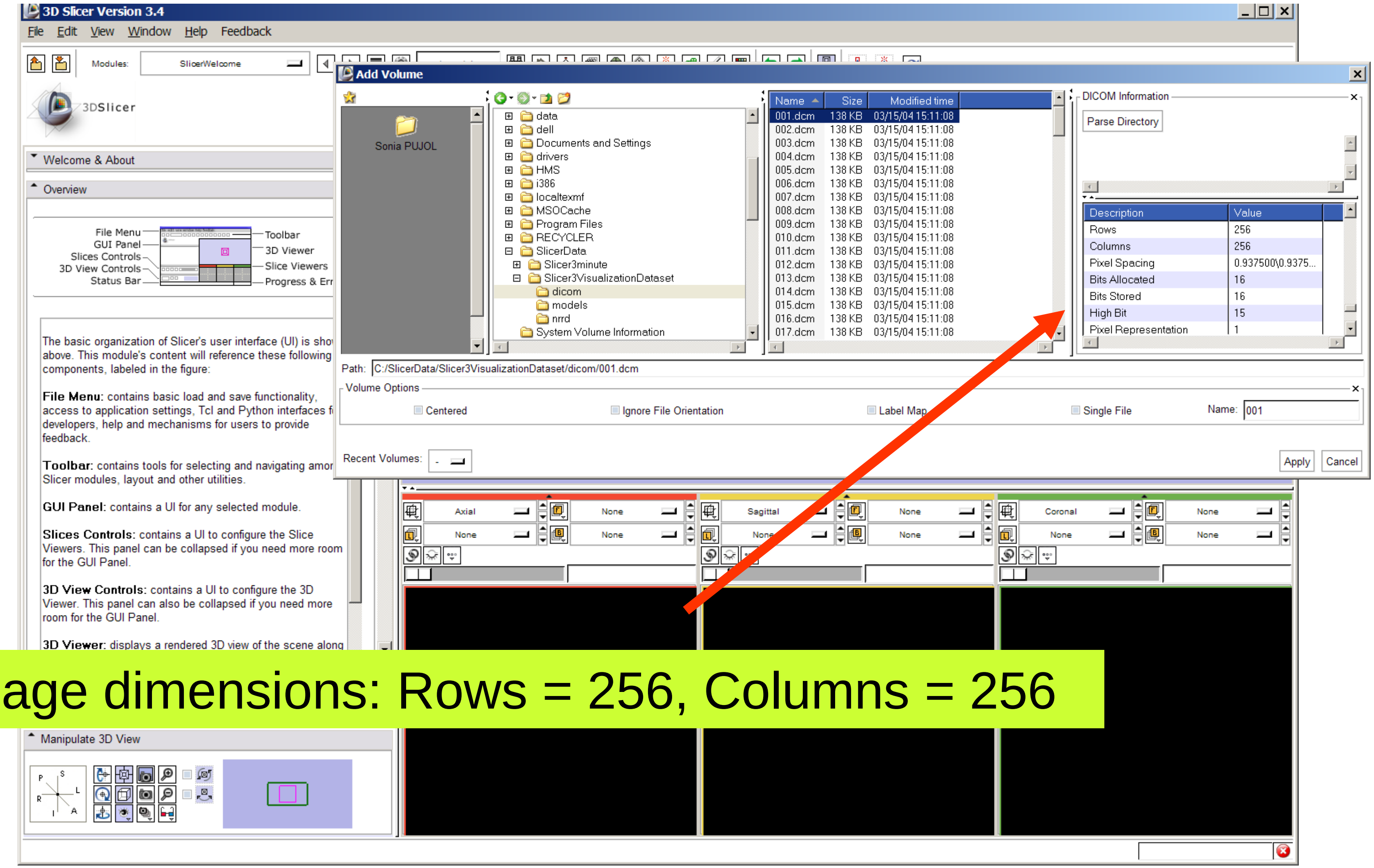
Path: C:/SlicerData/Slicer3VisualizationDataset/dicom/001.dcm

☐ Centered ☐ Ignore File Orientation ☐ Label Map ☐ Single File Name: 001

Recent Volumes: -

Slicer displays the **Dicom header information** of the images. Browse through the Dicom information panel to display the dimensions of the images.

Loading Volumes


3D Slicer Version 3.4
File
Edit
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Modules:
SlicerWelcome
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015.dcm	138 KB	03/15/04 15:11:08
016.dcm	138 KB	03/15/04 15:11:08
017.dcm	138 KB	03/15/04 15:11:08

Description	Value
Rows	256
Columns	256
Pixel Spacing	0.937500\0.9375...
Bits Allocated	16
Bits Stored	16
High Bit	15
Pixel Representation	1

Path: C:/SlicerData/Slicer3VisualizationDataset/dicom/001.dcm

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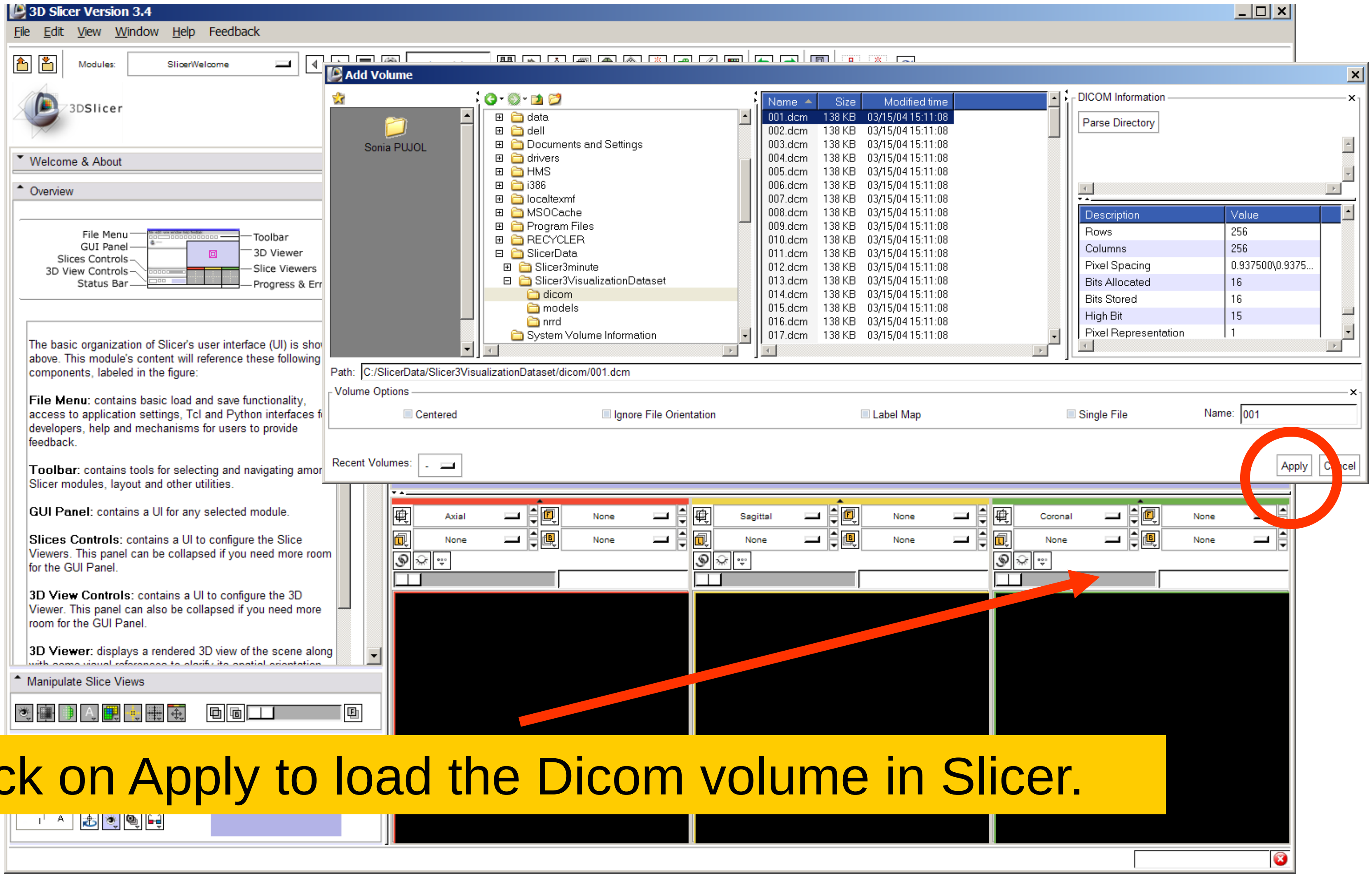
Image dimensions: Rows = 256, Columns = 256

Loading Volumes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Description	Value
Rows	256
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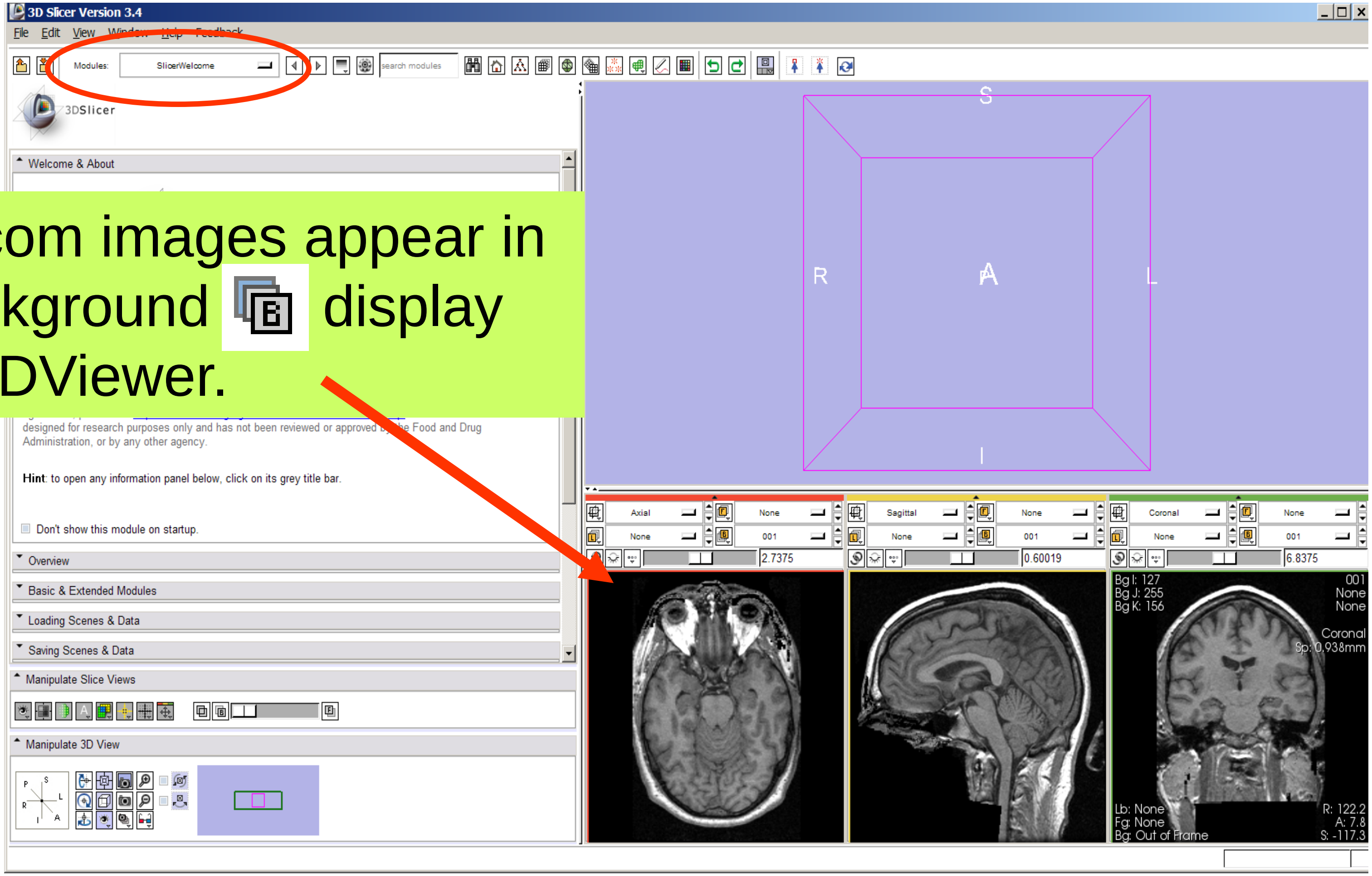
Pixel Spacing	0.937500\0.9375...
Bits Allocated	16
Bits Stored	16
High Bit	15
Pixel Representation	1

Path: C:/SlicerData/Slicer3VisualizationDataset/dicom/001.dcm

☐ Centered ☐ Ignore File Orientation ☐ Label Map ☐ Single File Name: 001

Click on Apply to load the Dicom volume in Slicer.

Loading Volumes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R
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L
I
Axial
None
001
2.7375
Sagittal
0.60019
Coronal
6.8375
Bg I: 127
Bg J: 255
Bg K: 156
Coronal
Sp: 0.938mm
Lb: None
Fg: None
Bg: Out of Frame
R: 122.2
A: 7.8
S: -117.3

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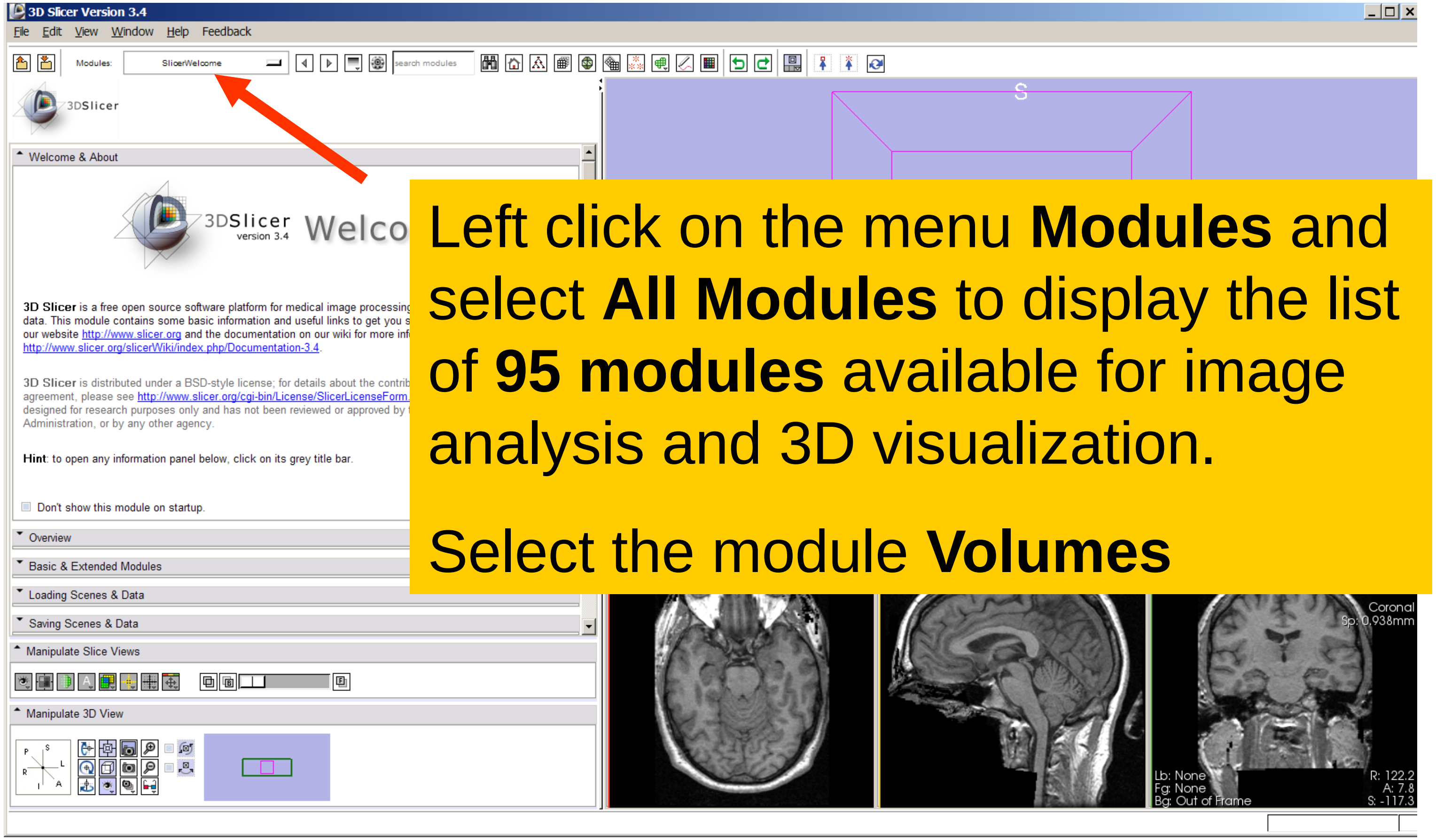
Hint: to open any information panel below, click on its grey title bar.

☐ Don't show this module on startup.

The Dicom images appear in the Background B display of the 2DViewer.

Loading Volumes


3D Slicer Version 3.4
File
Edit
View
Window
Help
Feedback
Modules:
SlicerWelcome
search modules
3DSlicer
Welcome & About
3DSlicer
version 3.4
Welco
Overview
Basic & Extended Modules
Loading Scenes & Data
Saving Scenes & Data
Manipulate Slice Views
Manipulate 3D View
S
Coronal
Sp: 0.938mm
Lb: None
Fg: None
Bg: Out of Frame
R: 122.2
A: 7.8
S: -117.3

3D Slicer is a free open source software platform for medical image processing
data. This module contains some basic information and useful links to get you s
our website http://www.slicer.org and the documentation on our wiki for more inf
http://www.slicer.org/slicerWiki/index.php/Documentation-3.4.

3D Slicer is distributed under a BSD-style license; for details about the contrib
agreement, please see http://www.slicer.org/cgi-bin/License/SlicerLicenseForm.
designed for research purposes only and has not been reviewed or approved by t
Administration, or by any other agency.

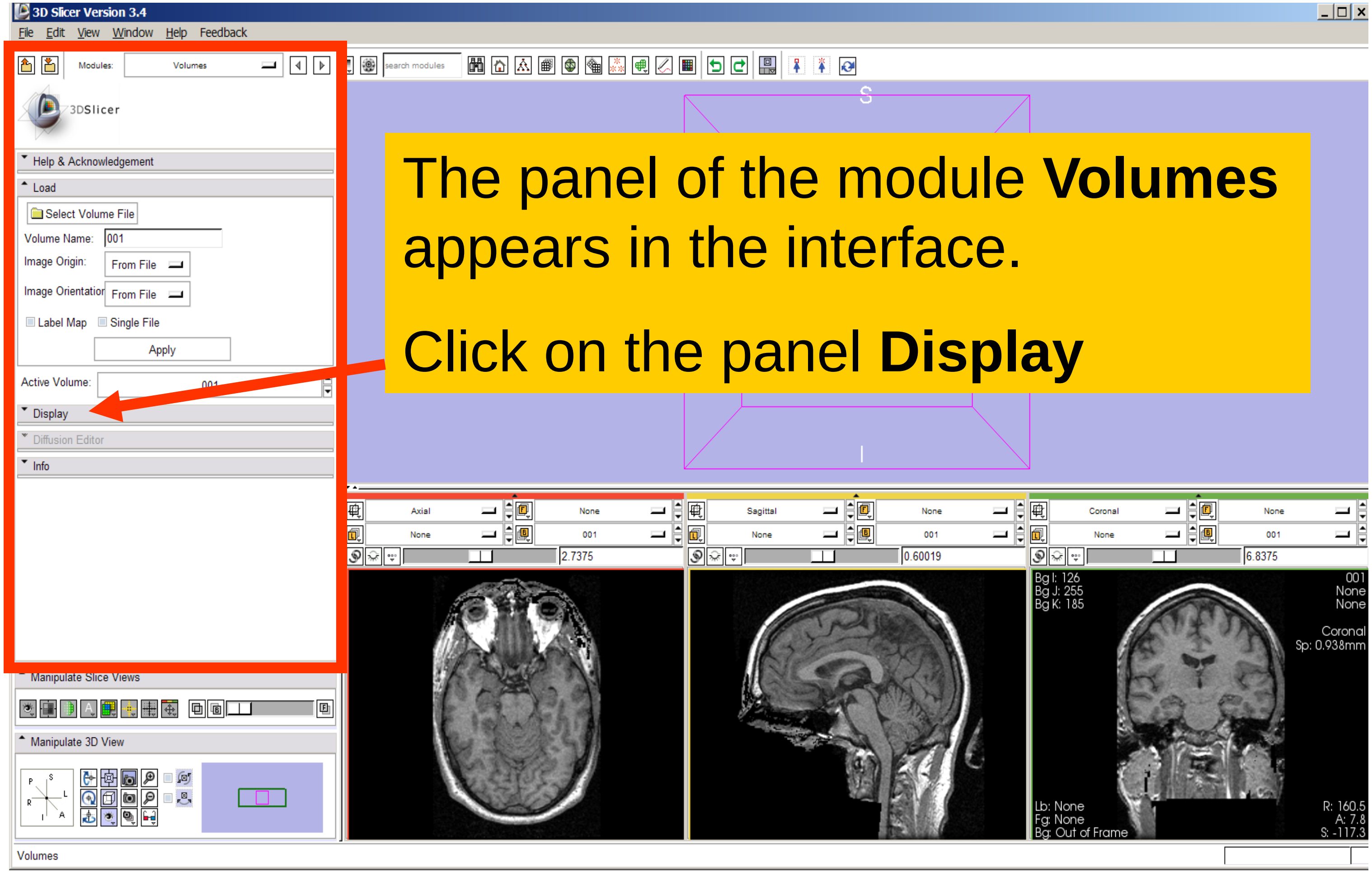
Hint: to open any information panel below, click on its grey title bar.

☐ Don't show this module on startup.

Left click on the menu **Modules** and select **All Modules** to display the list of **95 modules** available for image analysis and 3D visualization.

Select the module **Volumes**

Loading Volumes


3D Slicer Version 3.4
File
Edit
View
Window
Help
Feedback
search modules
3DSlicer
Help & Acknowledgement
Load
Select Volume File
Label Map
Single File
Apply
Display
Diffusion Editor
Info
Manipulate Slice Views
Manipulate 3D View
Volumes
S
I
Axial
Sagittal
Coronal
None

Modules: Volumes

Volume Name: 001

Image Origin: From File

Image Orientation: From File

☐ Label Map ☐ Single File

Active Volume: 001

Axial: 2.7375

Sagittal: 0.60019

Coronal: 6.8375

Bg I: 126
Bg J: 255
Bg K: 185

001
None
None

Coronal
Sp: 0.938mm

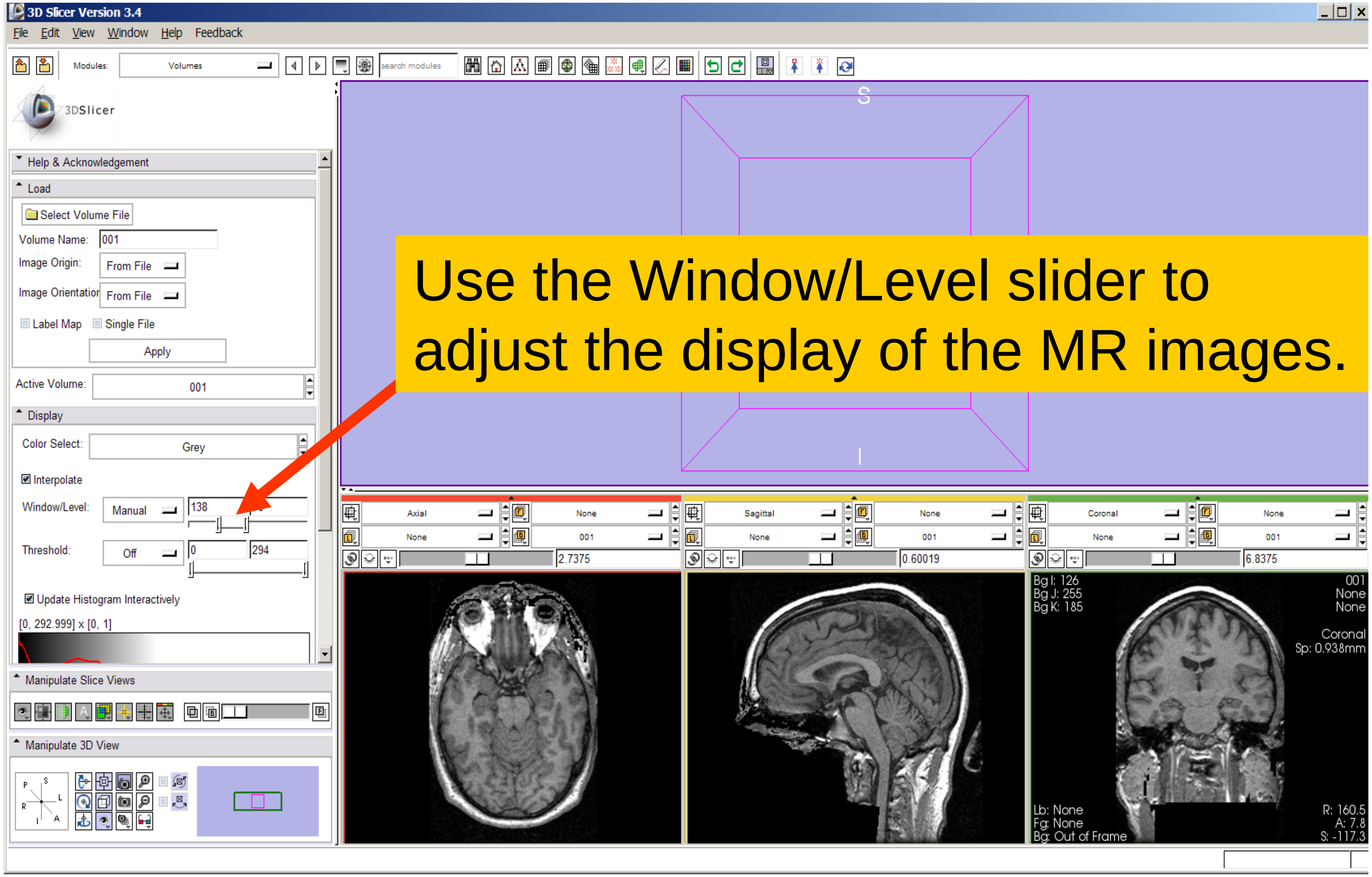
Lb: None
Fg: None
Bg: Out of Frame

R: 160.5
A: 7.8
S: -117.3

The panel of the module **Volumes** appears in the interface.

Click on the panel **Display**

Loading Volumes


3D Slicer Version 3.4
File Edit View Window Help Feedback
search modules
3DSlicer
Help & Acknowledgement
Load
Select Volume File
Apply
Display
Manipulate Slice Views
Manipulate 3D View
S
I
P S L R I A

Modules: Volumes

Volume Name: 001

Image Origin: From File

Image Orientation: From File

☐ Label Map ☐ Single File

Active Volume: 001

Color Select: Grey

☑ Interpolate

Window/Level: Manual 138

Threshold: Off 0 294

☑ Update Histogram Interactively

[0, 292.999] x [0, 1]

Axial None 001 2.7375

Sagittal None 001 0.60019

Coronal None 001 6.8375

Bg I: 126
Bg J: 255
Bg K: 185

001
None
None

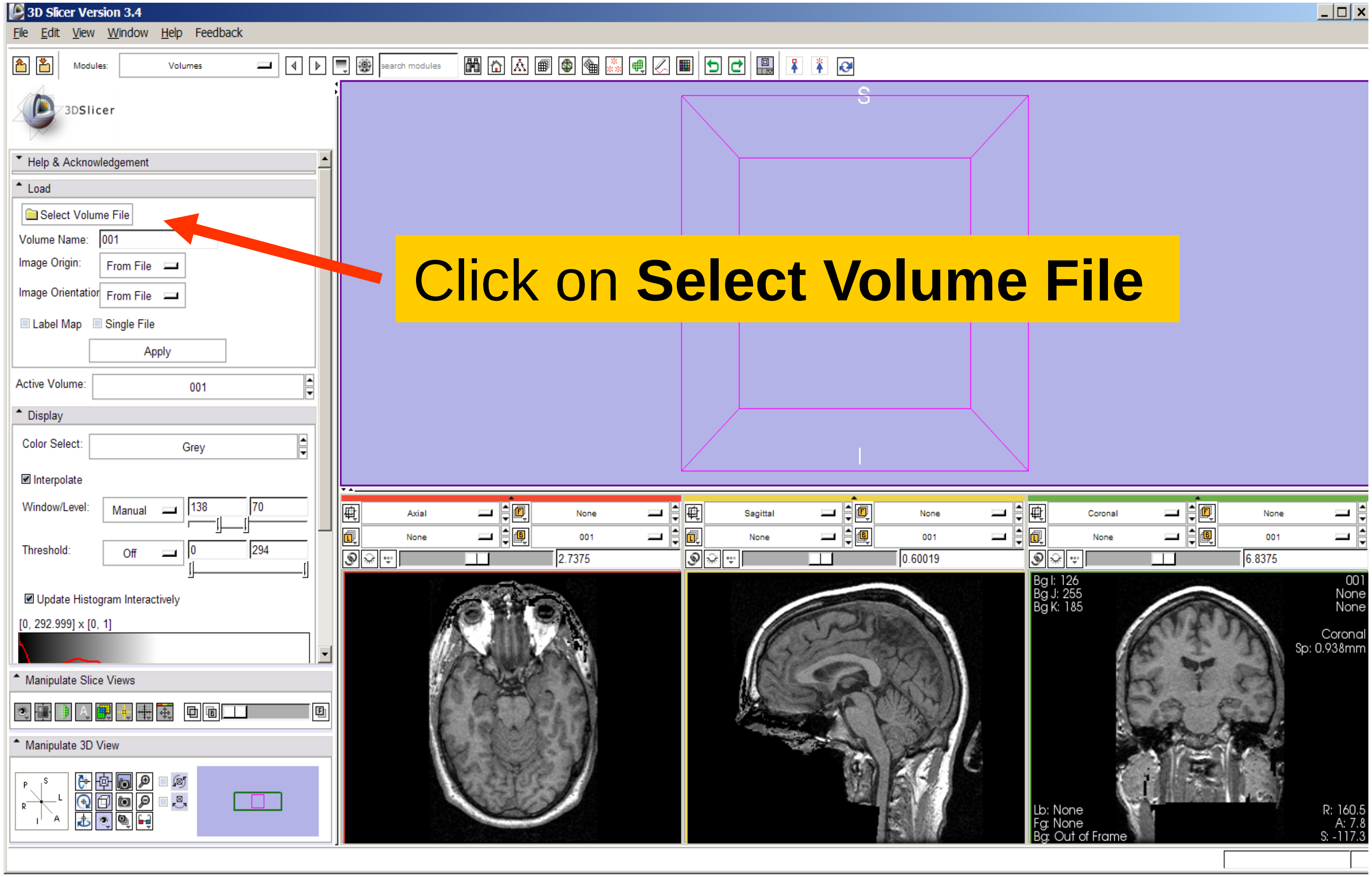
Coronal
Sp: 0.938mm

Lb: None
Fg: None
Bg: Out of Frame

R: 160.5
A: 7.8
S: -117.3

Use the Window/Level slider to adjust the display of the MR images.

Loading Volumes


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Volumes
search modules
3DSlicer
Help & Acknowledgement
Load
Select Volume File
Apply
Display
Manipulate Slice Views
Manipulate 3D View
Axial
Sagittal
Coronal
S
I

Volume Name: 001

Image Origin: From File

Image Orientation: From File

☐ Label Map ☐ Single File

Active Volume: 001

Color Select: Grey

☑ Interpolate

Window/Level: Manual 138 70

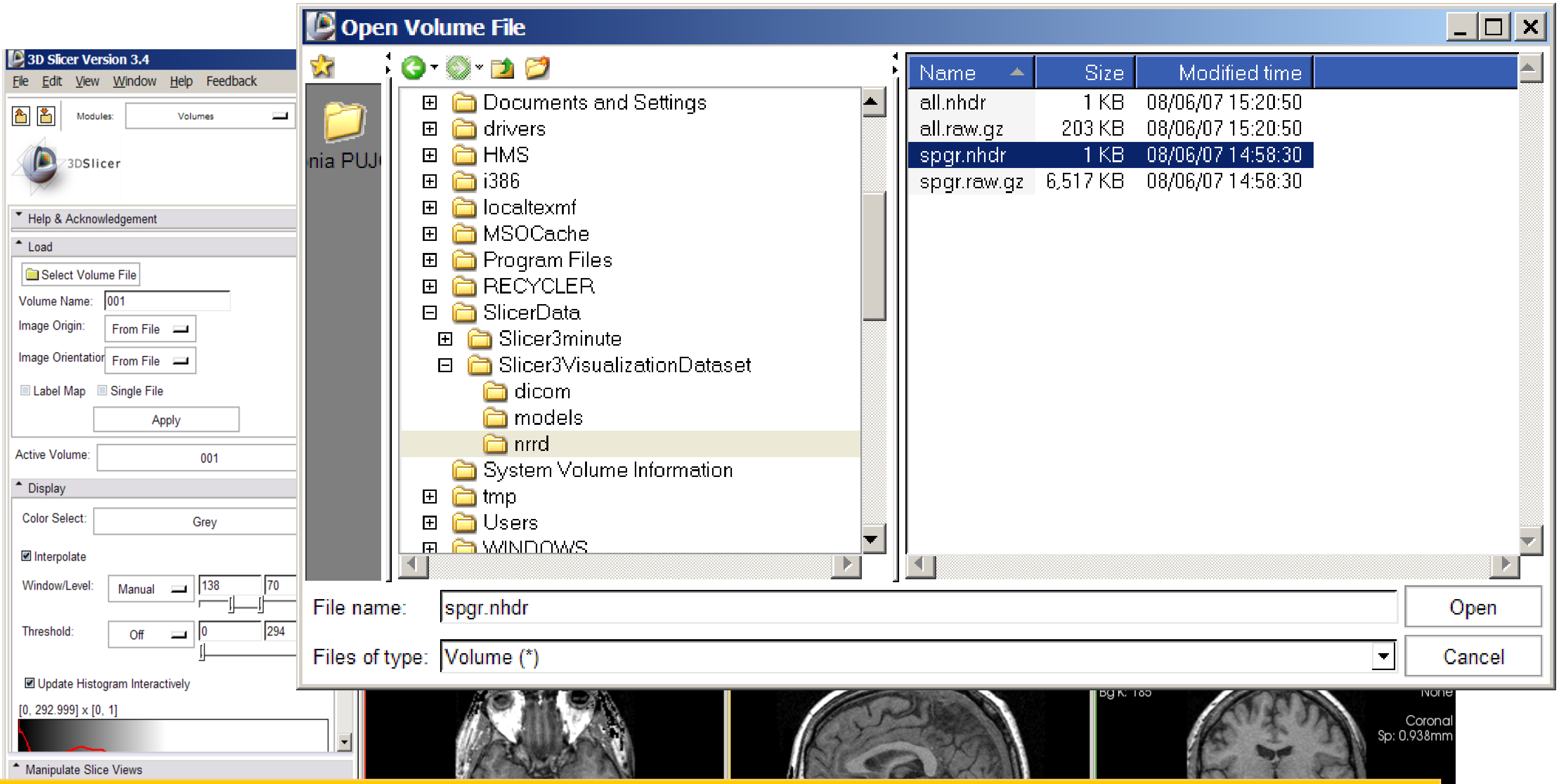
Threshold: Off 0 294

☑ Update Histogram Interactively

[0, 292.999] x [0, 1]

Click on **Select Volume File**

Loading Volumes


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Volumes
3DSlicer
Help & Acknowledgement
Load
Select Volume File
Label Map
Single File
Apply
Display
Manipulate Slice Views
Open Volume File
Documents and Settings
drivers
HMS
i386
localtexmf
MSOCache
Program Files
RECYCLER
SlicerData
Slicer3minute
Slicer3VisualizationDataset
dicom
models
nrrd
System Volume Information
tmp
Users
WINDOWS
Open
Cancel
Coronal
Sp: 0.938mm

Volume Name: 001

Image Origin: From File

Image Orientation: From File

Active Volume: 001

Color Select: Grey

☑ Interpolate

Window/Level: Manual 138 70

Threshold: Off 0 294

☑ Update Histogram Interactively

[0, 292.999] x [0, 1]

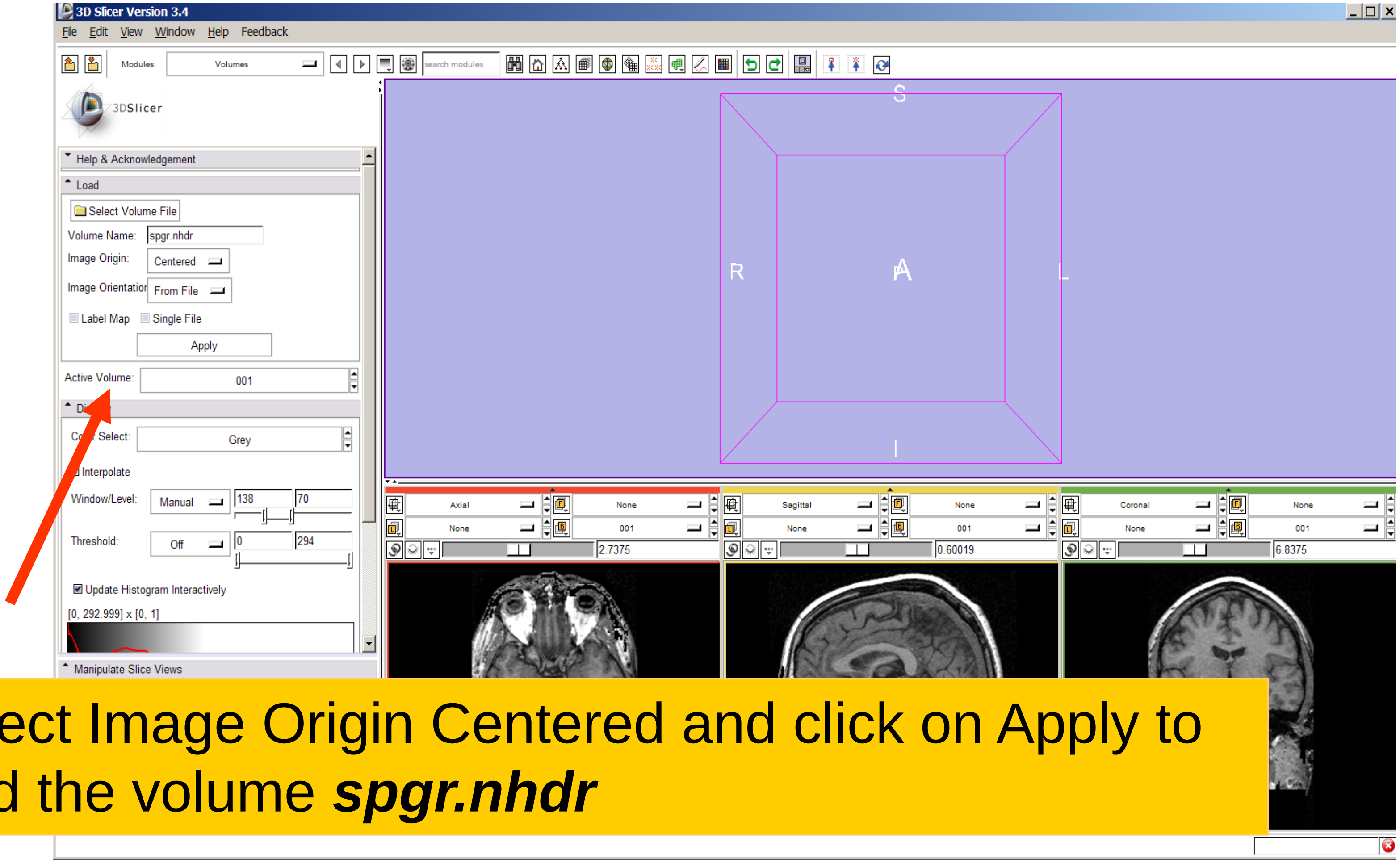
Name	Size	Modified time
all.nhdr	1 KB	08/06/07 15:20:50
all.raw.gz	203 KB	08/06/07 15:20:50
spgr.nhdr	1 KB	08/06/07 14:58:30
spgr.raw.gz	6,517 KB	08/06/07 14:58:30

File name: spgr.nhdr

Files of type: Volume (*)

Browse to find the header file of the spgr volume ***spgr.nhdr*** located in the directory ***Slicer3VisualizationDataset/nrrd*** and click on **Open.**

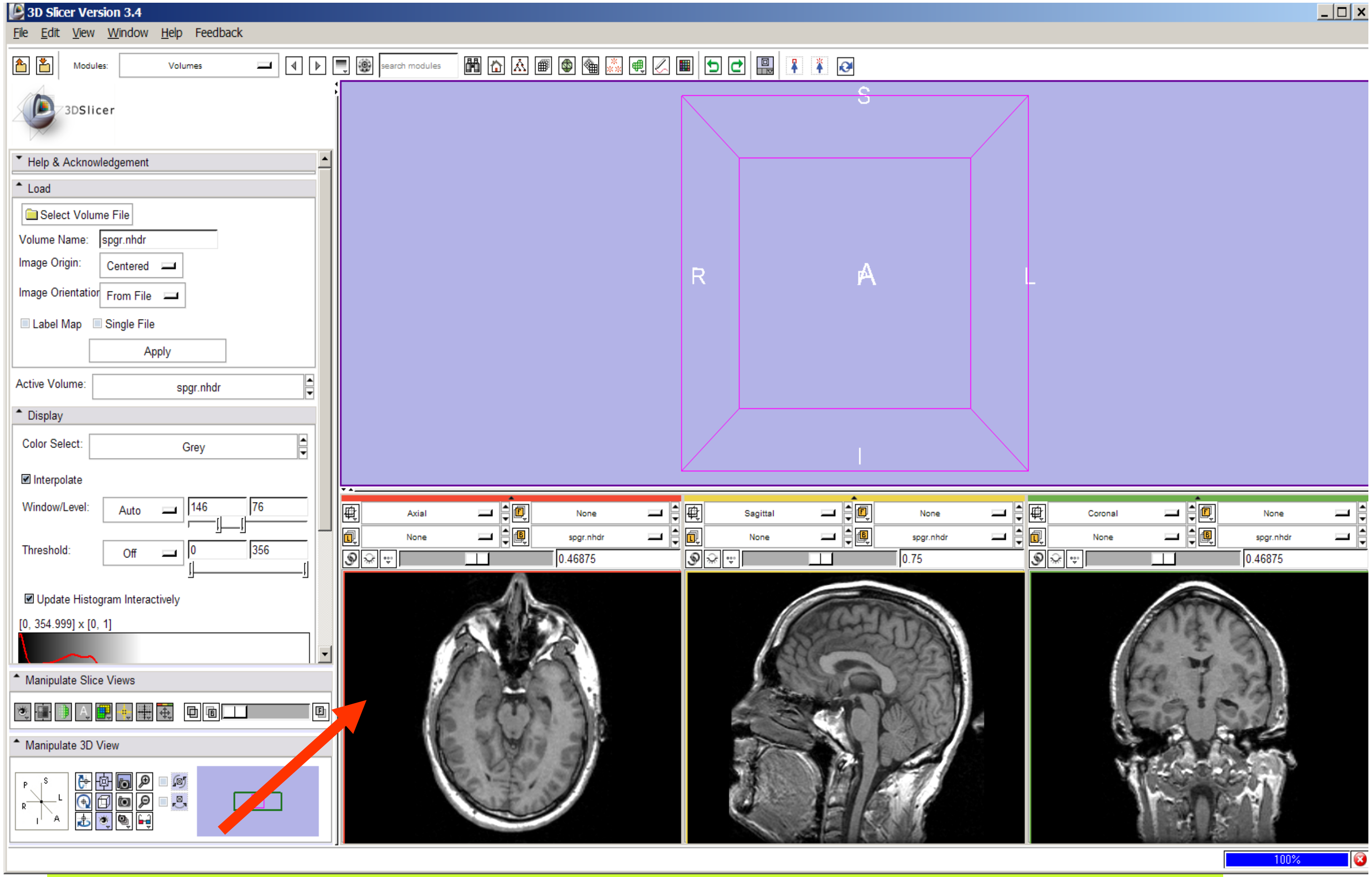
Loading Volumes


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Volumes
search modules
3DSlicer
Help & Acknowledgement
Load
Select Volume File
Apply
Manipulate Slice Views
S
R
A
L
I
Axial
Sagittal
Coronal
None

Volume Name: spgr.nhdr
Image Origin: Centered
Image Orientation: From File
☐ Label Map ☐ Single File
Active Volume: 001
Color Select: Grey
☐ Interpolate
Window/Level: Manual 138 70
Threshold: Off 0 294
☑ Update Histogram Interactively
[0, 292.999] x [0, 1]

Select Image Origin Centered and click on Apply to load the volume ***spgr.nhdr***

Loading Volumes


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Volumes
search modules
3DSlicer
Help & Acknowledgement
Load
Select Volume File
Apply
Display
Manipulate Slice Views
Manipulate 3D View
S
R
A
L
I
Axial
Sagittal
Coronal
None
100%

Volume Name: spgr.nhdr

Image Origin: Centered

Image Orientation: From File

☐ Label Map ☐ Single File

Active Volume: spgr.nhdr

Color Select: Grey

☑ Interpolate

Window/Level: Auto 146 76

Threshold: Off 0 356

☑ Update Histogram Interactively

[0, 354.999] x [0, 1]

Axial: None / spgr.nhdr 0.46875

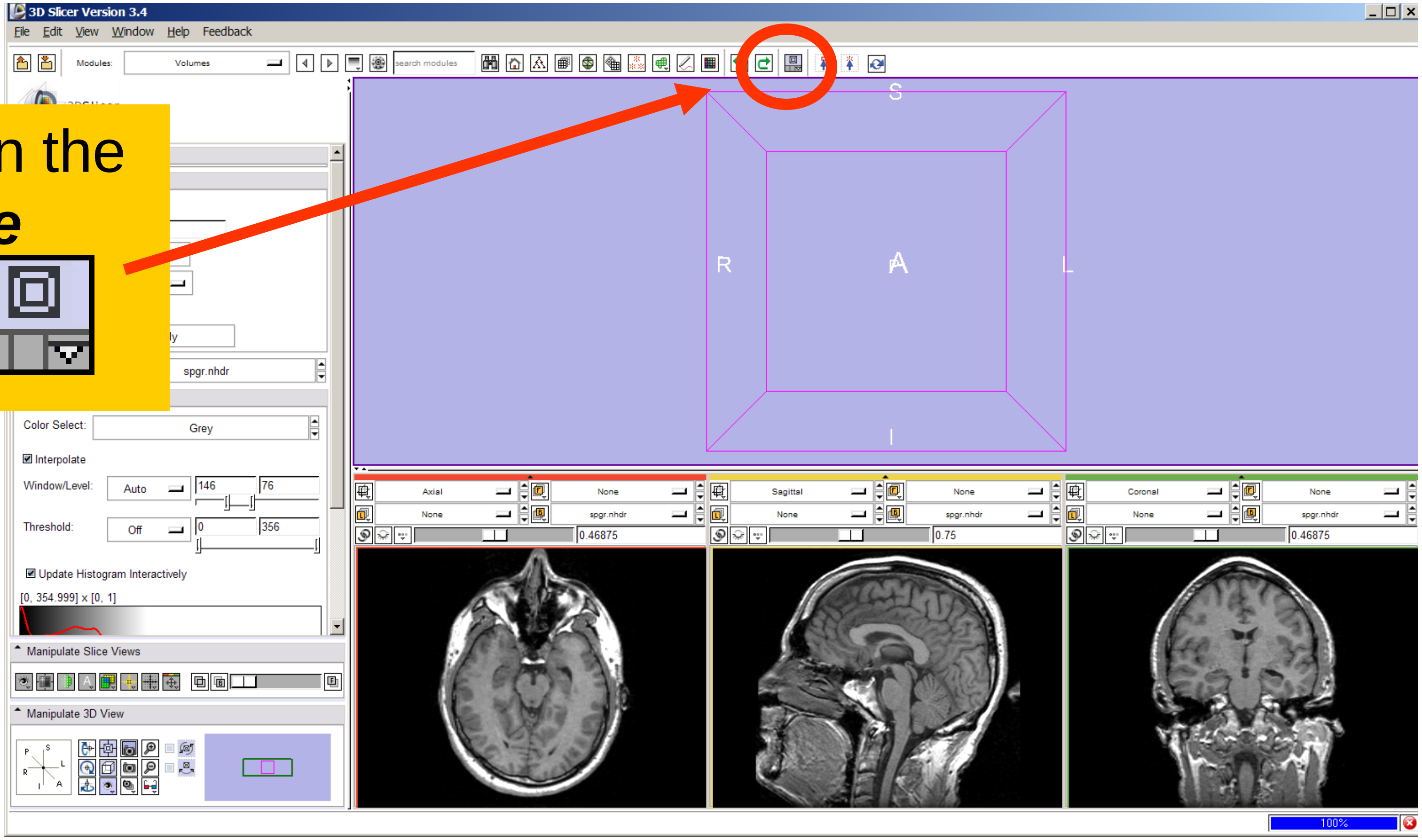
Sagittal: None / spgr.nhdr 0.75

Coronal: None / spgr.nhdr 0.46875

The spgr volume appears in the Background display B of the 2D Viewer.

Exploring the data

Click on the ***choose view*** icon


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Volumes
search modules
S
R
A
L
I
Axial
Sagittal
Coronal
None
spgr.nhdr
0.46875
0.75
Manipulate Slice Views
Manipulate 3D View
100%

spgr.nhdr

Color Select: Grey

☑ Interpolate

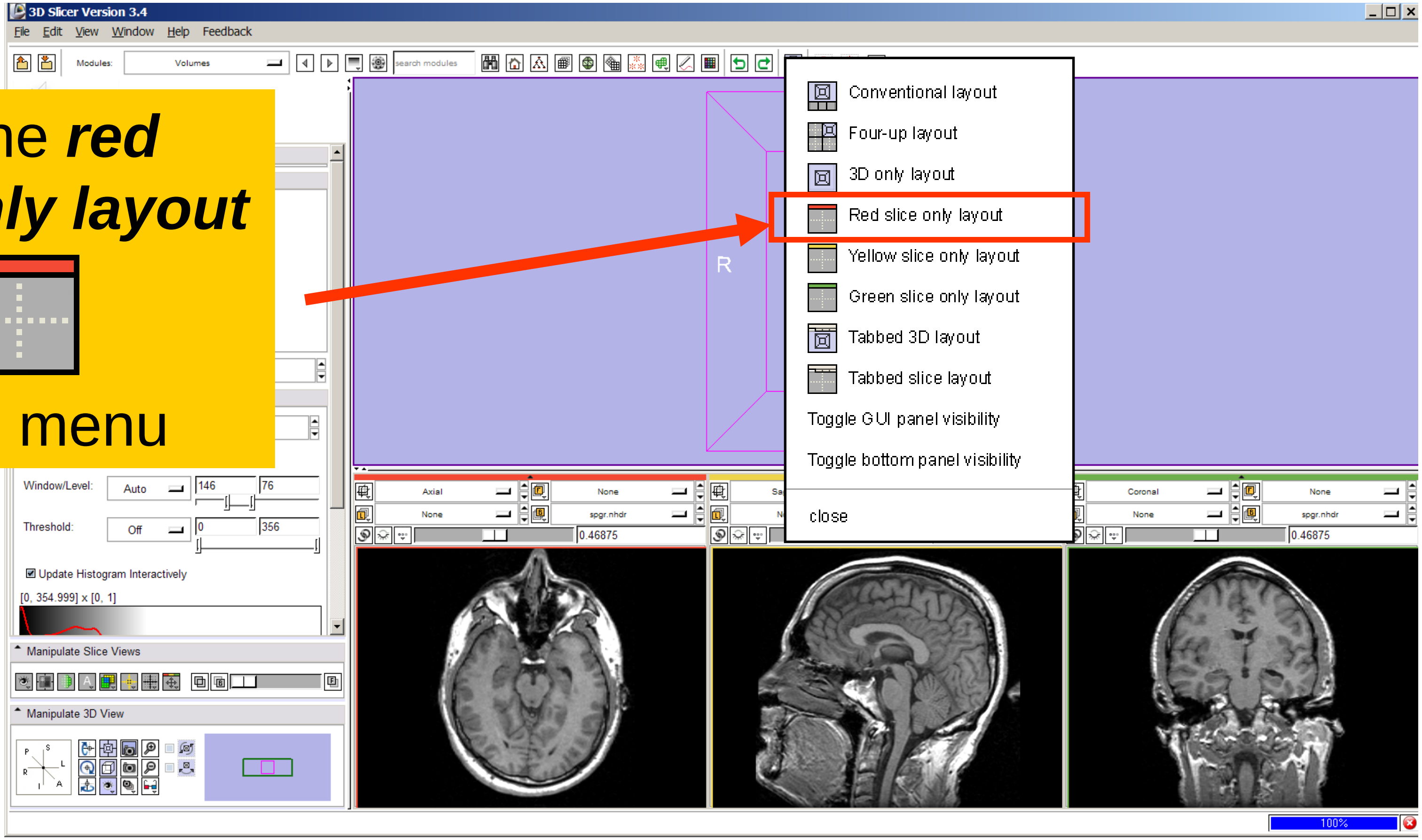
Window/Level: Auto 146 76

Threshold: Off 0 356

☑ Update Histogram Interactively

[0, 354.999] x [0, 1]

Exploring the data


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Volumes
Conventional layout
Four-up layout
3D only layout
Red slice only layout
Yellow slice only layout
Green slice only layout
Tabbed 3D layout
Tabbed slice layout
Toggle GUI panel visibility
Toggle bottom panel visibility
close
Manipulate Slice Views
Manipulate 3D View
Axial
Coronal
100%

Window/Level: Auto 146 76

Threshold: Off 0 356

☑ Update Histogram Interactively

[0, 354.999] x [0, 1]

Select the ***red slice only layout*** from the menu

Exploring the data

The axial slices of the spgr volume appear in the 3D viewer.

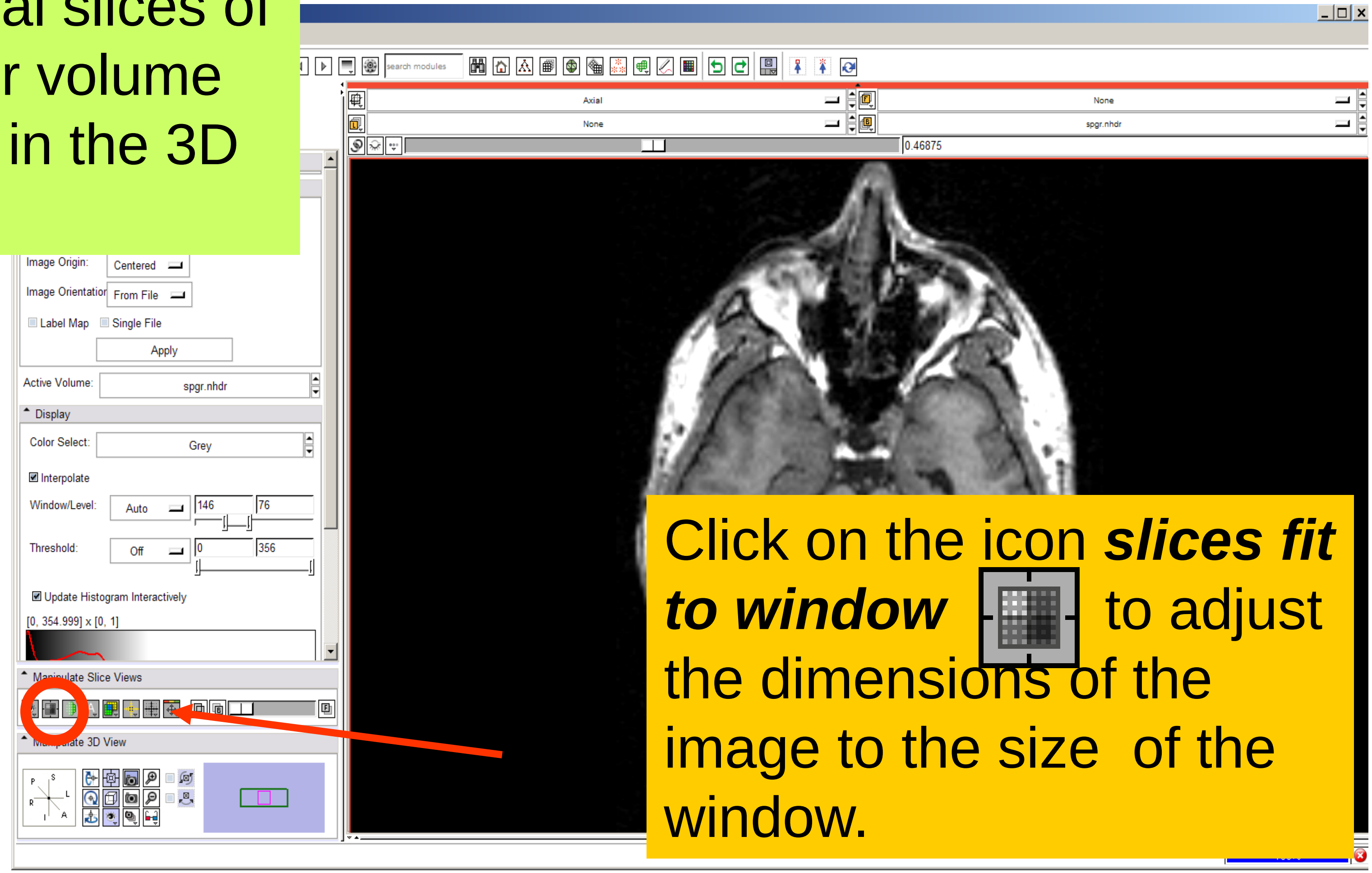


Image Origin: Centered

Image Orientation: From File

☐ Label Map ☐ Single File

Apply

Active Volume: spgr.nhdr

Display

Color Select: Grey

☑ Interpolate

Window/Level: Auto 146 76

Threshold: Off 0 356

☑ Update Histogram Interactively

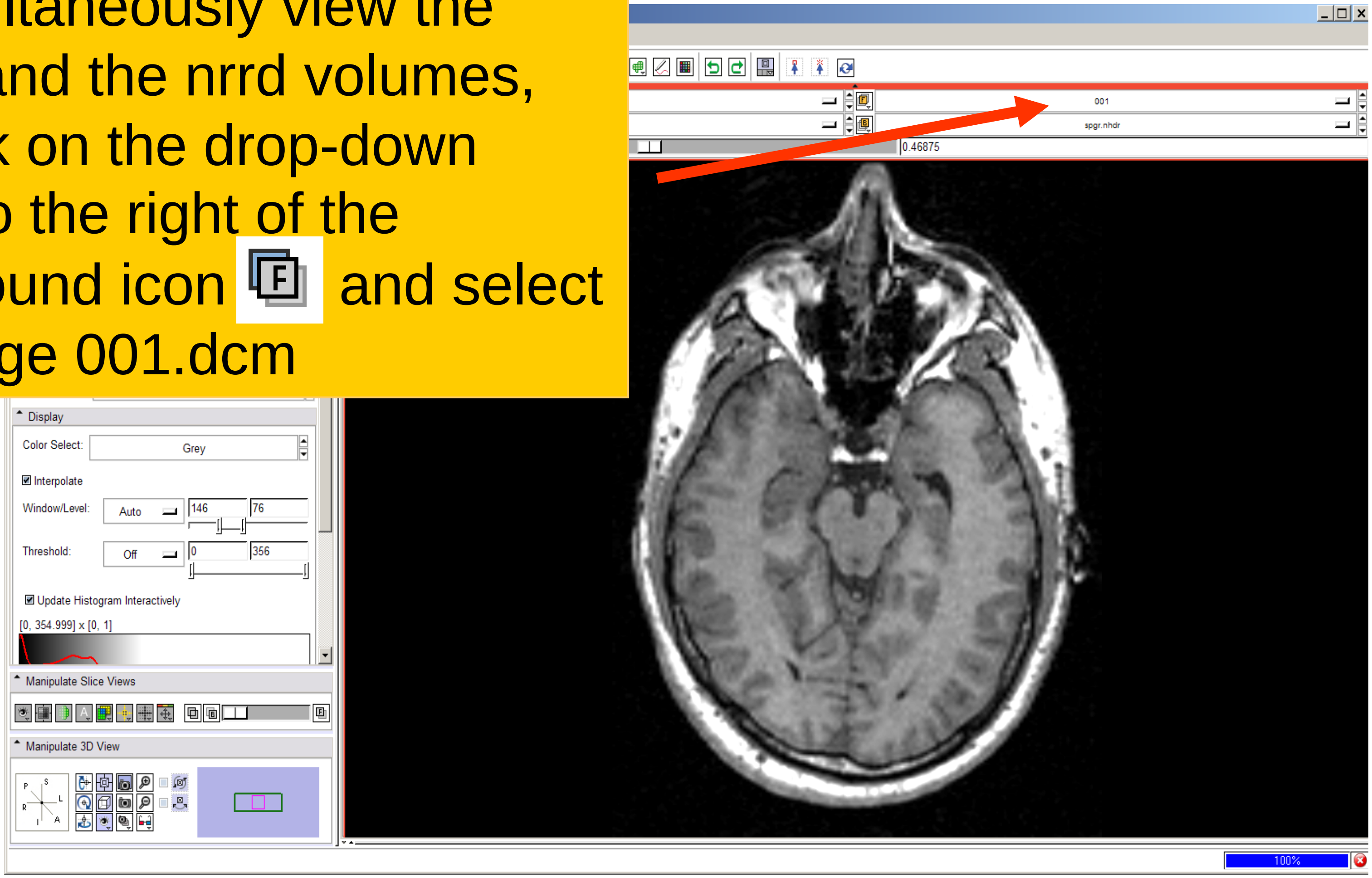
[0, 354.999] x [0, 1]

Manipulate Slice Views
Manipulate 3D View
search modules
Axial
None
None
spgr.nhdr
0.46875

Click on the icon ***slices fit to window*** to adjust the dimensions of the image to the size of the window.

Exploring the data

To simultaneously view the dicom and the nrrd volumes, left click on the drop-down menu to the right of the Foreground icon F and select the image 001.dcm


Display
Manipulate Slice Views
Manipulate 3D View

001
spgr.nhdr
0.46875

Color Select: Grey

☑ Interpolate

Window/Level: Auto 146 76

Threshold: Off 0 356

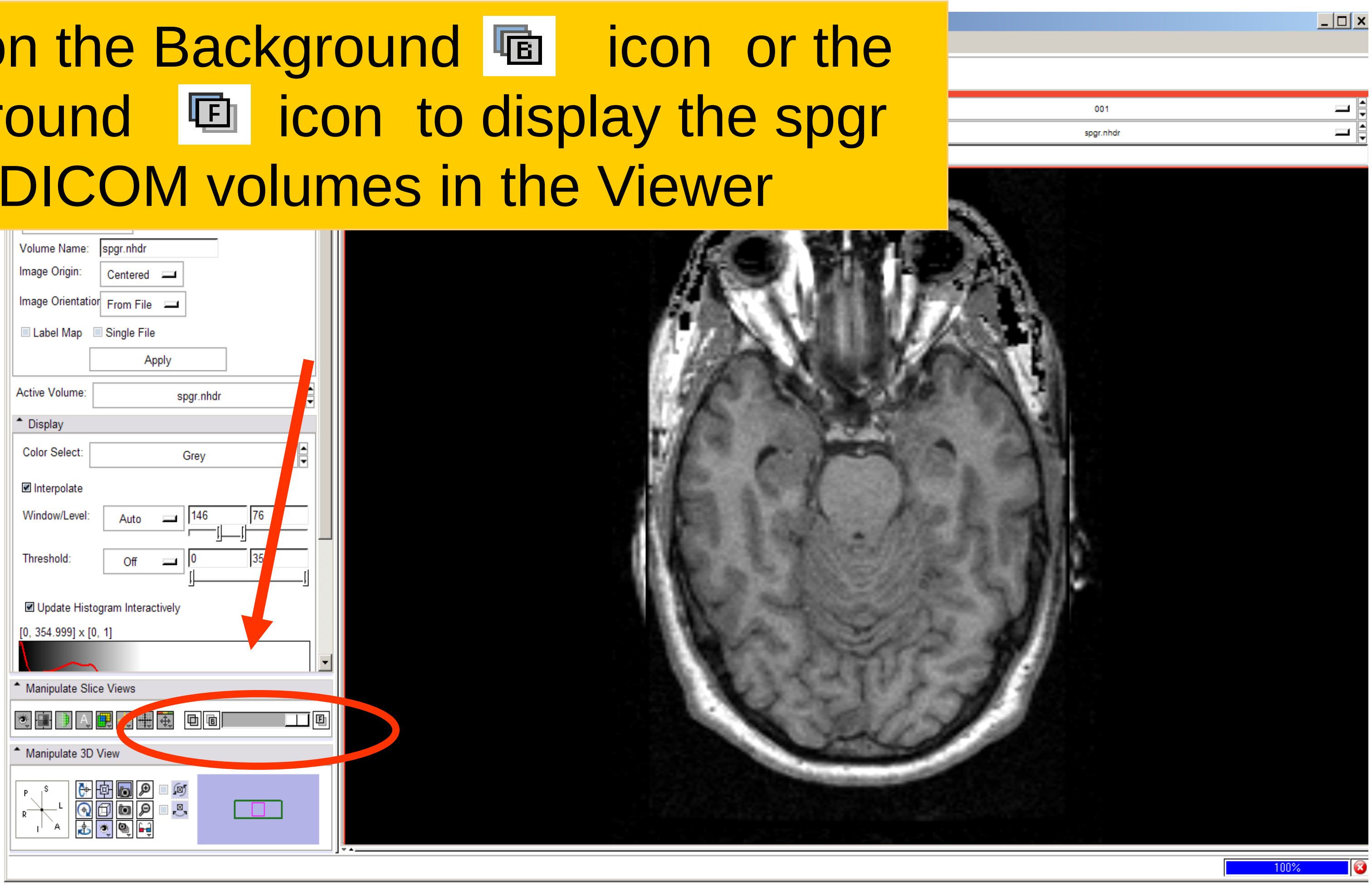
☑ Update Histogram Interactively

[0, 354.999] x [0, 1]

100%

Exploring the data

Click on the Background icon or the Foreground icon to display the spgr or the DICOM volumes in the Viewer



Volume Name: spgr.nhdr

Image Origin: Centered

Image Orientation: From File

☐ Label Map ☐ Single File

Active Volume: spgr.nhdr

Color Select: Grey

☑ Interpolate

Window/Level: Auto 146 76

Threshold: Off 0 35

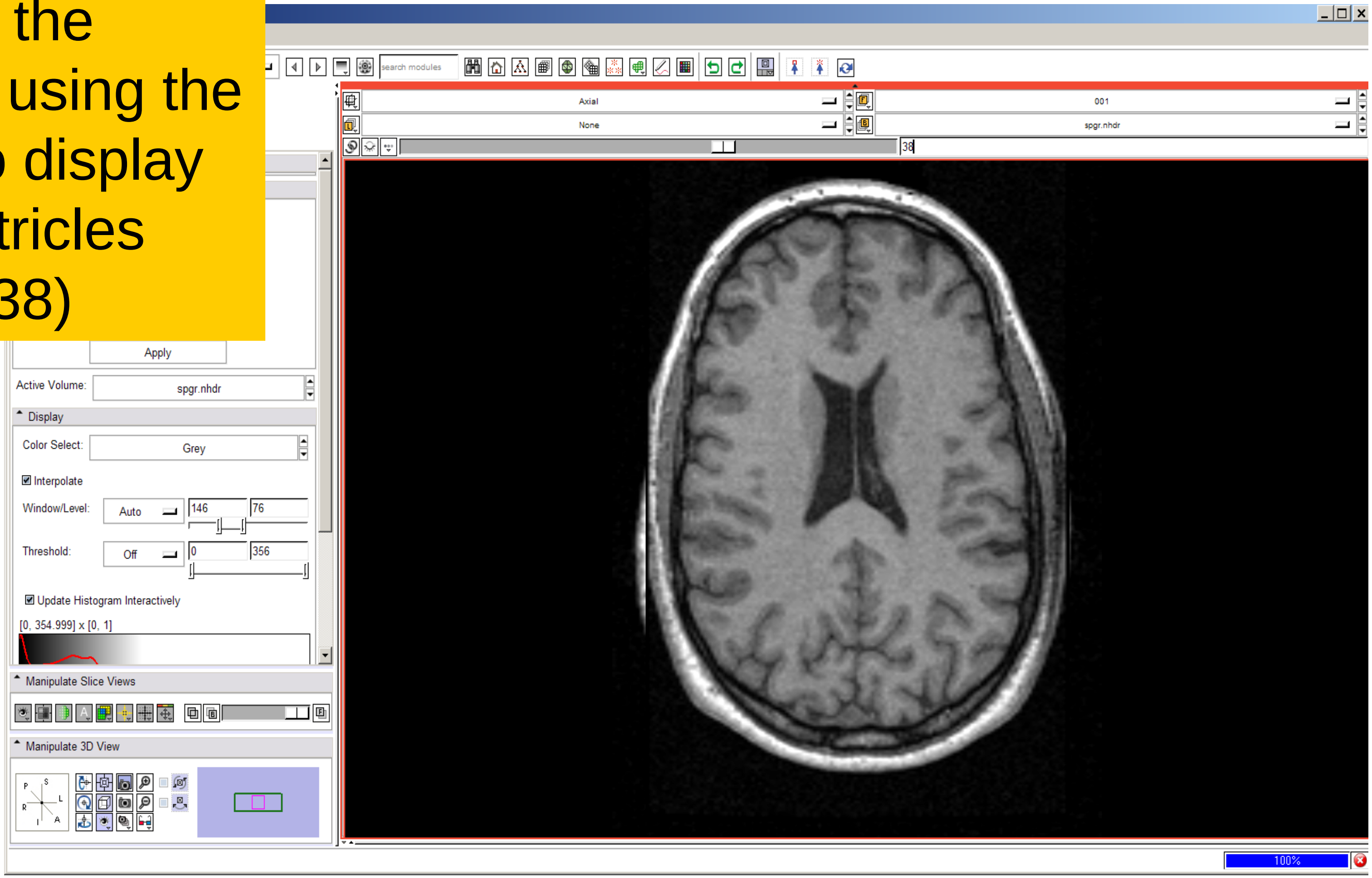
☑ Update Histogram Interactively

[0, 354.999] x [0, 1]

Apply
Display
Manipulate Slice Views
Manipulate 3D View
001
spgr.nhdr
100%

Exploring the data

Browse the images using the slider to display the ventricles (~slice 38)



search modules
Axial
001
None
spgr.nhdr
38
Apply

Active Volume: spgr.nhdr

Display

Color Select: Grey

☑ Interpolate

Window/Level: Auto 146 76

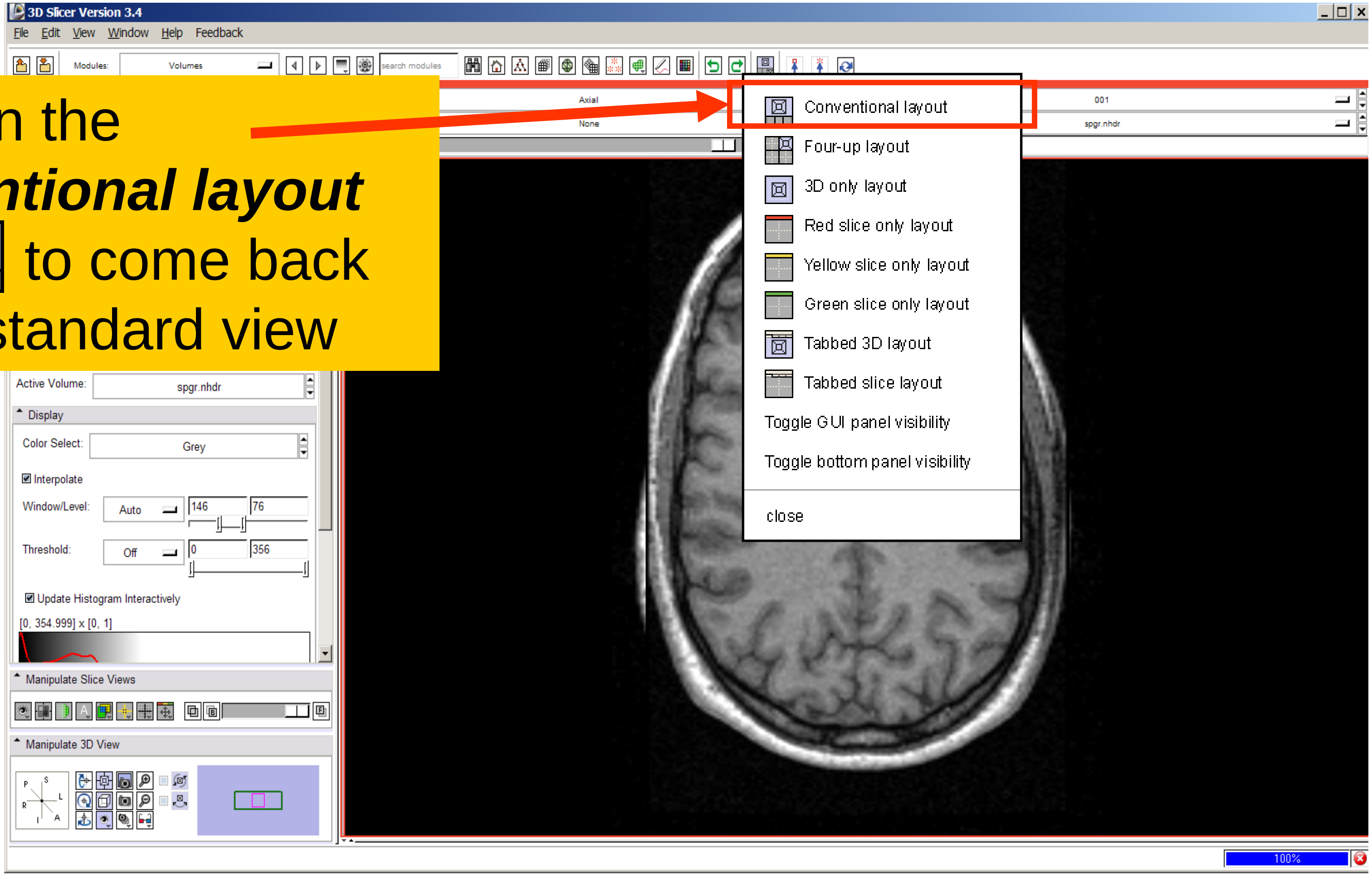
Threshold: Off 0 356

☑ Update Histogram Interactively

[0, 354.999] x [0, 1]

Manipulate Slice Views
Manipulate 3D View
P
S
L
R
I
A
100%

Exploring the data


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Volumes
search modules
Axial
None
001
spgr.nhdr
Conventional layout
Four-up layout
3D only layout
Red slice only layout
Yellow slice only layout
Green slice only layout
Tabbed 3D layout
Tabbed slice layout
Toggle GUI panel visibility
Toggle bottom panel visibility
close
Display
Manipulate Slice Views
Manipulate 3D View
100%

Active Volume: spgr.nhdr

Color Select: Grey

☑ Interpolate

Window/Level: Auto 146 76

Threshold: Off 0 356

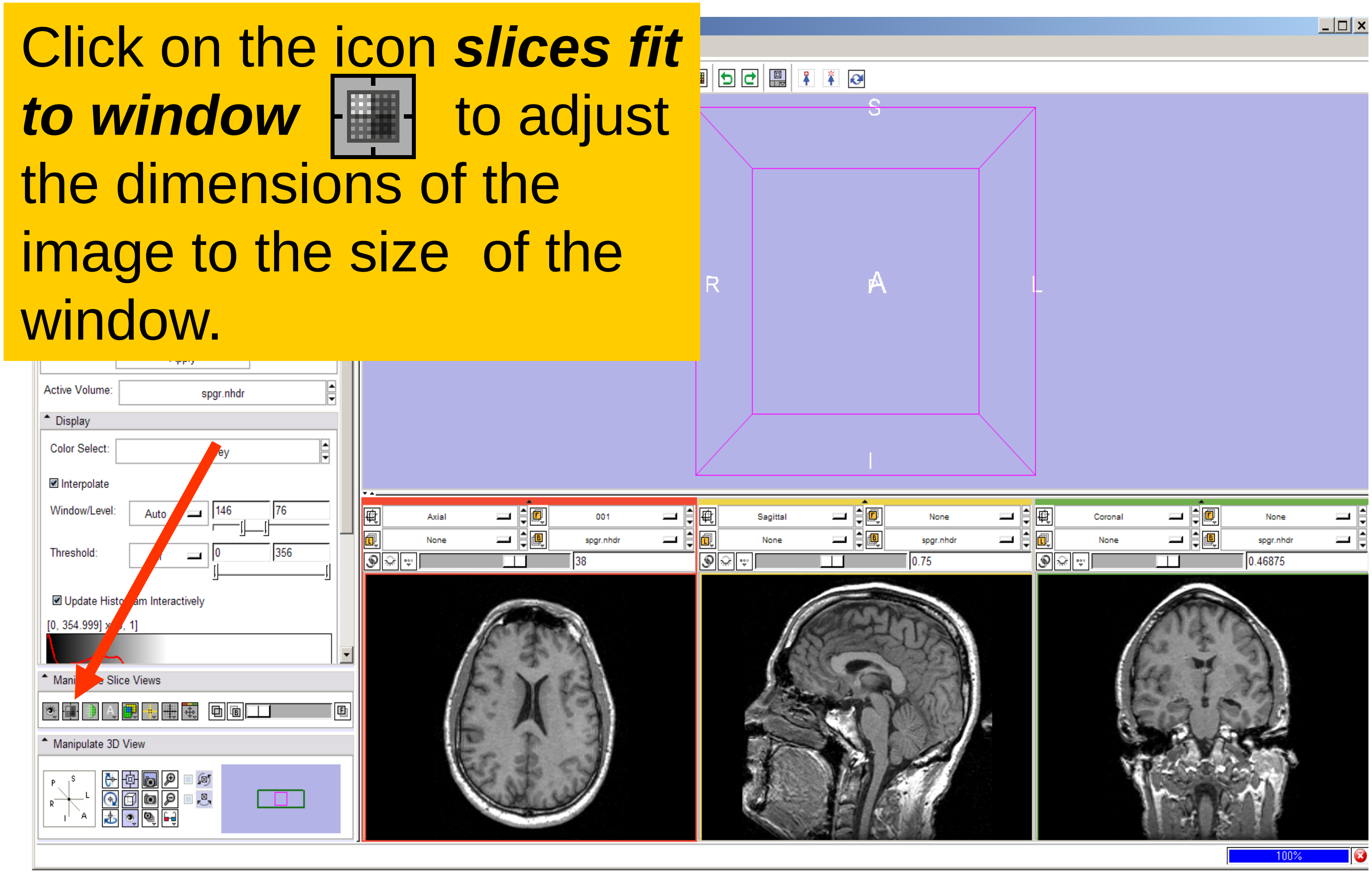
☑ Update Histogram Interactively

[0, 354.999] x [0, 1]

Click on the ***conventional layout icon*** ⊡ to come back to the standard view

Loading Volumes

Click on the icon ***slices fit to window*** to adjust the dimensions of the image to the size of the window.



Active Volume: spgr.nhdr

Display

Color Select: Grey

☑ Interpolate

Window/Level: Auto 146 76

Threshold: 0 356

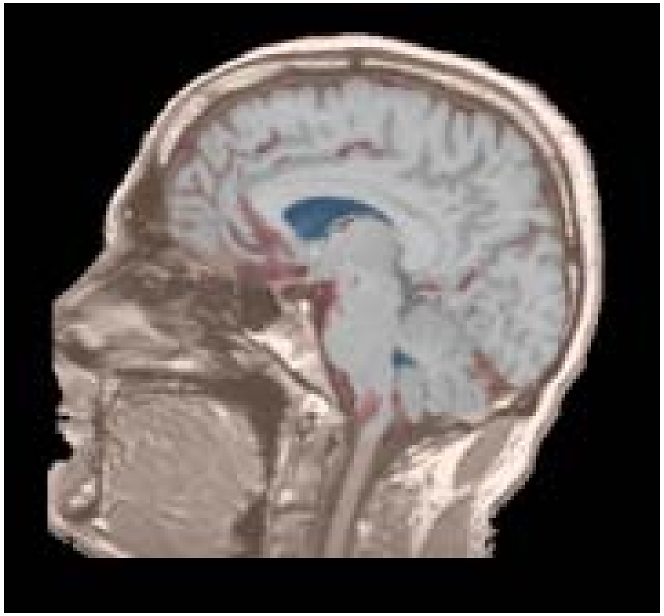
☑ Update Histogram Interactively

[0, 354.999] x [0, 1]

Manipulate Slice Views

Manipulate 3D View

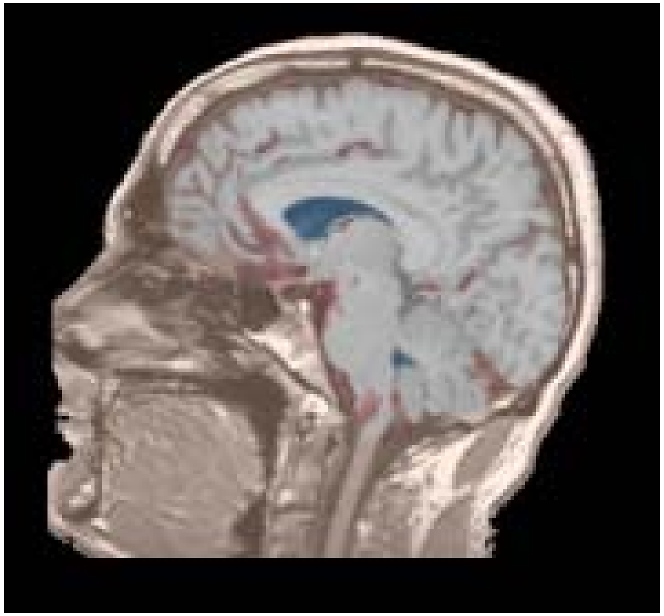
S
R
A
L
I
Axial
001
None
spgr.nhdr
38
Sagittal
None
None
spgr.nhdr
0.75
Coronal
None
None
spgr.nhdr
0.46875
100%



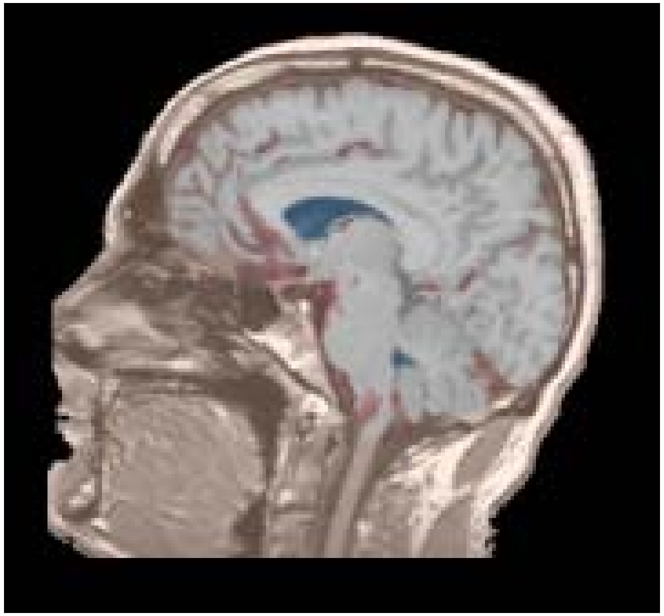
Part 2: Loading and visualizing segmented structures overlaid on grayscale images

Label map

- Image segmentation is the extraction of structural information of particular interest from surrounding image.

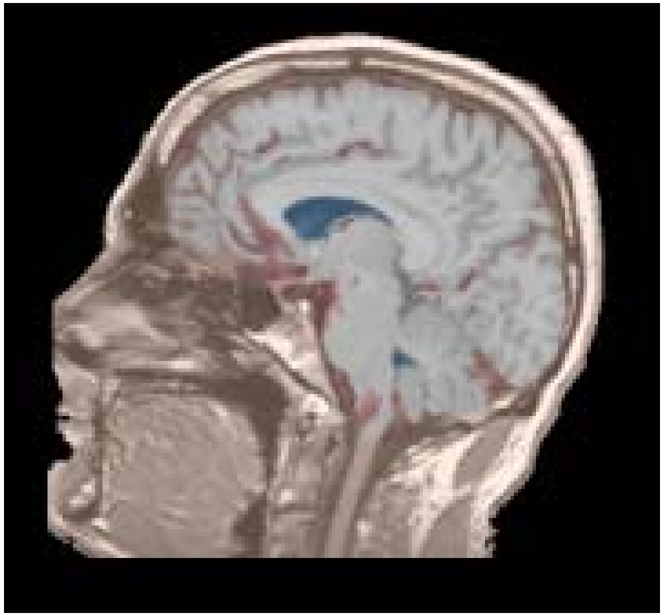


Label map



- Image segmentation is the extraction of structural information of particular interest from surrounding image.
- Each pixel is assigned a specific label value which corresponds to the anatomical structure that it belongs to.

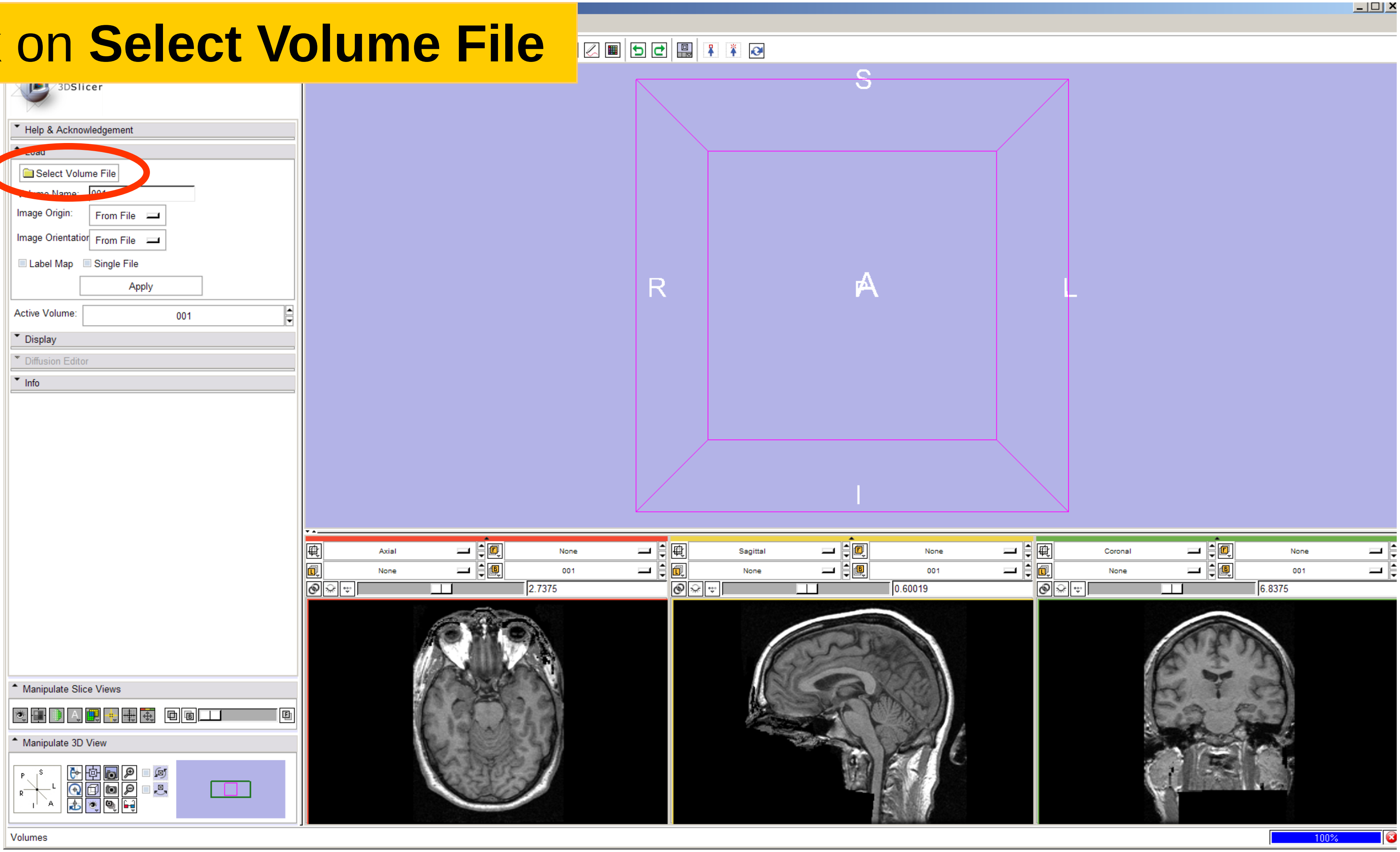
Label map



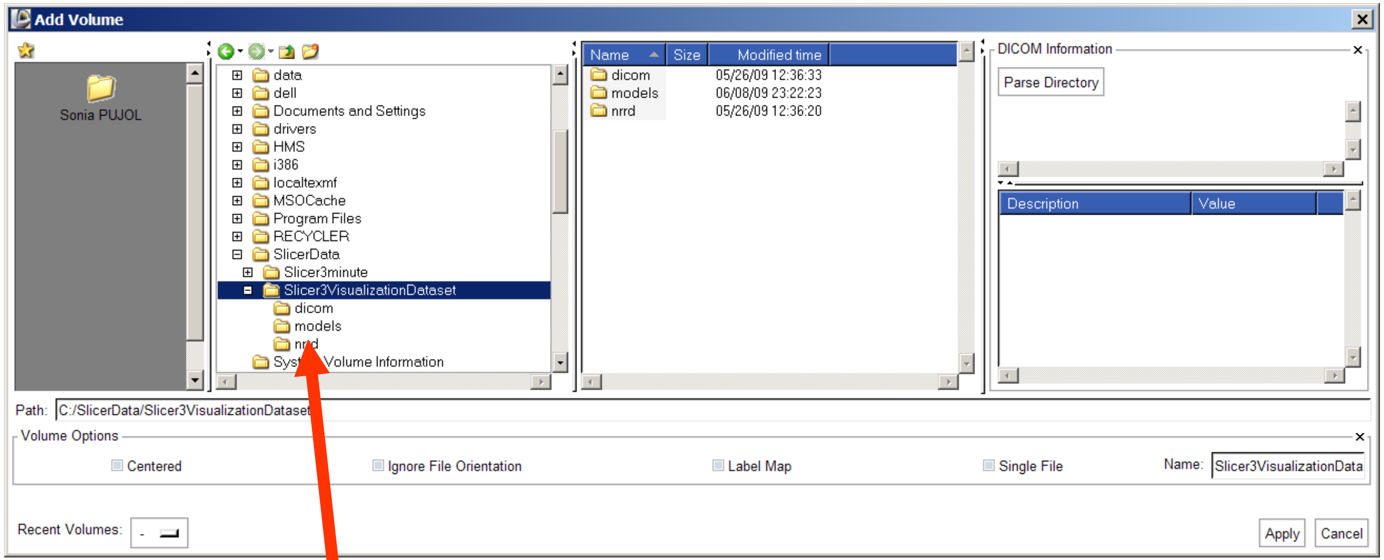
- Image segmentation is the extraction of structural information of particular interest from surrounding image.
- Each pixel is assigned a specific label value which corresponds to the anatomical structure that it belongs to.
- The three-dimensional result of the segmentation is a binary array called a label map.

Loading a label map

Click on **Select Volume File**


3DSlicer
Help & Acknowledgement
Load
Select Volume File
Volume Name:
001
Image Origin:
From File
Image Orientation
From File
Label Map
Single File
Apply
Active Volume:
001
Display
Diffusion Editor
Info
Manipulate Slice Views
Manipulate 3D View
S
R
A
L
I
Axial
None
None
001
2.7375
Sagittal
None
None
001
0.60019
Coronal
None
None
001
6.8375
Volumes
100%

Loading a label map

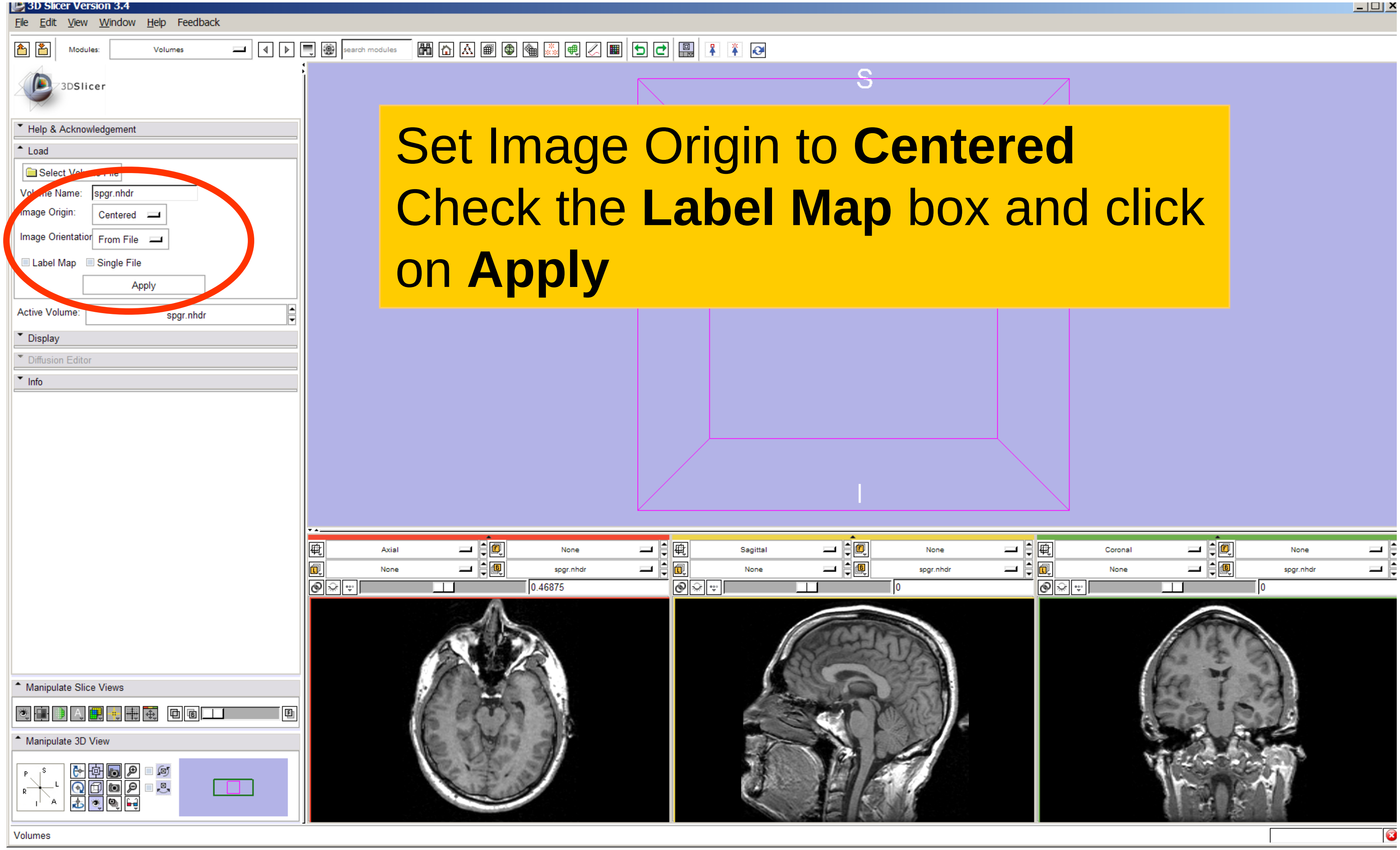

Add Volume
Sonia PUJOL
data
dell
Documents and Settings
drivers
HMS
i386
localtexmf
MSOCache
Program Files
RECYCLER
SlicerData
Slicer3minute
Slicer3VisualizationDataset
dicom
models
nrrd
System Volume Information
Name
Size
Modified time
dicom
models
nrrd
05/26/09 12:36:33
06/08/09 23:22:23
05/26/09 12:36:20
DICOM Information
Parse Directory
Description
Value
Volume Options
☐ Centered
☐ Ignore File Orientation
☐ Label Map
☐ Single File
Recent Volumes:
Apply
Cancel

Path: C:/SlicerData/Slicer3VisualizationDataset

Name: Slicer3VisualizationData

Browse to find the header file ***all.nhdr*** of the label map dataset located in the directory ***Slicer3VisualizationDataset/nrrd*** and click on **Open**

Visualizing a label map


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Volumes
search modules
3DSlicer
Help & Acknowledgement
Load
Select Volume File
Apply
Display
Diffusion Editor
Info
Manipulate Slice Views
Manipulate 3D View
S
I
Axial
Sagittal
Coronal
None
0.46875
0
Volumes

Volume Name: spgr.nhdr

Image Origin: Centered

Image Orientation: From File

☐ Label Map ☐ Single File

Active Volume: spgr.nhdr

Set Image Origin to **Centered**

Check the **Label Map** box and click on **Apply**

Visualizing a label map

Slicer displays the label map ***all*** in the **Label layer** ▣

Click on the ***links*** icon. ◎

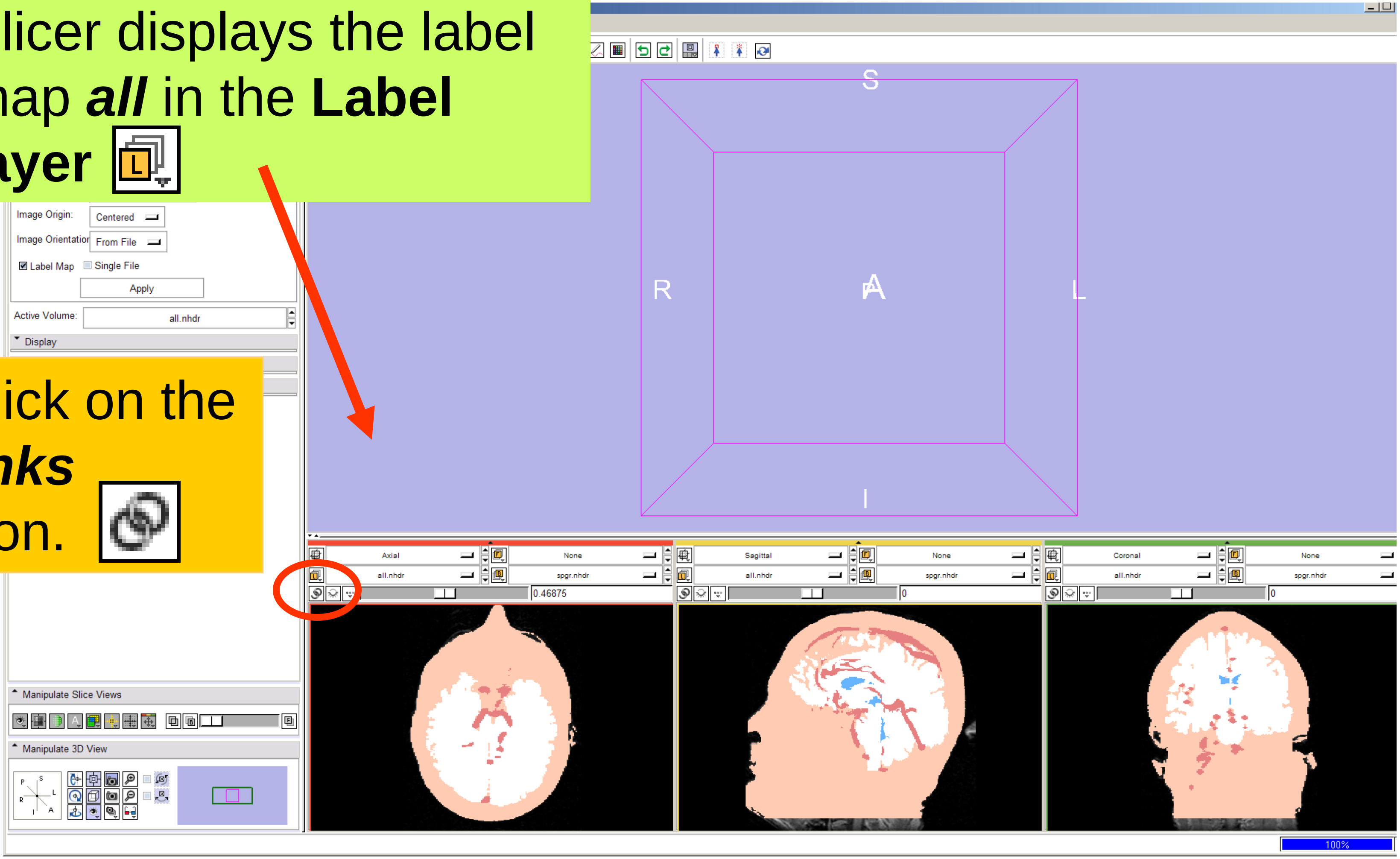


Image Origin: Centered

Image Orientation: From File

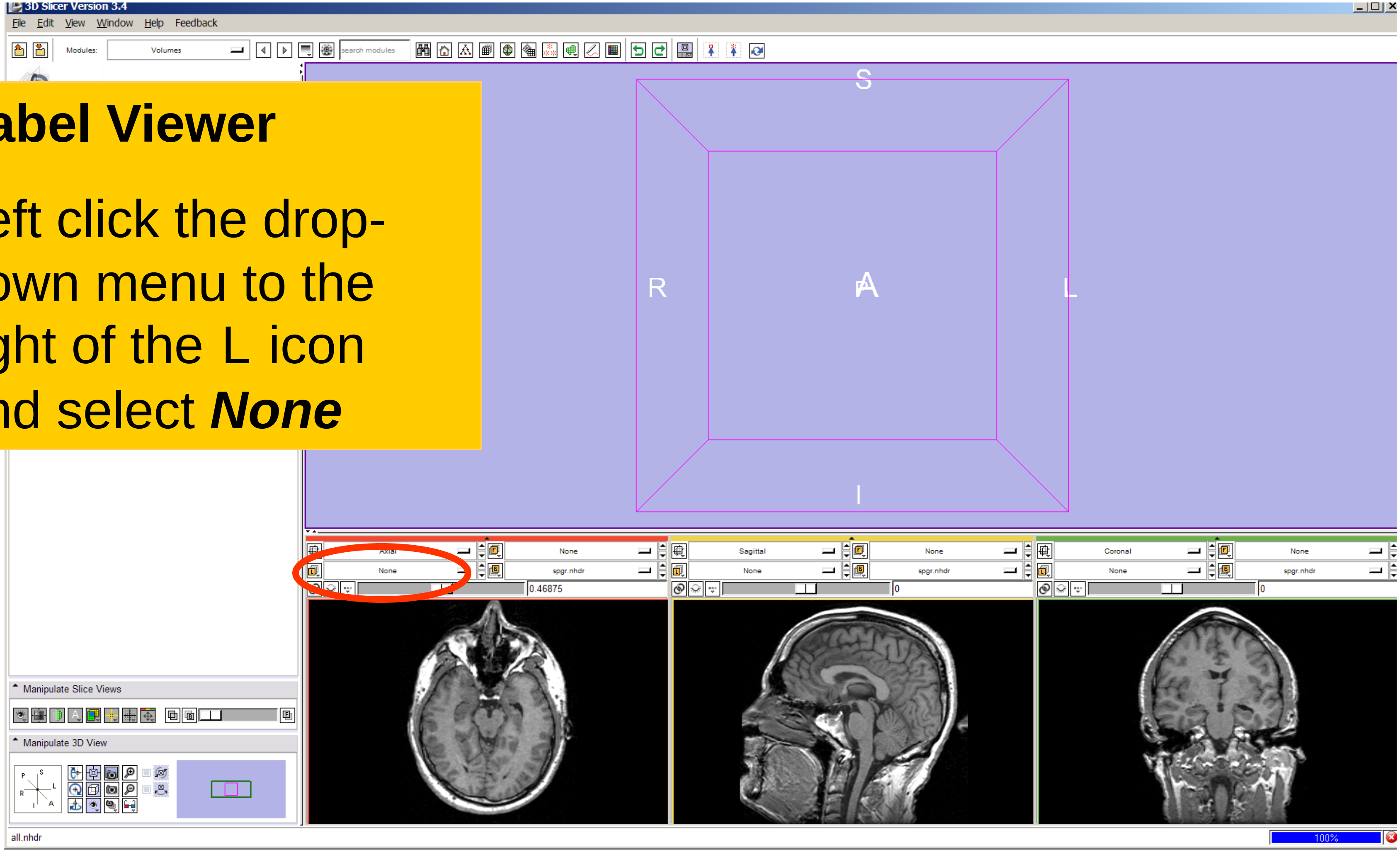
☑ Label Map ☐ Single File

Apply

Active Volume: all.nhdr

Display
S
R
A
L
I
Axial
None
all.nhdr
spgr.nhdr
0.46875
Sagittal
None
all.nhdr
spgr.nhdr
0
Coronal
None
all.nhdr
spgr.nhdr
0
Manipulate Slice Views
Manipulate 3D View
100%

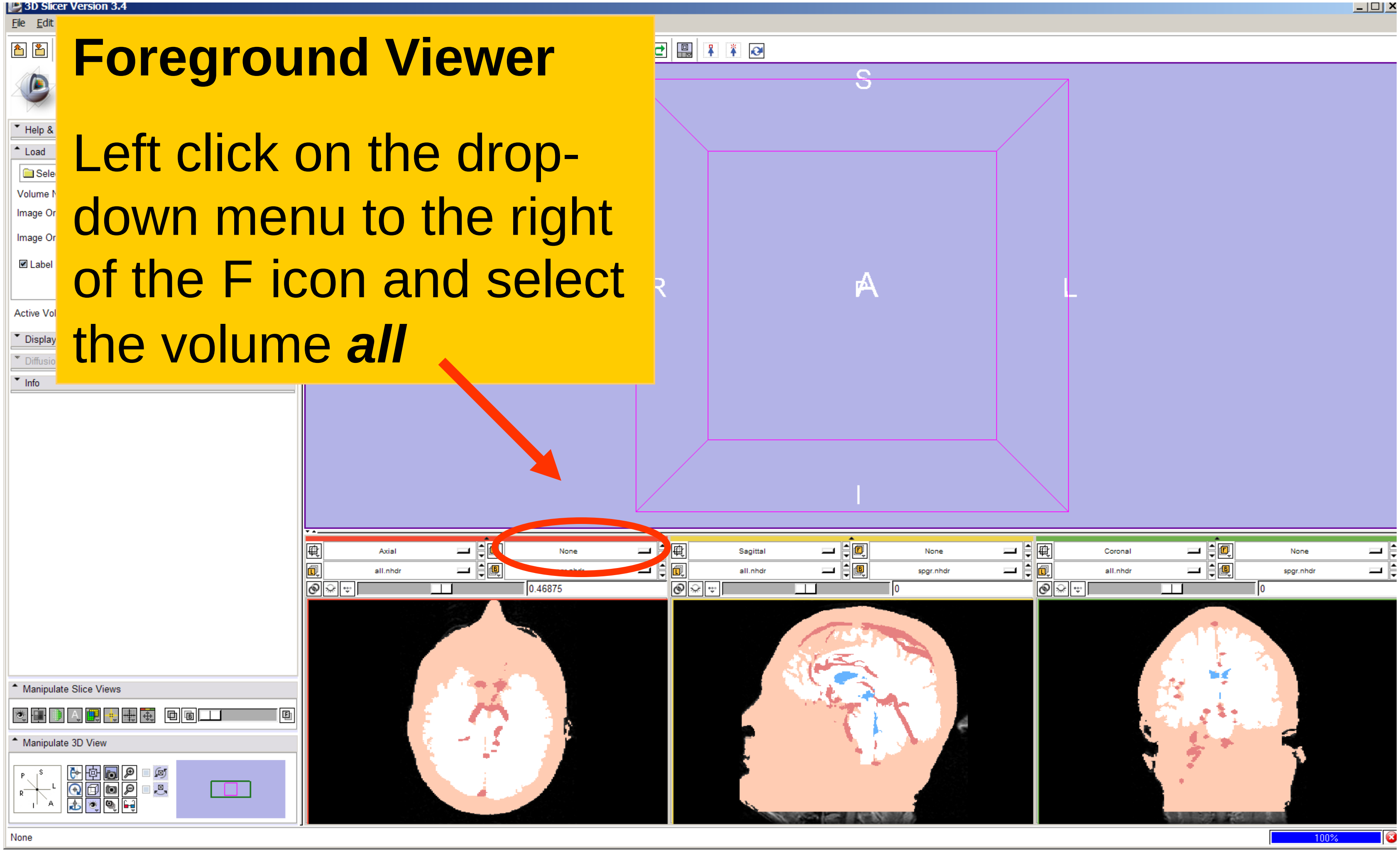
Visualizing Multiple Volumes


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Volumes
search modules
S
R
A
L
I
Axial
None
None
spgr.nhdr
0.46875
Sagittal
None
None
spgr.nhdr
0
Coronal
None
None
spgr.nhdr
0
Manipulate Slice Views
Manipulate 3D View
all.nhdr
100%

Label Viewer

Left click the drop-down menu to the right of the L icon and select ***None***

Visualizing Multiple Volumes



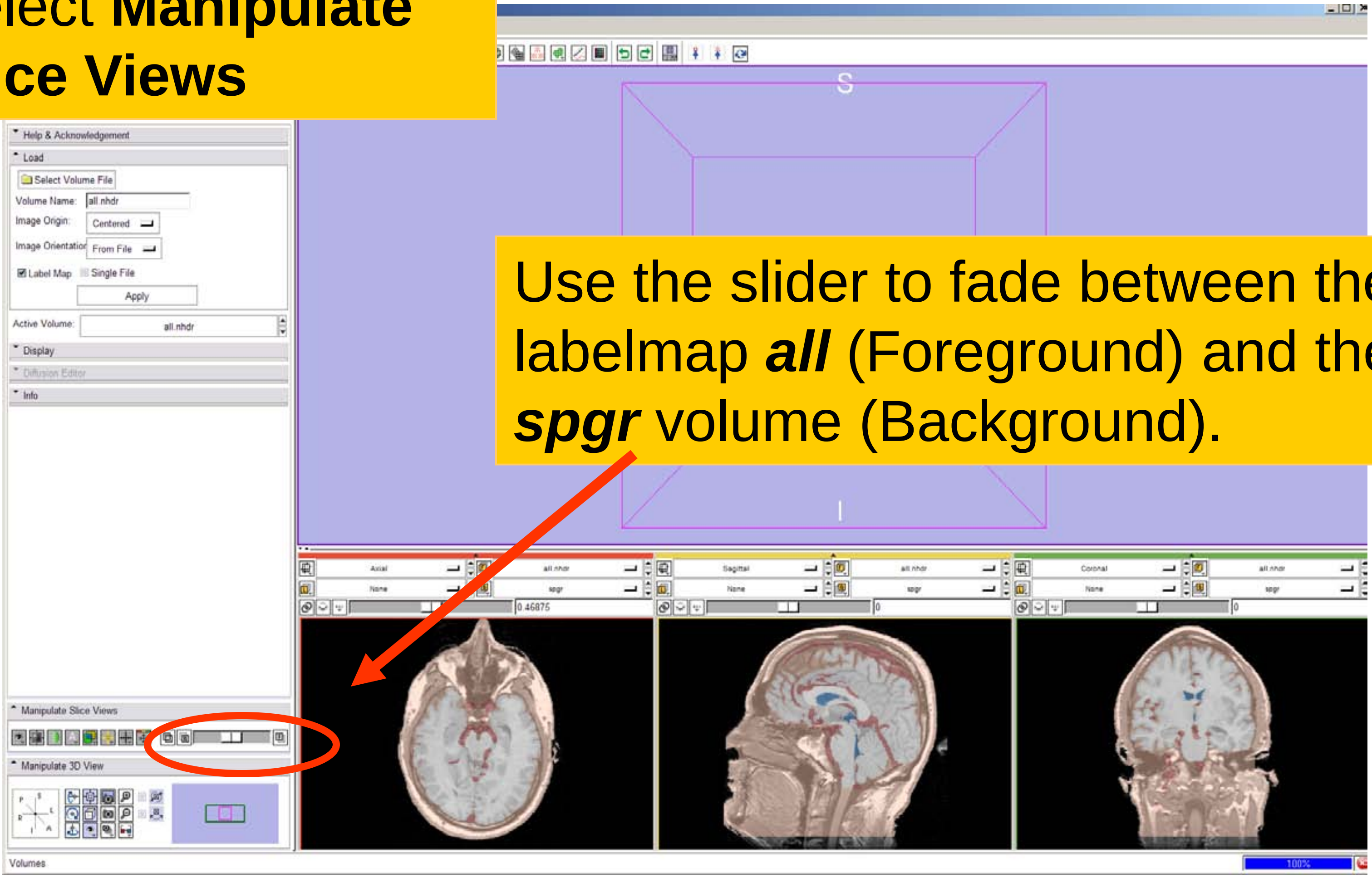
3D Slicer Version 3.4
File
Edit
Help &
Load
Sele
Volume N
Image Or
Image Or
Label
Active Vol
Display
Diffusio
Info
S
R
A
L
I
Axial
None
all.nhdr
0.46875
Sagittal
None
all.nhdr
spgr.nhdr
0
Coronal
None
all.nhdr
spgr.nhdr
0
Manipulate Slice Views
Manipulate 3D View
None
100%

Foreground Viewer

Left click on the drop-down menu to the right of the F icon and select the volume ***all***

Visualizing Multiple Volumes

Select **Manipulate Slice Views**



Help & Acknowledgement
Load
Select Volume File
Display
Diffusion Editor
Info
Manipulate Slice Views
Manipulate 3D View
Volumes
S
I
Axial
Sagittal
Coronal
100%

Volume Name: all.nhdr

Image Origin: Centered

Image Orientation: From File

☑ Label Map ☐ Single File

Apply

Active Volume: all.nhdr

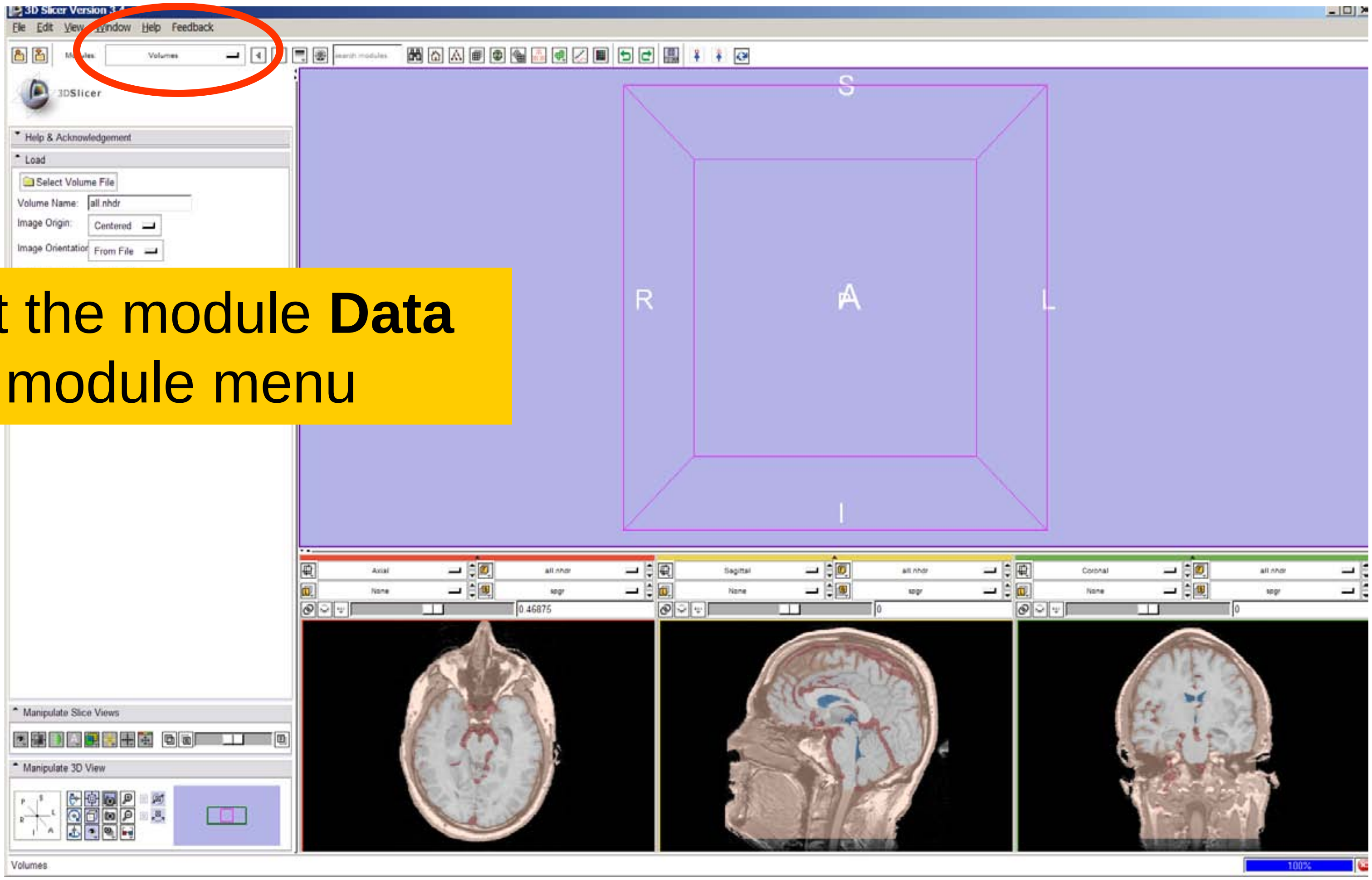
Axial: all.nhdr / None / spgr / 0.46875

Sagittal: all.nhdr / None / spgr / 0

Coronal: all.nhdr / None / spgr / 0

Use the slider to fade between the labelmap ***all*** (Foreground) and the ***spgr*** volume (Background).

3D Visualization


3D Slicer Version 3
File Edit View Window Help Feedback
Modules: Volumes
3DSlicer
Help & Acknowledgement
Load
Select Volume File
S
R
A
L
I
Axial
Sagittal
Coronal
Manipulate Slice Views
Manipulate 3D View
Volumes
100%

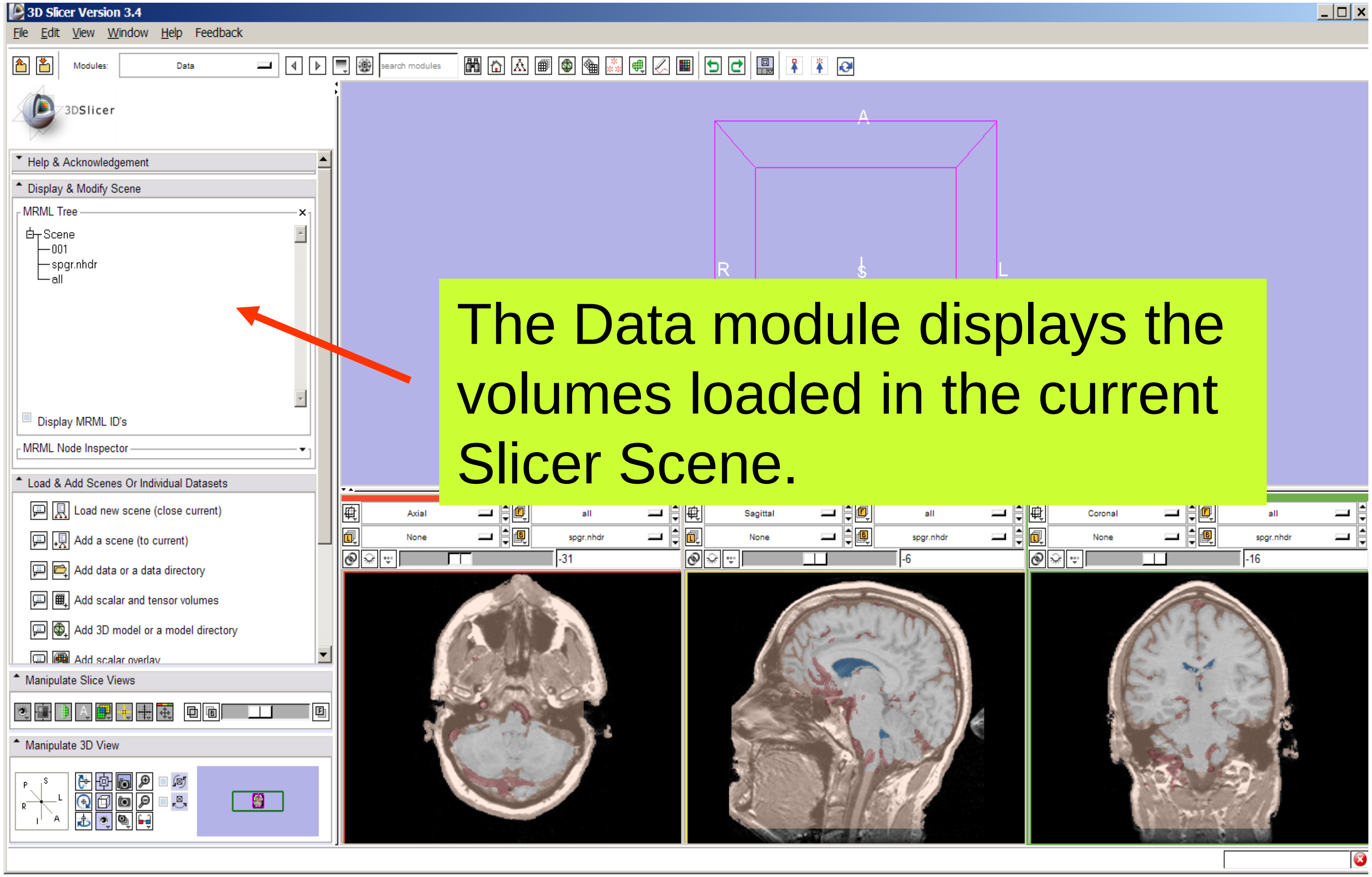
Volume Name: all.nhdr

Image Origin: Centered

Image Orientation: From File

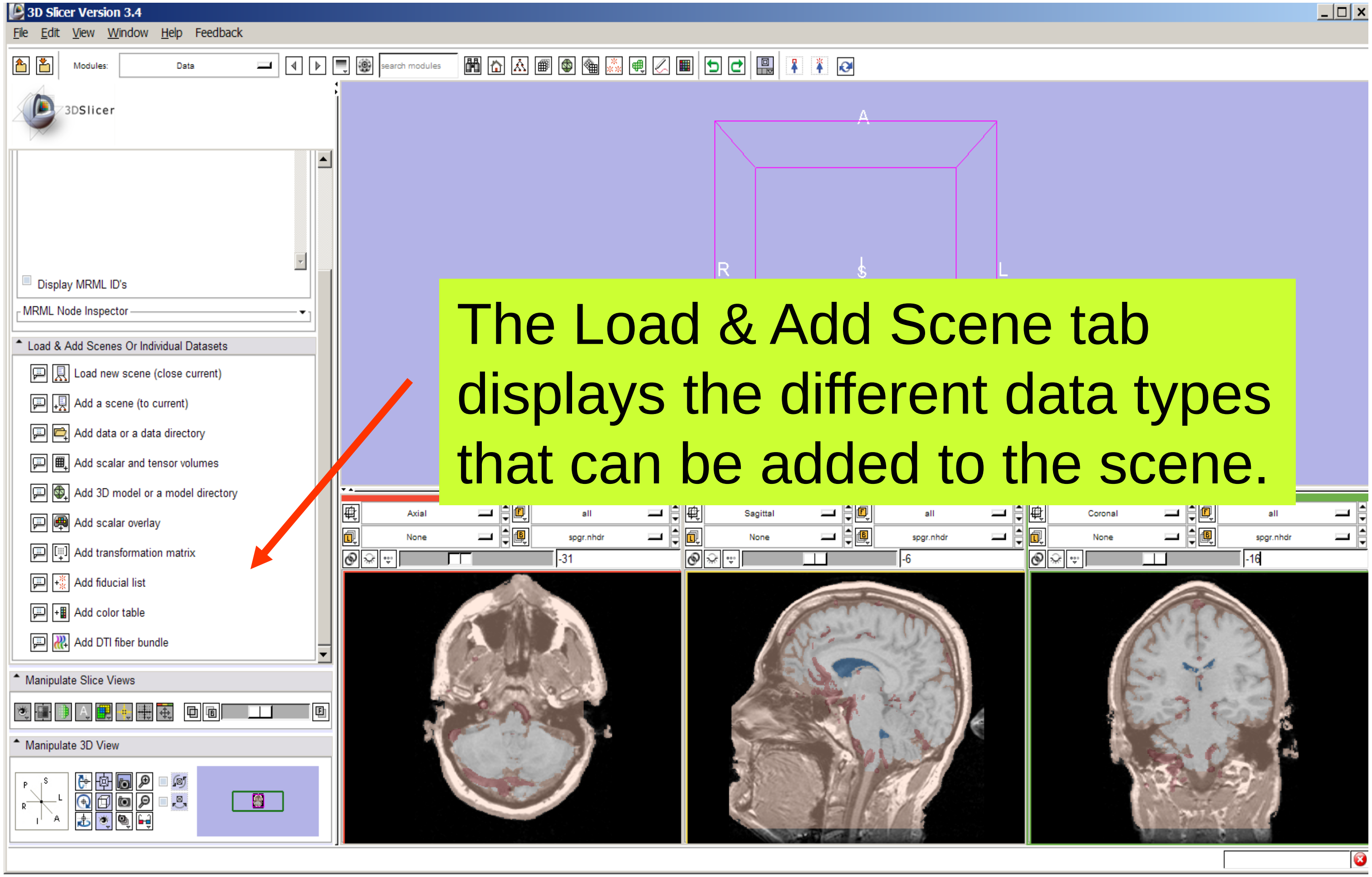
Select the module **Data** in the module menu

3D Visualization


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Data
Help & Acknowledgement
Display & Modify Scene
MRML Tree
Scene
001
spgr.nhdr
all
Display MRML ID's
MRML Node Inspector
Load & Add Scenes Or Individual Datasets
Load new scene (close current)
Add a scene (to current)
Add data or a data directory
Add scalar and tensor volumes
Add 3D model or a model directory
Add scalar overlay
Manipulate Slice Views
Manipulate 3D View
Axial
Sagittal
Coronal

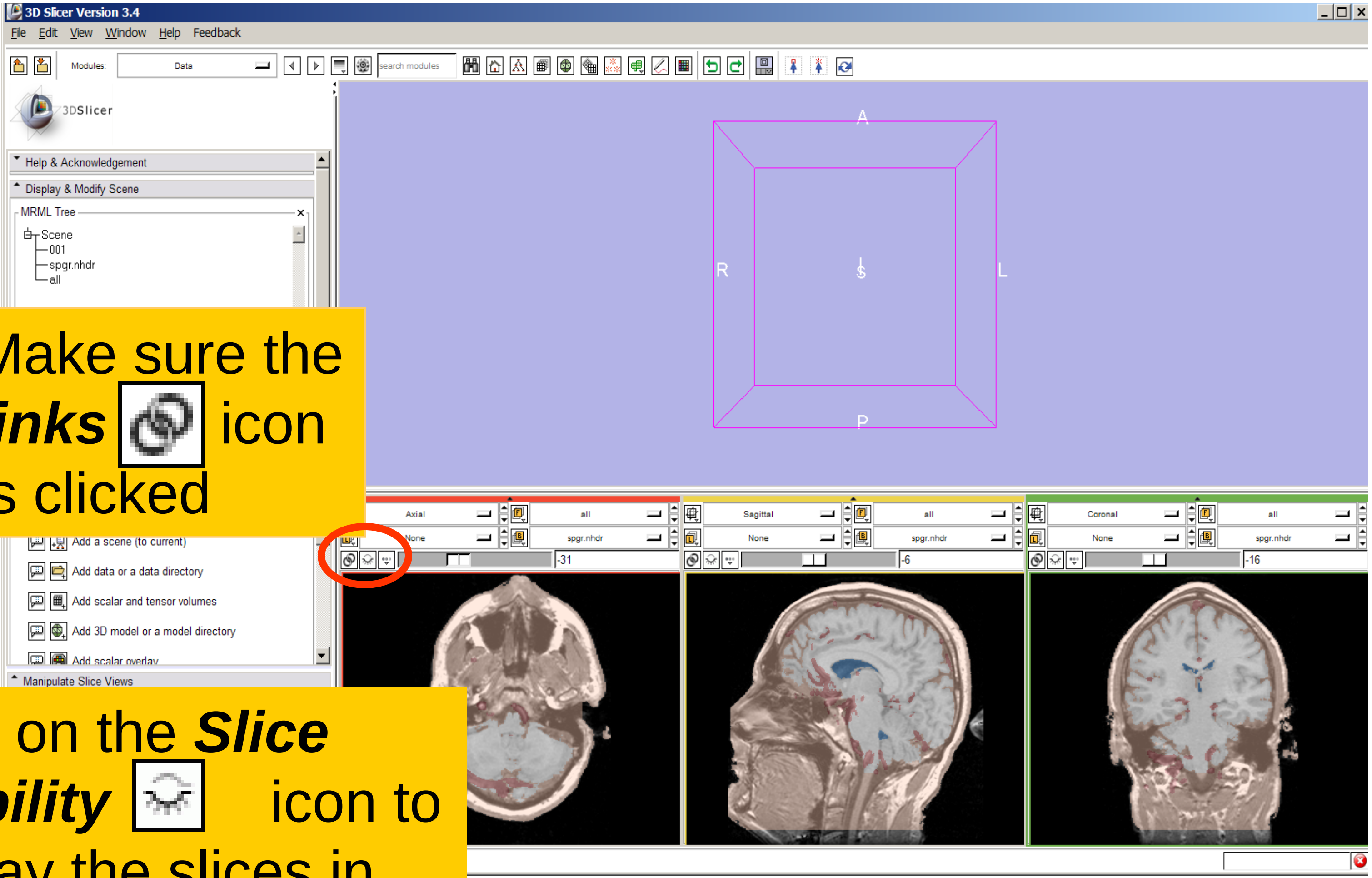
The Data module displays the volumes loaded in the current Slicer Scene.

3D Visualization


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Data
Display MRML ID's
MRML Node Inspector
Load & Add Scenes Or Individual Datasets
Load new scene (close current)
Add a scene (to current)
Add data or a data directory
Add scalar and tensor volumes
Add 3D model or a model directory
Add scalar overlay
Add transformation matrix
Add fiducial list
Add color table
Add DTI fiber bundle
Manipulate Slice Views
Manipulate 3D View
Axial
Sagittal
Coronal
None
spgr.nhdr
-31
-6
-16

The Load & Add Scene tab displays the different data types that can be added to the scene.

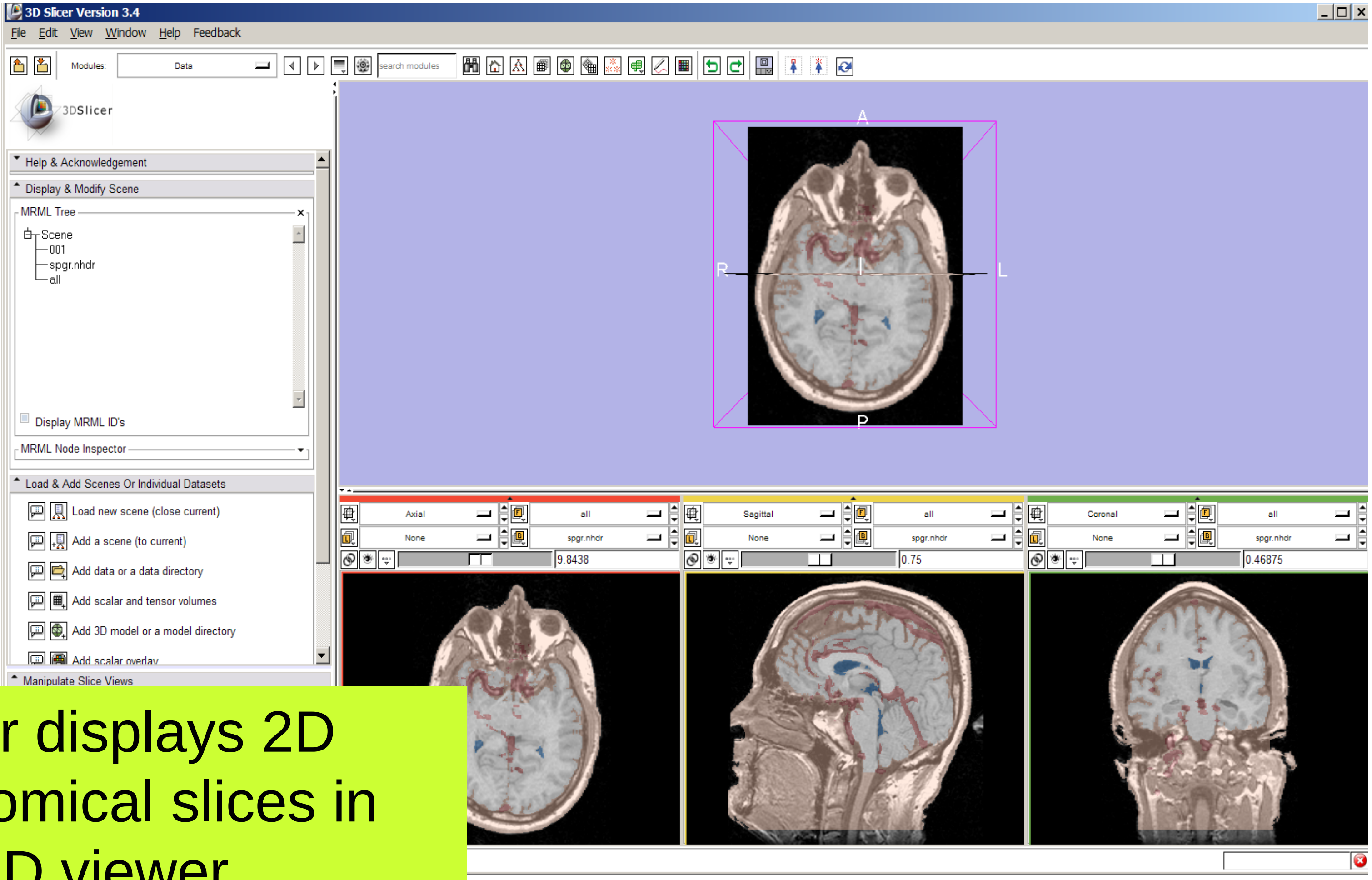
3D Visualization


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Data
search modules
3DSlicer
Help & Acknowledgement
Display & Modify Scene
MRML Tree
Scene
001
spgr.nhdr
all
Add a scene (to current)
Add data or a data directory
Add scalar and tensor volumes
Add 3D model or a model directory
Add scalar overlay
Manipulate Slice Views
A
R
L
P
S
Axial
all
None
spgr.nhdr
-31
Sagittal
all
None
spgr.nhdr
-6
Coronal
all
None
spgr.nhdr
-16

Make sure the ***links*** icon is clicked

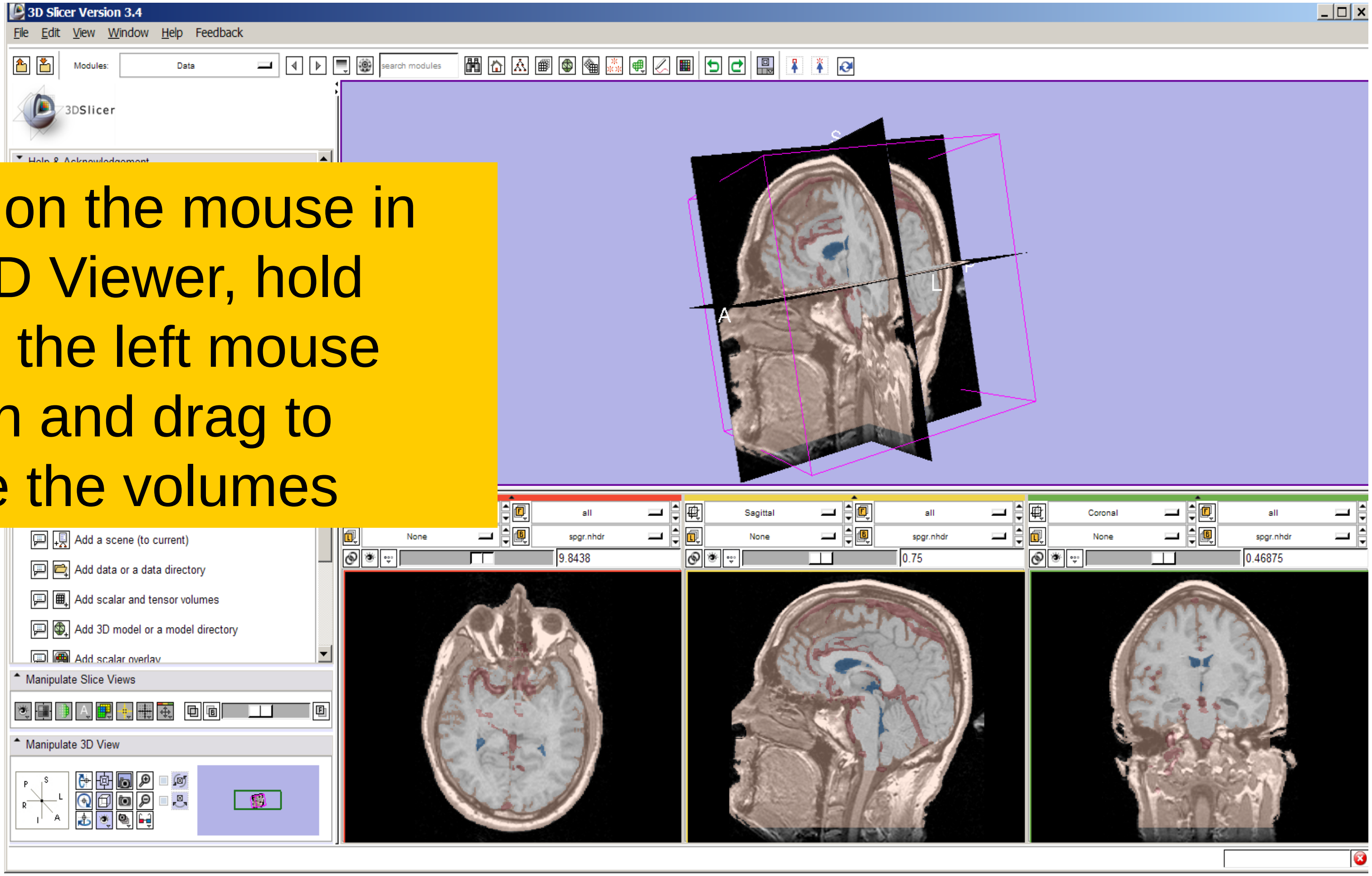
Click on the ***Slice Visibility*** icon to display the slices in the 3D Viewer

3D Visualization

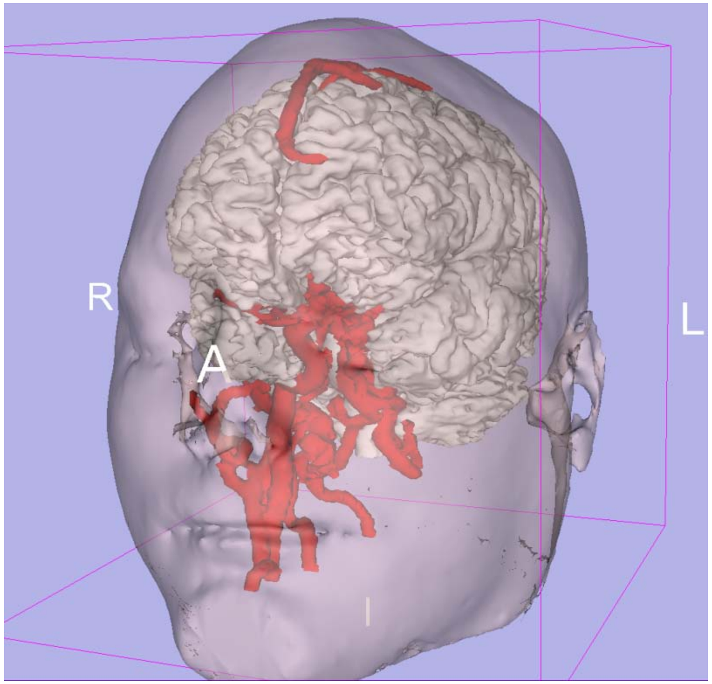

3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Data
search modules
3DSlicer
Help & Acknowledgement
Display & Modify Scene
MRML Tree
Scene
001
spgr.nhdr
all
Display MRML ID's
MRML Node Inspector
Load & Add Scenes Or Individual Datasets
Load new scene (close current)
Add a scene (to current)
Add data or a data directory
Add scalar and tensor volumes
Add 3D model or a model directory
Add scalar overlay
Manipulate Slice Views
A
R
L
P
Axial
all
None
spgr.nhdr
9.8438
Sagittal
all
None
spgr.nhdr
0.75
Coronal
all
None
spgr.nhdr
0.46875

Slicer displays 2D anatomical slices in the 3D viewer

3D Visualization

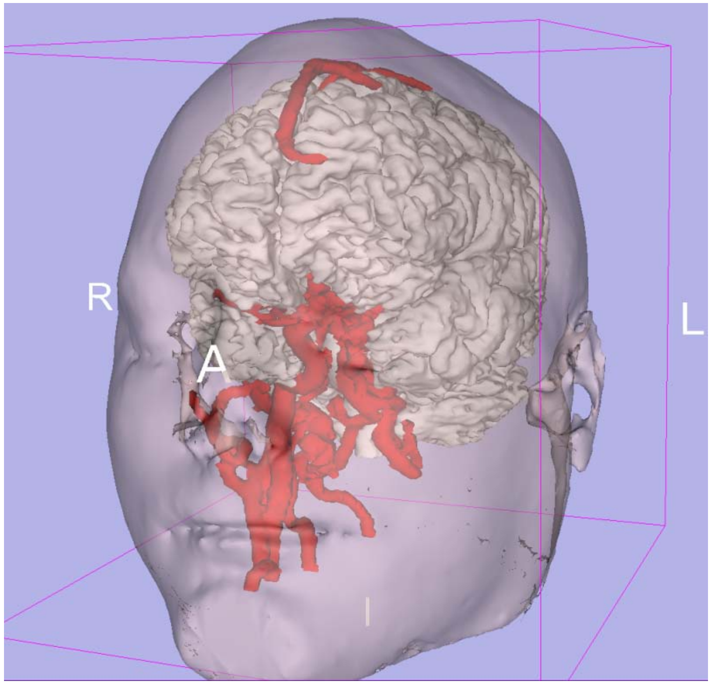

3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Data
search modules
3DSlicer
Help & Acknowledgement
Add a scene (to current)
Add data or a data directory
Add scalar and tensor volumes
Add 3D model or a model directory
Add scalar overlay
Manipulate Slice Views
Manipulate 3D View
S
A
L
Sagittal
Coronal
all
None
spgr.nhdr
9.8438
0.75
0.46875

Position the mouse in the 3D Viewer, hold down the left mouse button and drag to rotate the volumes



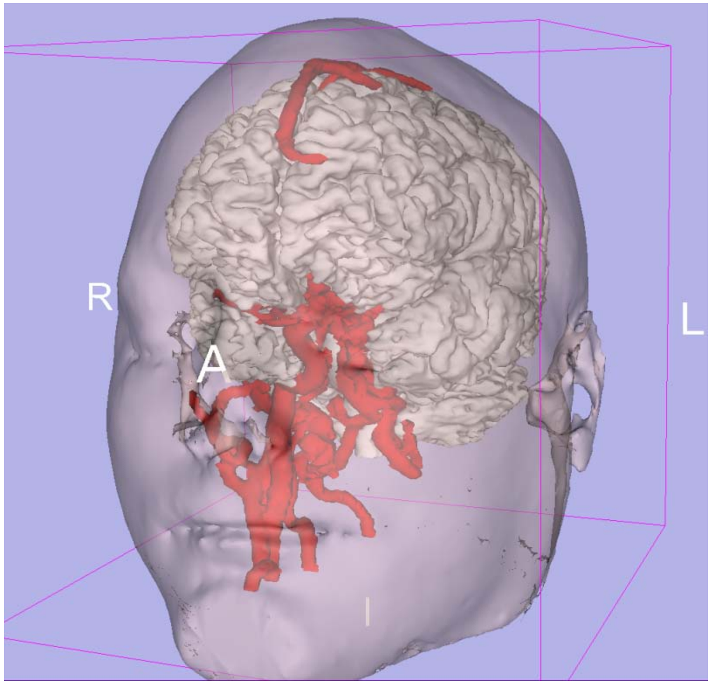
Part 3: Loading and visualizing 3D models of the anatomy

3D models



- A 3D model is a surface reconstruction of an anatomical structure.

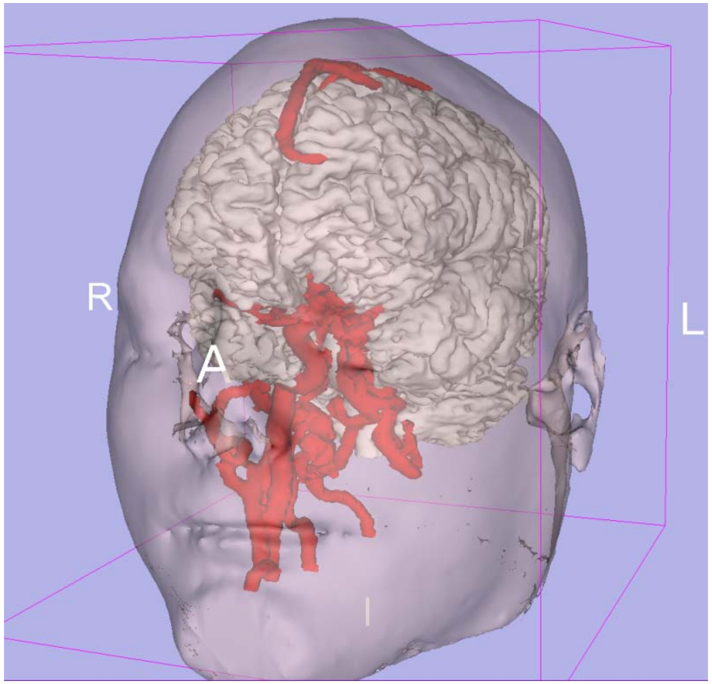
3D models



- A 3D model is a surface reconstruction of an anatomical structure.

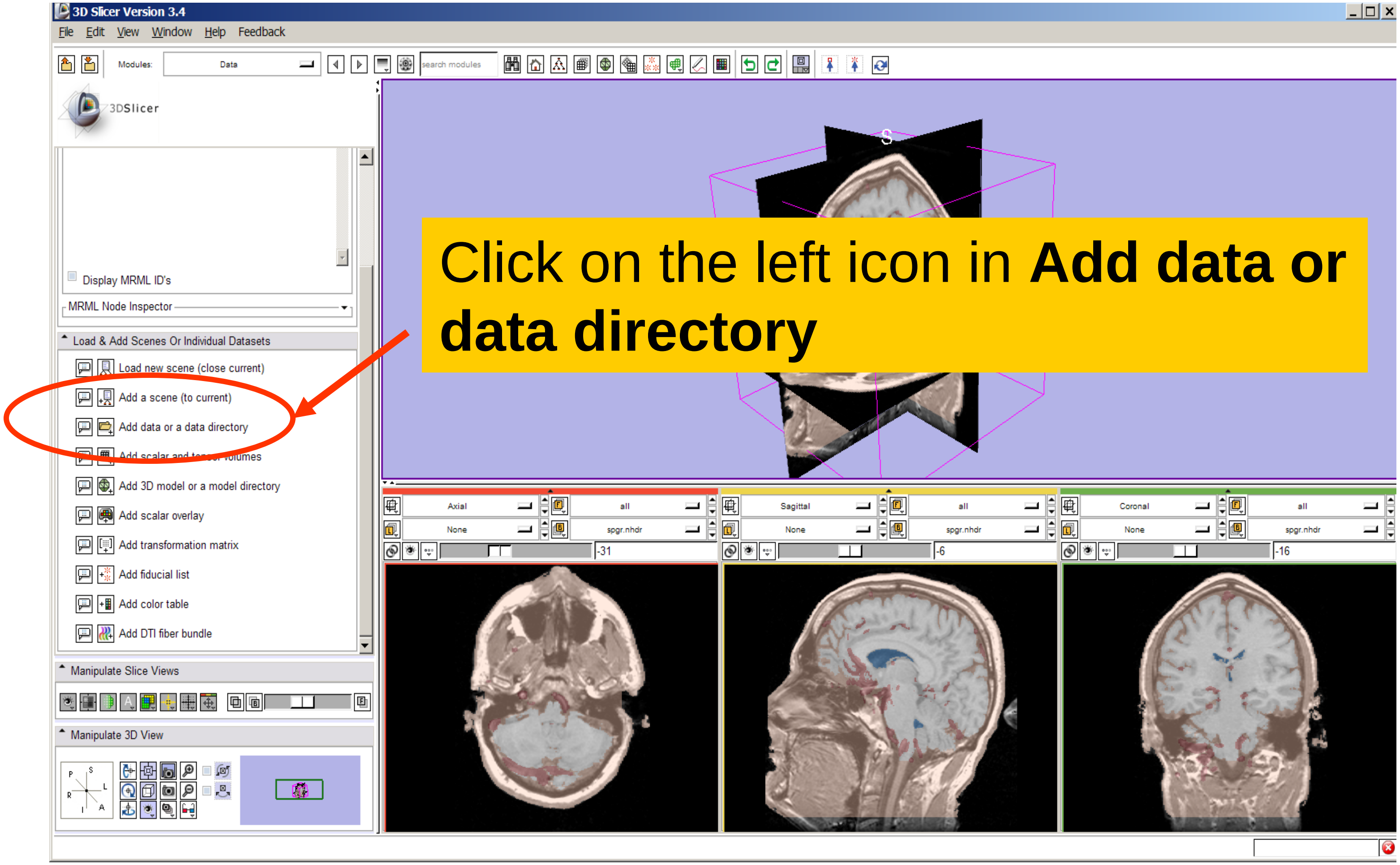
- The model is a triangular mesh that approximates a surface from a 3D label map.

3D models



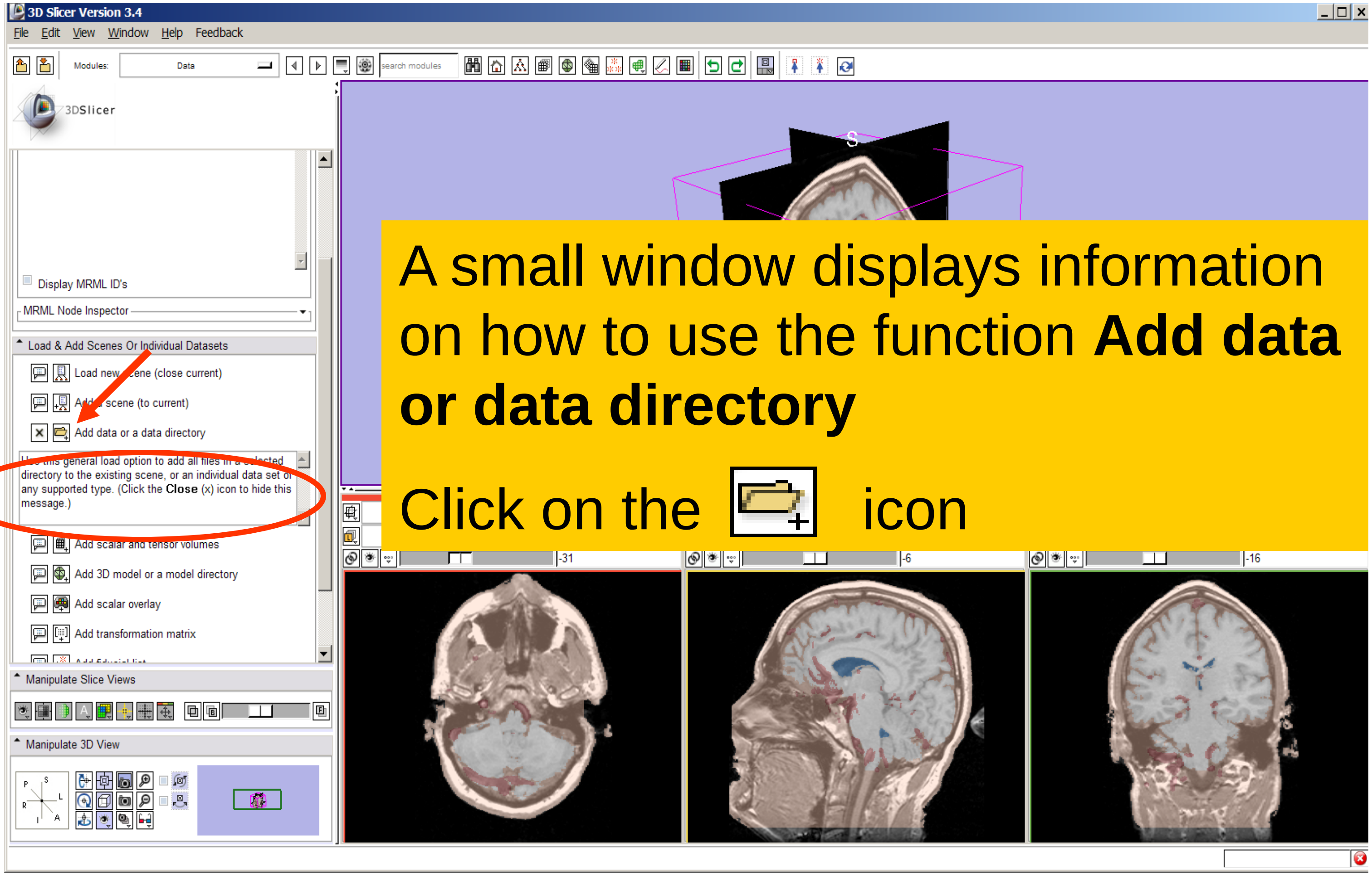
- A 3D model is a surface reconstruction of an anatomical structure.
- The model is a triangular mesh that approximates a surface from a 3D label map.
- The scalar values for surface models are integers which correspond to the label that had been assigned in the segmentation process.

3D Visualization


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Data
search modules
Display MRML ID's
MRML Node Inspector
Load & Add Scenes Or Individual Datasets
Load new scene (close current)
Add a scene (to current)
Add data or a data directory
Add scalar and tensor volumes
Add 3D model or a model directory
Add scalar overlay
Add transformation matrix
Add fiducial list
Add color table
Add DTI fiber bundle
Manipulate Slice Views
Manipulate 3D View
Axial
Sagittal
Coronal
None
all
spgr.nhdr
-31
-6
-16

Click on the left icon in **Add data or data directory**

3D Visualization


3D Slicer Version 3.4
File
Edit
View
Window
Help
Feedback
Modules:
Data
search modules
3DSlicer
☐ Display MRML ID's
MRML Node Inspector
Load & Add Scenes Or Individual Datasets
Load new scene (close current)
Add a scene (to current)
☒ Add data or a data directory

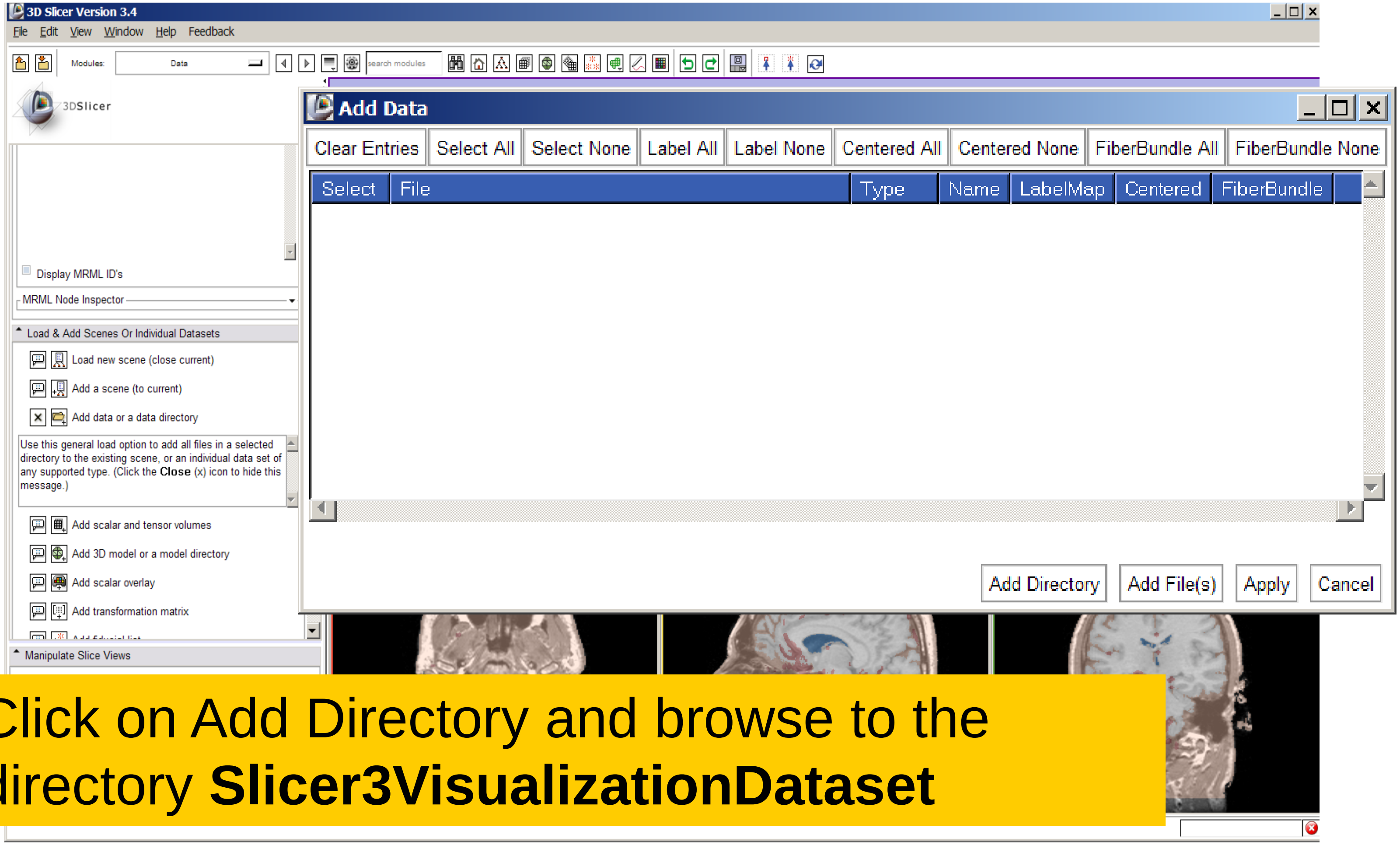
Use this general load option to add all files in a selected directory to the existing scene, or an individual data set of any supported type. (Click the **Close** (x) icon to hide this message.)

Add scalar and tensor volumes
Add 3D model or a model directory
Add scalar overlay
Add transformation matrix
Manipulate Slice Views
Manipulate 3D View
-31
-6
-16

A small window displays information on how to use the function **Add data or data directory**

Click on the icon

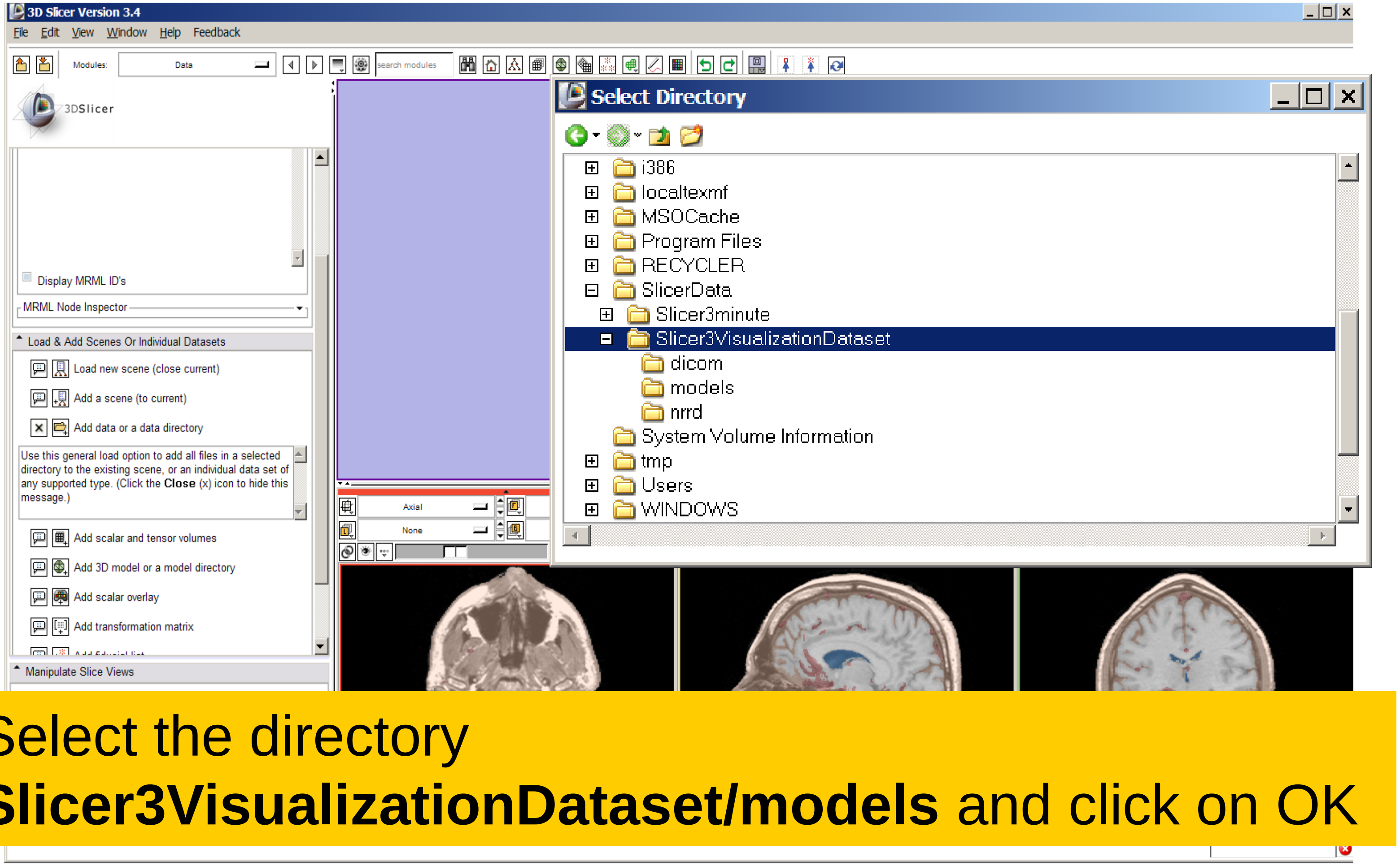
3D Visualization


3D Slicer Version 3.4
File
Edit
View
Window
Help
Feedback
Modules:
Data
search modules
3DSlicer
Display MRML ID's
MRML Node Inspector
Load & Add Scenes Or Individual Datasets
Load new scene (close current)
Add a scene (to current)
Add data or a data directory
Add scalar and tensor volumes
Add 3D model or a model directory
Add scalar overlay
Add transformation matrix
Manipulate Slice Views
Add Data
Clear Entries
Select All
Select None
Label All
Label None
Centered All
Centered None
FiberBundle All
FiberBundle None
Select
File
Type
Name
LabelMap
Centered
FiberBundle
Add Directory
Add File(s)
Apply
Cancel

Use this general load option to add all files in a selected directory to the existing scene, or an individual data set of any supported type. (Click the **Close** (x) icon to hide this message.)

Click on Add Directory and browse to the directory **Slicer3VisualizationDataset**

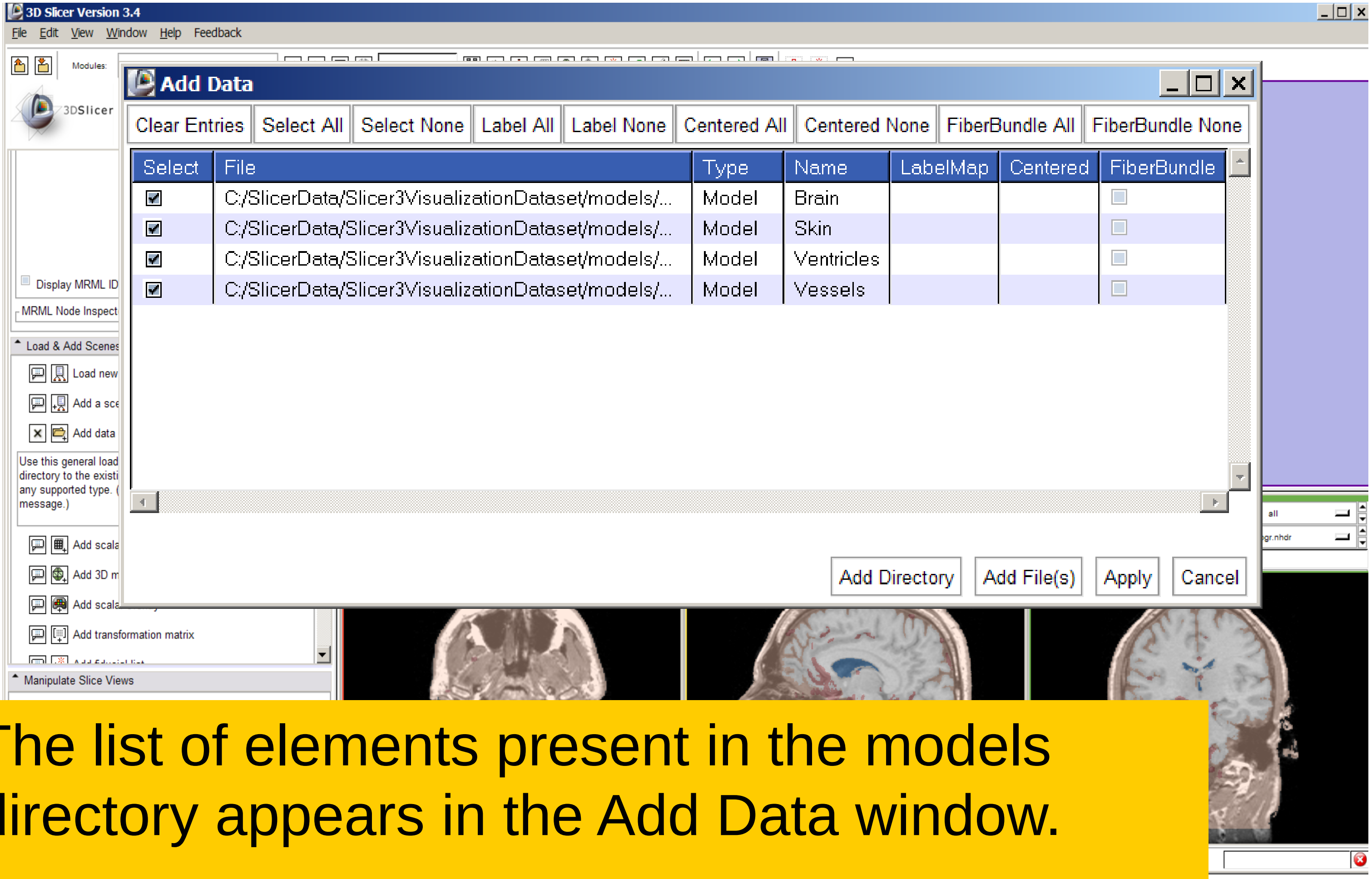
Loading 3D models


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Data
search modules
3DSlicer
Display MRML ID's
MRML Node Inspector
Load & Add Scenes Or Individual Datasets
Load new scene (close current)
Add a scene (to current)
Add data or a data directory
Add scalar and tensor volumes
Add 3D model or a model directory
Add scalar overlay
Add transformation matrix
Manipulate Slice Views
Axial
None
Select Directory
i386
localtexmf
MSOCache
Program Files
RECYCLER
SlicerData
Slicer3minute
Slicer3VisualizationDataset
dicom
models
nrrd
System Volume Information
tmp
Users
WINDOWS

Use this general load option to add all files in a selected directory to the existing scene, or an individual data set of any supported type. (Click the **Close** (x) icon to hide this message.)

Select the directory **Slicer3VisualizationDataset/models** and click on OK

Loading 3D models

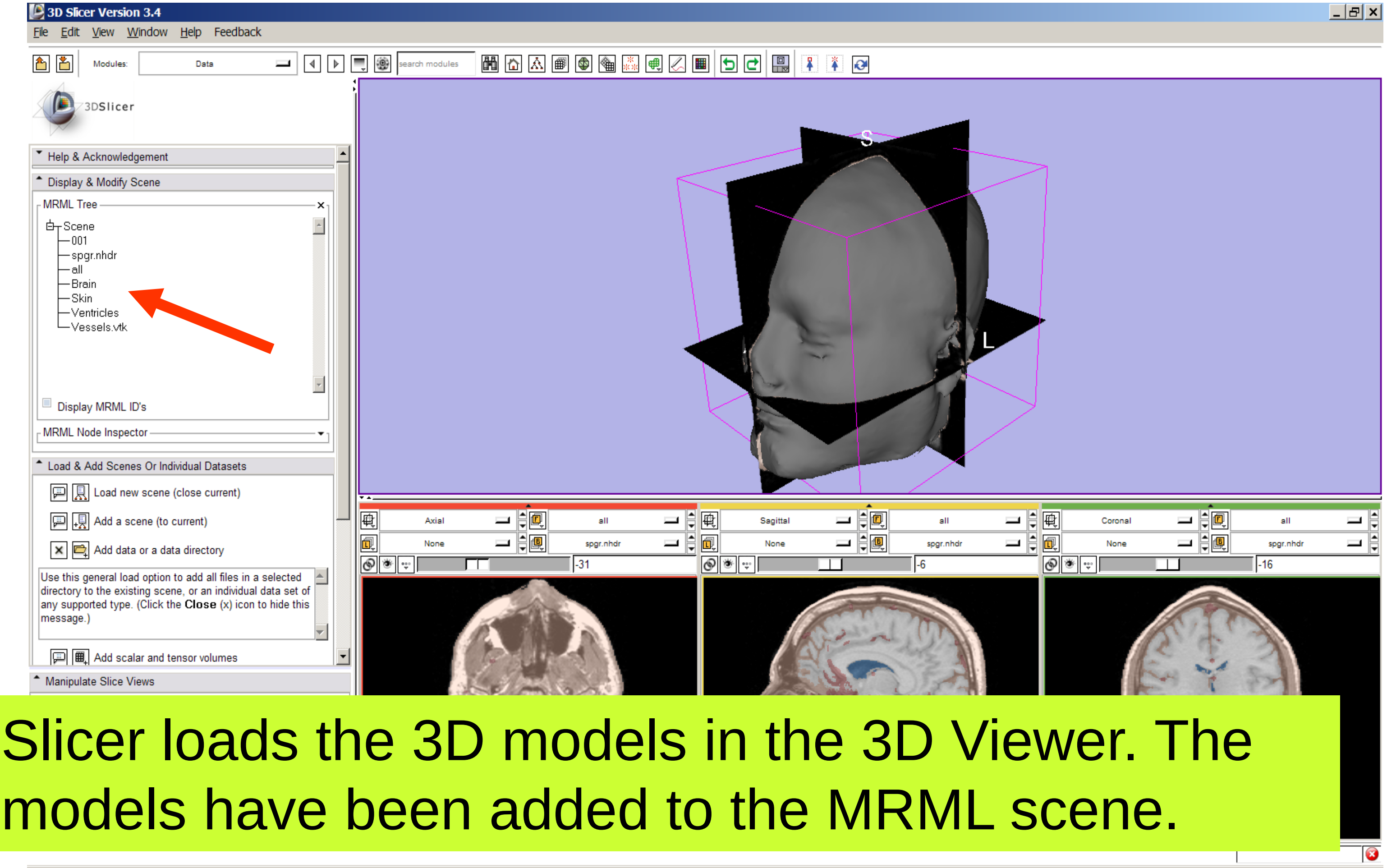

3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules:
3DSlicer
Display MRML ID
MRML Node Inspect
Load & Add Scenes
Load new
Add a sce
Add data
Use this general load directory to the existi any supported type. (message.)
Add scala
Add 3D m
Add scala
Add transformation matrix
Manipulate Slice Views
all
gr.nhdr
Add Data
Clear Entries
Select All
Select None
Label All
Label None
Centered All
Centered None
FiberBundle All
FiberBundle None
Add Directory
Add File(s)
Apply
Cancel

Select	File	Type	Name	LabelMap	Centered	FiberBundle
☑	C:/SlicerData/Slicer3VisualizationDataset/models/...	Model	Brain			☐
☑	C:/SlicerData/Slicer3VisualizationDataset/models/...	Model	Skin			☐
☑	C:/SlicerData/Slicer3VisualizationDataset/models/...	Model	Ventricles			☐
☑	C:/SlicerData/Slicer3VisualizationDataset/models/...	Model	Vessels			☐

The list of elements present in the models directory appears in the Add Data window.

Click on **Apply** to load all the **3D models**.

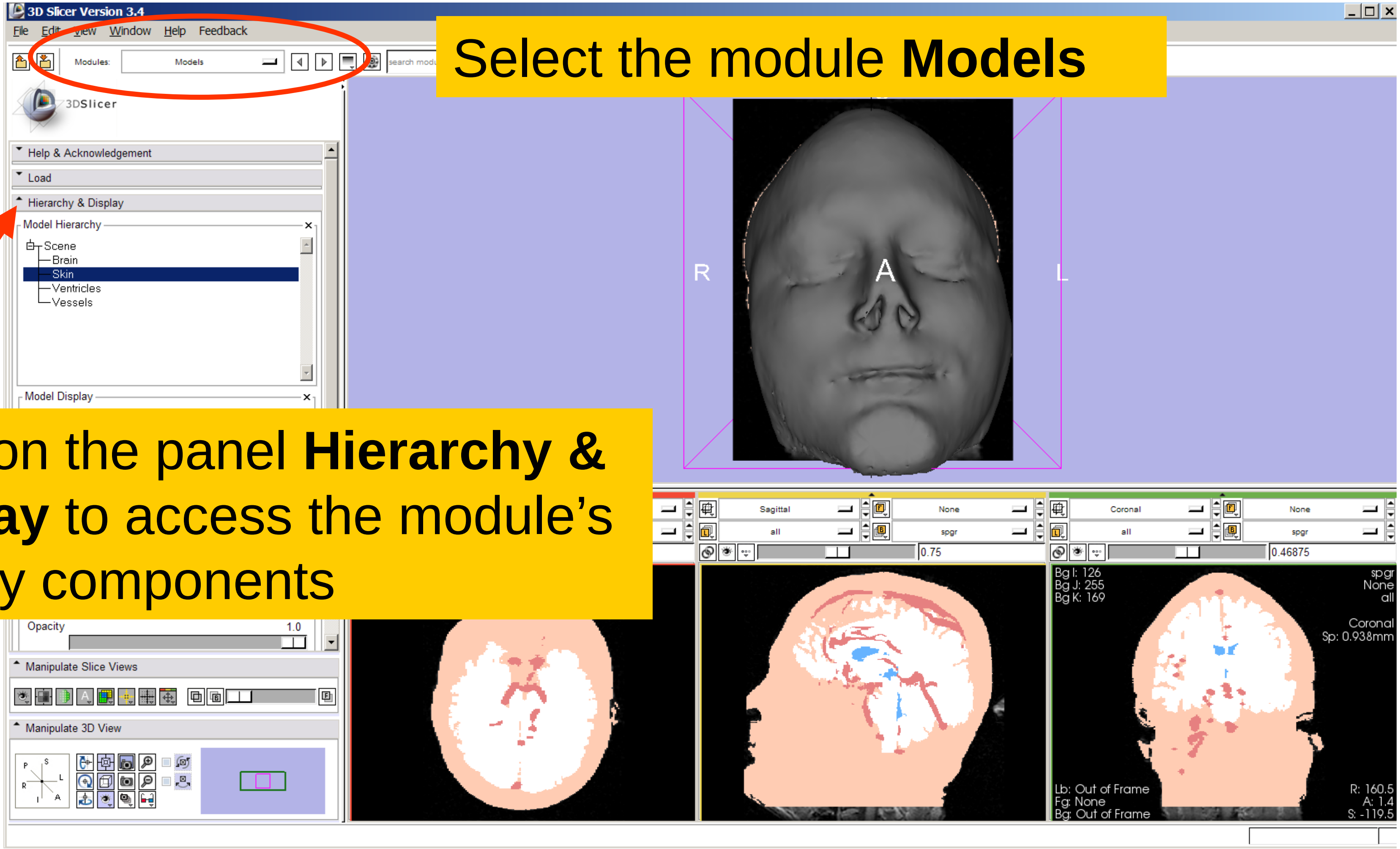
Loading 3D models


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Data
search modules
3DSlicer
Help & Acknowledgement
Display & Modify Scene
MRML Tree
Scene
001
spgr.nhdr
all
Brain
Skin
Ventricles
Vessels.vtk
Display MRML ID's
MRML Node Inspector
Load & Add Scenes Or Individual Datasets
Load new scene (close current)
Add a scene (to current)
Add data or a data directory
Add scalar and tensor volumes
Manipulate Slice Views
S
L
Axial
all
None
spgr.nhdr
-31
Sagittal
all
None
spgr.nhdr
-6
Coronal
all
None
spgr.nhdr
-16

Use this general load option to add all files in a selected directory to the existing scene, or an individual data set of any supported type. (Click the **Close** (x) icon to hide this message.)

Slicer loads the 3D models in the 3D Viewer. The models have been added to the MRML scene.

Loading a 3D model

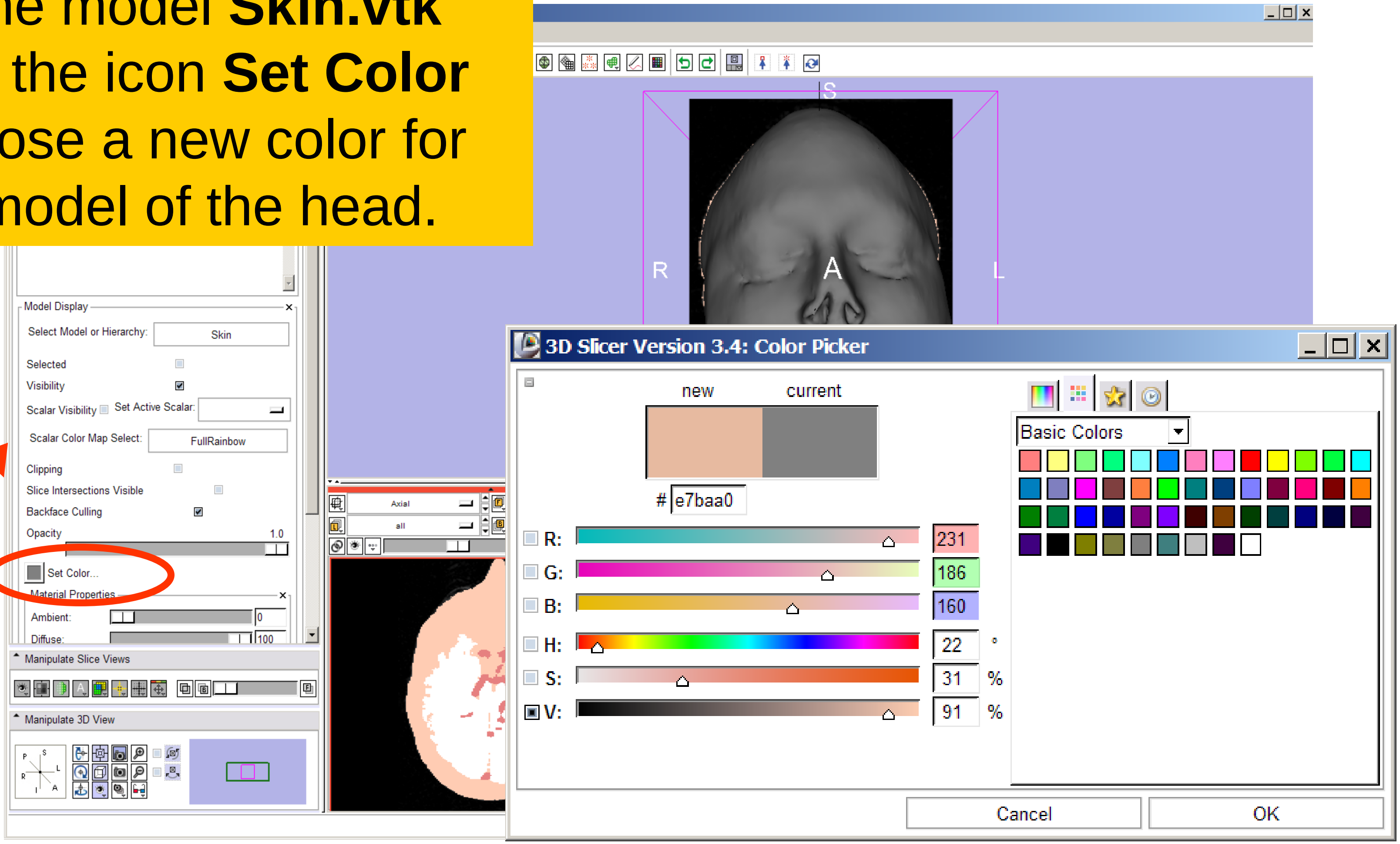

3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Models
3DSlicer
Help & Acknowledgement
Load
Hierarchy & Display
Model Hierarchy
Scene
Brain
Skin
Ventricles
Vessels
Model Display
Opacity 1.0
Manipulate Slice Views
Manipulate 3D View
R
A
L
Sagittal
None
all
spgr
0.75
Coronal
None
all
spgr
0.46875
Bg I: 126
Bg J: 255
Bg K: 169
spgr
None
all
Coronal
Sp: 0.938mm
Lb: Out of Frame
Fg: None
Bg: Out of Frame
R: 160.5
A: 1.4
S: -119.5

Select the module **Models**

Click on the panel **Hierarchy & Display** to access the module's display components

Visualizing a 3D model

Select the model **Skin.vtk**
Click on the icon **Set Color**
and choose a new color for
the 3D model of the head.



S
R
A
L

Model Display

Select Model or Hierarchy: Skin

Selected ☐

Visibility ☑

Scalar Visibility ☐ Set Active Scalar:

Scalar Color Map Select: FullRainbow

Clipping ☐

Slice Intersections Visible ☐

Backface Culling ☑

Opacity 1.0

Set Color...

Material Properties

Ambient: 0

Diffuse: 100

Manipulate Slice Views
Manipulate 3D View
Axial
all

3D Slicer Version 3.4: Color Picker

new current

e7baa0

R: 231

G: 186

B: 160

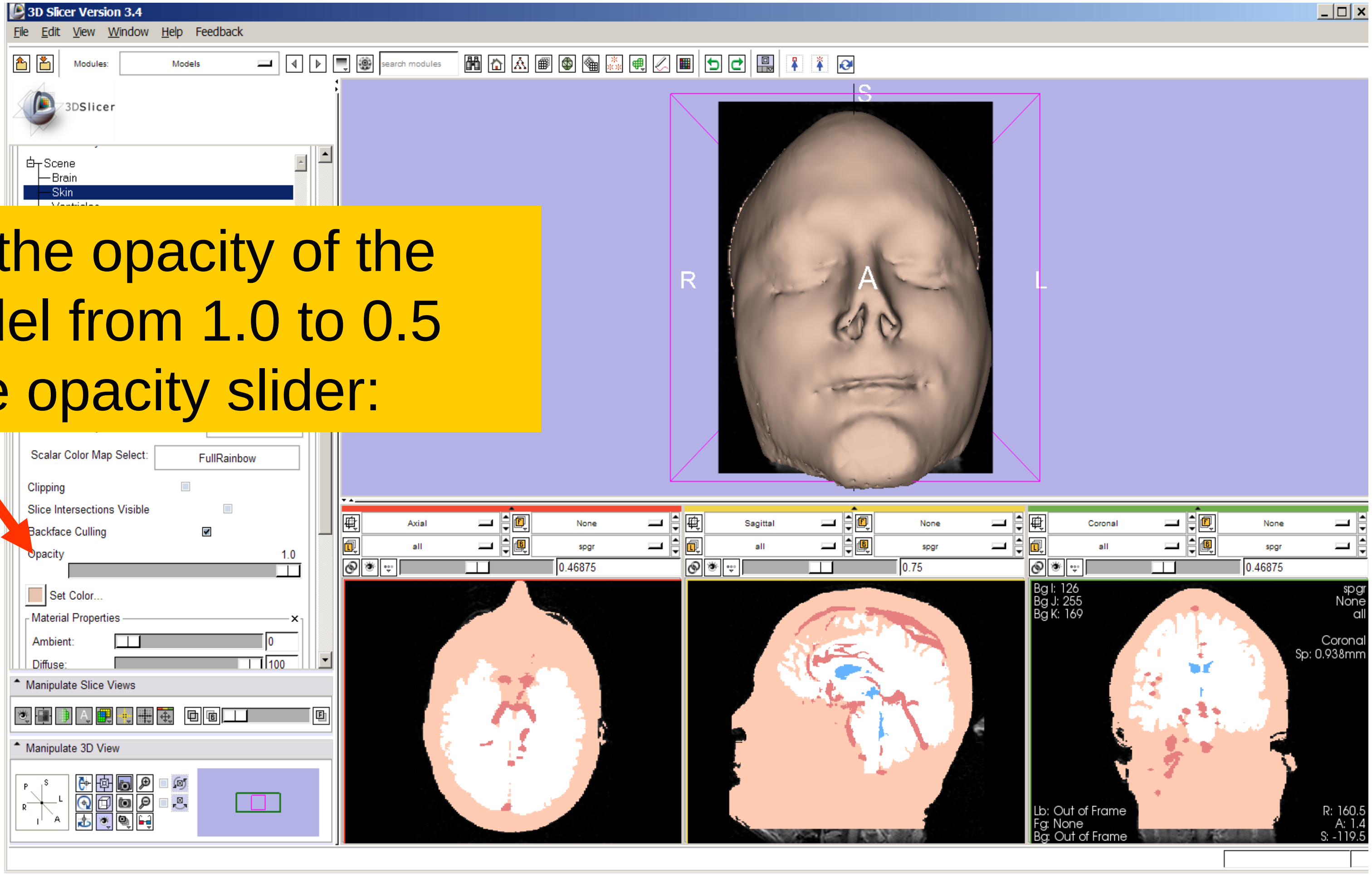
H: 22 °

S: 31 %

V: 91 %

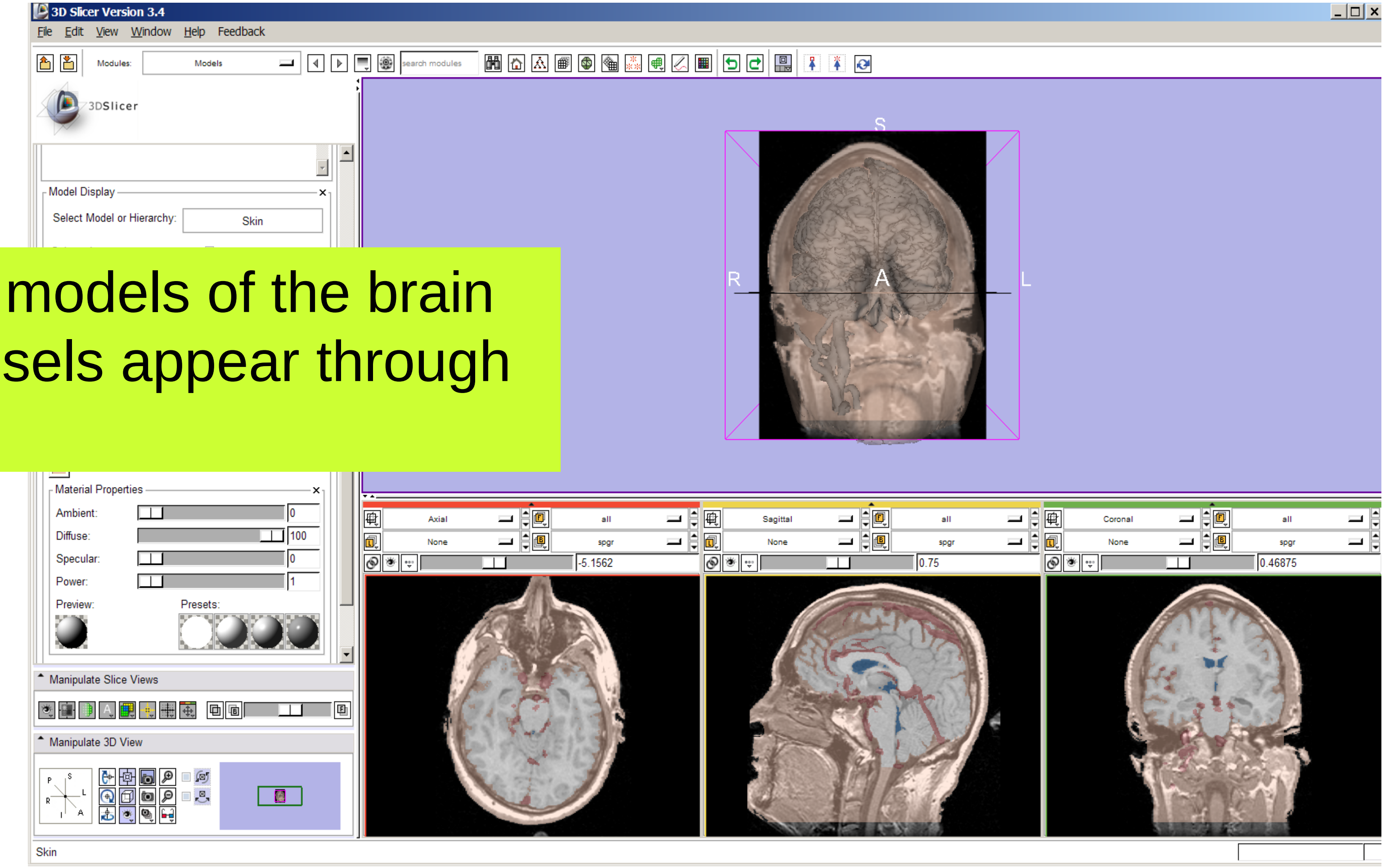
Basic Colors
Cancel
OK

Visualizing a 3D model


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Models
Scene
Brain
Skin
Scalar Color Map Select: FullRainbow
Clipping
Slice Intersections Visible
Backface Culling
Opacity 1.0
Set Color...
Material Properties
Ambient: 0
Diffuse: 100
Manipulate Slice Views
Manipulate 3D View
S
R
A
L
Axial
Sagittal
Coronal
None
all
spgr
0.46875
0.75
Bg I: 126
Bg J: 255
Bg K: 169
Coronal
Sp: 0.938mm
Lb: Out of Frame
Fg: None
Bg: Out of Frame
R: 160.5
A: 1.4
S: -119.5

Change the opacity of the skin model from 1.0 to 0.5 using the opacity slider:

Visualizing a 3D model


3D Slicer Version 3.4
File
Edit
View
Window
Help
Feedback
search modules
3DSlicer
Model Display
Material Properties
Preview:
Presets:
Manipulate Slice Views
Manipulate 3D View
S
R
A
L
Axial
Sagittal
Coronal
all
None
spgr

Modules: Models

Select Model or Hierarchy: Skin

Ambient: 0

Diffuse: 100

Specular: 0

Power: 1

-5.1562

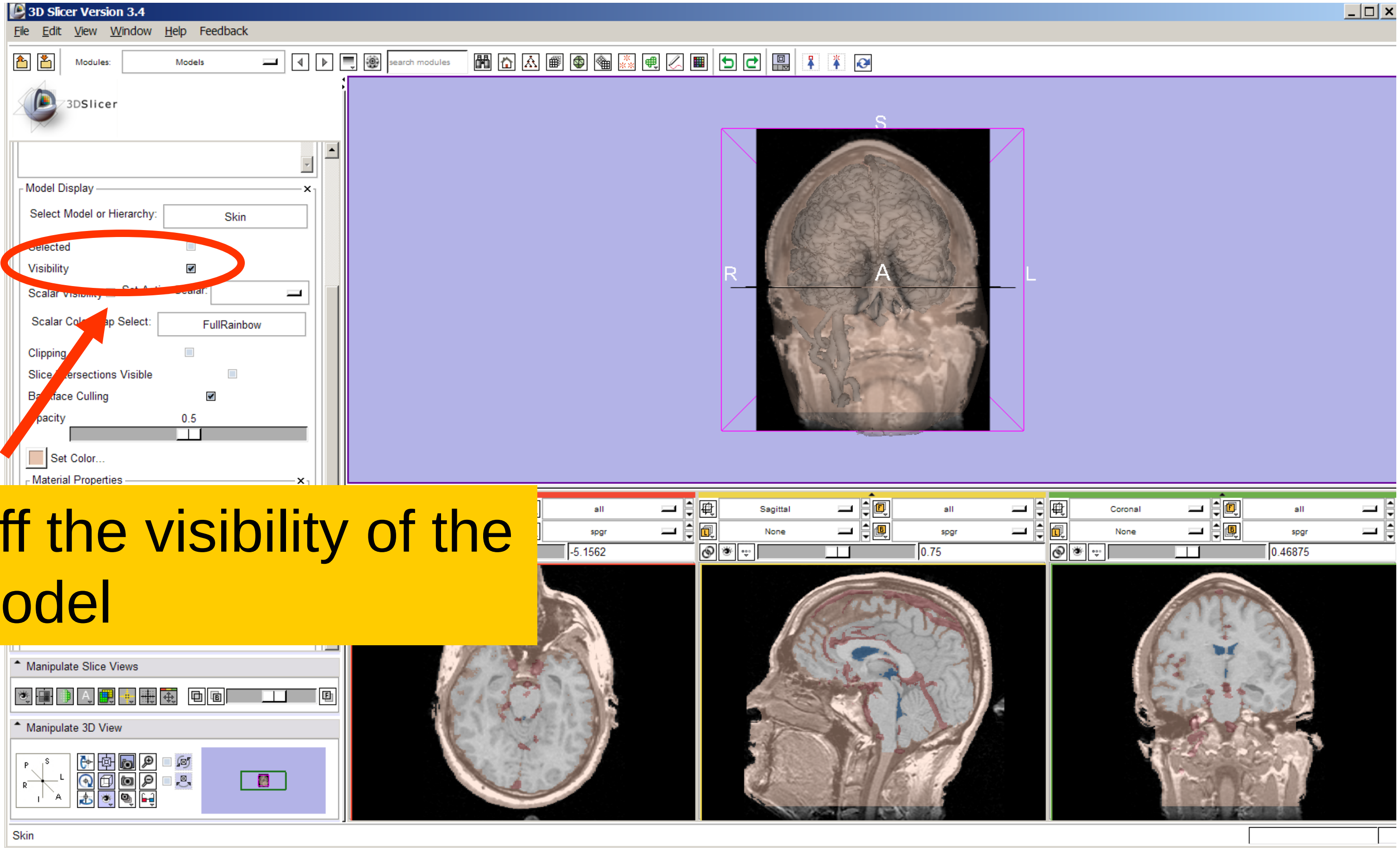
0.75

0.46875

Skin

The 3D models of the brain and vessels appear through the skin

Visualizing a 3D model


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Models
search modules
3DSlicer
S
R
A
L
Sagittal
Coronal
all
spgr
None
-5.1562
0.75
0.46875
Manipulate Slice Views
Manipulate 3D View
Skin

Model Display

Select Model or Hierarchy: Skin

elected ☐

Visibility ☑

Scalar Visibility ☐

Scalar Col ap Select: FullRainbow

Clipping ☐

Slice ersections Visible ☐

Ba face Culling ☑

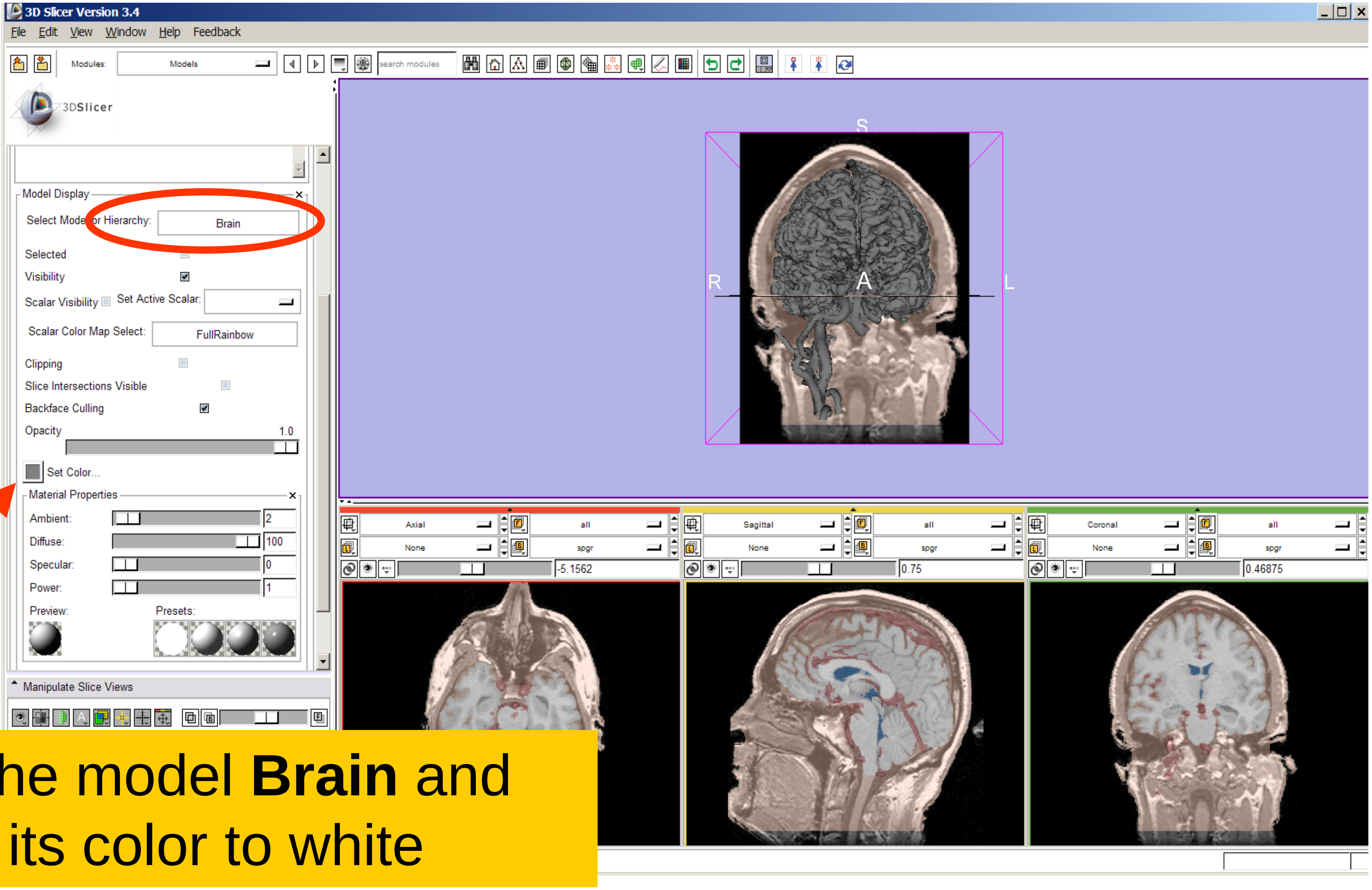
pacity 0.5

Set Color...

Material Properties

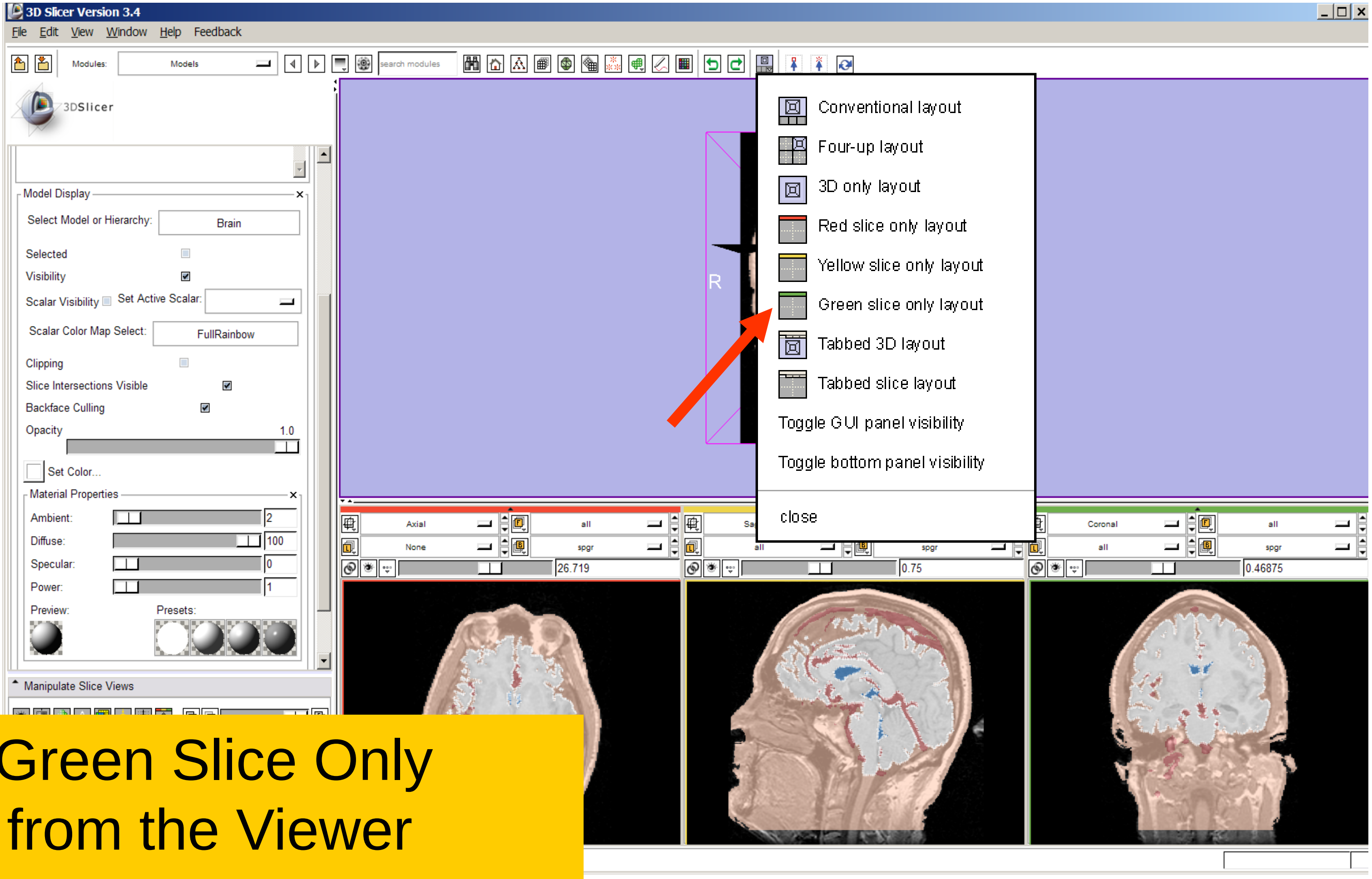
Turn off the visibility of the skin model

Visualizing a 3D model


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Models
search modules
Model Display
Select Model or Hierarchy: Brain
Selected
Visibility ☑
Scalar Visibility ☐ Set Active Scalar:
Scalar Color Map Select: FullRainbow
Clipping ☐
Slice Intersections Visible ☐
Backface Culling ☑
Opacity 1.0
Set Color...
Material Properties
Ambient: 2
Diffuse: 100
Specular: 0
Power: 1
Preview:
Presets:
Manipulate Slice Views
S
R
A
L
Axial
all
None
spgr
-5.1562
Sagittal
0.75
Coronal
0.46875

Select the model **Brain** and change its color to white

Visualizing a 3D model



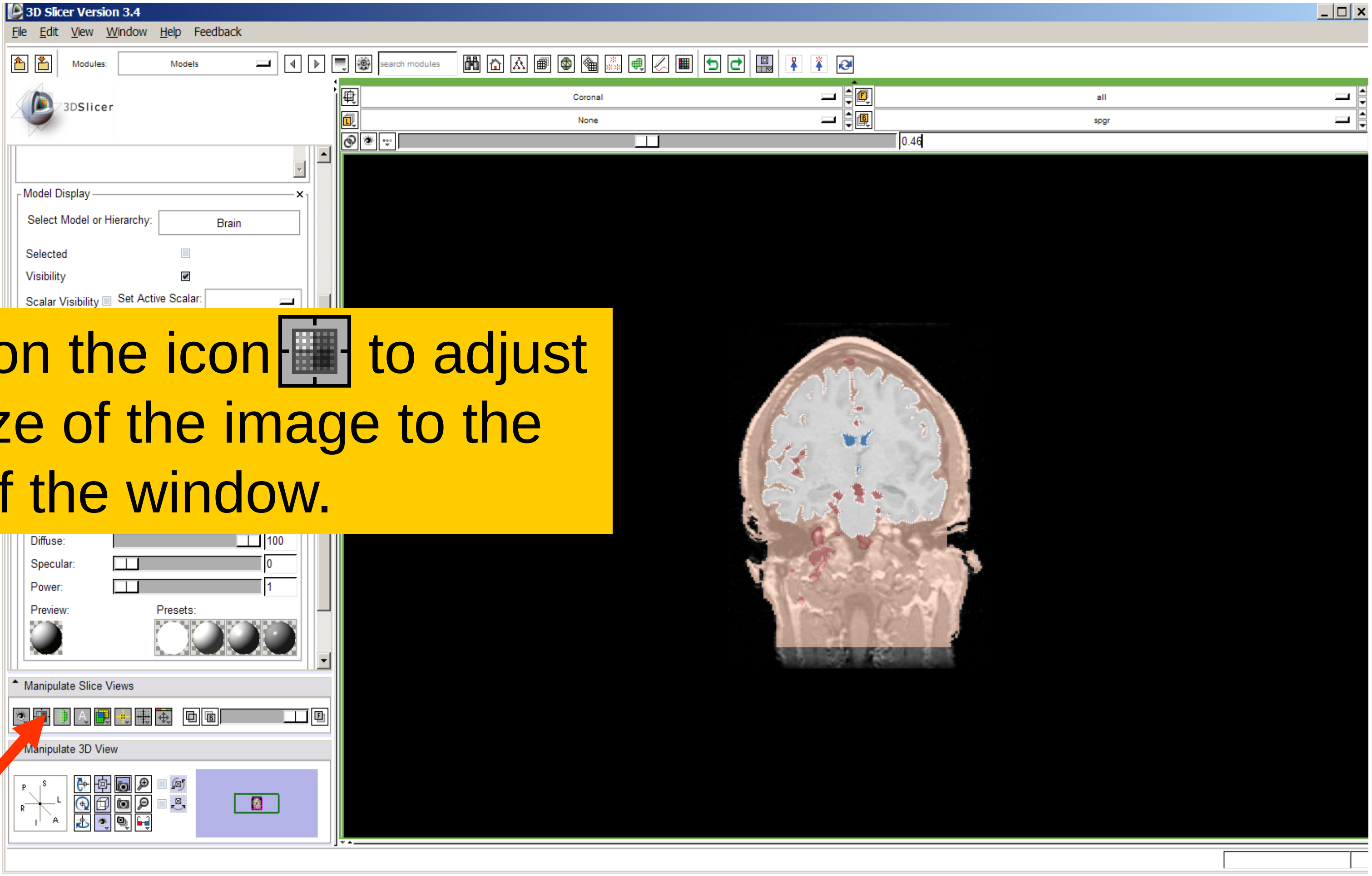
3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Models
search modules
3DSlicer
Conventional layout
Four-up layout
3D only layout
Red slice only layout
Yellow slice only layout
Green slice only layout
Tabbed 3D layout
Tabbed slice layout
Toggle GUI panel visibility
Toggle bottom panel visibility
close
R
Manipulate Slice Views
Axial
Coronal
26.719
0.75
0.46875

Model Display
Select Model or Hierarchy: Brain
Selected ☐
Visibility ☑
Scalar Visibility ☐ Set Active Scalar:
Scalar Color Map Select: FullRainbow
Clipping ☐
Slice Intersections Visible ☑
Backface Culling ☑
Opacity 1.0
☐ Set Color...

Material Properties
Ambient: 2
Diffuse: 100
Specular: 0
Power: 1
Preview:
Presets:

Select Green Slice Only Layout from the Viewer menu

Visualizing a 3D model


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules:
search modules
3DSlicer
Manipulate Slice Views
Manipulate 3D View
Preview:
Presets:

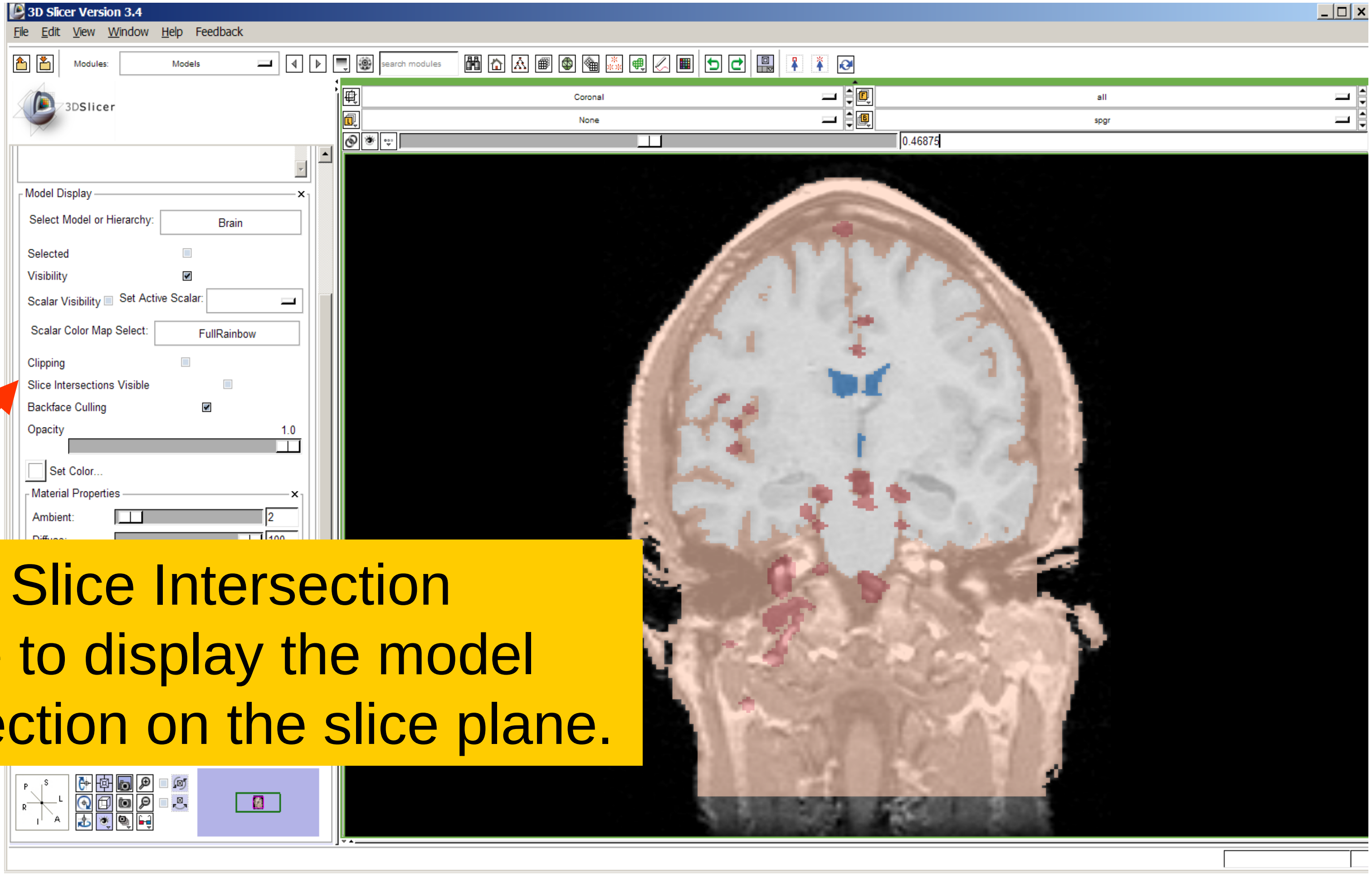
Modules: Models

Coronal | all
None | spgr
0.46

Model Display
Select Model or Hierarchy: Brain
Selected ☐
Visibility ☑
Scalar Visibility ☐ Set Active Scalar:
Diffuse: 100
Specular: 0
Power: 1

Click on the icon to adjust the size of the image to the size of the window.

Visualizing a 3D model


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Models
search modules
3DSlicer
Coronal
None
all
spgr
0.46875

Model Display

Select Model or Hierarchy: Brain

Selected ☐

Visibility ☑

Scalar Visibility ☐ Set Active Scalar:

Scalar Color Map Select: FullRainbow

Clipping ☐

Slice Intersections Visible ☐

Backface Culling ☑

Opacity 1.0

☐ Set Color...

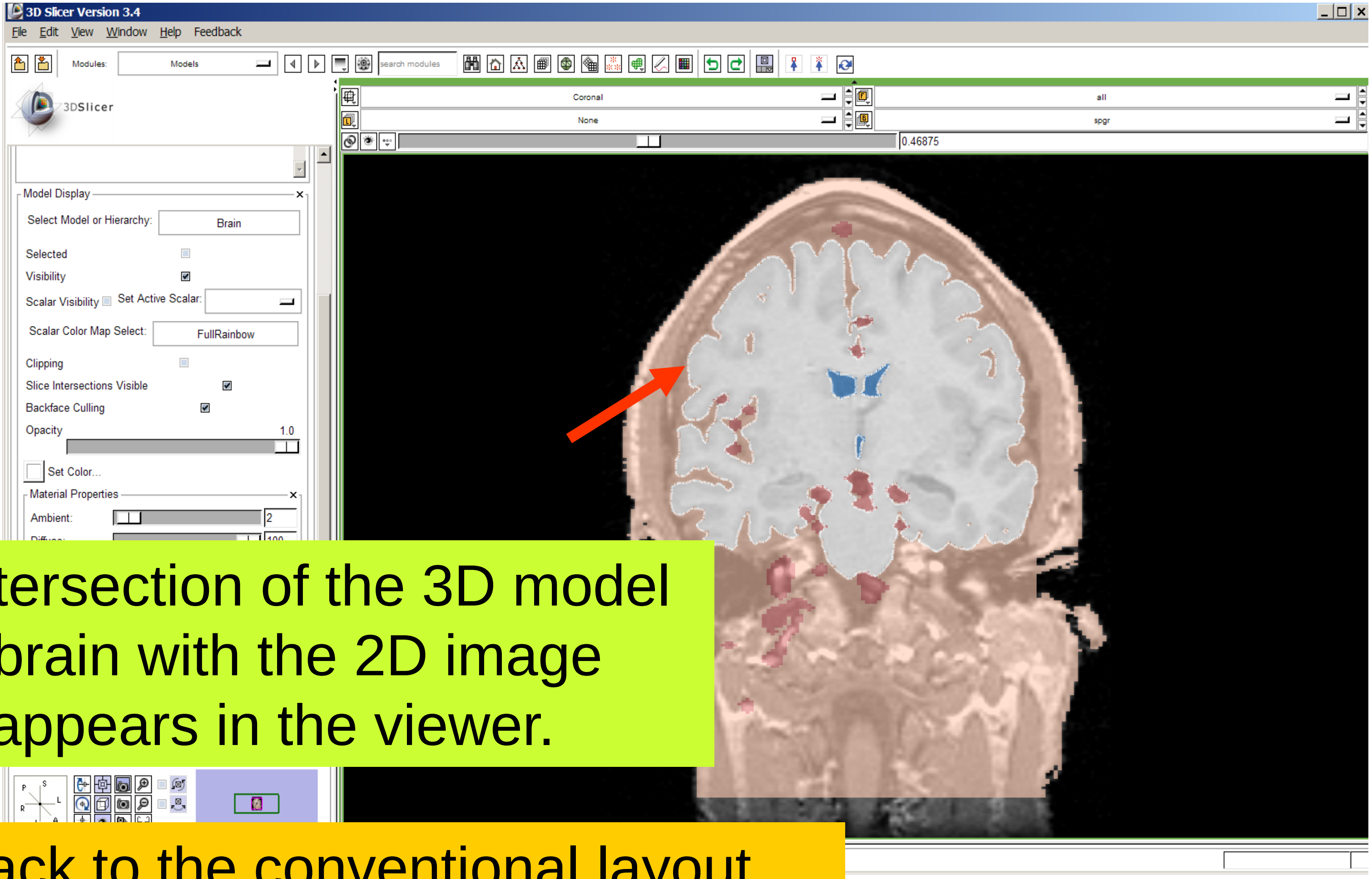
Material Properties

Ambient: 2

Diffuse: 100

Select Slice Intersection Visible to display the model intersection on the slice plane.

Visualizing a 3D model


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules:
search modules
3DSlicer

Models

Model Display

Select Model or Hierarchy: Brain

Selected ☐

Visibility ☑

Scalar Visibility ☐ Set Active Scalar:

Scalar Color Map Select: FullRainbow

Clipping ☐

Slice Intersections Visible ☑

Backface Culling ☑

Opacity 1.0

Set Color...

Material Properties

Ambient: 2

Coronal

None

all

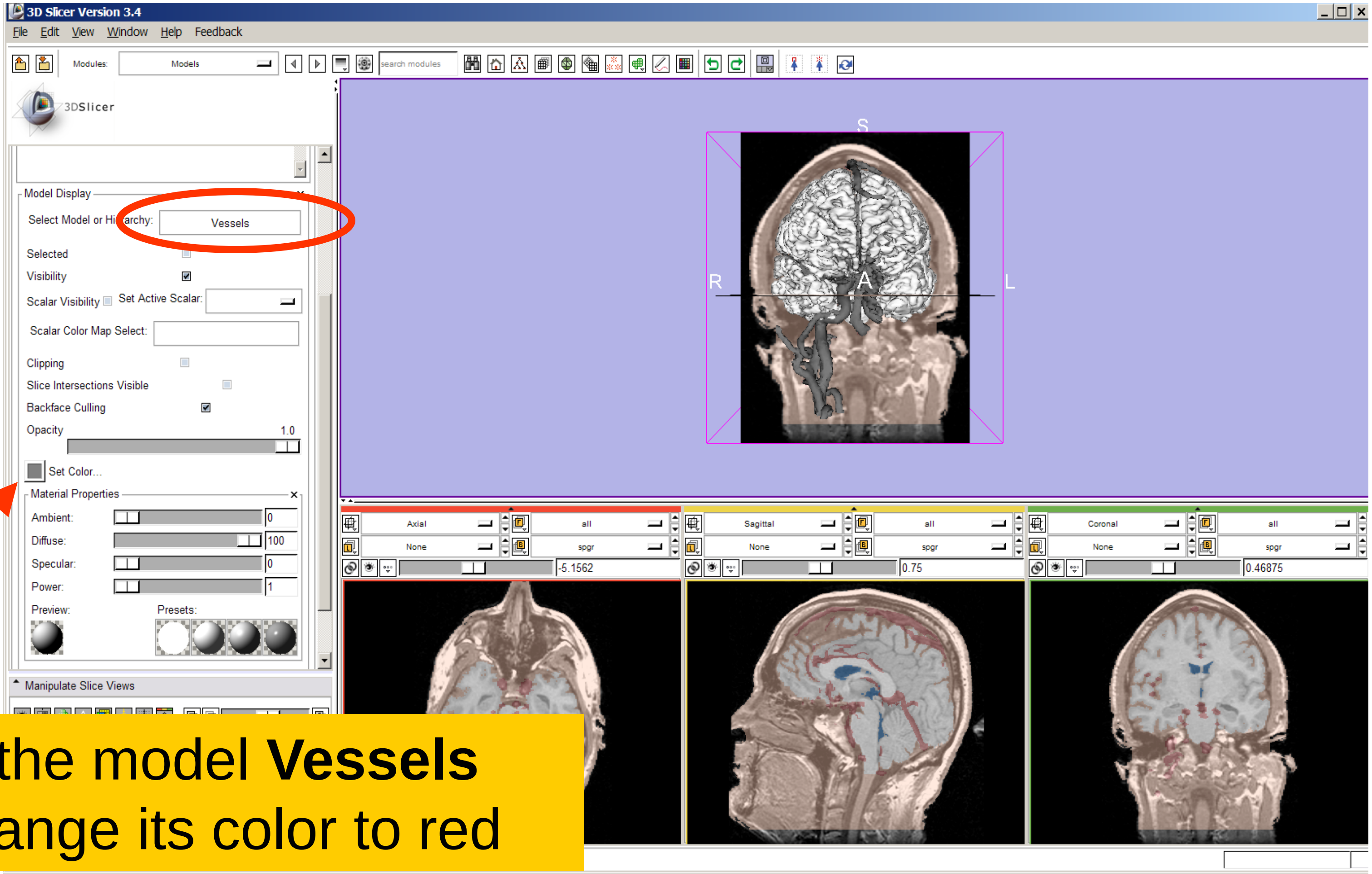
spgr

0.46875

The intersection of the 3D model of the brain with the 2D image plane appears in the viewer.

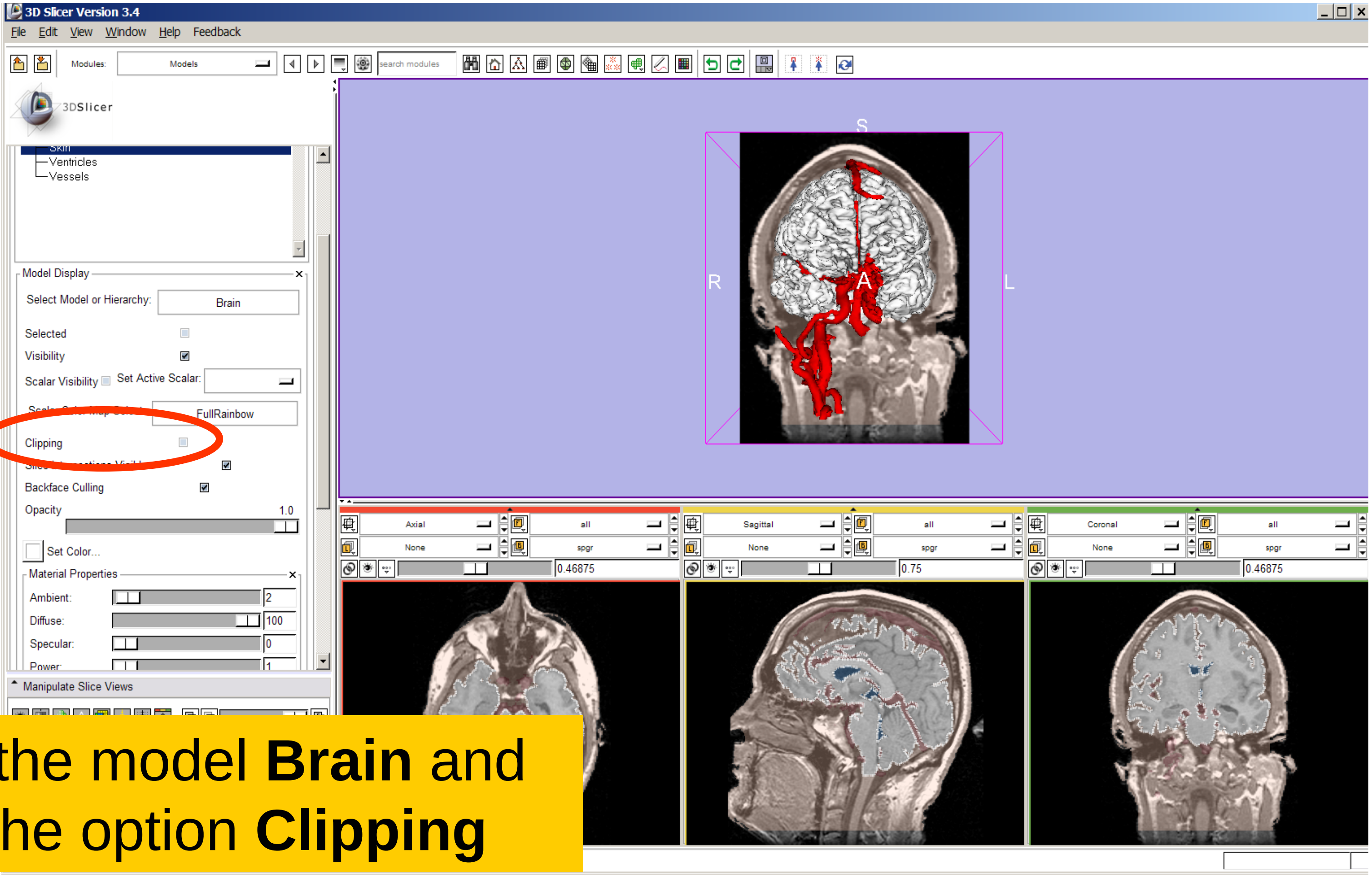
Go back to the conventional layout

Visualizing a 3D model


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Models
Model Display
Select Model or Hierarchy: Vessels
Selected
Visibility
Scalar Visibility
Set Active Scalar:
Scalar Color Map Select:
Clipping
Slice Intersections Visible
Backface Culling
Opacity 1.0
Set Color...
Material Properties
Ambient: 0
Diffuse: 100
Specular: 0
Power: 1
Preview:
Presets:
Manipulate Slice Views
S
R
A
L
Axial
Sagittal
Coronal
-5.1562
0.75
0.46875

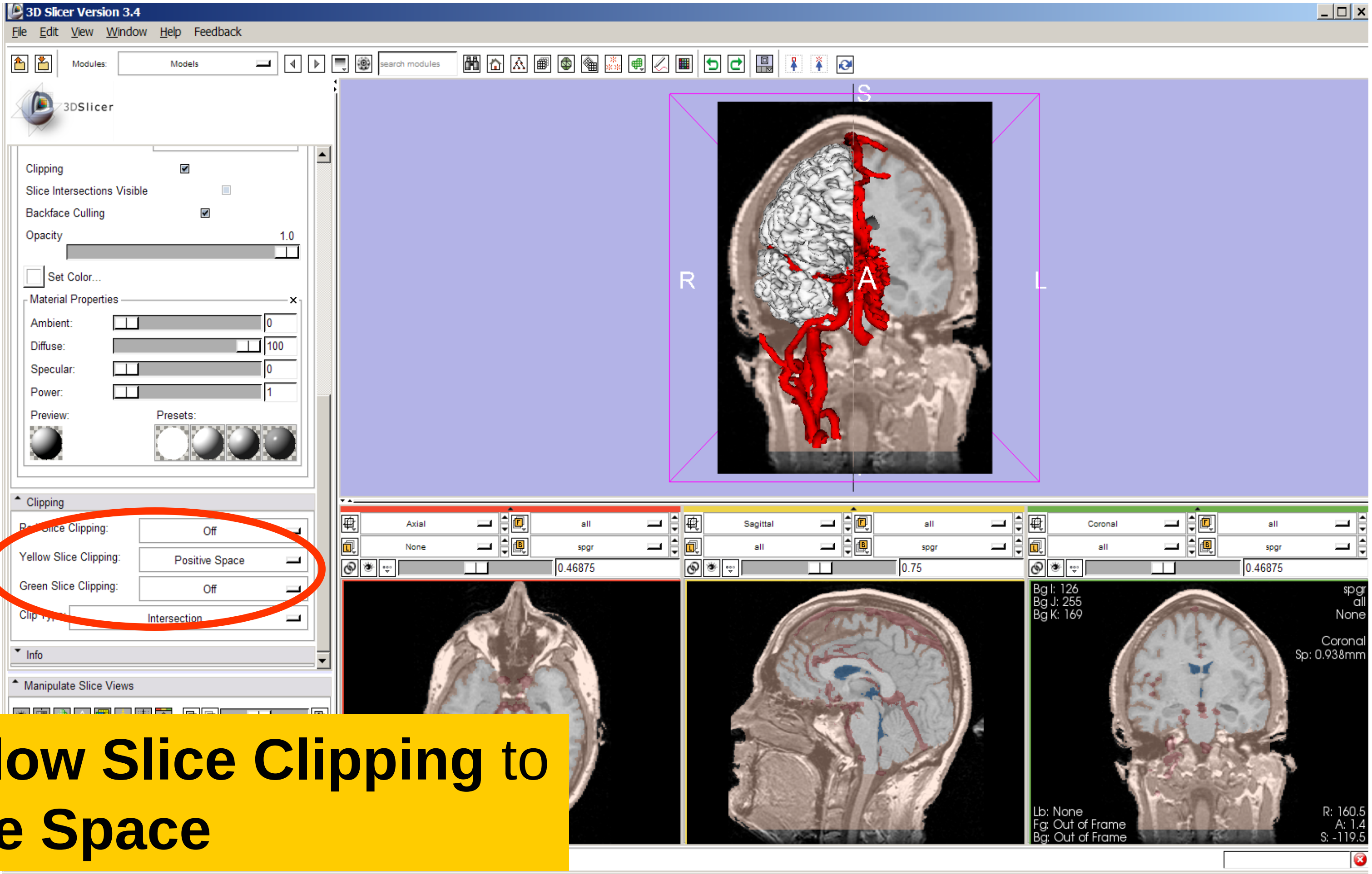
Select the model **Vessels** and change its color to red

Visualizing a 3D model


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Models
Skin
Ventricles
Vessels
Model Display
Select Model or Hierarchy: Brain
Selected
Visibility
Scalar Visibility
Set Active Scalar:
FullRainbow
Clipping
Backface Culling
Opacity 1.0
Set Color...
Material Properties
Ambient: 2
Diffuse: 100
Specular: 0
Power: 1
Manipulate Slice Views
S
R
A
L
Axial
all
None
spgr
0.46875
Sagittal
0.75
Coronal

Select the model **Brain** and select the option **Clipping**

Visualizing a 3D model


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Models
search modules
3DSlicer
S
R
A
L
Axial
None
all
spgr
0.46875
Sagittal
all
spgr
0.75
Coronal
all
spgr
0.46875
Bg I: 126
Bg J: 255
Bg K: 169
spgr
all
None
Coronal
Sp: 0.938mm
Lb: None
Fg: Out of Frame
Bg: Out of Frame
R: 160.5
A: 1.4
S: -119.5
Info
Manipulate Slice Views

Clipping ☑

Slice Intersections Visible ☐

Backface Culling ☑

Opacity 1.0

Set Color...

Material Properties

Ambient: 0

Diffuse: 100

Specular: 0

Power: 1

Preview:

Presets:

Clipping

Red Slice Clipping: Off

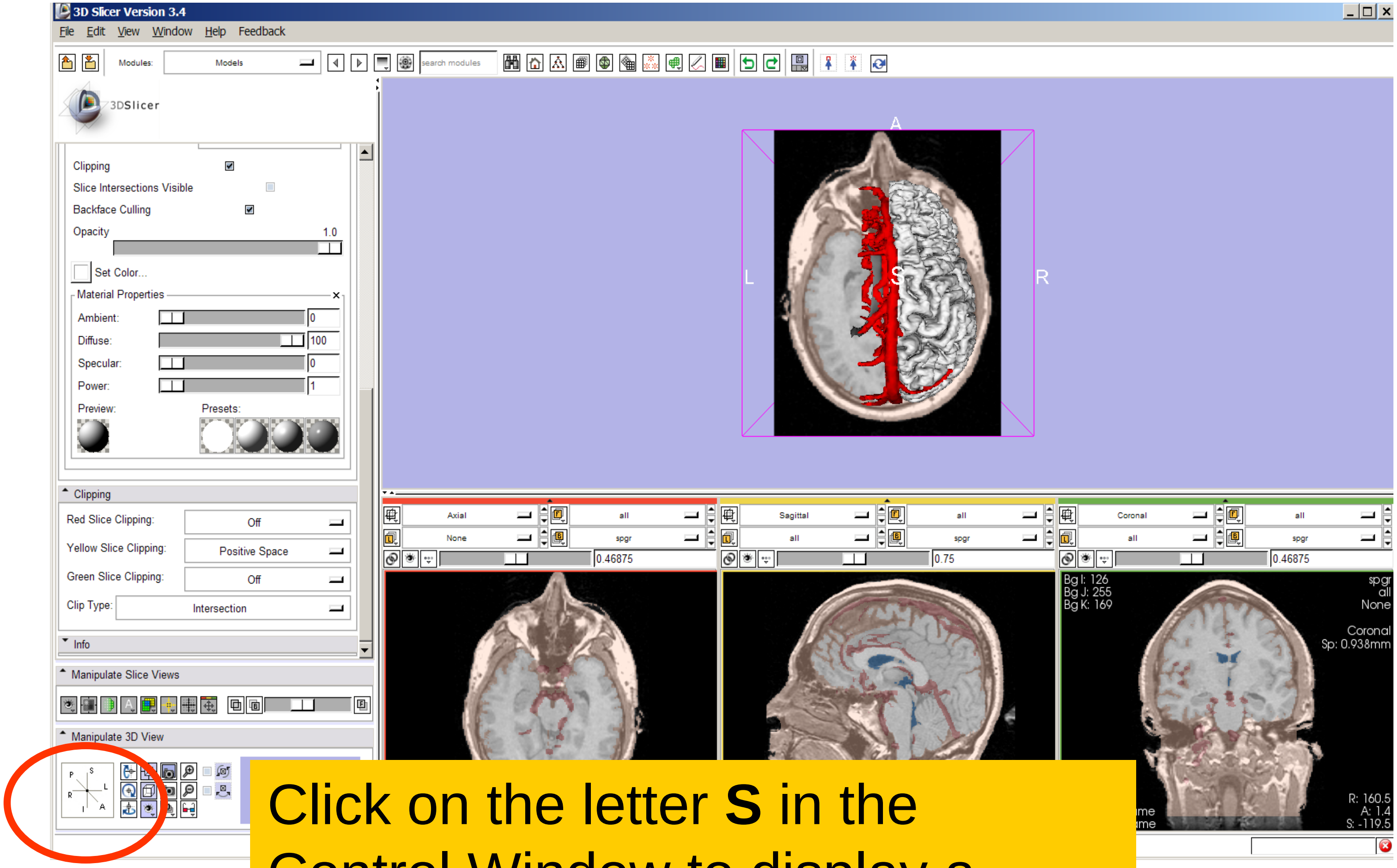
Yellow Slice Clipping: Positive Space

Green Slice Clipping: Off

Clip Type: Intersection

Set **Yellow Slice Clipping** to **Positive Space**

Visualizing a 3D model


3D Slicer Version 3.4
File
Edit
View
Window
Help
Feedback
Modules:
Models
search modules
3DSlicer
A
L
R
S
Axial
all
None
spgr
Sagittal
all
spgr
Coronal
all
spgr
0.46875
0.75
0.46875
Info
Manipulate Slice Views
Manipulate 3D View
Bg I: 126
Bg J: 255
Bg K: 169
spgr
all
None
Coronal
Sp: 0.938mm
R: 160.5
A: 1.4
S: -119.5

Clipping ☑

Slice Intersections Visible ☐

Backface Culling ☑

Opacity 1.0

Set Color...

Material Properties

Ambient: 0

Diffuse: 100

Specular: 0

Power: 1

Preview:

Presets:

Clipping

Red Slice Clipping: Off

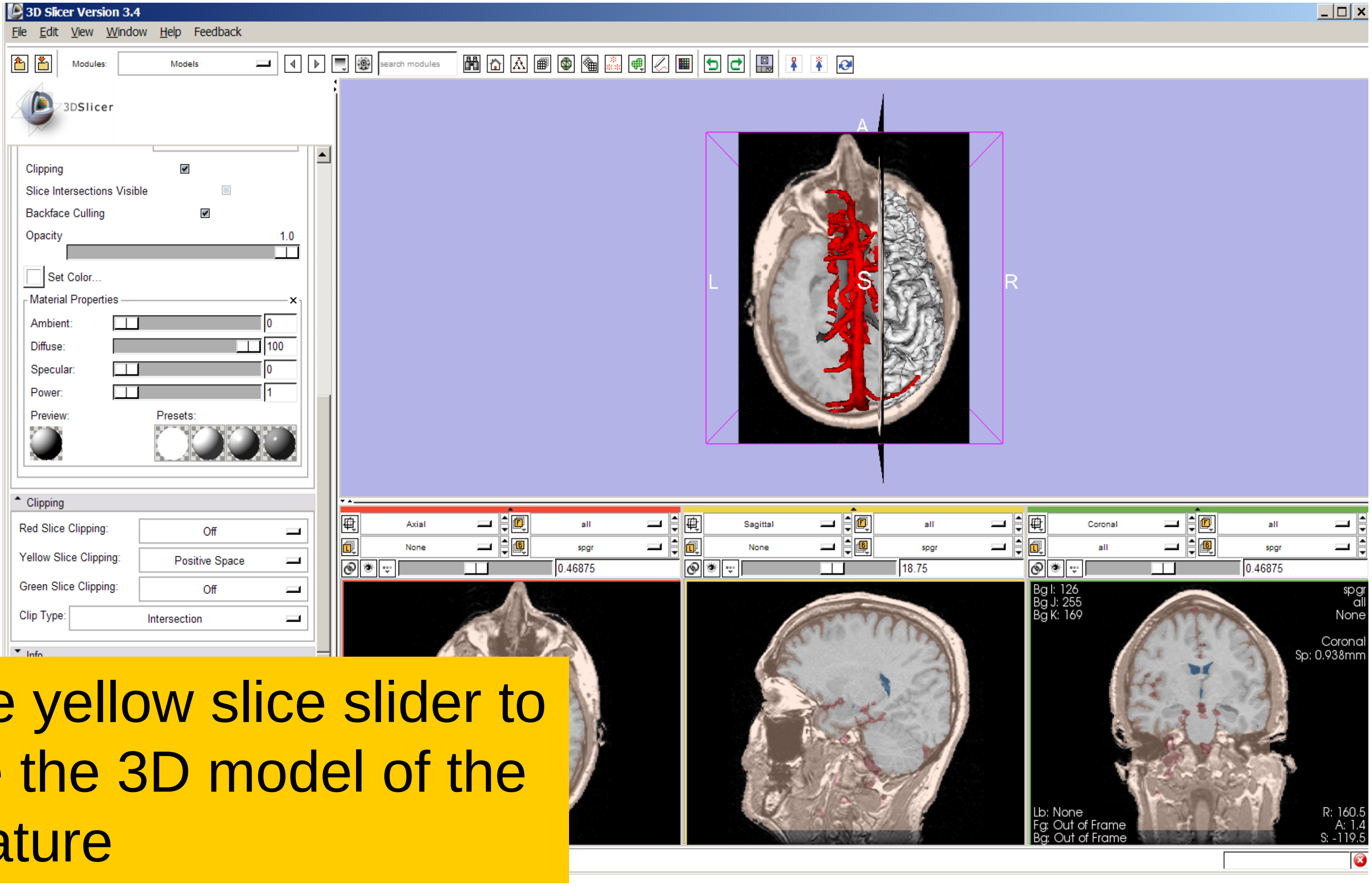
Yellow Slice Clipping: Positive Space

Green Slice Clipping: Off

Clip Type: Intersection

Click on the letter **S** in the Control Window to display a superior view of the 3D models

Visualizing a 3D model


3D Slicer Version 3.4
File Edit View Window Help Feedback
search modules
3DSlicer
A
L
S
R
Axial
Sagittal
Coronal
all
None
spgr
Bg I: 126
Bg J: 255
Bg K: 169
Coronal
Sp: 0.938mm
Lb: None
Fg: Out of Frame
Bg: Out of Frame
R: 160.5
A: 1.4
S: -119.5
Preview:
Presets:
Info

Modules: Models

Clipping ☑

Slice Intersections Visible ☐

Backface Culling ☑

Opacity 1.0

Set Color...

Material Properties

Ambient: 0

Diffuse: 100

Specular: 0

Power: 1

Clipping

Red Slice Clipping: Off

Yellow Slice Clipping: Positive Space

Green Slice Clipping: Off

Clip Type: Intersection

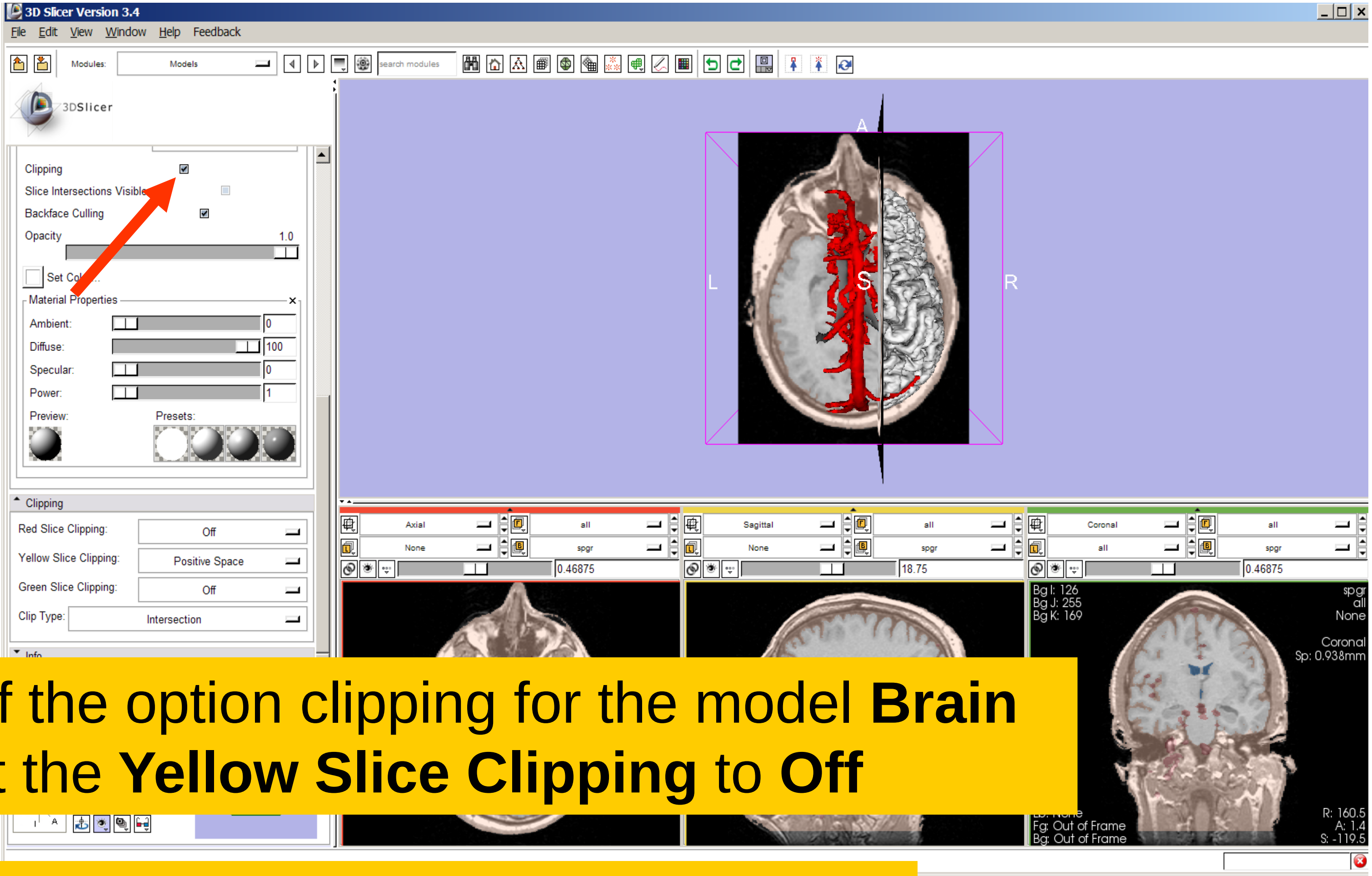
0.46875

18.75

0.46875

Use the yellow slice slider to expose the 3D model of the vasculature

Visualizing a 3D model


3D Slicer Version 3.4
File
Edit
View
Window
Help
Feedback
Modules:
Models
search modules
3DSlicer
Material Properties
Preview:
Presets:
Set Color...
Info
A
L
R
S
Axial
Sagittal
Coronal
all
spgr
None
Bg I: 126
Bg J: 255
Bg K: 169
Coronal
Sp: 0.938mm
R: 160.5
A: 1.4
S: -119.5
Fg: Out of Frame
Bg: Out of Frame

Clipping ☑

Slice Intersections Visible ☐

Backface Culling ☑

Opacity 1.0

Ambient: 0

Diffuse: 100

Specular: 0

Power: 1

Clipping

Red Slice Clipping: Off

Yellow Slice Clipping: Positive Space

Green Slice Clipping: Off

Clip Type: Intersection

0.46875

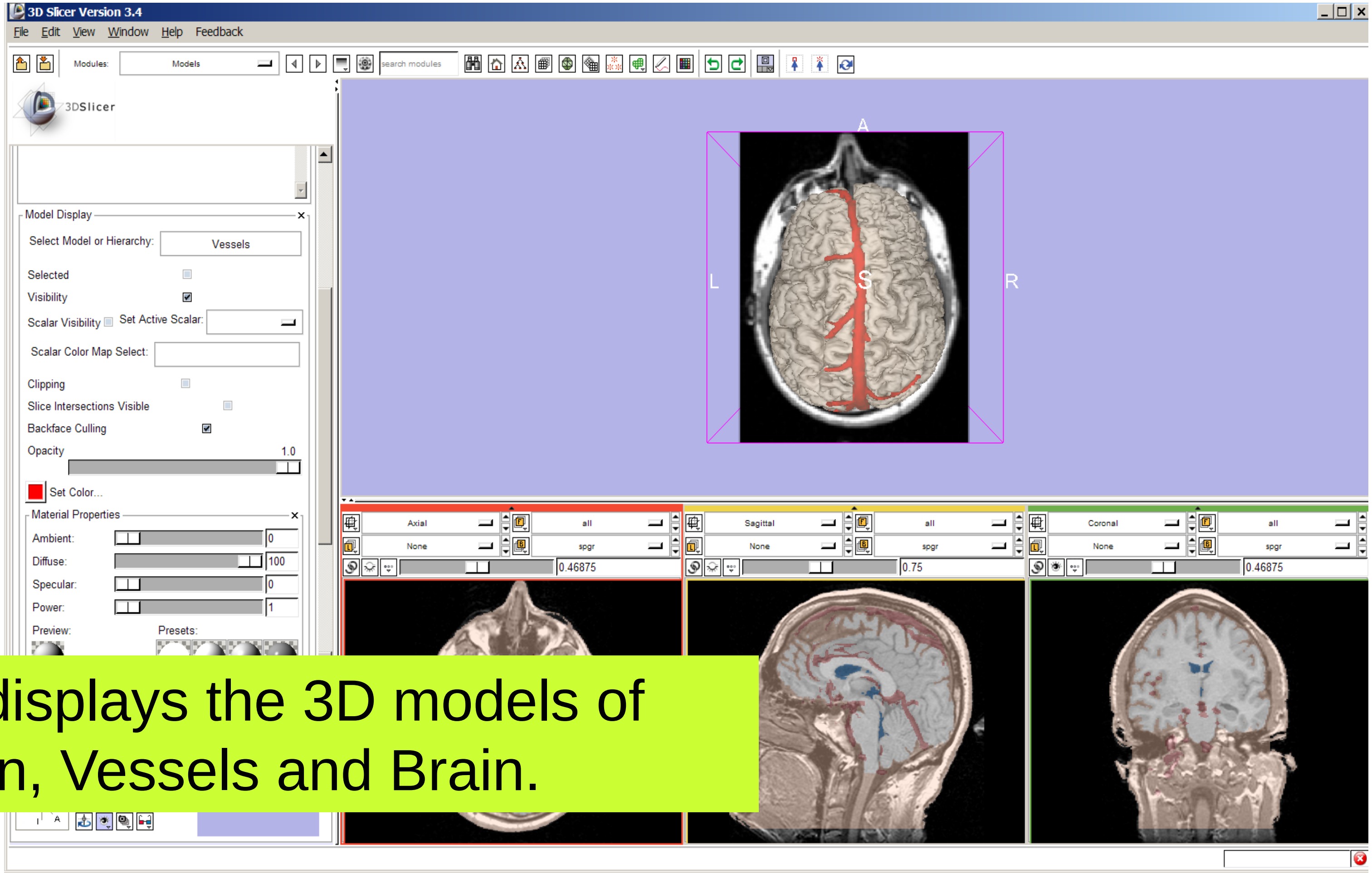
18.75

0.46875

Turn off the option clipping for the model **Brain** and set the **Yellow Slice Clipping** to **Off**

Turn on the visibility of the model **Skin**

Visualizing a 3D model


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules:
Models
search modules
3DSlicer
A
L
R
S
Axial
Sagittal
Coronal
all
None
spgr
0.46875
0.75

Model Display

Select Model or Hierarchy: Vessels

Selected ☐

Visibility ☑

Scalar Visibility ☐ Set Active Scalar:

Scalar Color Map Select:

Clipping ☐

Slice Intersections Visible ☐

Backface Culling ☑

Opacity 1.0

🟥 Set Color...

Material Properties

Ambient: 0

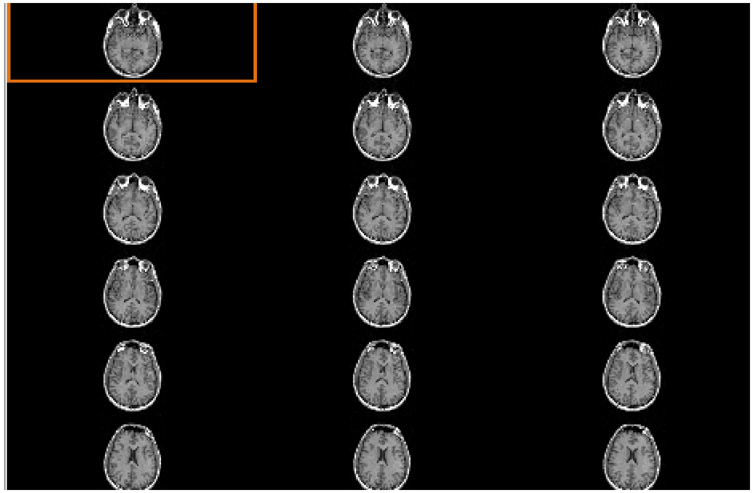
Diffuse: 100

Specular: 0

Power: 1

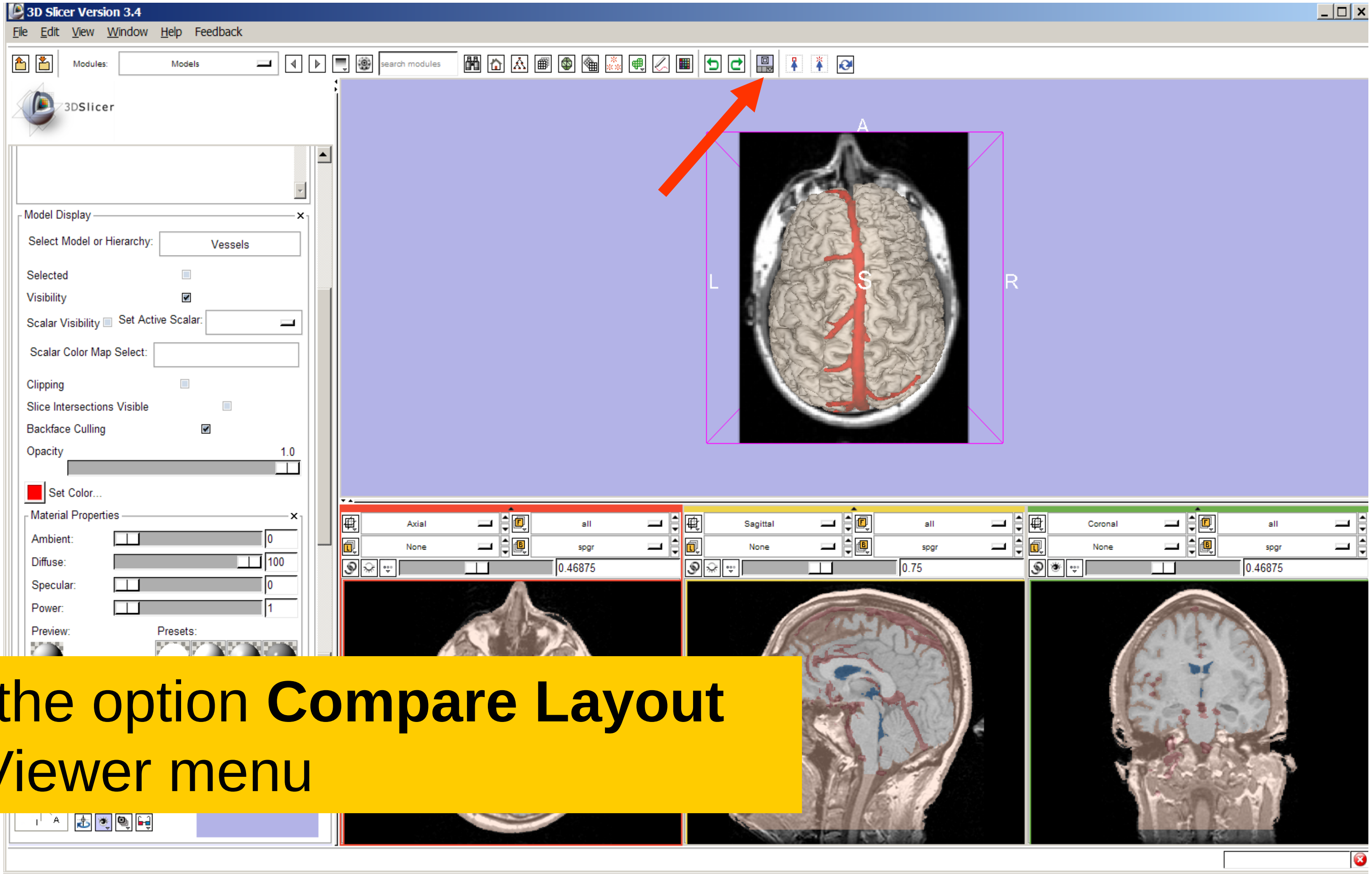
Preview: Presets:

Slicer displays the 3D models of the Skin, Vessels and Brain.



Part 4: Lightbox viewer

Visualizing a 3D model


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Models
search modules
A
L
S
R
Axial
Sagittal
Coronal
None
all
spgr

Model Display

Select Model or Hierarchy: Vessels

Selected ☐

Visibility ☑

Scalar Visibility ☐ Set Active Scalar:

Scalar Color Map Select:

Clipping ☐

Slice Intersections Visible ☐

Backface Culling ☑

Opacity 1.0

Set Color...

Material Properties

Ambient: 0

Diffuse: 100

Specular: 0

Power: 1

Preview: Presets:

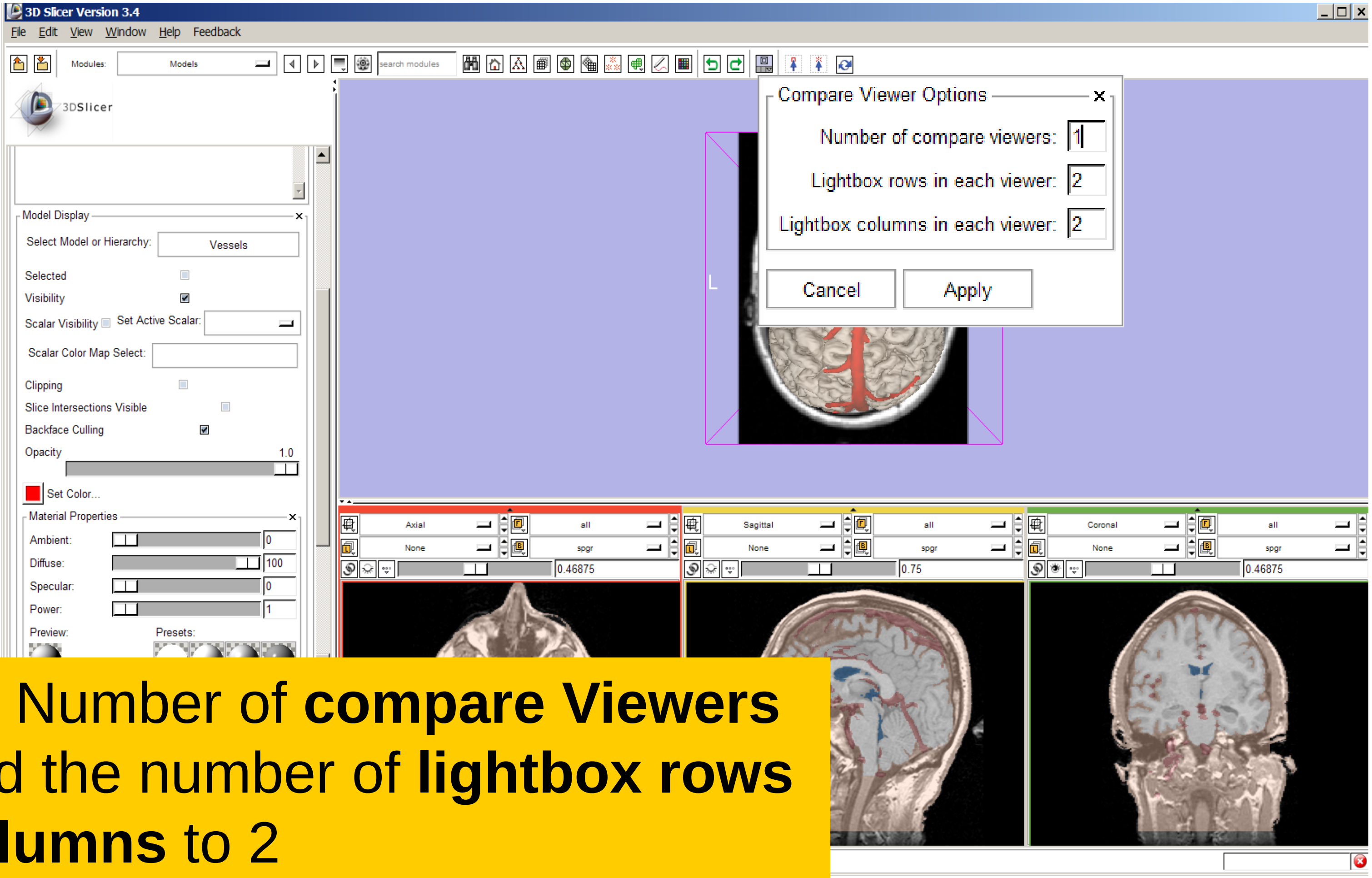
0.46875

0.75

0.46875

Select the option **Compare Layout** in the Viewer menu

Visualizing a 3D model


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Models
Model Display
Material Properties
Preview: Presets:
Axial
Sagittal
Coronal
Cancel
Apply

Compare Viewer Options

Number of compare viewers: 1

Lightbox rows in each viewer: 2

Lightbox columns in each viewer: 2

Select Model or Hierarchy: Vessels

Selected ☐

Visibility ☑

Scalar Visibility ☐ Set Active Scalar:

Scalar Color Map Select:

Clipping ☐

Slice Intersections Visible ☐

Backface Culling ☑

Opacity 1.0

Set Color...

Ambient: 0

Diffuse: 100

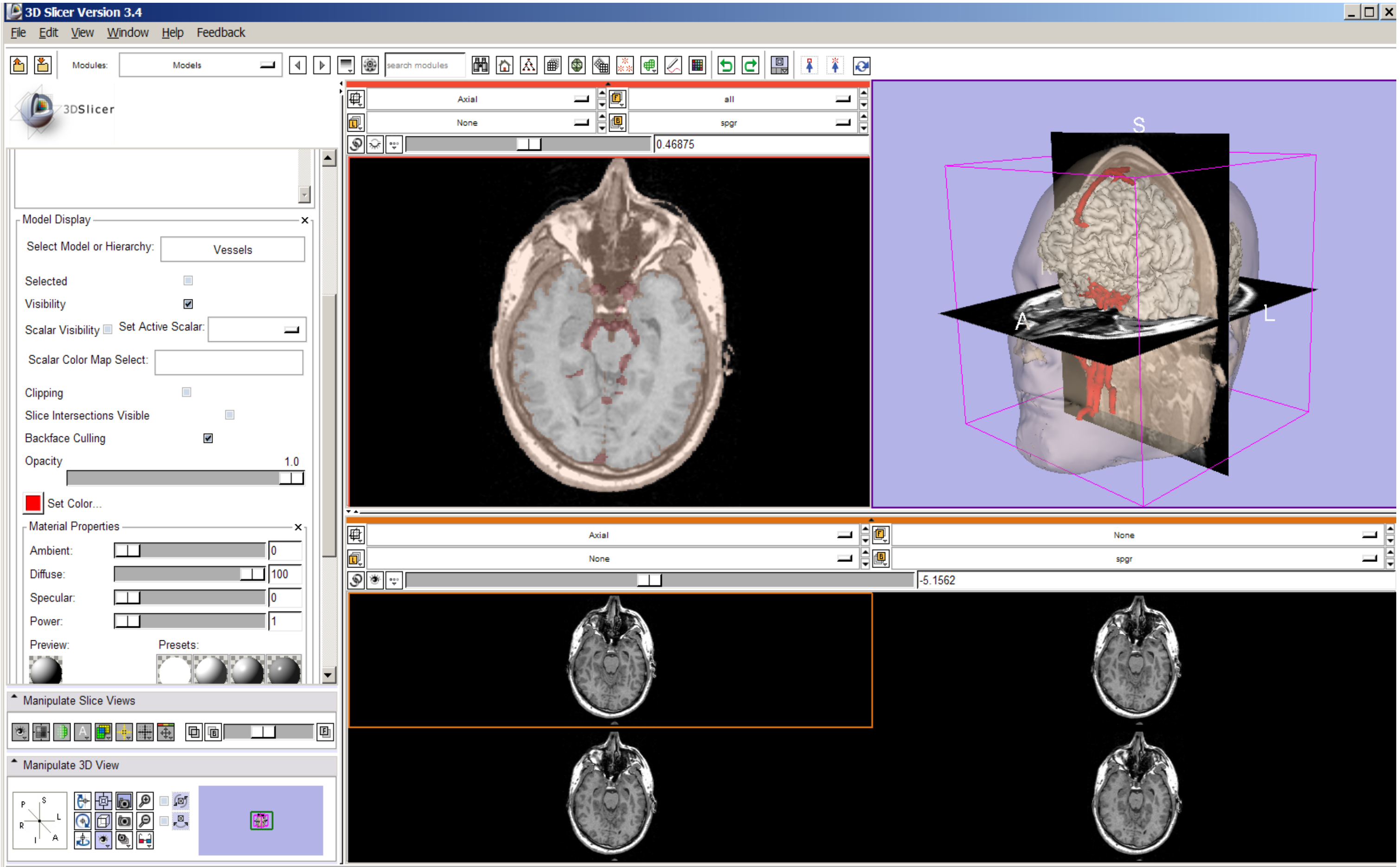
Specular: 0

Power: 1

Set the Number of **compare Viewers** to 1 and the number of **lightbox rows** and **columns** to 2

Click on **Apply**

Lightbox viewer


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules:
search modules
3DSlicer
Set Color...
Material Properties
Preview:
Presets:
Manipulate Slice Views
Manipulate 3D View
S
A
L

Modules: Models

Model Display

Select Model or Hierarchy: Vessels

Selected ☐

Visibility ☑

Scalar Visibility ☐ Set Active Scalar:

Scalar Color Map Select:

Clipping ☐

Slice Intersections Visible ☐

Backface Culling ☑

Opacity 1.0

Ambient: 0

Diffuse: 100

Specular: 0

Power: 1

Axial | all

None | spgr

0.46875

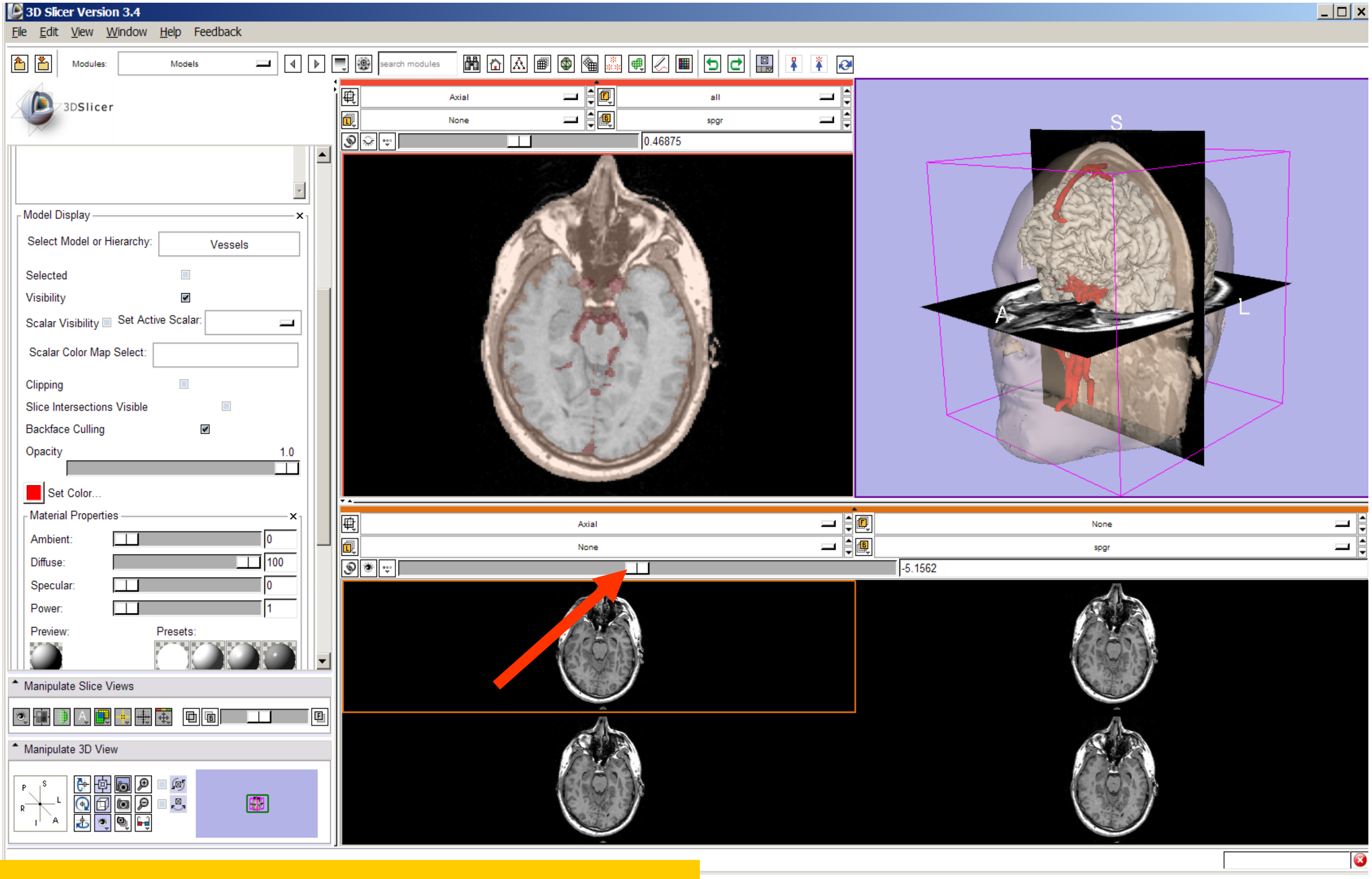
Axial | None

None | spgr

-5.1562

Slicer displays a lightbox view of the Background dataset.

Lightbox viewer


3D Slicer Version 3.4
File
Edit
View
Window
Help
Feedback
search modules
3DSlicer
Model Display
Set Color...
Material Properties
Preview:
Presets:
Manipulate Slice Views
Manipulate 3D View
S
A
L
P
R
I

Modules: Models

Select Model or Hierarchy: Vessels

Selected ☐

Visibility ☑

Scalar Visibility ☐ Set Active Scalar:

Scalar Color Map Select:

Clipping ☐

Slice Intersections Visible ☐

Backface Culling ☑

Opacity 1.0

Ambient: 0

Diffuse: 100

Specular: 0

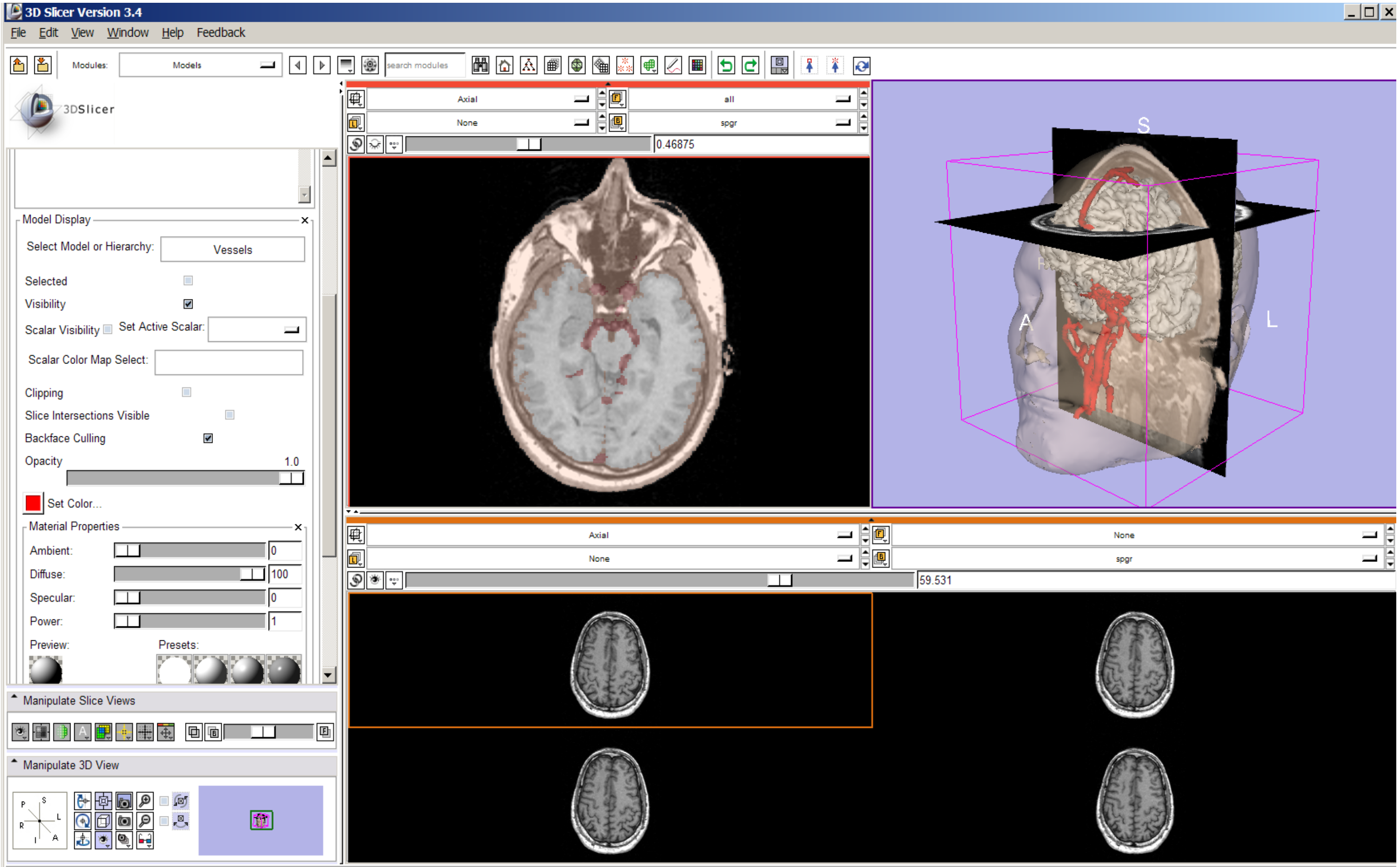
Power: 1

Axial | all | None | spgr | 0.46875

Axial | None | None | spgr | -5.1562

Browse through the spgr volume using the lightbox slider

Lightbox viewer


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules:
search modules
3DSlicer
Model Display
Set Color...
Material Properties
Preview:
Presets:
Manipulate Slice Views
Manipulate 3D View
S
A
L
P
R
I

Modules: Models

Select Model or Hierarchy: Vessels

Selected ☐

Visibility ☑

Scalar Visibility ☐ Set Active Scalar:

Scalar Color Map Select:

Clipping ☐

Slice Intersections Visible ☐

Backface Culling ☑

Opacity 1.0

Ambient: 0

Diffuse: 100

Specular: 0

Power: 1

Axial | all

None | spgr

0.46875

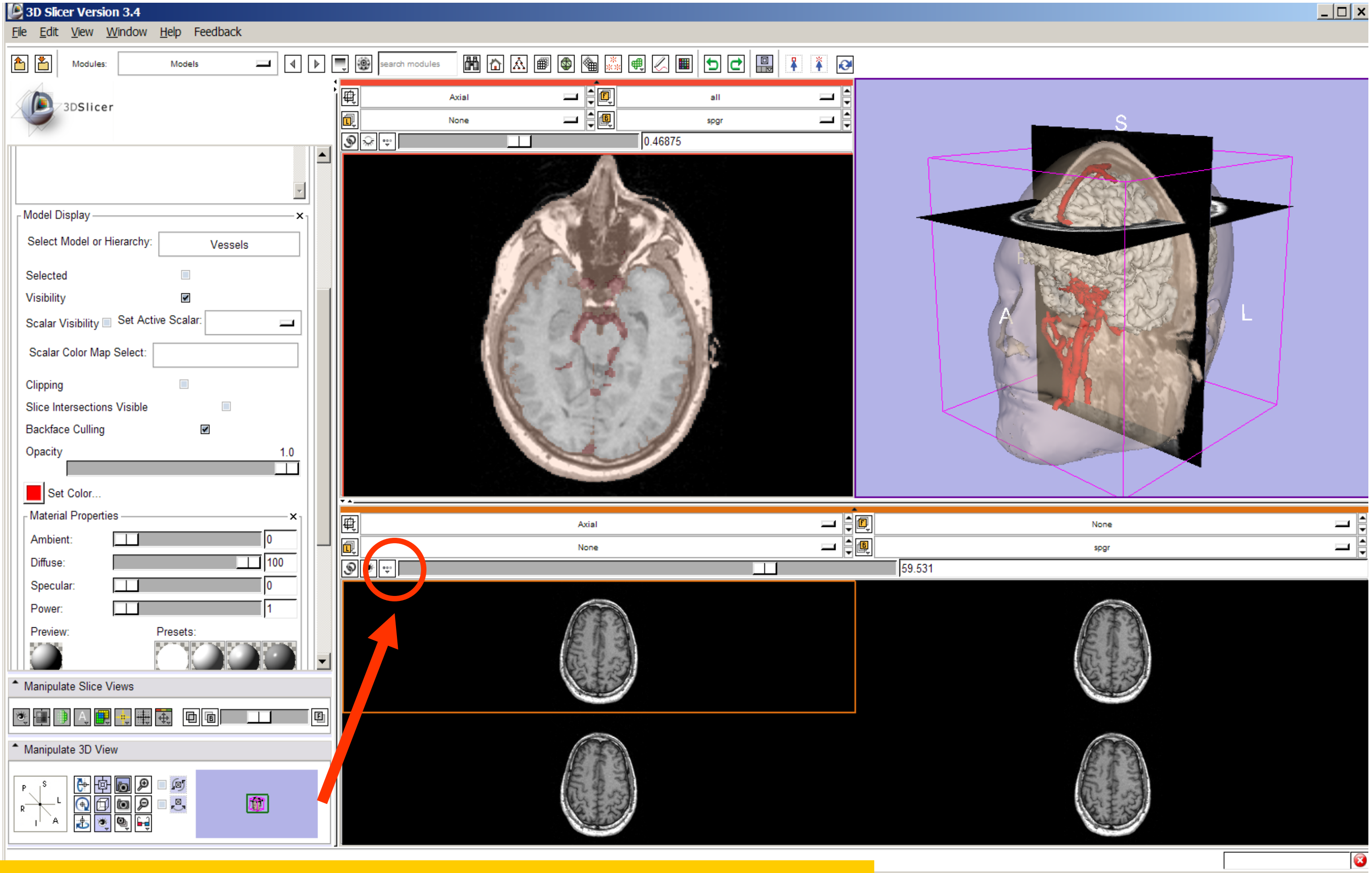
Axial | None

None | spgr

59.531

Slicer displays 4 adjacent axial slices of the spgr volume simultaneously

Lightbox viewer



3D Slicer Version 3.4
File Edit View Window Help Feedback
search modules
3DSlicer
S
A
L

Modules: Models

Model Display

Select Model or Hierarchy: Vessels

Selected ☐

Visibility ☑

Scalar Visibility ☐ Set Active Scalar:

Scalar Color Map Select:

Clipping ☐

Slice Intersections Visible ☐

Backface Culling ☑

Opacity 1.0

Set Color...

Material Properties

Ambient: 0

Diffuse: 100

Specular: 0

Power: 1

Preview: Presets:

Manipulate Slice Views

Manipulate 3D View

Axial all

None spgr

0.46875

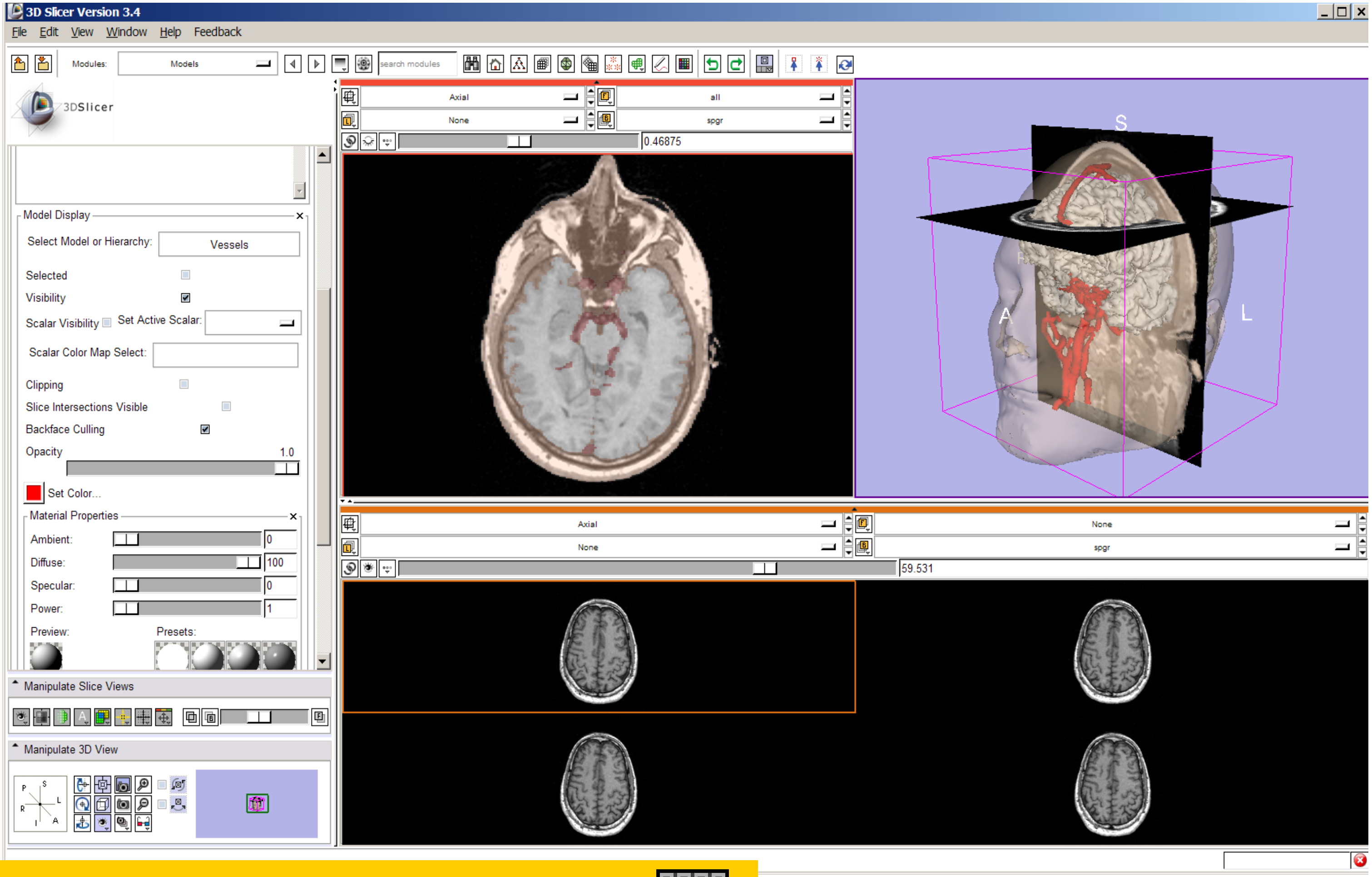
Axial None

None spgr

59.531

Left click on the Slice Viewer menu of the Compare Layout viewer

Lightbox viewer


3D Slicer Version 3.4

File Edit View Window Help Feedback
Modules: Models
search modules
3DSlicer
Axial
all
None
spgr
0.46875
S
A
L
Axial
None
None
spgr
59.531
Manipulate Slice Views
Manipulate 3D View

Model Display

Select Model or Hierarchy: Vessels

Selected ☐

Visibility ☑

Scalar Visibility ☐ Set Active Scalar:

Scalar Color Map Select:

Clipping ☐

Slice Intersections Visible ☐

Backface Culling ☑

Opacity 1.0

Set Color...

Material Properties

Ambient: 0

Diffuse: 100

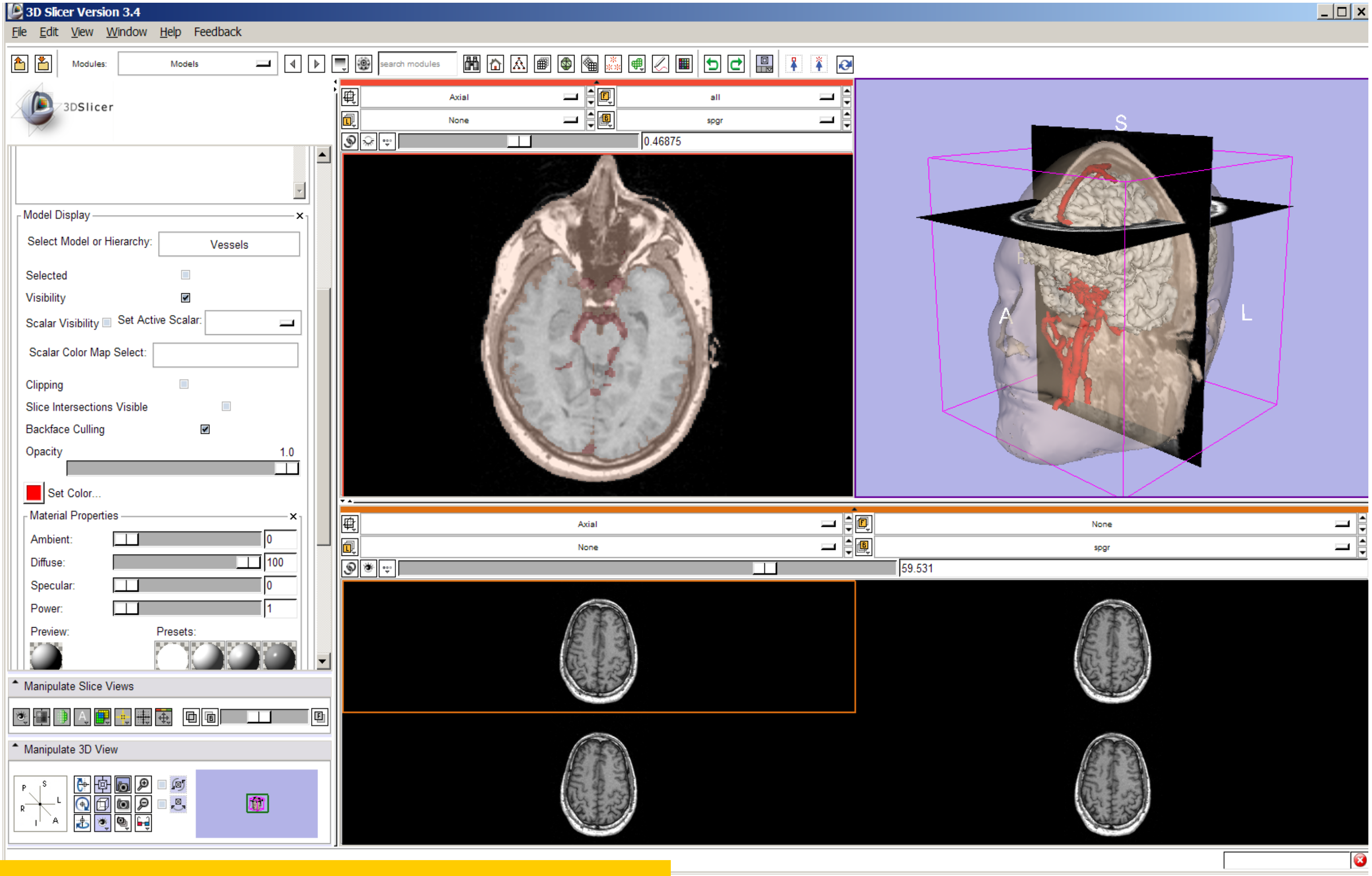
Specular: 0

Power: 1

Preview: Presets:

Select the **lightbox view** option ▦

Lightbox viewer


3D Slicer Version 3.4
File
Edit
View
Window
Help
Feedback
search modules
3DSlicer
Manipulate Slice Views
Manipulate 3D View
S
A
L

Modules: Models

Model Display

Select Model or Hierarchy: Vessels

Selected ☐

Visibility ☑

Scalar Visibility ☐ Set Active Scalar:

Scalar Color Map Select:

Clipping ☐

Slice Intersections Visible ☐

Backface Culling ☑

Opacity 1.0

🟥 Set Color...

Material Properties

Ambient: 0

Diffuse: 100

Specular: 0

Power: 1

Preview:

Presets:

Axial | all

None | spgr

0.46875

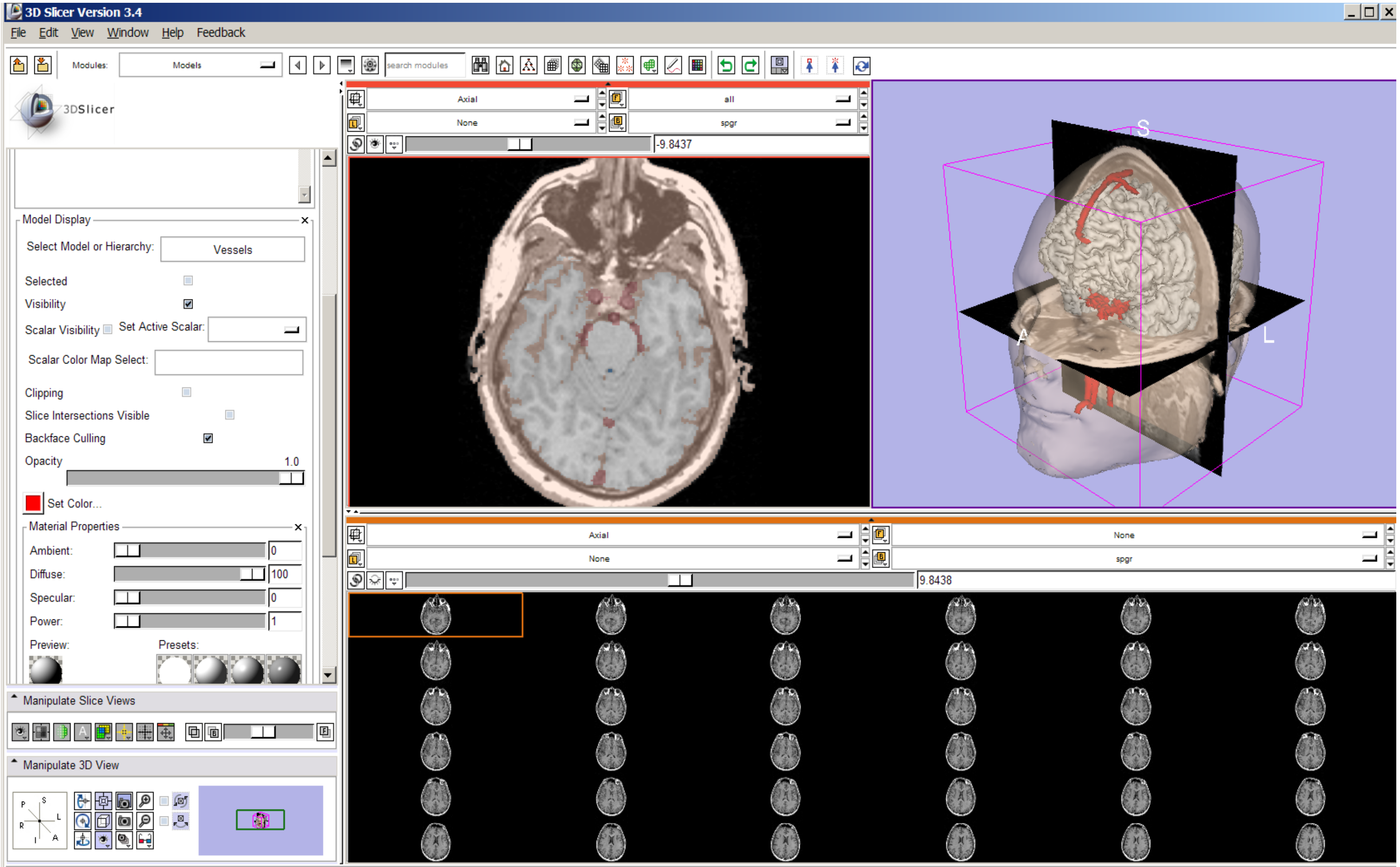
Axial | None

None | spgr

59.531

Set the configuration of the light box view to **6x6**

Lightbox viewer



3D Slicer Version 3.4

Modules: Models

Model Display

Select Model or Hierarchy: Vessels

Selected ☐

Visibility ☑

Scalar Visibility ☐ Set Active Scalar:

Scalar Color Map Select:

Clipping ☐

Slice Intersections Visible ☐

Backface Culling ☑

Opacity 1.0

Set Color...

Material Properties

Ambient: 0

Diffuse: 100

Specular: 0

Power: 1

Preview:

Presets:

Axial | all

None | spgr

-9.8437

Axial | None

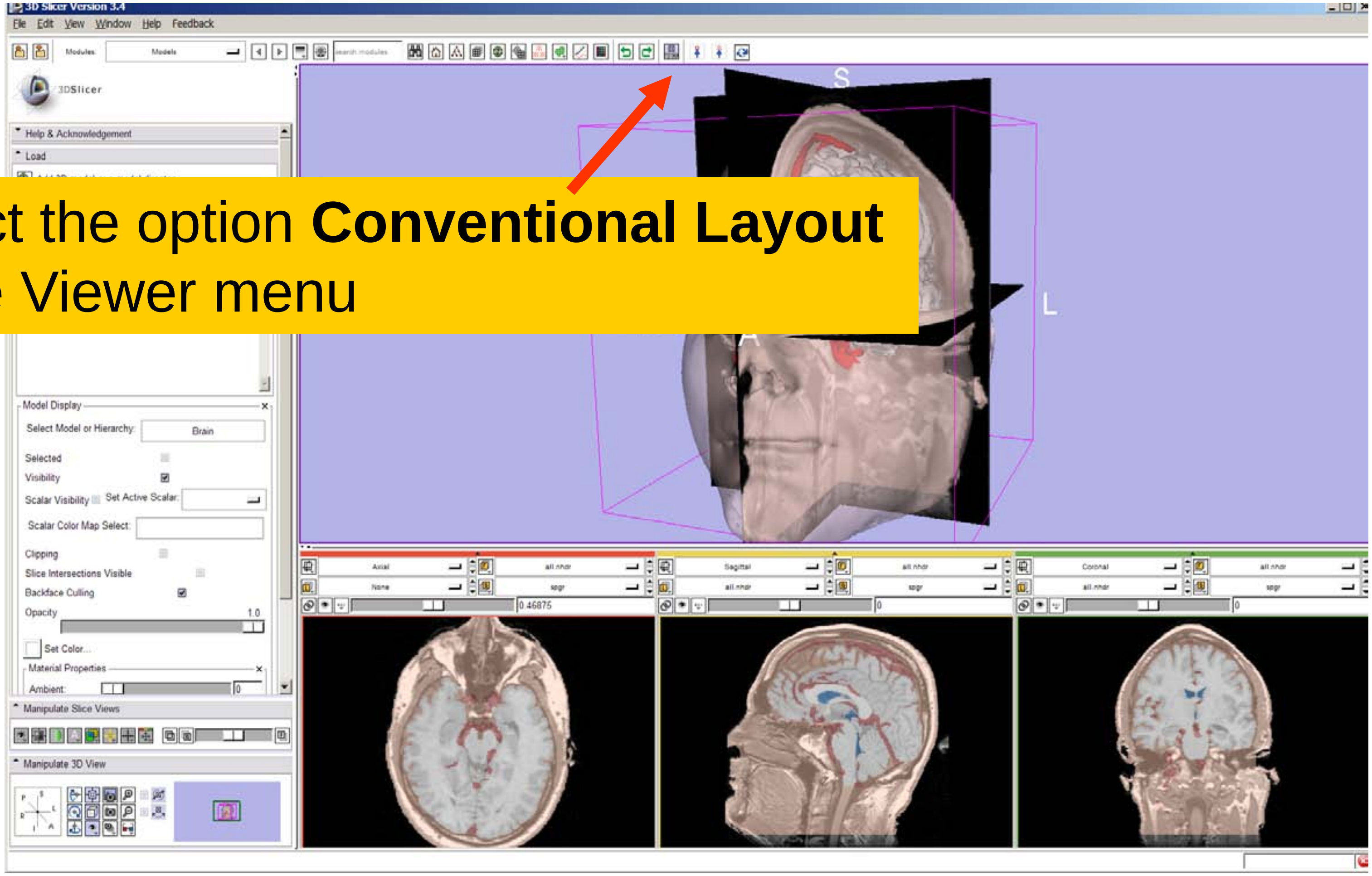
None | spgr

9.8438

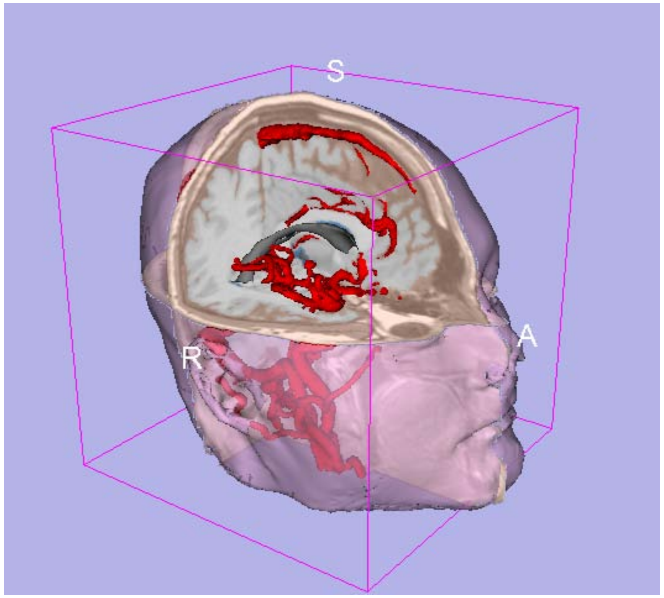
File
Edit
View
Window
Help
Feedback
search modules
3DSlicer
Manipulate Slice Views
Manipulate 3D View
S
A
L
P
R
I

Slicer displays a matrix of 36 adjacent axial slices of the spgr volume.

Lightbox viewer

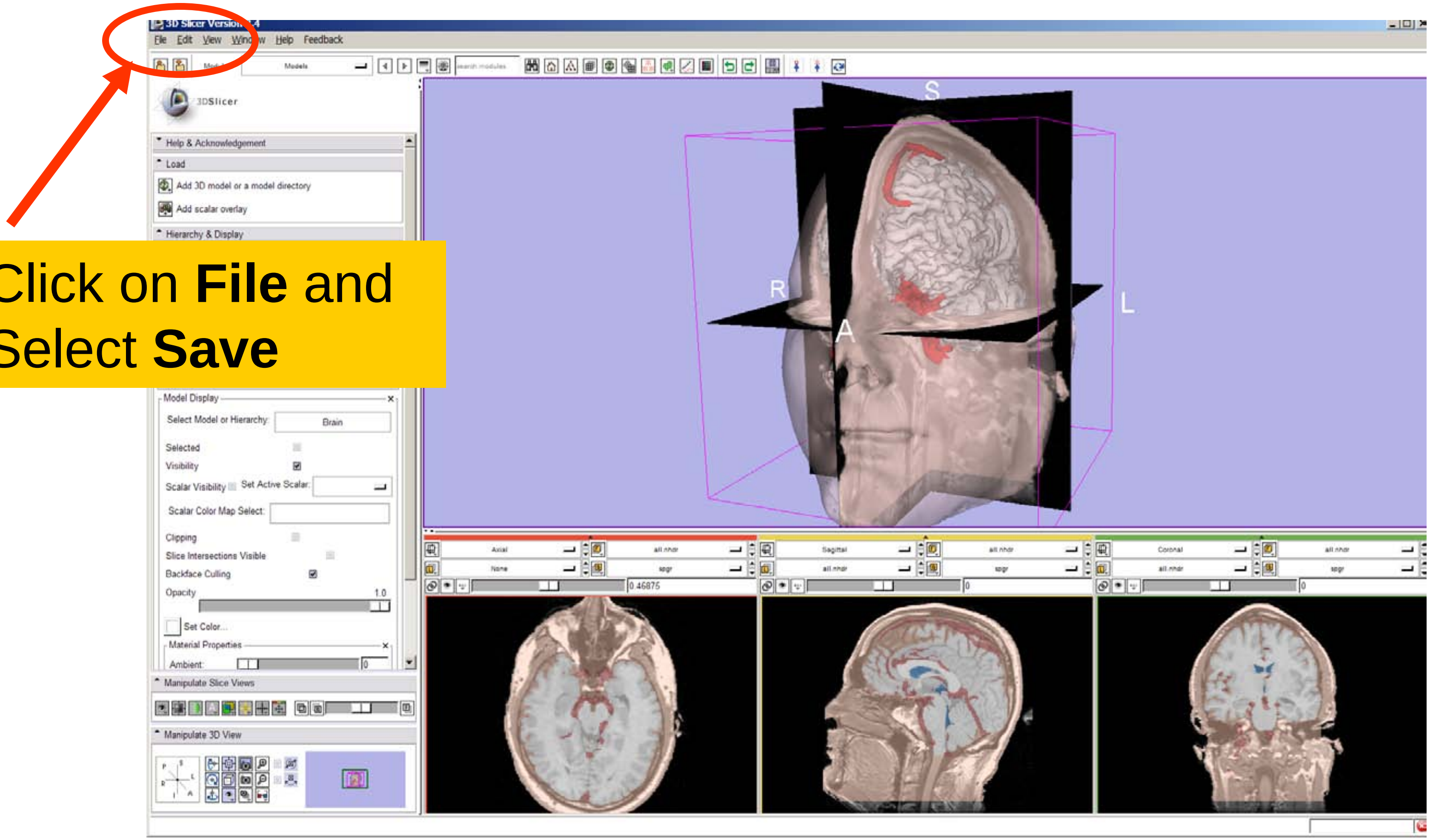

3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Models
3DSlicer
Help & Acknowledgement
Load
Model Display
Select Model or Hierarchy: Brain
Selected
Visibility
Scalar Visibility
Set Active Scalar:
Scalar Color Map Select:
Clipping
Slice Intersections Visible
Backface Culling
Opacity 1.0
Set Color...
Material Properties
Ambient: 0
Manipulate Slice Views
Manipulate 3D View
S
L
A
Axial
Sagittal
Coronal

Select the option **Conventional Layout** in the Viewer menu



Part 5: Loading and saving a Scene

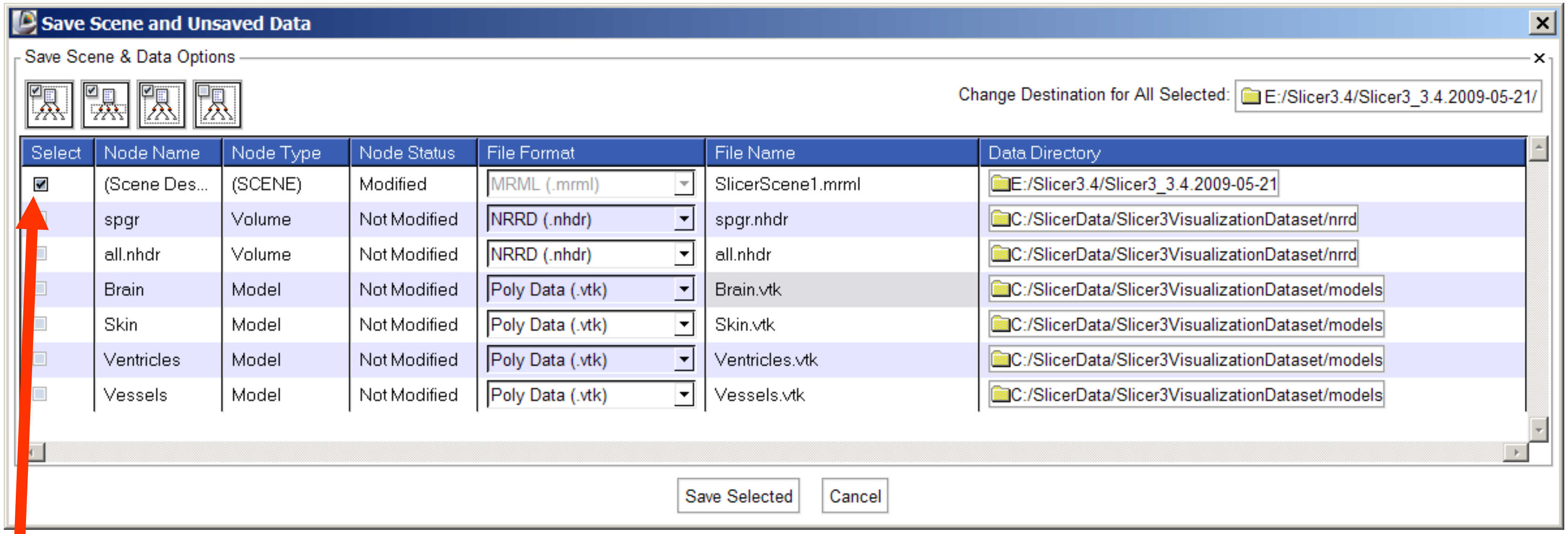
Saving Data


3D Slicer Version
File Edit View Window Help Feedback
Models
3DSlicer
Help & Acknowledgement
Load
Add 3D model or a model directory
Add scalar overlay
Hierarchy & Display
Model Display
Select Model or Hierarchy: Brain
Selected
Visibility
Scalar Visibility
Set Active Scalar:
Scalar Color Map Select:
Clipping
Slice Intersections Visible
Backface Culling
Opacity 1.0
Set Color...
Material Properties
Ambient: 0
Manipulate Slice Views
Manipulate 3D View
S
R
L
A
Axial
Sagittal
Coronal

Click on **File** and Select **Save**

Saving Data

The list of elements currently loaded into Slicer3 appears.



Save Scene and Unsaved Data
Save Scene & Data Options
Change Destination for All Selected: E:/Slicer3.4/Slicer3_3.4.2009-05-21/

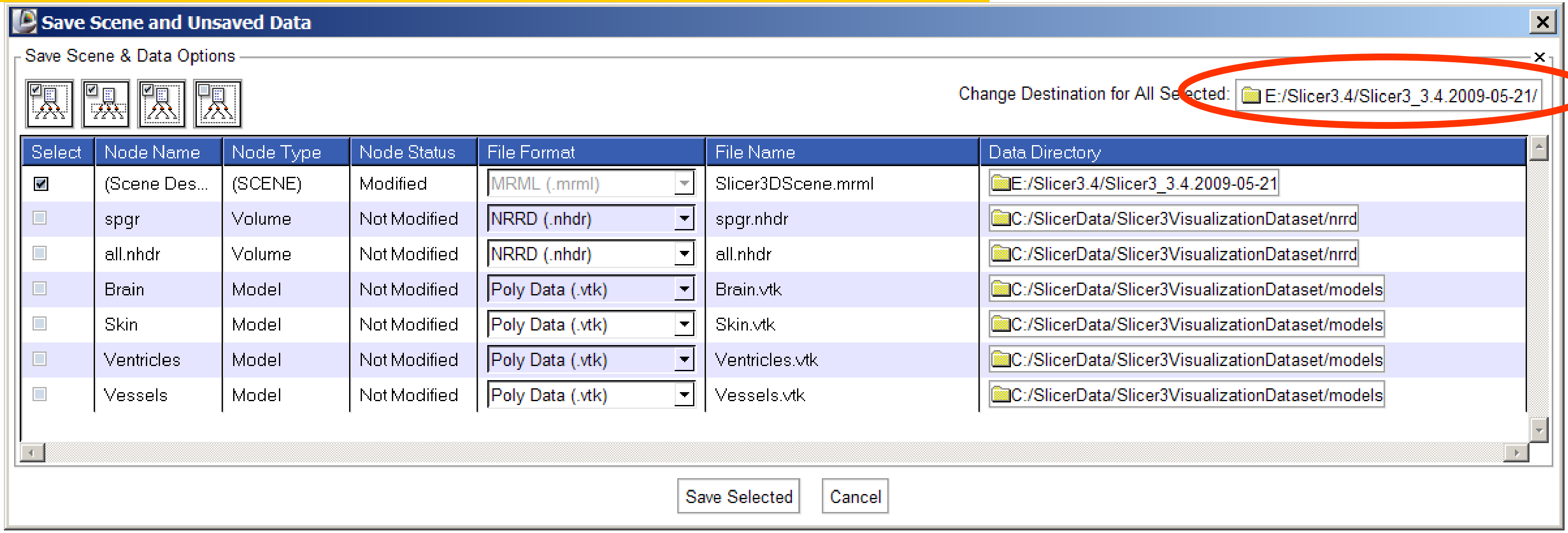
Select	Node Name	Node Type	Node Status	File Format	File Name	Data Directory
☑	(Scene Des...	(SCENE)	Modified	MRML (.mrml)	SlicerScene1.mrml	E:/Slicer3.4/Slicer3_3.4.2009-05-21
☐	spgr	Volume	Not Modified	NRRD (.nhdr)	spgr.nhdr	C:/SlicerData/Slicer3VisualizationDataset/nrrd
☐	all.nhdr	Volume	Not Modified	NRRD (.nhdr)	all.nhdr	C:/SlicerData/Slicer3VisualizationDataset/nrrd
☐	Brain	Model	Not Modified	Poly Data (.vtk)	Brain.vtk	C:/SlicerData/Slicer3VisualizationDataset/models
☐	Skin	Model	Not Modified	Poly Data (.vtk)	Skin.vtk	C:/SlicerData/Slicer3VisualizationDataset/models
☐	Ventricles	Model	Not Modified	Poly Data (.vtk)	Ventricles.vtk	C:/SlicerData/Slicer3VisualizationDataset/models
☐	Vessels	Model	Not Modified	Poly Data (.vtk)	Vessels.vtk	C:/SlicerData/Slicer3VisualizationDataset/models

Save Selected
Cancel

Make sure only the first check box is selected

Saving Data

Click on Change Destination for All Selected and browse to the location where the scene will be saved

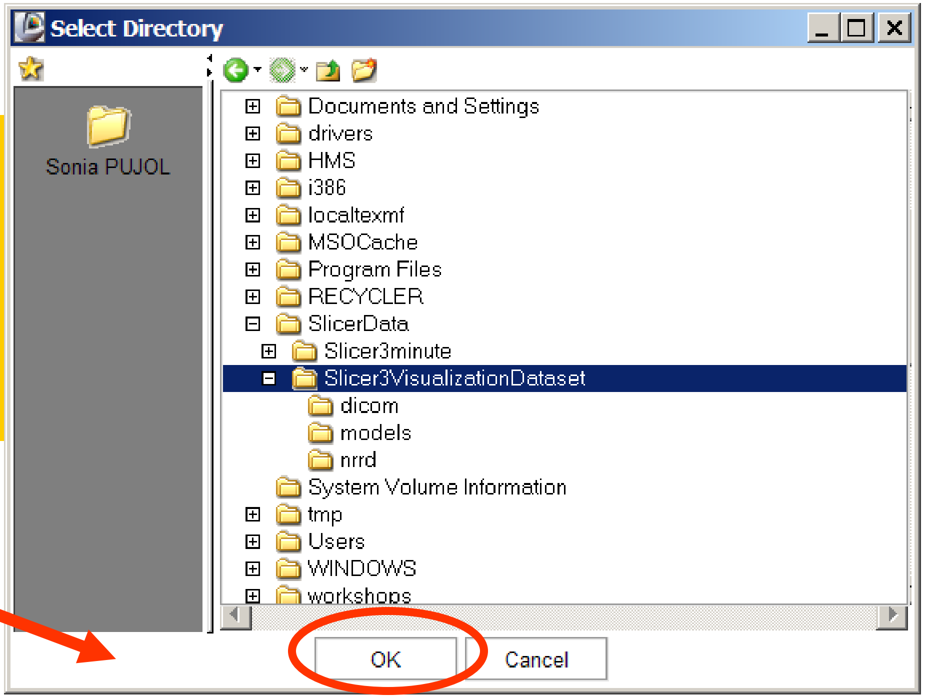


Change Destination for All Selected: E:/Slicer3.4/Slicer3_3.4.2009-05-21/

Select	Node Name	Node Type	Node Status	File Format	File Name	Data Directory
☑	(Scene Des...	(SCENE)	Modified	MRML (.mrml)	Slicer3DScene.mrml	E:/Slicer3.4/Slicer3_3.4.2009-05-21
☐	spgr	Volume	Not Modified	NRRD (.nhdr)	spgr.nhdr	C:/SlicerData/Slicer3VisualizationDataset/nrrd
☐	all.nhdr	Volume	Not Modified	NRRD (.nhdr)	all.nhdr	C:/SlicerData/Slicer3VisualizationDataset/nrrd
☐	Brain	Model	Not Modified	Poly Data (.vtk)	Brain.vtk	C:/SlicerData/Slicer3VisualizationDataset/models
☐	Skin	Model	Not Modified	Poly Data (.vtk)	Skin.vtk	C:/SlicerData/Slicer3VisualizationDataset/models
☐	Ventricles	Model	Not Modified	Poly Data (.vtk)	Ventricles.vtk	C:/SlicerData/Slicer3VisualizationDataset/models
☐	Vessels	Model	Not Modified	Poly Data (.vtk)	Vessels.vtk	C:/SlicerData/Slicer3VisualizationDataset/models

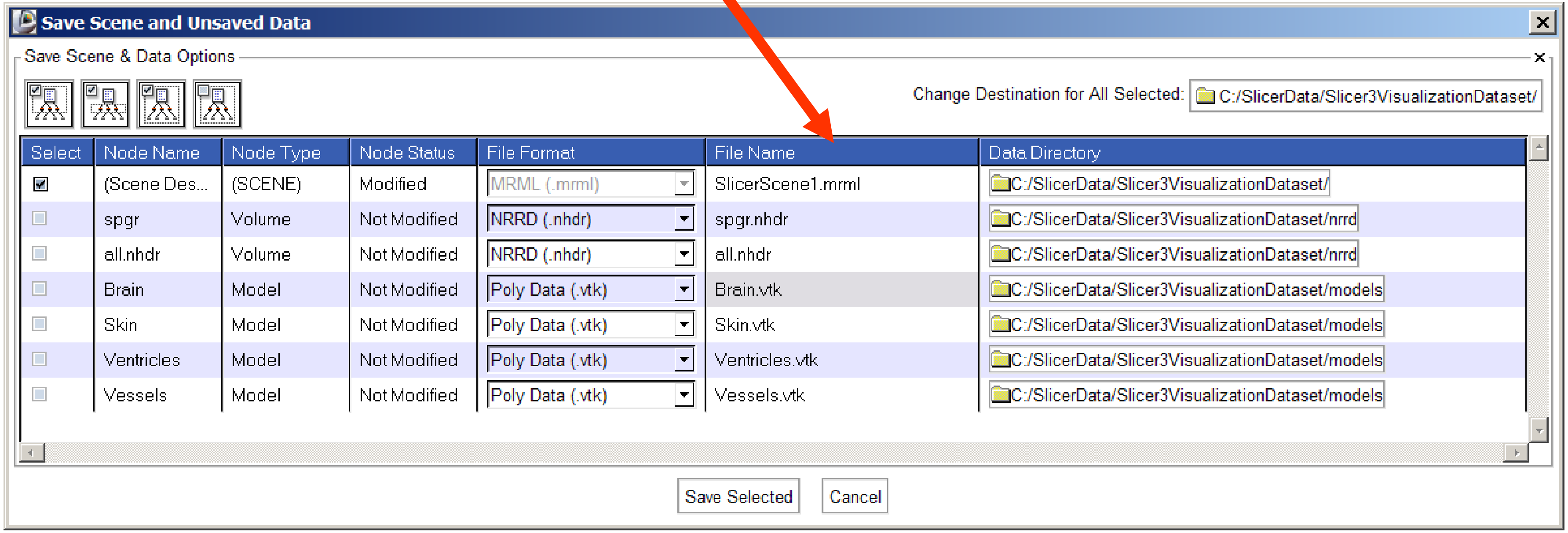
Saving Data

Browse to the directory where you would like to save your scene and click OK


Select Directory
Sonia PUJOL
Documents and Settings
drivers
HMS
i386
localtexmf
MSOCache
Program Files
RECYCLER
SlicerData
Slicer3minute
Slicer3VisualizationDataset
dicom
models
nrrd
System Volume Information
tmp
Users
WINDOWS
workshops
OK
Cancel

Saving Data

Double click on the file name **SlicerScene1** and change it to **Slicer3DScene**



Save Scene and Unsaved Data

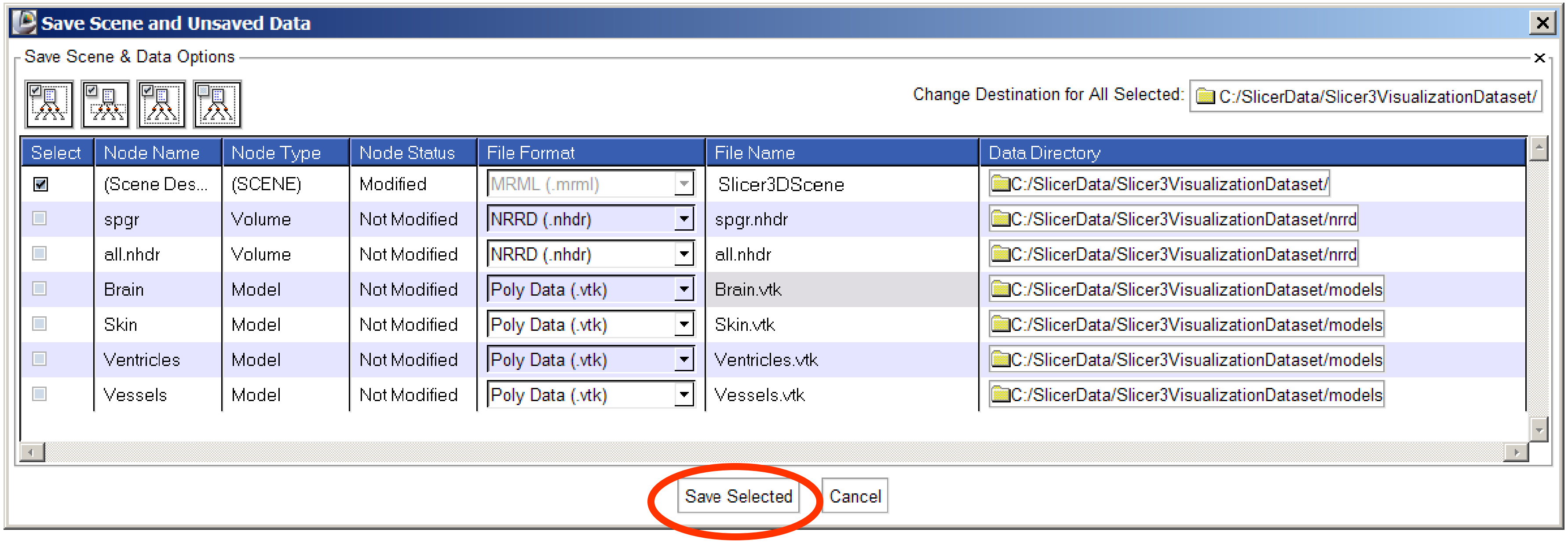
Save Scene & Data Options

Change Destination for All Selected: C:/SlicerData/Slicer3VisualizationDataset/

Select	Node Name	Node Type	Node Status	File Format	File Name	Data Directory
☑	(Scene Des...	(SCENE)	Modified	MRML (.mrml)	SlicerScene1.mrml	C:/SlicerData/Slicer3VisualizationDataset/
☐	spgr	Volume	Not Modified	NRRD (.nhdr)	spgr.nhdr	C:/SlicerData/Slicer3VisualizationDataset/nrrd
☐	all.nhdr	Volume	Not Modified	NRRD (.nhdr)	all.nhdr	C:/SlicerData/Slicer3VisualizationDataset/nrrd
☐	Brain	Model	Not Modified	Poly Data (.vtk)	Brain.vtk	C:/SlicerData/Slicer3VisualizationDataset/models
☐	Skin	Model	Not Modified	Poly Data (.vtk)	Skin.vtk	C:/SlicerData/Slicer3VisualizationDataset/models
☐	Ventricles	Model	Not Modified	Poly Data (.vtk)	Ventricles.vtk	C:/SlicerData/Slicer3VisualizationDataset/models
☐	Vessels	Model	Not Modified	Poly Data (.vtk)	Vessels.vtk	C:/SlicerData/Slicer3VisualizationDataset/models

Saving Data

Click on Save Selected



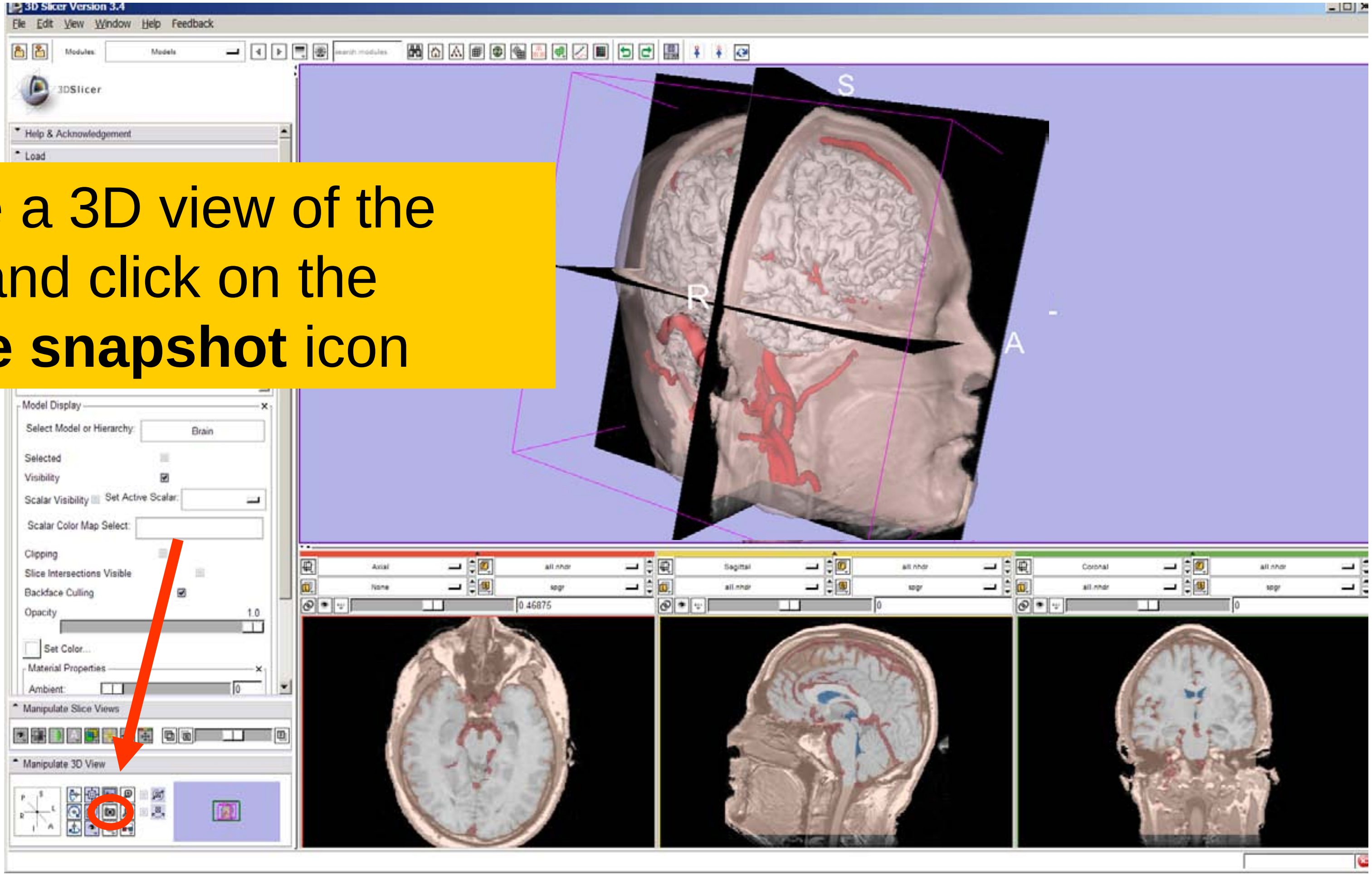
Save Scene and Unsaved Data

Save Scene & Data Options

Change Destination for All Selected: C:/SlicerData/Slicer3VisualizationDataset/

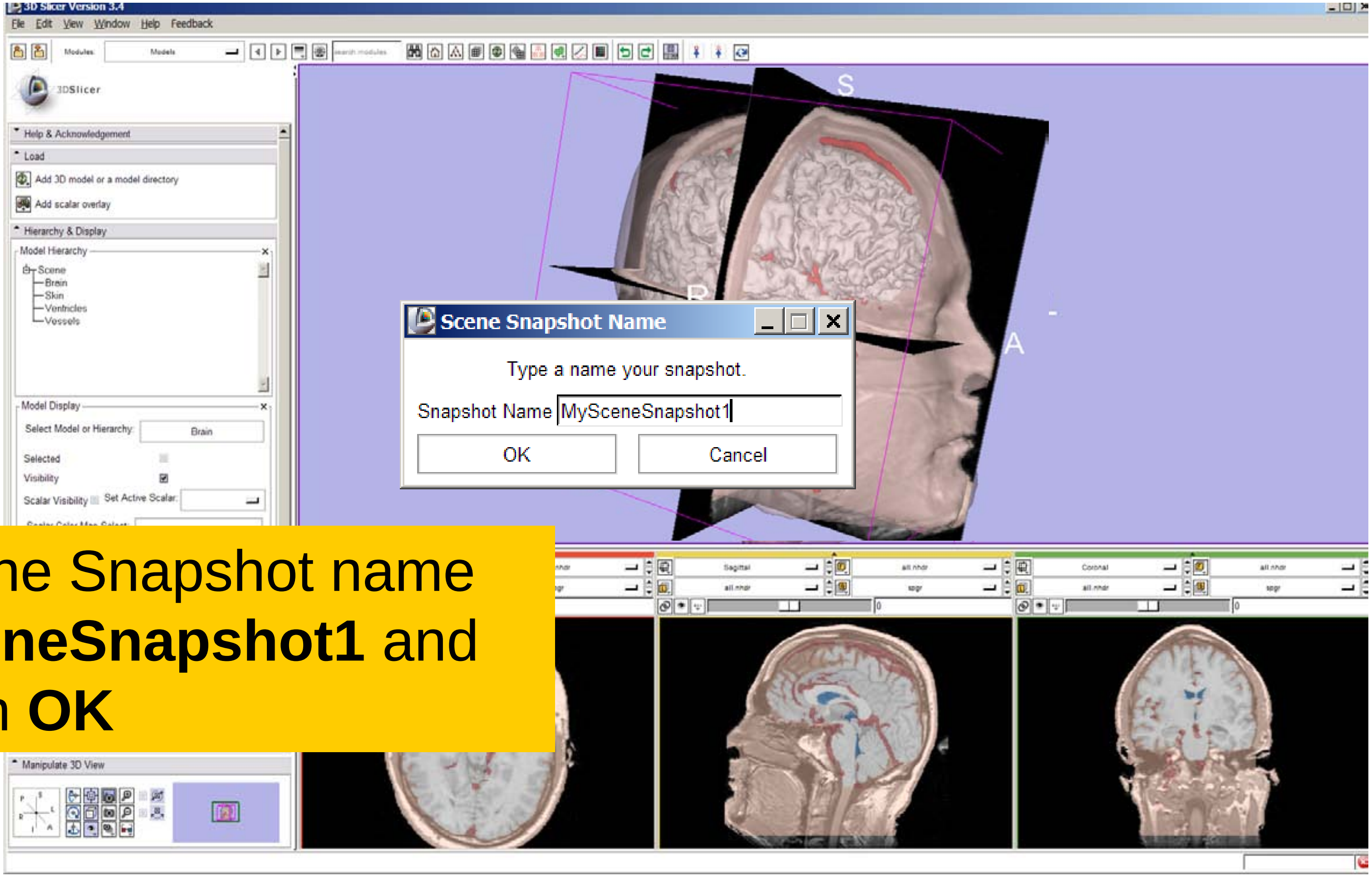
Select	Node Name	Node Type	Node Status	File Format	File Name	Data Directory
☑	(Scene Des...	(SCENE)	Modified	MRML (.mrml)	Slicer3DScene	C:/SlicerData/Slicer3VisualizationDataset/
☐	spgr	Volume	Not Modified	NRRD (.nhdr)	spgr.nhdr	C:/SlicerData/Slicer3VisualizationDataset/nrrd
☐	all.nhdr	Volume	Not Modified	NRRD (.nhdr)	all.nhdr	C:/SlicerData/Slicer3VisualizationDataset/nrrd
☐	Brain	Model	Not Modified	Poly Data (.vtk)	Brain.vtk	C:/SlicerData/Slicer3VisualizationDataset/models
☐	Skin	Model	Not Modified	Poly Data (.vtk)	Skin.vtk	C:/SlicerData/Slicer3VisualizationDataset/models
☐	Ventricles	Model	Not Modified	Poly Data (.vtk)	Ventricles.vtk	C:/SlicerData/Slicer3VisualizationDataset/models
☐	Vessels	Model	Not Modified	Poly Data (.vtk)	Vessels.vtk	C:/SlicerData/Slicer3VisualizationDataset/models

Creating Scene Snapshots


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Models
3DSlicer
Help & Acknowledgement
Load
Model Display
Select Model or Hierarchy: Brain
Selected
Visibility
Scalar Visibility
Set Active Scalar:
Scalar Color Map Select:
Clipping
Slice Intersections Visible
Backface Culling
Opacity 1.0
Set Color...
Material Properties
Ambient: 0
Manipulate Slice Views
Manipulate 3D View
S
R
A
Axial
Sagittal
Coronal
0.46875

Choose a 3D view of the scene and click on the **capture snapshot** icon

Creating Scene Snapshots


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Models
Help & Acknowledgement
Load
Add 3D model or a model directory
Add scalar overlay
Hierarchy & Display
Model Hierarchy
Scene
Brain
Skin
Ventricles
Vessels
Model Display
Select Model or Hierarchy: Brain
Selected
Visibility
Scalar Visibility
Set Active Scalar:
Manipulate 3D View
S
R
A
Sagittal
Coronal

Scene Snapshot Name

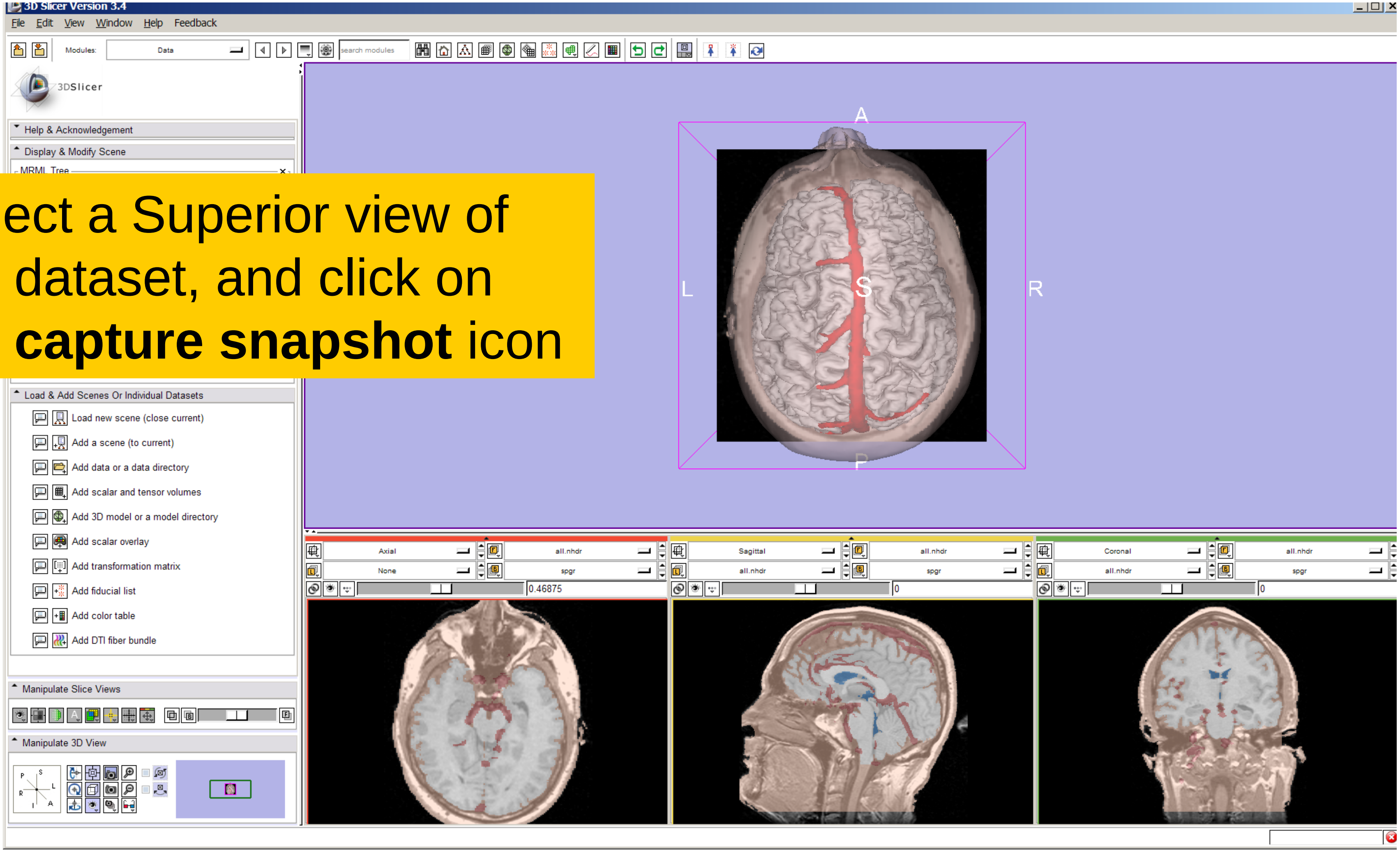
Type a name your snapshot.

Snapshot Name: MySceneSnapshot1

OK
Cancel

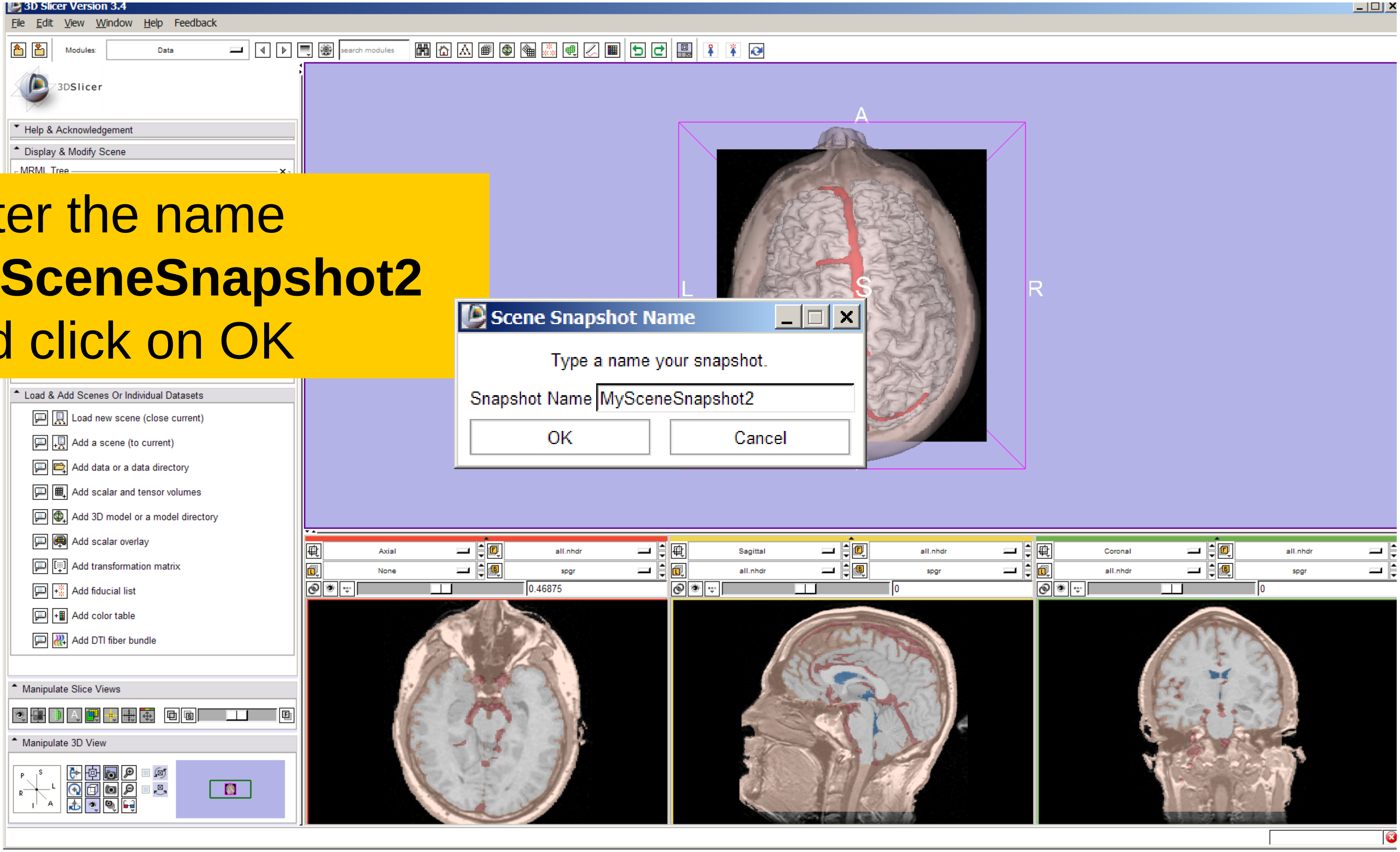
Enter the Snapshot name **MySceneSnapshot1** and click on **OK**

Creating Scene Snapshots


3D Slicer Version 3.4
File
Edit
View
Window
Help
Feedback
Modules:
Data
search modules
3DSlicer
Help & Acknowledgement
Display & Modify Scene
MRML Tree
Load & Add Scenes Or Individual Datasets
Load new scene (close current)
Add a scene (to current)
Add data or a data directory
Add scalar and tensor volumes
Add 3D model or a model directory
Add scalar overlay
Add transformation matrix
Add fiducial list
Add color table
Add DTI fiber bundle
Manipulate Slice Views
Manipulate 3D View
A
L
S
R
P
Axial
all.nhdr
None
spgr
0.46875
Sagittal
all.nhdr
all.nhdr
spgr
0
Coronal
all.nhdr
all.nhdr
spgr
0

Select a Superior view of the dataset, and click on the **capture snapshot** icon

Creating Scene Snapshots


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Data
Help & Acknowledgement
Display & Modify Scene
MRML Tree
Load & Add Scenes Or Individual Datasets
Load new scene (close current)
Add a scene (to current)
Add data or a data directory
Add scalar and tensor volumes
Add 3D model or a model directory
Add scalar overlay
Add transformation matrix
Add fiducial list
Add color table
Add DTI fiber bundle
Manipulate Slice Views
Manipulate 3D View
A
L
S
R
Axial
Sagittal
Coronal
all.nhdr
None
spgr
0.46875
0

Scene Snapshot Name

Type a name your snapshot.

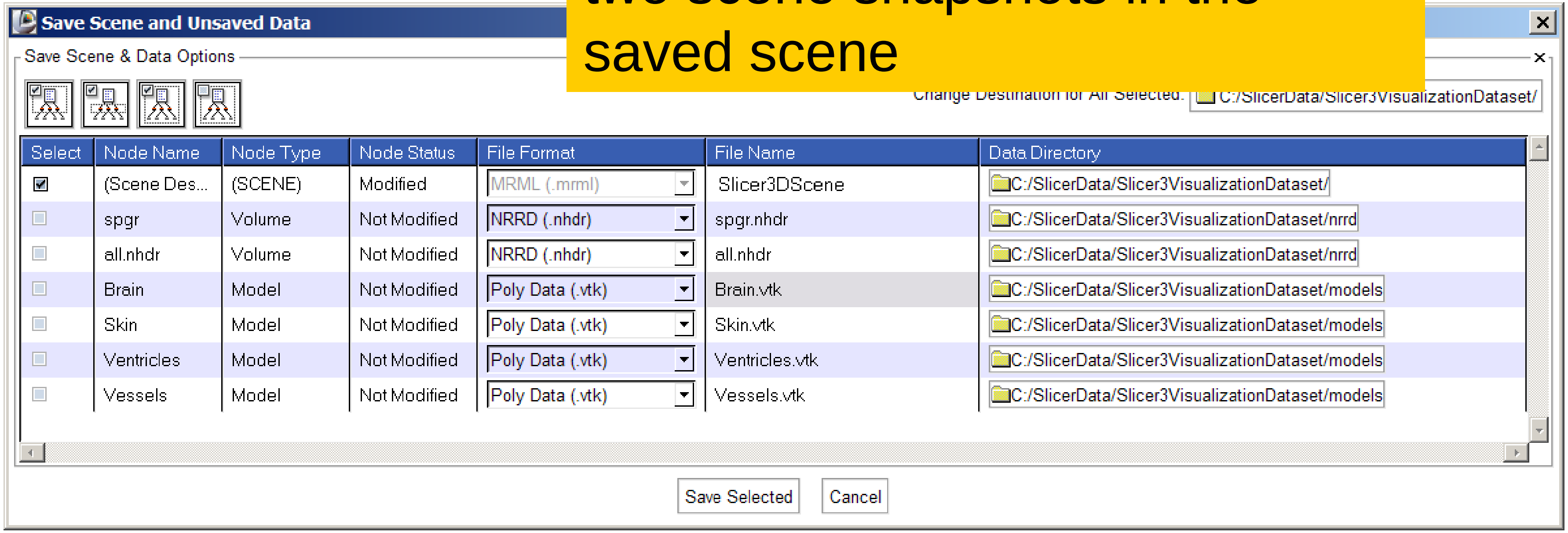
Snapshot Name: MySceneSnapshot2

OK
Cancel

Enter the name **MySceneSnapshot2** and click on OK

Creating Scene Snapshots

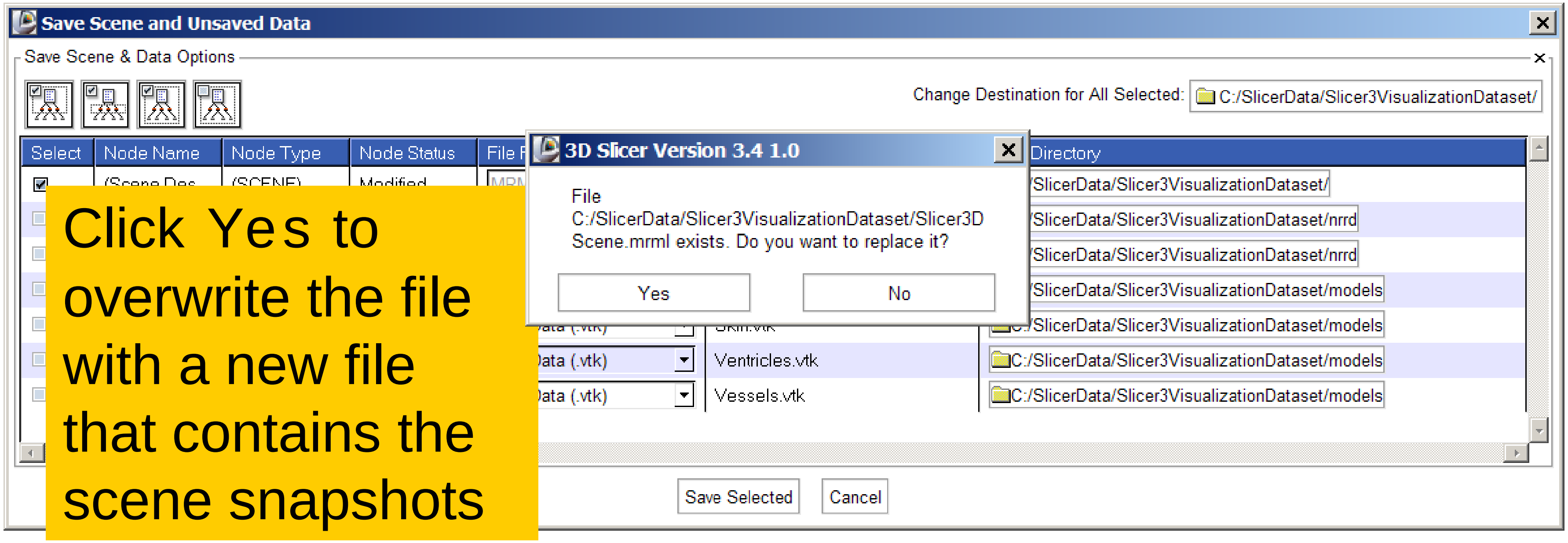
Select **File→ Save** and click on **Save Selected** to include the two scene snapshots in the saved scene



Change Destination for All Selected: C:/SlicerData/Slicer3VisualizationDataset/

Select	Node Name	Node Type	Node Status	File Format	File Name	Data Directory
☑	(Scene Des...	(SCENE)	Modified	MRML (.mrml)	Slicer3DScene	C:/SlicerData/Slicer3VisualizationDataset/
☐	spgr	Volume	Not Modified	NRRD (.nhdr)	spgr.nhdr	C:/SlicerData/Slicer3VisualizationDataset/nrrd
☐	all.nhdr	Volume	Not Modified	NRRD (.nhdr)	all.nhdr	C:/SlicerData/Slicer3VisualizationDataset/nrrd
☐	Brain	Model	Not Modified	Poly Data (.vtk)	Brain.vtk	C:/SlicerData/Slicer3VisualizationDataset/models
☐	Skin	Model	Not Modified	Poly Data (.vtk)	Skin.vtk	C:/SlicerData/Slicer3VisualizationDataset/models
☐	Ventricles	Model	Not Modified	Poly Data (.vtk)	Ventricles.vtk	C:/SlicerData/Slicer3VisualizationDataset/models
☐	Vessels	Model	Not Modified	Poly Data (.vtk)	Vessels.vtk	C:/SlicerData/Slicer3VisualizationDataset/models

Creating Scene Snapshots



Click Yes to overwrite the file with a new file that contains the scene snapshots

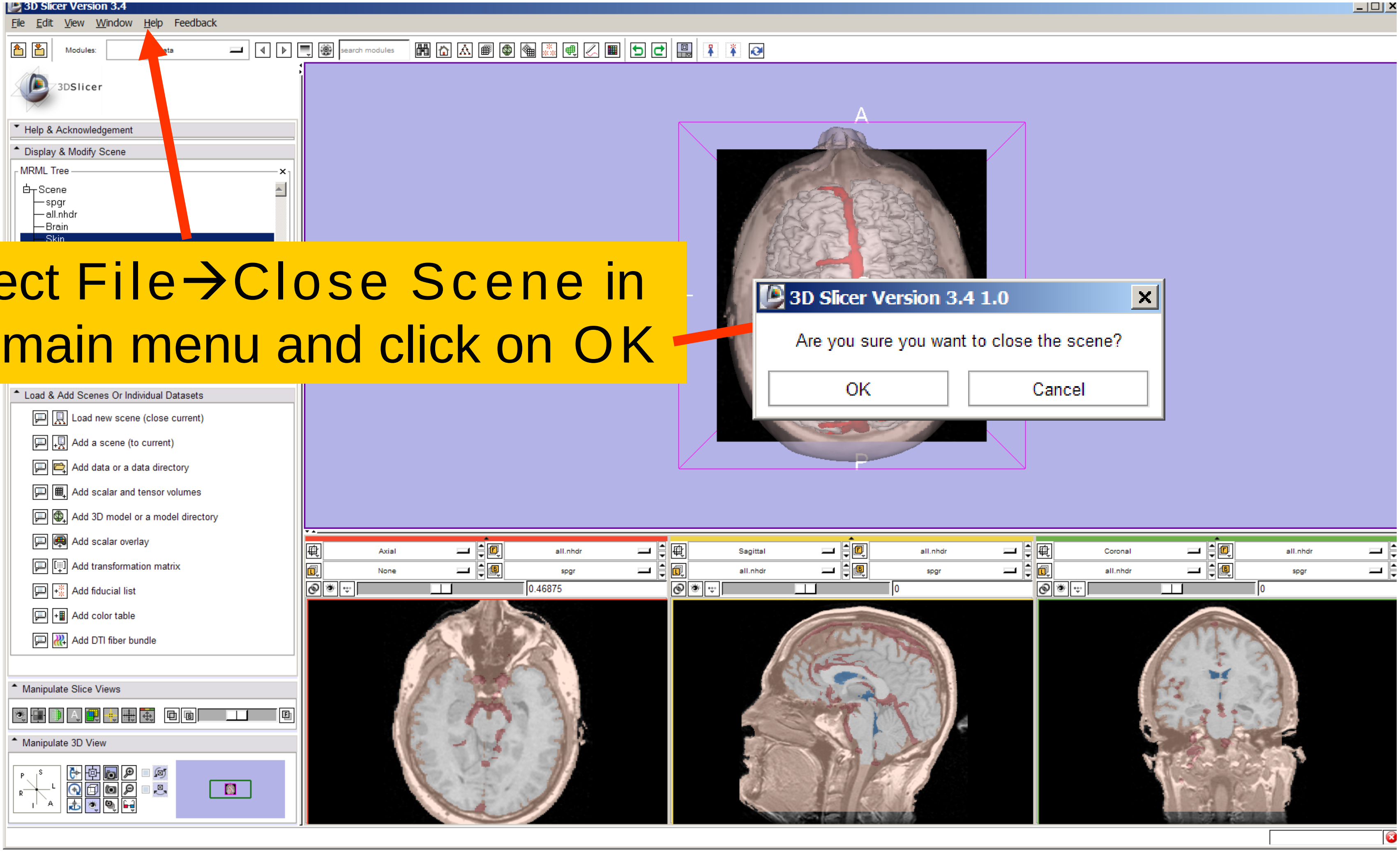
Save Scene and Unsaved Data

3D Slicer Version 3.4 1.0

File C:/SlicerData/Slicer3VisualizationDataset/Slicer3D Scene.mrml exists. Do you want to replace it?

Yes
No
Save Scene & Data Options
Change Destination for All Selected: C:/SlicerData/Slicer3VisualizationDataset/
Select
Node Name
Node Type
Node Status
Directory
Ventricles.vtk
Vessels.vtk
Save Selected
Cancel

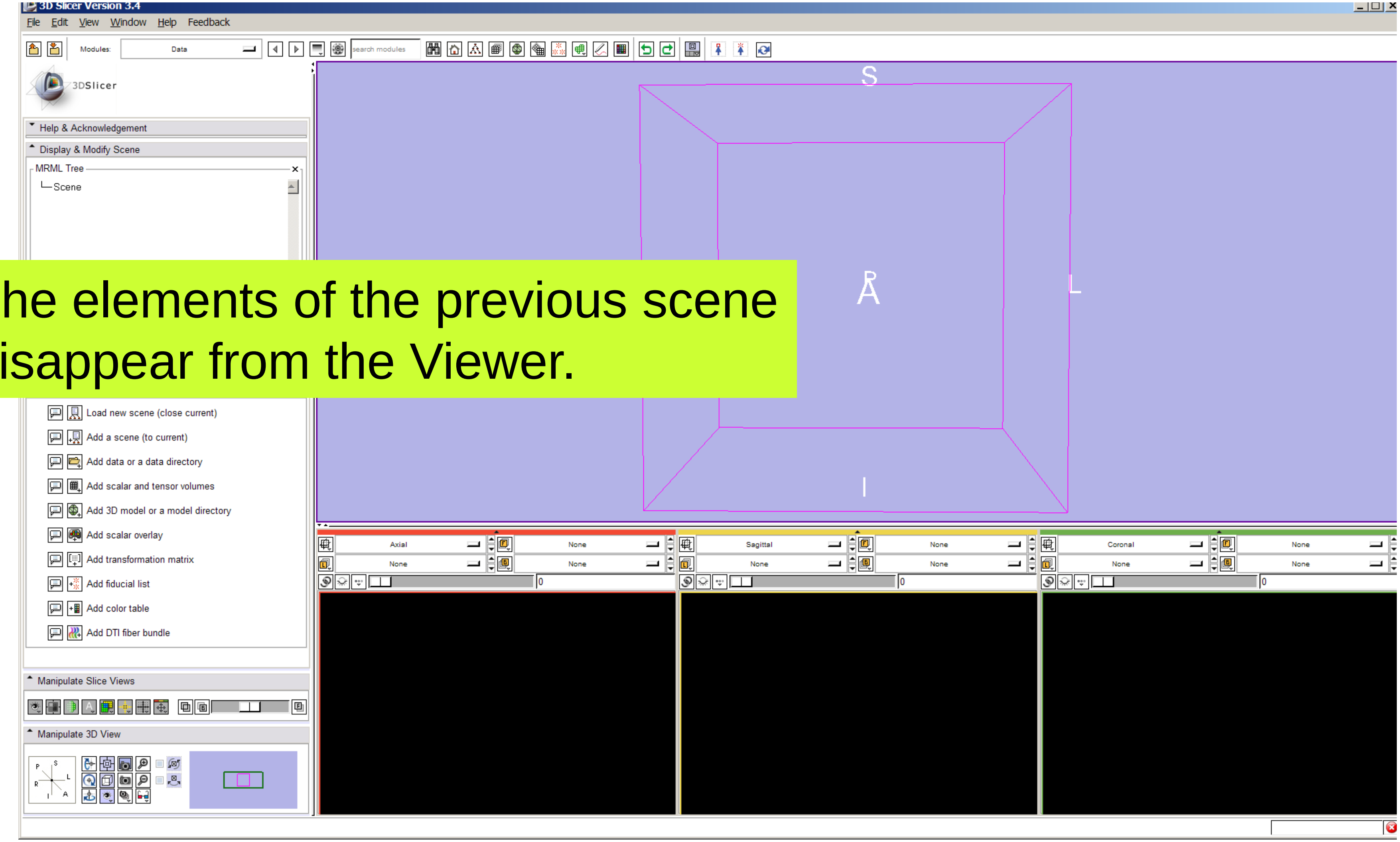
Saving Data


3D Slicer Version 3.4
File
Edit
View
Window
Help
Feedback
Modules:
search modules
3DSlicer
Help & Acknowledgement
Display & Modify Scene
MRML Tree
Scene
spgr
all.nhdr
Brain
Skin
Load & Add Scenes Or Individual Datasets
Load new scene (close current)
Add a scene (to current)
Add data or a data directory
Add scalar and tensor volumes
Add 3D model or a model directory
Add scalar overlay
Add transformation matrix
Add fiducial list
Add color table
Add DTI fiber bundle
Manipulate Slice Views
Manipulate 3D View
A
P
3D Slicer Version 3.4 1.0
OK
Cancel
Axial
None
all.nhdr
spgr
0.46875
Sagittal
Coronal
0

Are you sure you want to close the scene?

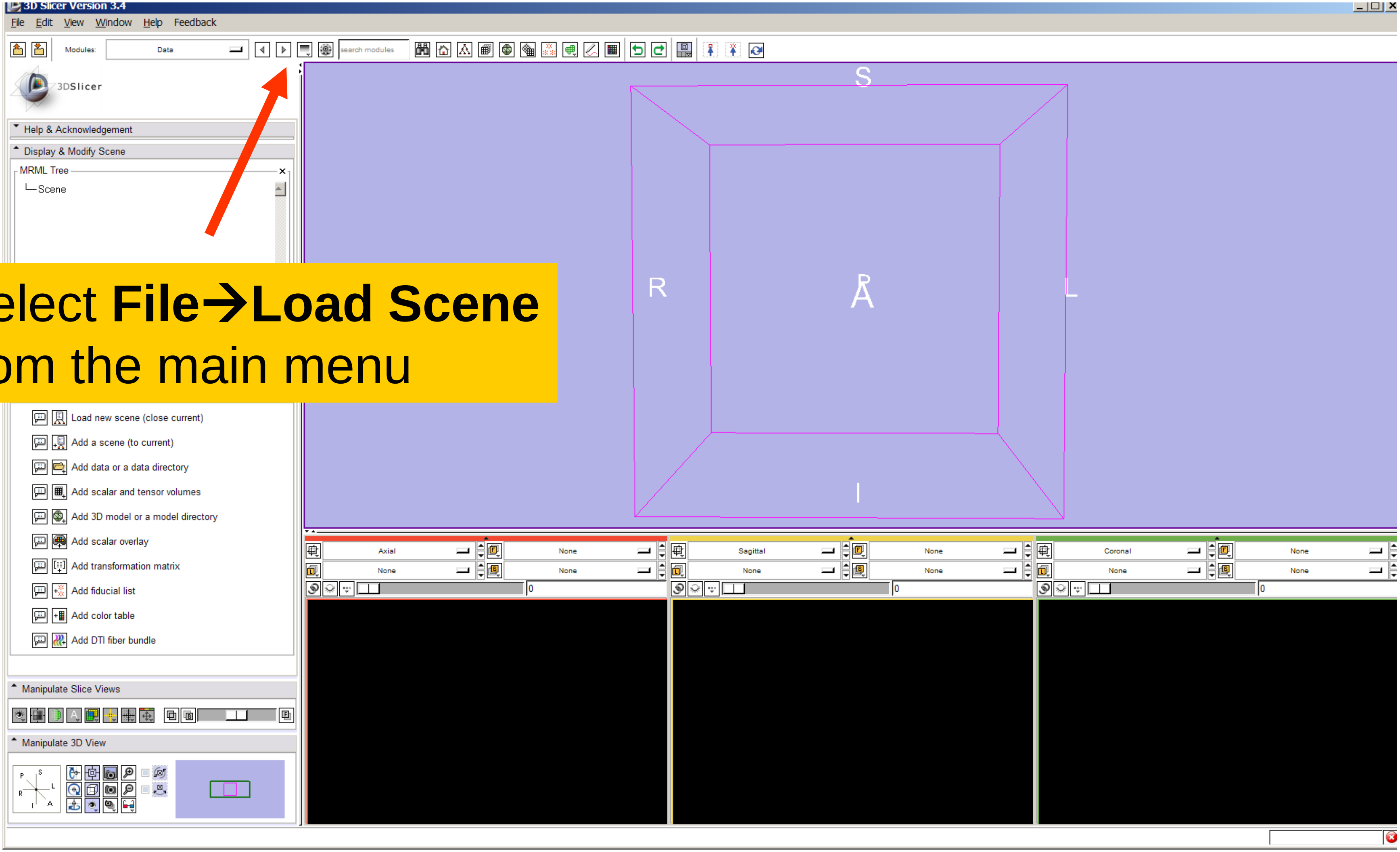
Select File→Close Scene in the main menu and click on OK

Saving Data


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Data
search modules
3DSlicer
Help & Acknowledgement
Display & Modify Scene
MRML Tree
Scene
Load new scene (close current)
Add a scene (to current)
Add data or a data directory
Add scalar and tensor volumes
Add 3D model or a model directory
Add scalar overlay
Add transformation matrix
Add fiducial list
Add color table
Add DTI fiber bundle
Manipulate Slice Views
Manipulate 3D View
S
R
A
L
I
Axial
Sagittal
Coronal
None

The elements of the previous scene disappear from the Viewer.

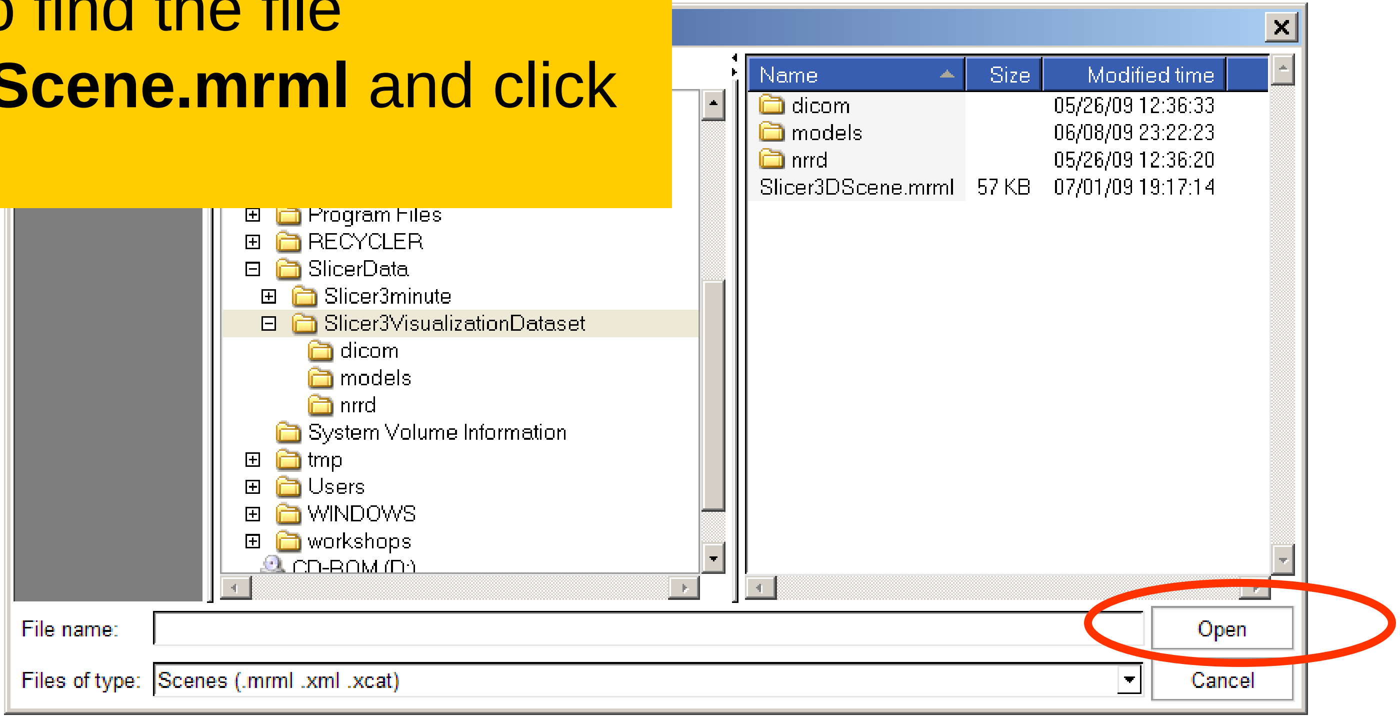
Saving Data


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Data
search modules
3DSlicer
Help & Acknowledgement
Display & Modify Scene
MRML Tree
Scene
Load new scene (close current)
Add a scene (to current)
Add data or a data directory
Add scalar and tensor volumes
Add 3D model or a model directory
Add scalar overlay
Add transformation matrix
Add fiducial list
Add color table
Add DTI fiber bundle
Manipulate Slice Views
Manipulate 3D View
S
R
A
L
I
Axial
Sagittal
Coronal
None

Select **File→Load Scene** from the main menu

Saving Data

Browse to find the file **Slicer3DScene.mrml** and click on **Open**



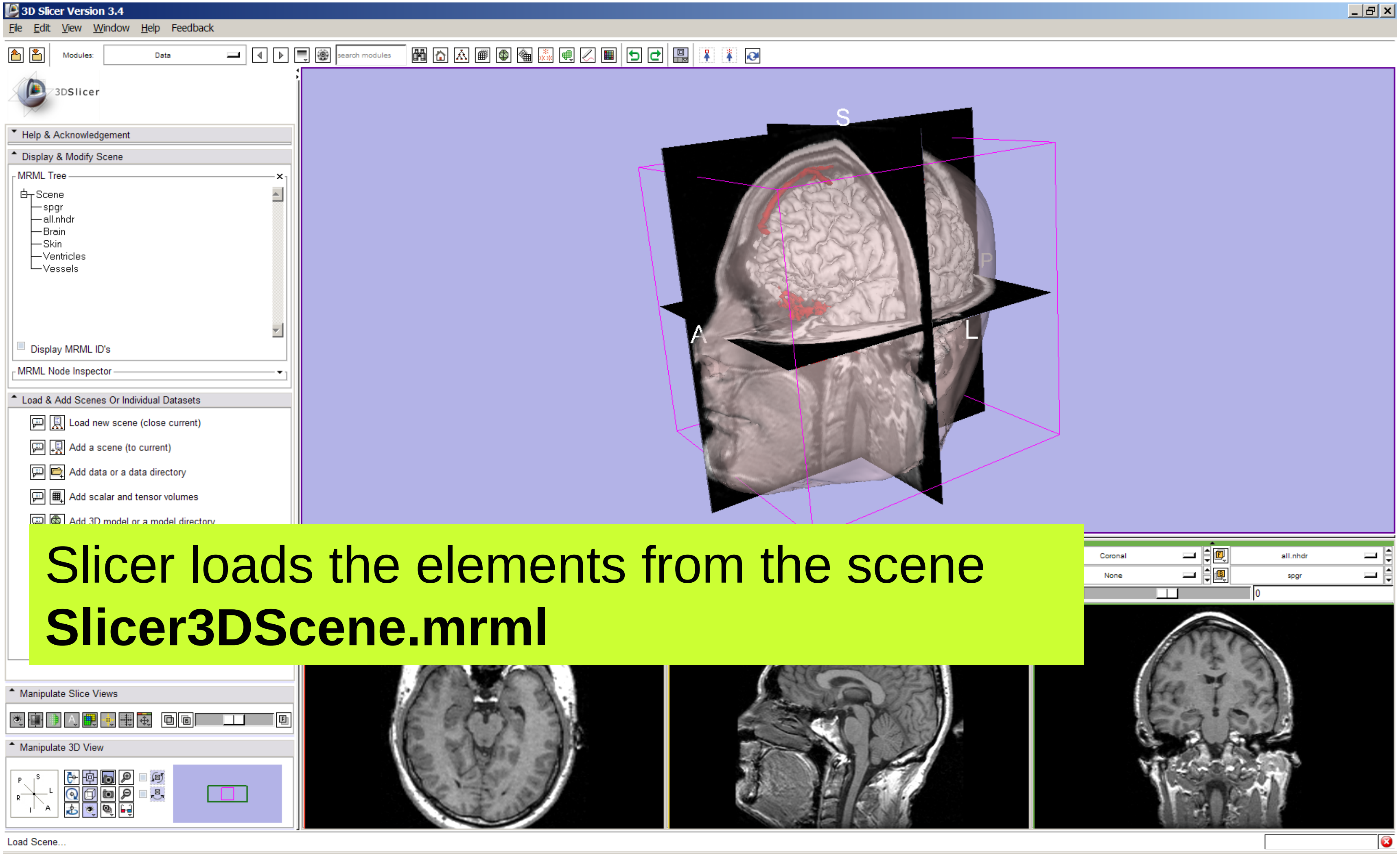
Name	Size	Modified time
dicom		05/26/09 12:36:33
models		06/08/09 23:22:23
nrrd		05/26/09 12:36:20
Slicer3DScene.mrml	57 KB	07/01/09 19:17:14

Program Files
RECYCLER
SlicerData
Slicer3minute
Slicer3VisualizationDataset
dicom
models
nrrd
System Volume Information
tmp
Users
WINDOWS
workshops
CD-ROM (D:)
Open
Cancel

File name:

Files of type: Scenes (.mrml .xml .xcat)

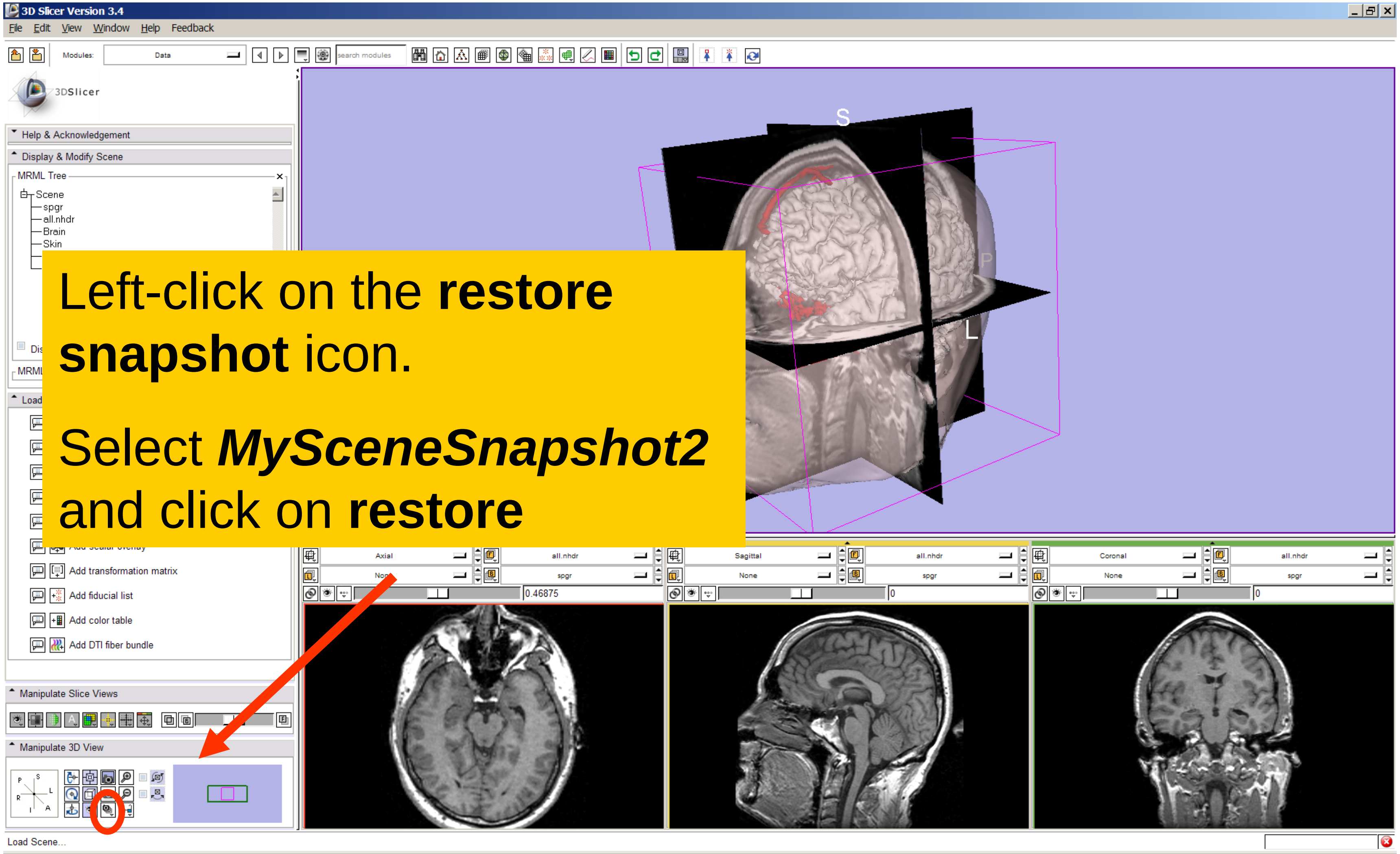
Loading a Scene


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Data
search modules
3DSlicer
Help & Acknowledgement
Display & Modify Scene
MRML Tree
Scene
spgr
all.nhdr
Brain
Skin
Ventricles
Vessels
Display MRML ID's
MRML Node Inspector
Load & Add Scenes Or Individual Datasets
Load new scene (close current)
Add a scene (to current)
Add data or a data directory
Add scalar and tensor volumes
Add 3D model or a model directory
Manipulate Slice Views
Manipulate 3D View
S
P
A
L
Coronal
None
all.nhdr
spgr
0
Load Scene...

Slicer loads the elements from the scene

Slicer3DScene.mrml

Loading a Scene

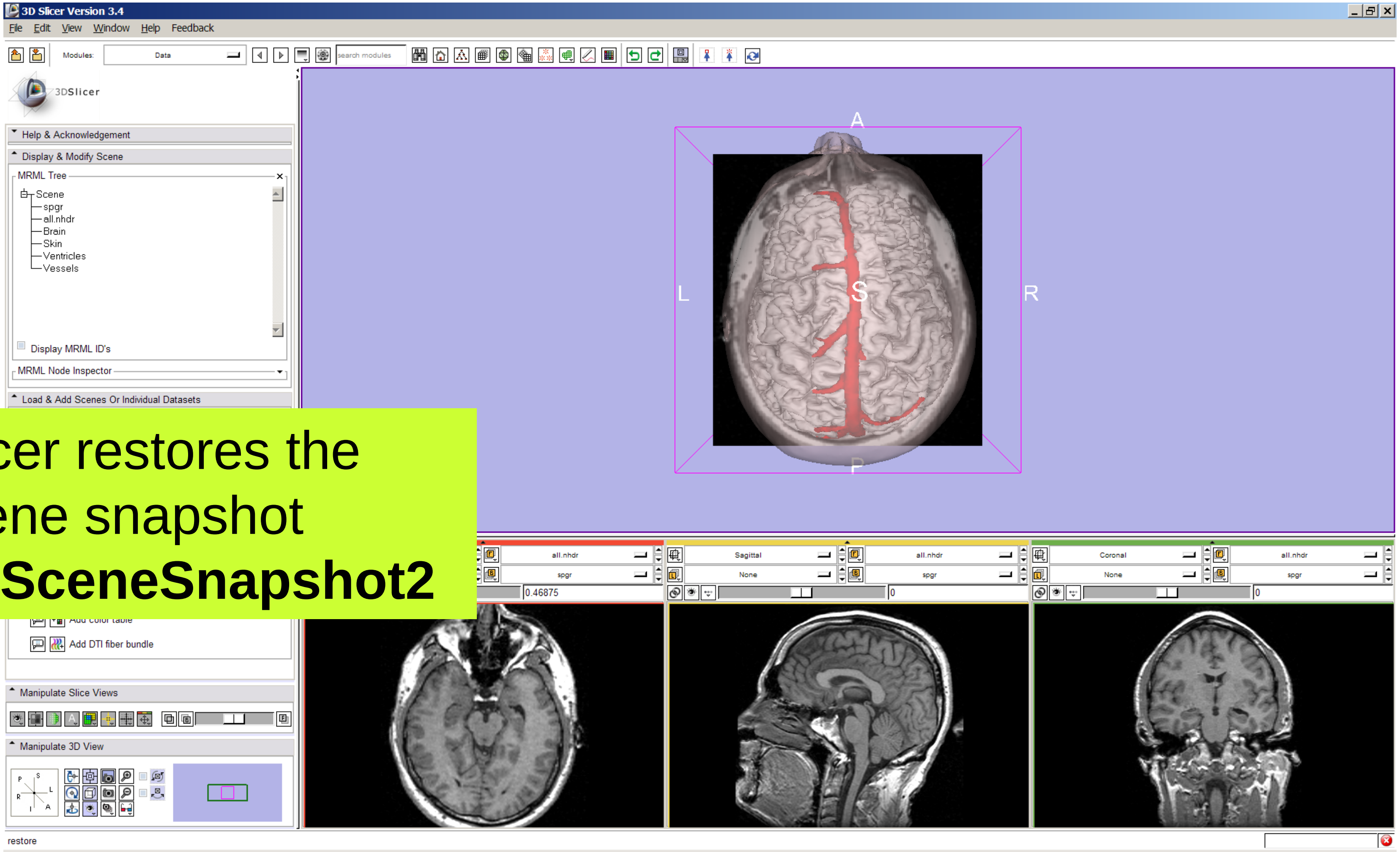


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Data
Help & Acknowledgement
Display & Modify Scene
MRML Tree
Scene
spgr
all.nhdr
Brain
Skin
Add transformation matrix
Add fiducial list
Add color table
Add DTI fiber bundle
Manipulate Slice Views
Manipulate 3D View
Axial
Sagittal
Coronal
Load Scene...

Left-click on the **restore snapshot** icon.

Select ***MySceneSnapshot2*** and click on **restore**

Loading a Scene


3D Slicer Version 3.4
File Edit View Window Help Feedback
Modules: Data
search modules
3DSlicer
Help & Acknowledgement
Display & Modify Scene
MRML Tree
Scene
spgr
all.nhdr
Brain
Skin
Ventricles
Vessels
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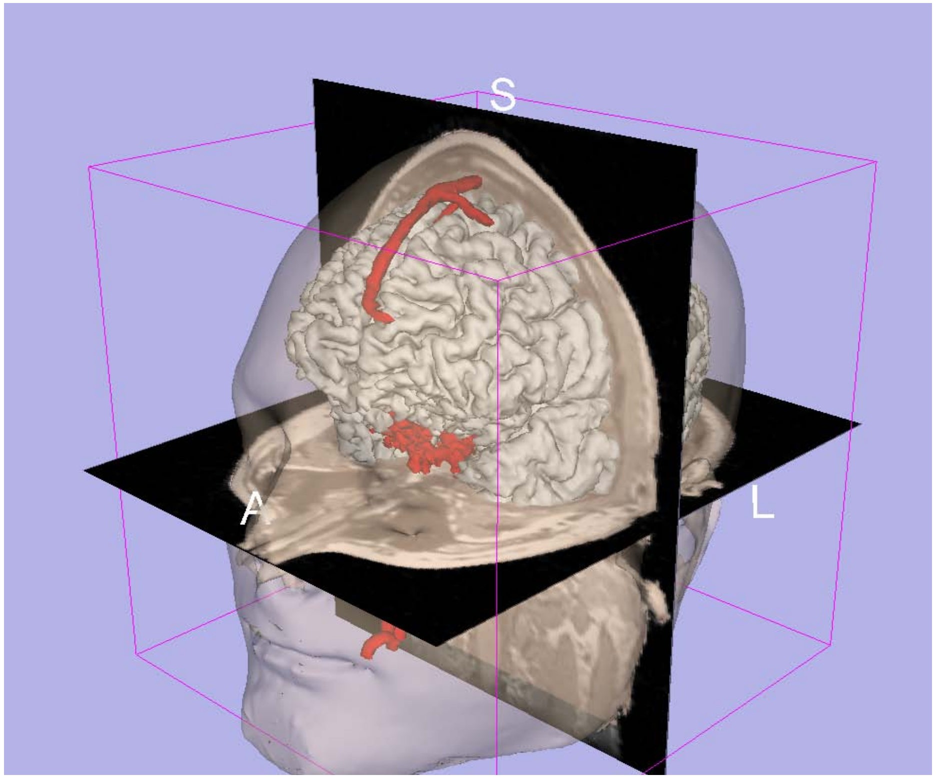
MRML Node Inspector
Load & Add Scenes Or Individual Datasets
Add color table
Add DTI fiber bundle
Manipulate Slice Views
Manipulate 3D View
A
L
S
R
P
all.nhdr
spgr
0.46875
Sagittal
None
0
Coronal
restore

Slicer restores the scene snapshot **MySceneSnapshot2**

Conclusion



- 3D visualization of anatomical surface reconstructions
- 3D interaction with volumes and models
- Open-source platform

Acknowledgments

National Alliance for Medical Image Computing

NIH U54EB005149

Neuroimage Analysis Center

NIH P41RR013218