

Slicer3 minute tutorial

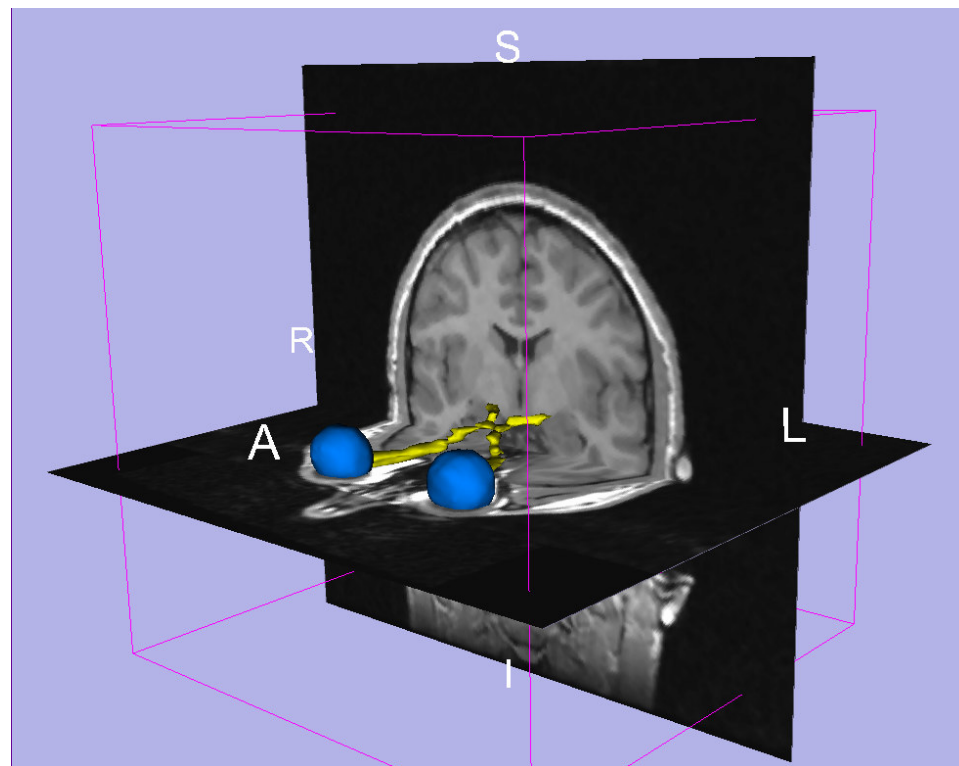
Sonia Pujol, Ph.D.

Surgical Planning Laboratory
Harvard Medical School



Slicer3 minute tutorial

This tutorial is a short introduction to the advanced **3D visualization** capabilities of the **Slicer3** software for medical image analysis.





The Slicer3 software

- 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





Download the material

Slicer3 is a **multi-platform** software running on **Windows, Linux, and Mac OSX.**

- Download and install the Slicer3.4 software from the Slicer web site


<http://www.slicer.org/pages/Special:SlicerDownloads>



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.

Download Slicer3.4

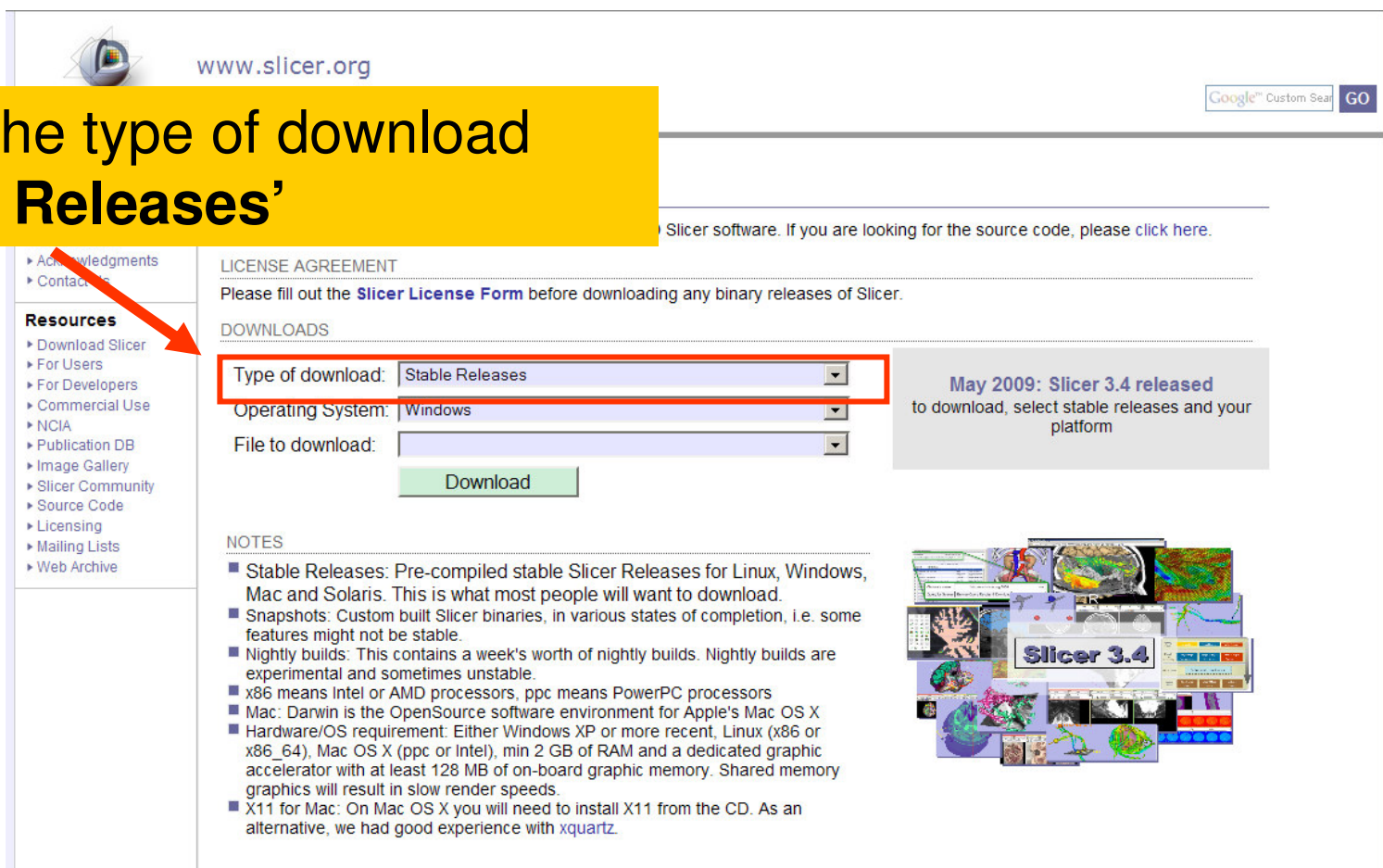


The screenshot shows the 'Slicer Downloads' page on the website www.slicer.org. The page includes a navigation menu on the left with sections for 'About Slicer' and 'Resources'. The main content area features a 'Slicer Downloads' heading, a brief introduction, a 'LICENSE AGREEMENT' section, and a 'DOWNLOADS' section with three dropdown menus for 'Type of download' (set to 'Stable Releases'), 'Operating System' (set to 'Windows'), and 'File to download'. A green 'Download' button is positioned below these menus. A grey callout box on the right states 'May 2009: Slicer 3.4 released to download, select stable releases and your platform'. Below the download section, there is a 'NOTES' section with two bullet points: 'Stable Releases: Pre-compiled stable Slicer Releases for Linux, Windows, Mac and Solaris. This is what most people will want to download.' and 'Snapshots: Custom built Slicer binaries, in various states of completion, i.e. some features might not be stable.' To the right of the notes is a collage of medical image analysis software screenshots.

Slicer3 is under active development by the medical research community. Frequent releases incorporating cutting-edge medical image analysis capabilities. This tutorial uses the current stable **Slicer3.4 release version**.

Download Slicer3.4

Select the type of download
'Stable Releases'



The screenshot shows the website www.slicer.org with a search bar and a navigation menu. A yellow callout box highlights the instruction to select 'Stable Releases' from the 'Type of download' dropdown menu. The dropdown menu is currently set to 'Stable Releases'. Below the dropdown menu, there are fields for 'Operating System' (set to 'Windows') and 'File to download'. A green 'Download' button is visible. To the right, a grey box contains the text 'May 2009: Slicer 3.4 released to download, select stable releases and your platform'. Below this, there is a collage of images showing various 3D medical models and software interfaces, with 'Slicer 3.4' prominently displayed in the center.

www.slicer.org

Google Custom Search GO

Slicer software. If you are looking for the source code, please [click here](#).

Resources

- ▶ Acknowledgments
- ▶ Contact Us
- ▶ Download Slicer
- ▶ For Users
- ▶ For Developers
- ▶ Commercial Use
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- ▶ Publication DB
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- ▶ Slicer Community
- ▶ Source Code
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- ▶ Mailing Lists
- ▶ Web Archive

LICENSE AGREEMENT

Please fill out the [Slicer License Form](#) before downloading any binary releases of Slicer.

DOWNLOADS

Type of download: Stable Releases

Operating System: Windows

File to download:

Download

NOTES

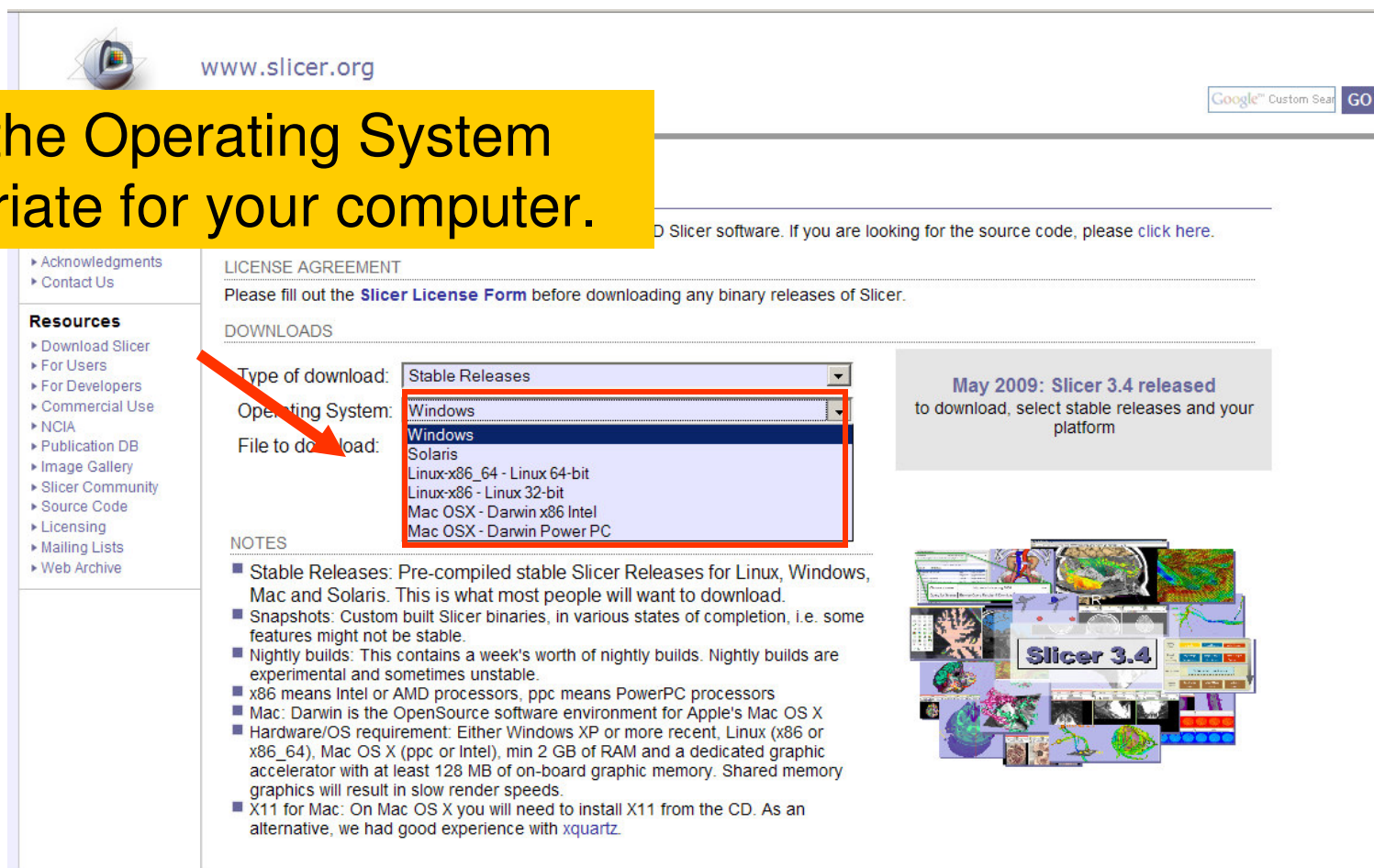
- Stable Releases: Pre-compiled stable Slicer Releases for Linux, Windows, Mac and Solaris. This is what most people will want to download.
- Snapshots: Custom built Slicer binaries, in various states of completion, i.e. some features might not be stable.
- Nightly builds: This contains a week's worth of nightly builds. Nightly builds are experimental and sometimes unstable.
- x86 means Intel or AMD processors, ppc means PowerPC processors
- Mac: Darwin is the OpenSource software environment for Apple's Mac OS X
- Hardware/OS requirement: Either Windows XP or more recent, Linux (x86 or x86_64), Mac OS X (ppc or Intel), min 2 GB of RAM and a dedicated graphic accelerator with at least 128 MB of on-board graphic memory. Shared memory graphics will result in slow render speeds.
- X11 for Mac: On Mac OS X you will need to install X11 from the CD. As an alternative, we had good experience with [xquartz](#).

May 2009: Slicer 3.4 released
to download, select stable releases and your platform

Slicer 3.4

Download Slicer3.4

Select the Operating System appropriate for your computer.



The screenshot shows the Slicer website's download page. At the top left is the Slicer logo and the URL 'www.slicer.org'. A Google Custom Search bar is in the top right. A yellow callout box highlights the instruction: 'Select the Operating System appropriate for your computer.' Below this, the page is divided into sections: 'LICENSE AGREEMENT', 'DOWNLOADS', and 'NOTES'. In the 'DOWNLOADS' section, there are three dropdown menus: 'Type of download:' (set to 'Stable Releases'), 'Operating System:' (with a dropdown menu open showing 'Windows', 'Solaris', 'Linux-x86_64 - Linux 64-bit', 'Linux-x86 - Linux 32-bit', 'Mac OSX - Darwin x86 Intel', and 'Mac OSX - Darwin Power PC'), and 'File to download:'. A red arrow points to the 'Operating System' dropdown. To the right of the dropdowns is a grey box with the text: 'May 2009: Slicer 3.4 released to download, select stable releases and your platform'. Below this is a collage of images showing Slicer 3.4 in use, with a central label 'Slicer 3.4'. The 'NOTES' section contains a list of bullet points providing details about stable releases, snapshots, nightly builds, and hardware requirements for various operating systems.

www.slicer.org

Google Custom Search GO

Download Slicer software. If you are looking for the source code, please [click here](#).

Resources

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DOWNLOADS

Type of download: Stable Releases

Operating System: Windows

File to download:

NOTES

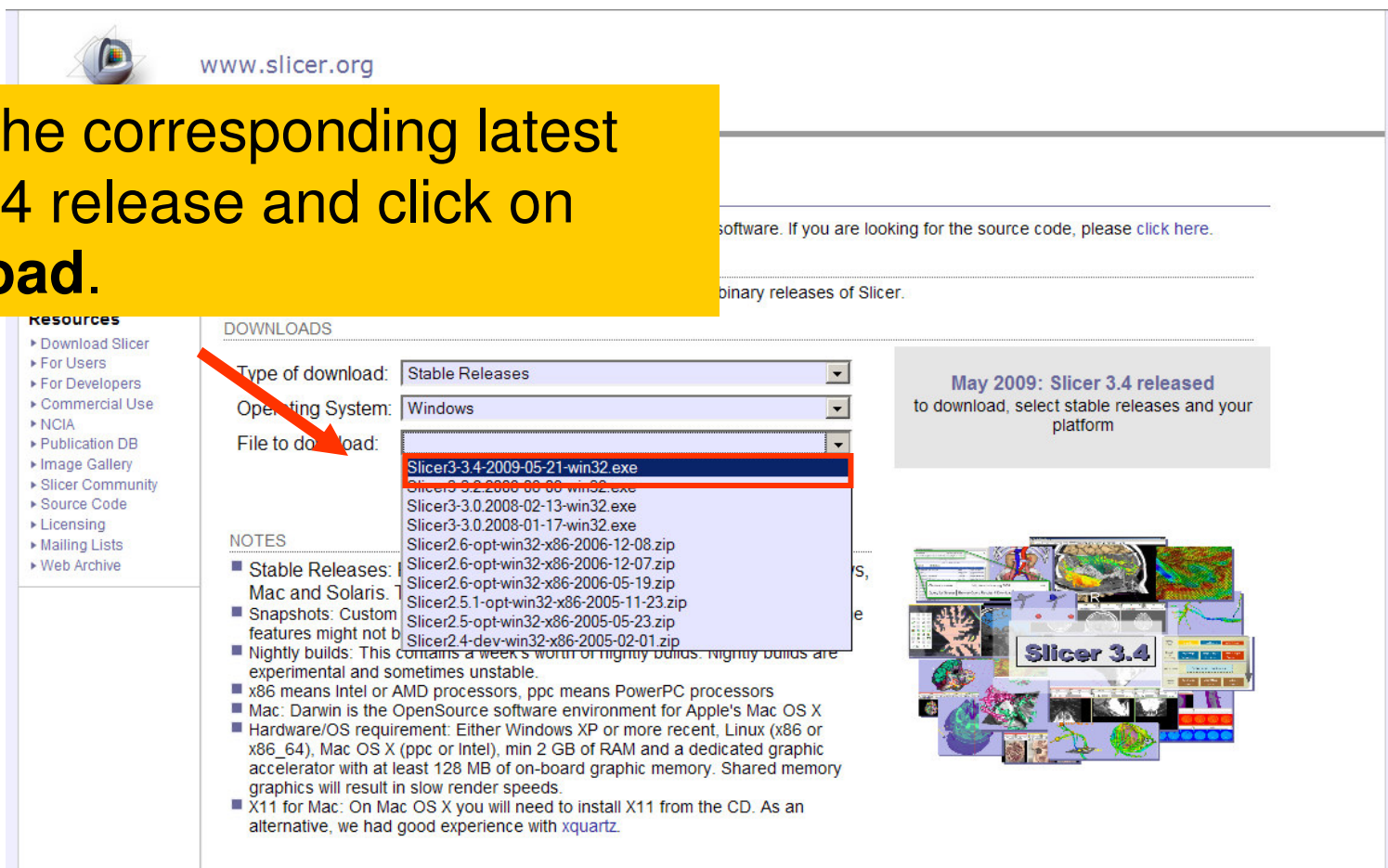
- **Stable Releases:** Pre-compiled stable Slicer Releases for Linux, Windows, Mac and Solaris. This is what most people will want to download.
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- **Nightly builds:** This contains a week's worth of nightly builds. Nightly builds are experimental and sometimes unstable.
- **x86** means Intel or AMD processors, **ppc** means PowerPC processors
- **Mac:** Darwin is the OpenSource software environment for Apple's Mac OS X
- **Hardware/OS requirement:** Either Windows XP or more recent, Linux (x86 or x86_64), Mac OS X (ppc or Intel), min 2 GB of RAM and a dedicated graphic accelerator with at least 128 MB of on-board graphic memory. Shared memory graphics will result in slow render speeds.
- **X11 for Mac:** On Mac OS X you will need to install X11 from the CD. As an alternative, we had good experience with `xquartz`.

May 2009: Slicer 3.4 released
to download, select stable releases and your platform

Slicer 3.4

Download Slicer3.4

Select the corresponding latest Slicer3.4 release and click on **Download.**



The screenshot shows the website www.slicer.org with a navigation menu on the left and a 'DOWNLOADS' section. The 'File to download:' dropdown menu is open, showing a list of files. The file 'Slicer3-3.4-2009-05-21-win32.exe' is highlighted with a red box and a red arrow pointing to it. To the right of the dropdown menu, there is a grey box with the text: 'May 2009: Slicer 3.4 released to download, select stable releases and your platform'. Below this box is a collage of images related to Slicer 3.4, including a 3D model of a hand, a 3D model of a brain, and a 3D model of a heart.

Resources

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DOWNLOADS

Type of download: Stable Releases

Operating System: Windows


File to download:

- Slicer3-3.4-2009-05-21-win32.exe
- Slicer3-3.2-2008-08-08-win32.exe
- Slicer3-3.0-2008-02-13-win32.exe
- Slicer3-3.0-2008-01-17-win32.exe
- Slicer2.6-opt-win32-x86-2006-12-08.zip
- Slicer2.6-opt-win32-x86-2006-12-07.zip
- Slicer2.6-opt-win32-x86-2006-05-19.zip
- Slicer2.5.1-opt-win32-x86-2005-11-23.zip
- Slicer2.5-opt-win32-x86-2005-05-23.zip
- Slicer2.4-dev-win32-x86-2005-02-01.zip

NOTES

- Stable Releases: Mac and Solaris.
- Snapshots: Custom features might not be available.
- Nightly builds: This contains a week's worth of nightly builds. Nightly builds are experimental and sometimes unstable.
- x86 means Intel or AMD processors, ppc means PowerPC processors
- Mac: Darwin is the OpenSource software environment for Apple's Mac OS X
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May 2009: Slicer 3.4 released
to download, select stable releases and your platform

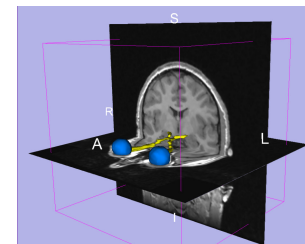




Download the material

Slicer3 is a **multi-platform** software running on **Windows, Linux, and Mac OSX.**

- Download the training dataset:
Slicer3minuteDataset.zip



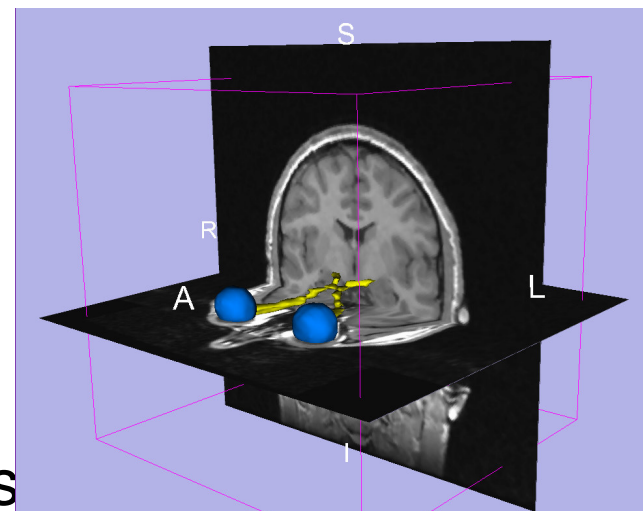
<http://www.slicer.org/slicerWiki/index.php/Slicer3.4:Training>



Tutorial Dataset

- The Slicer3minute dataset is composed of an **MR scan** of the brain and **3D surface reconstructions** of anatomical structures.
- The data are part of the SPL Brain Atlas developed by Talos et al. The atlas is available at:

<http://www.spl.harvard.edu/publications/item/view/1265>

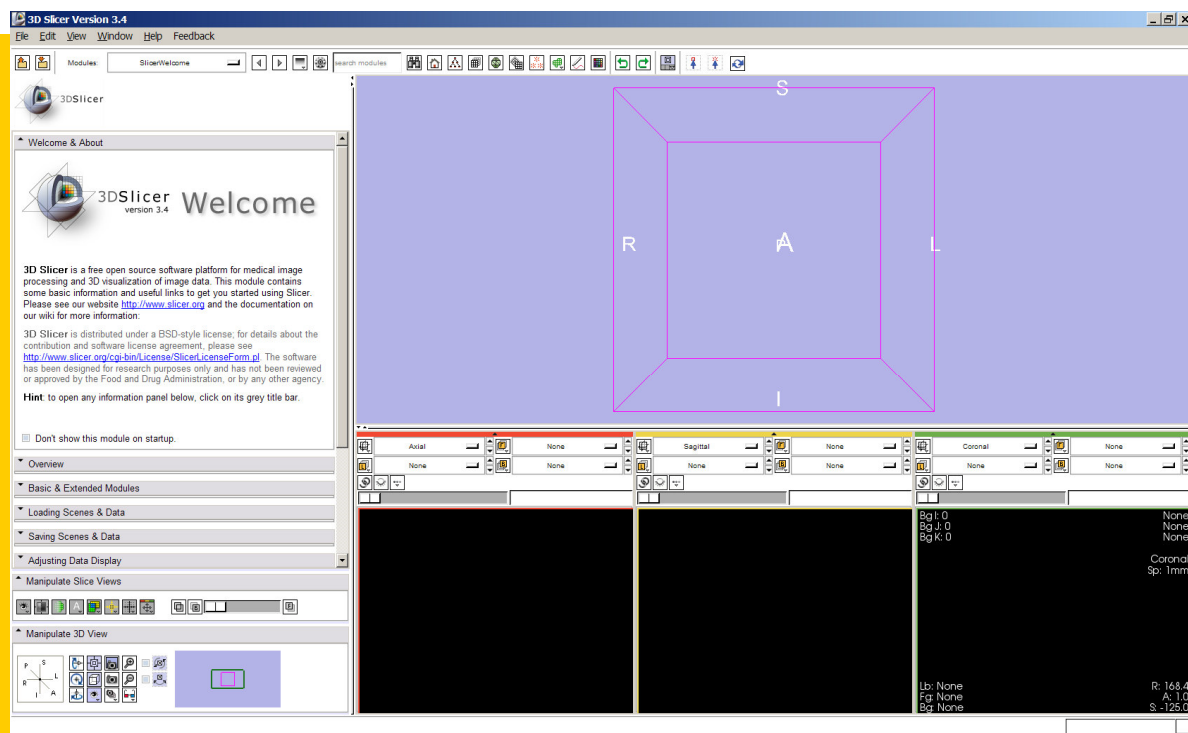




Start Slicer3

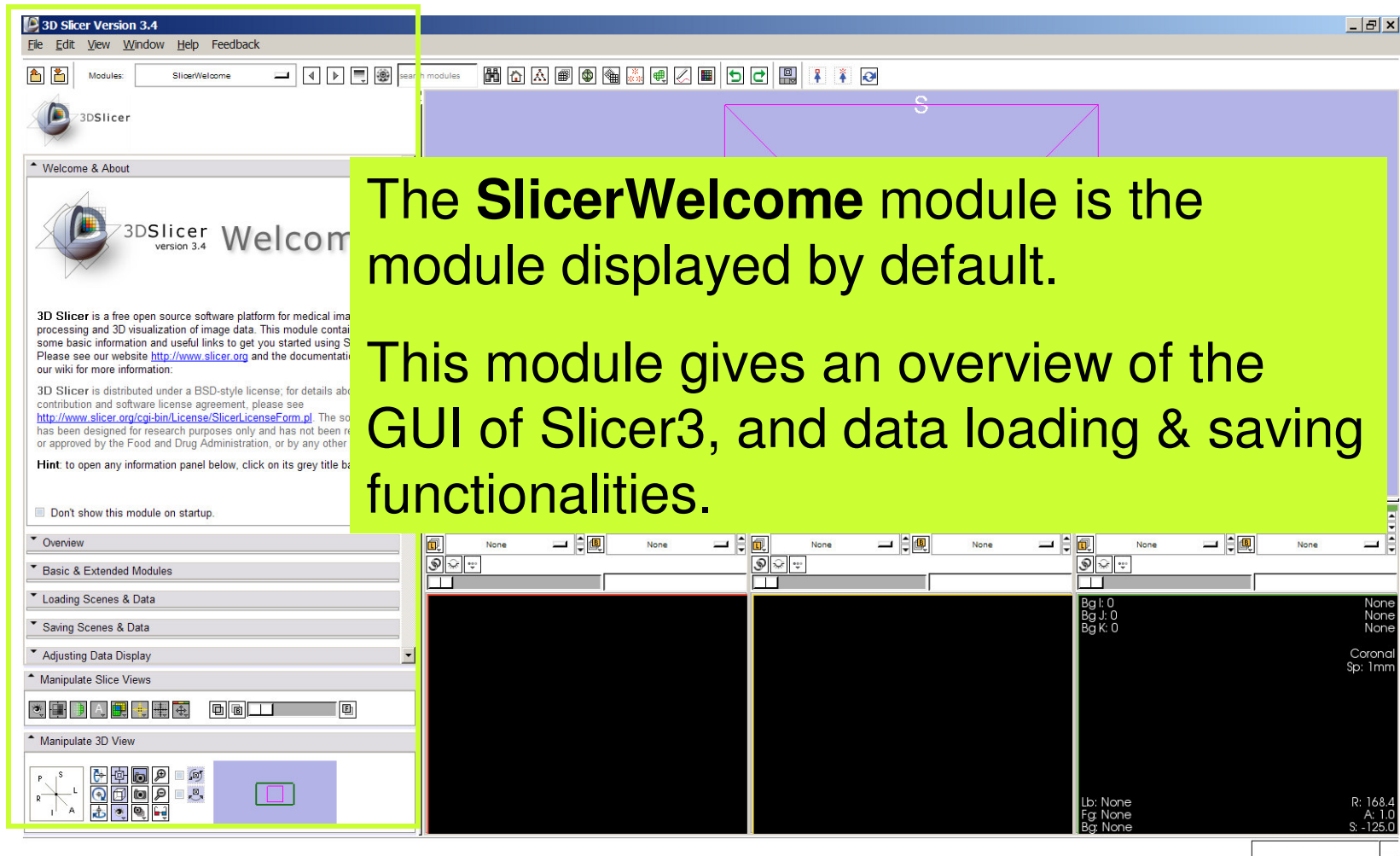
Linux/Mac users
Launch the Slicer3 executable located in the Slicer3.4 directory

Windows users
Select
Start → All Programs
→ Slicer3 3.4 2009-05-21 → Slicer3





Slicer Welcome

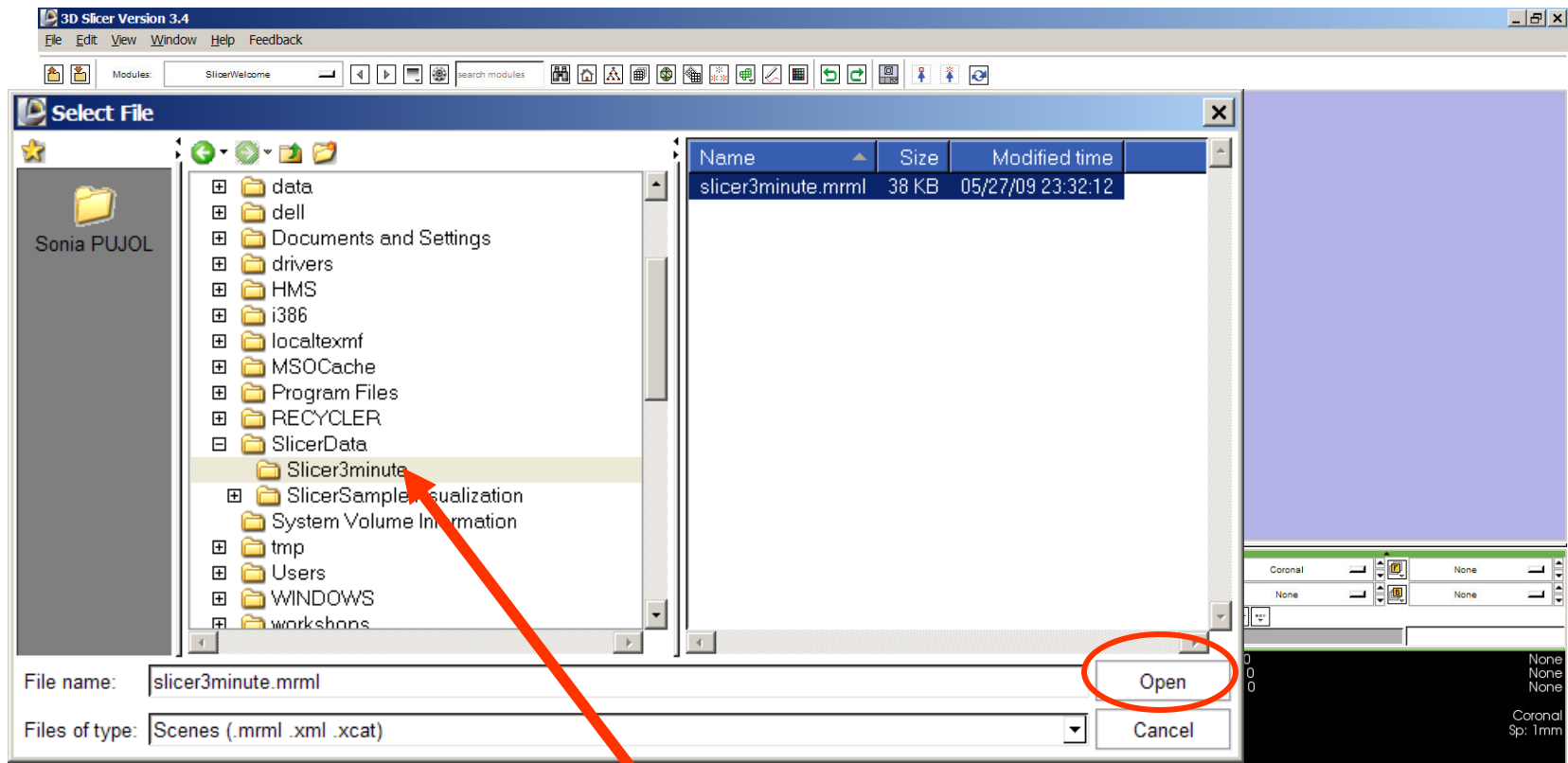




Loading a 3D Scene

The screenshot shows the 3DSlicer Version 3.4 interface. The 'File' menu in the top-left corner is circled in red. A yellow callout box with black text points to it, containing the instruction: **Select File → Load Scene from the File menu**. The interface includes a menu bar (File, Edit, View, Window, Help, Feedback), a toolbar, a 'Welcome & About' panel on the left, a central 3D view area with a purple wireframe box, and a bottom panel with three view windows (Axial, Sagittal, Coronal) and a status bar.

Loading a 3D Scene



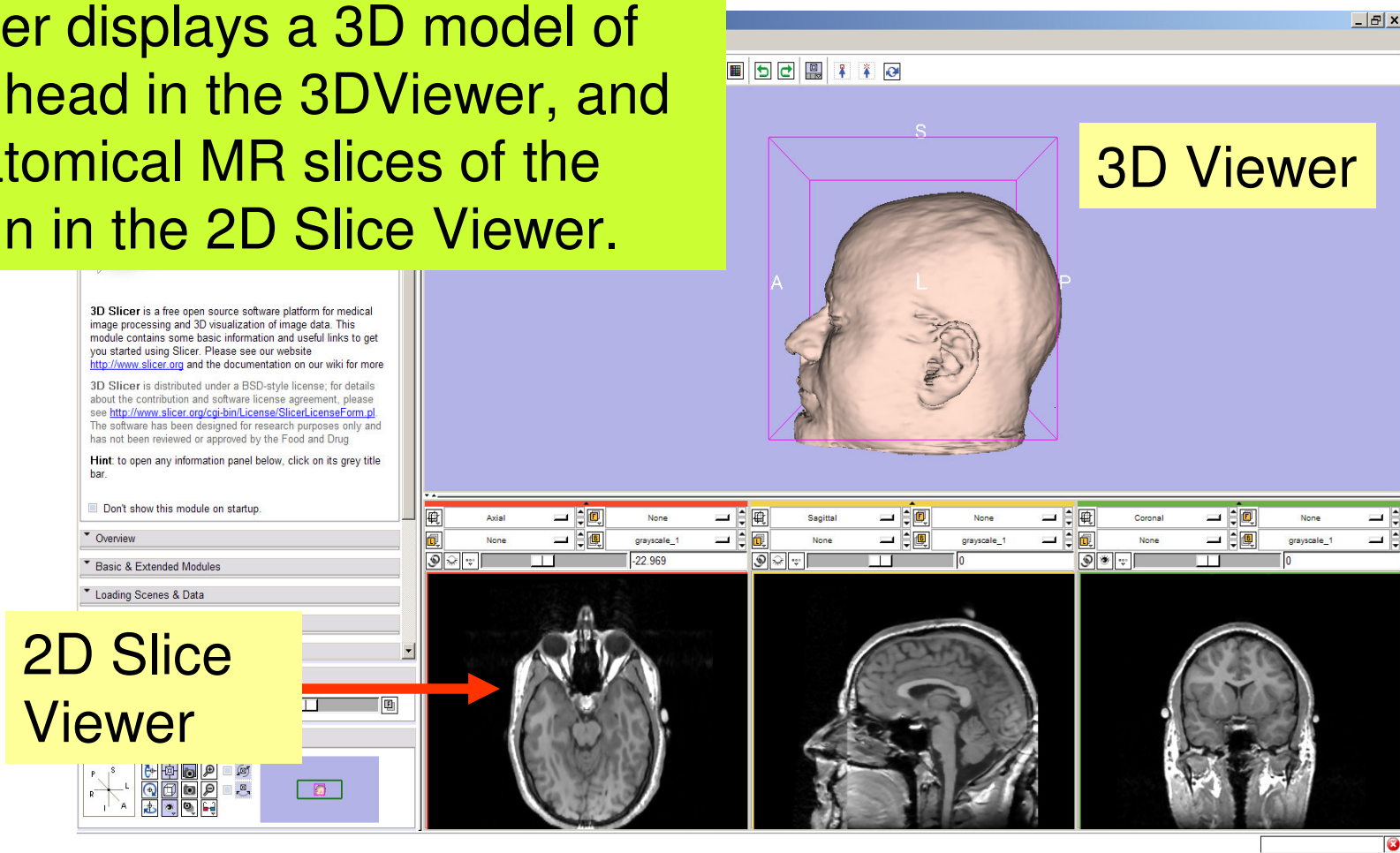
Browse to the location of the Slicer3MinuteDataset directory and select the scene file **slicer3minute.mrml**

Click on **Open** to load the scene



Loading a 3D Scene

Slicer displays a 3D model of the head in the 3D Viewer, and anatomical MR slices of the brain in the 2D Slice Viewer.





Loading a 3D Scene

3D Slicer Version 3.4

File Edit View Window Help Feedback

Modules: SlicerWelcome

3DSlicer

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

Axial Sagittal Coronal

None None None

None None None

Bg I: 0 Bg J: 0 Bg K: 0

None None None

Coronal Sp: 1mm


Lb: None Fg: None Bg: None

R: 168.4 A: 1.0 S: -125.0

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

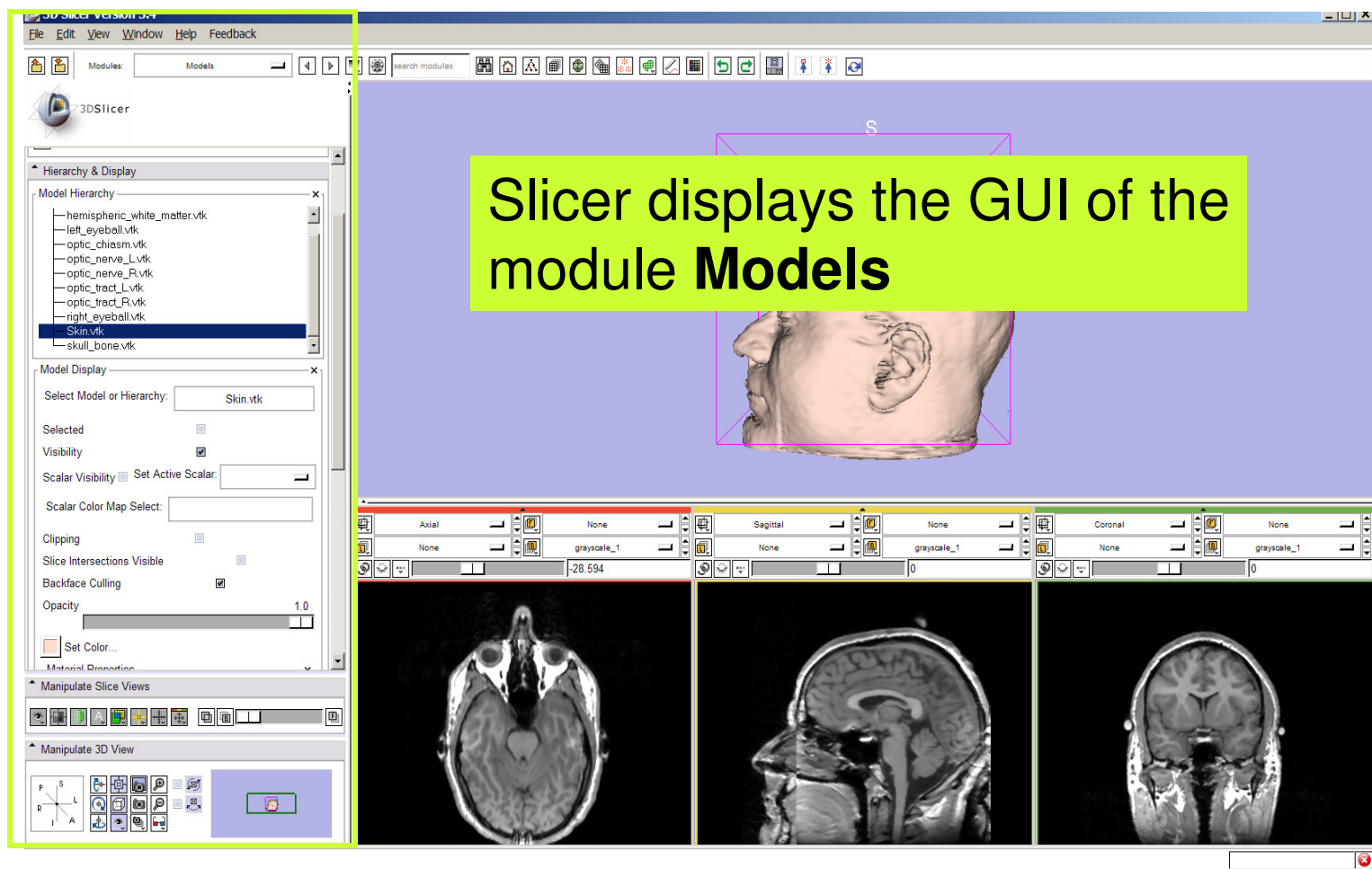


Loading a 3D Scene

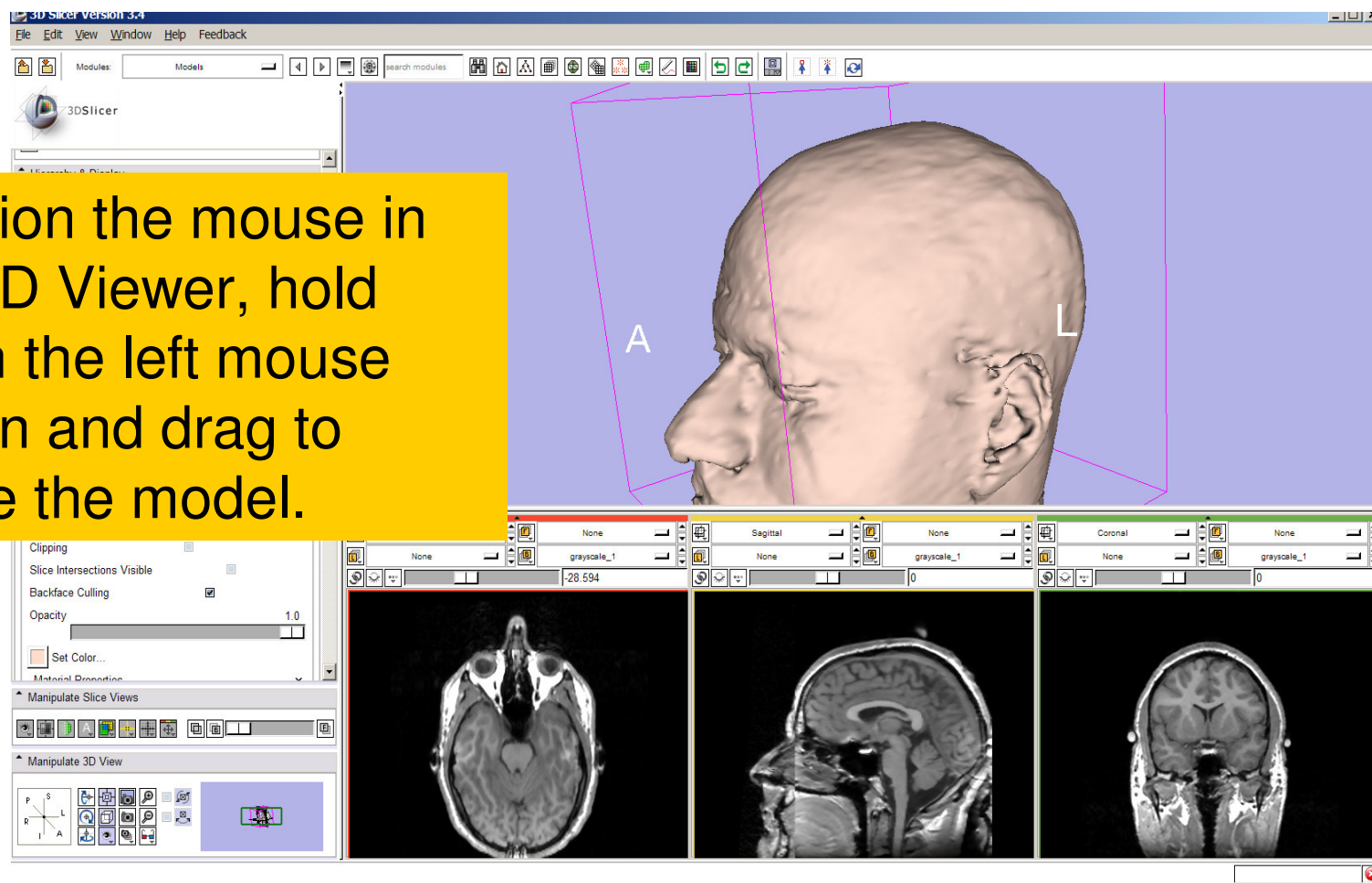
To access the module **Models**, browse through the list of modules or click on the icon  in the toolbar button.



Loading a 3D Scene




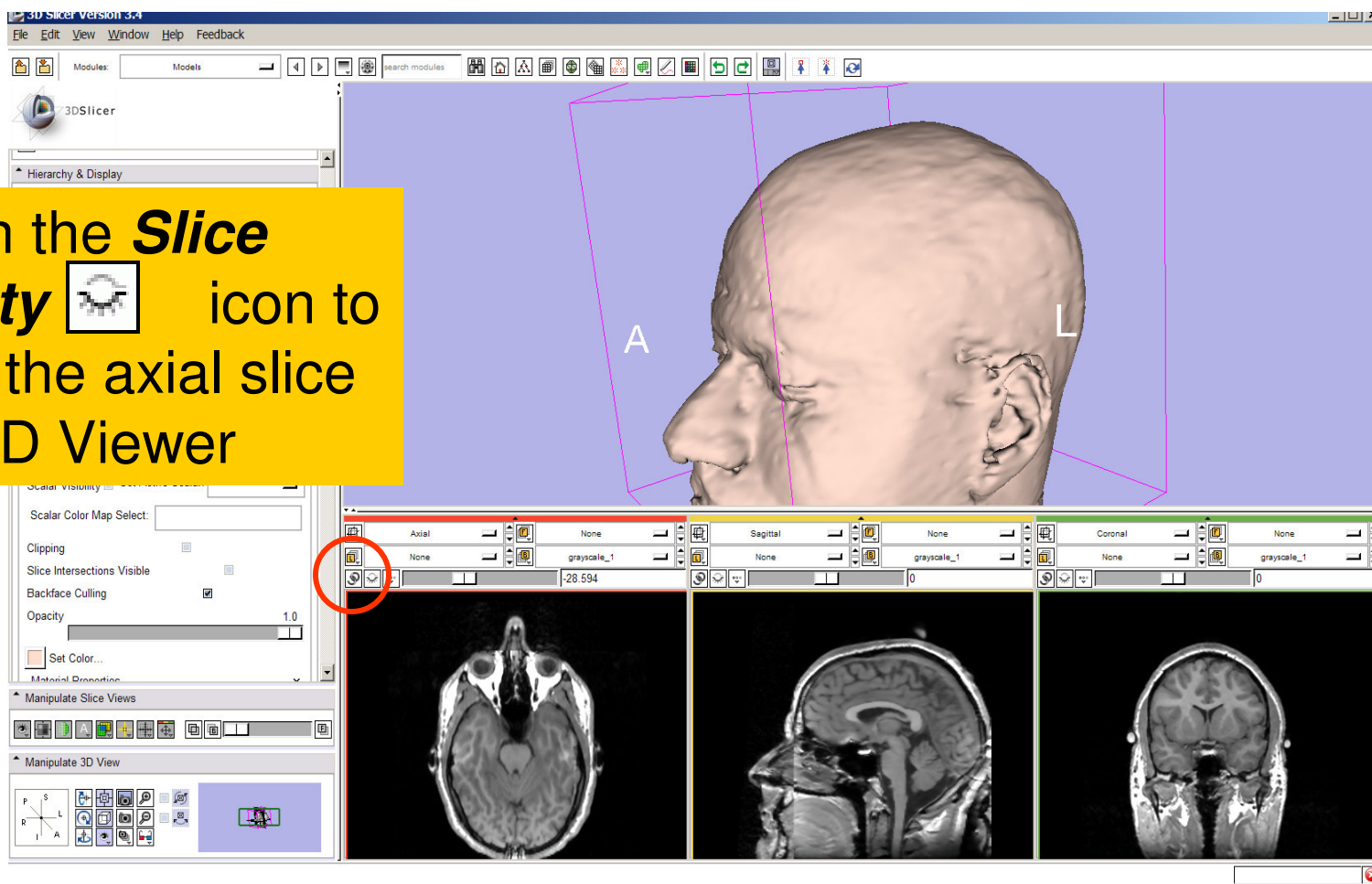
Position the mouse in the 3D Viewer, hold down the left mouse button and drag to rotate the model.

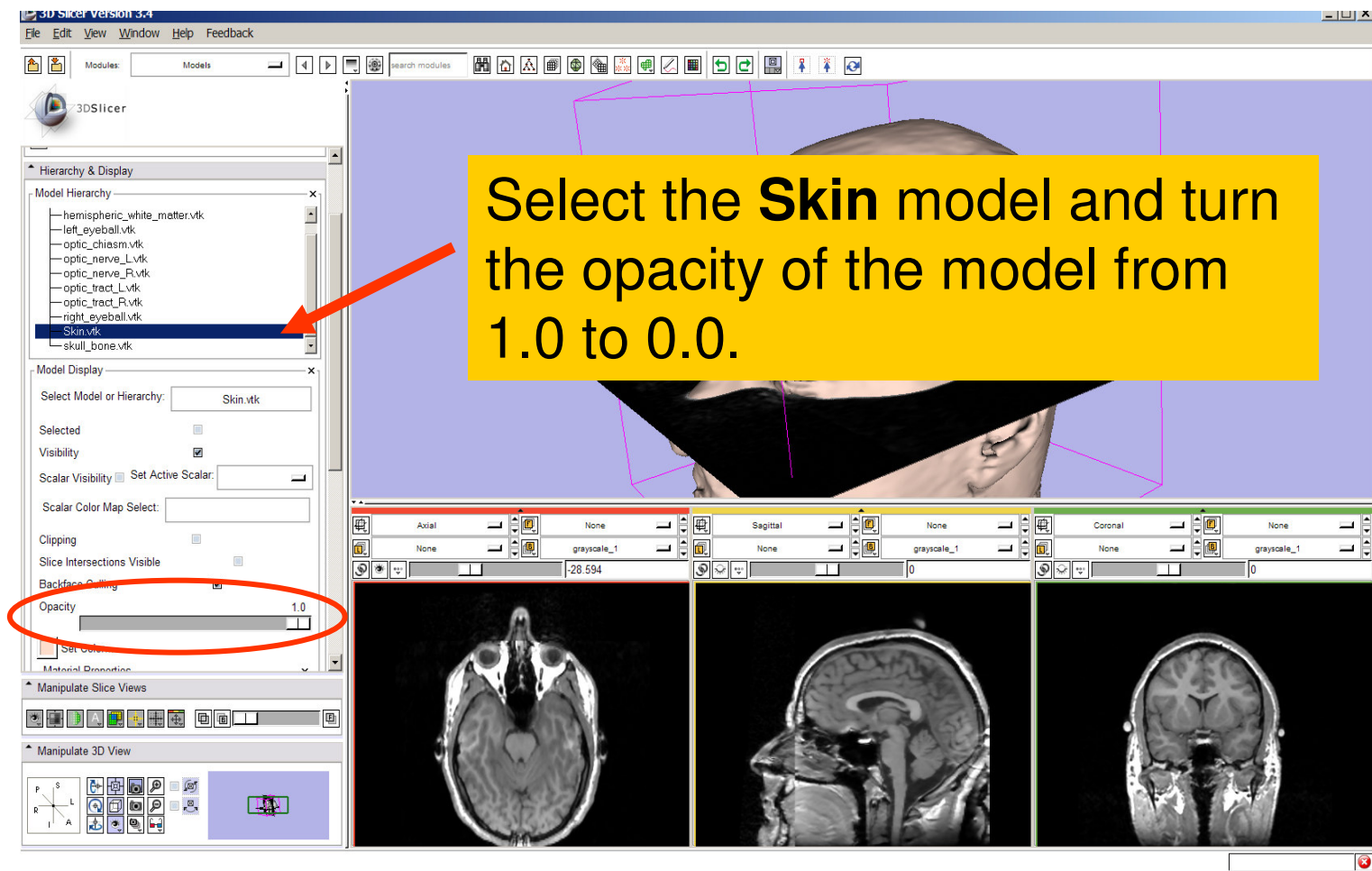




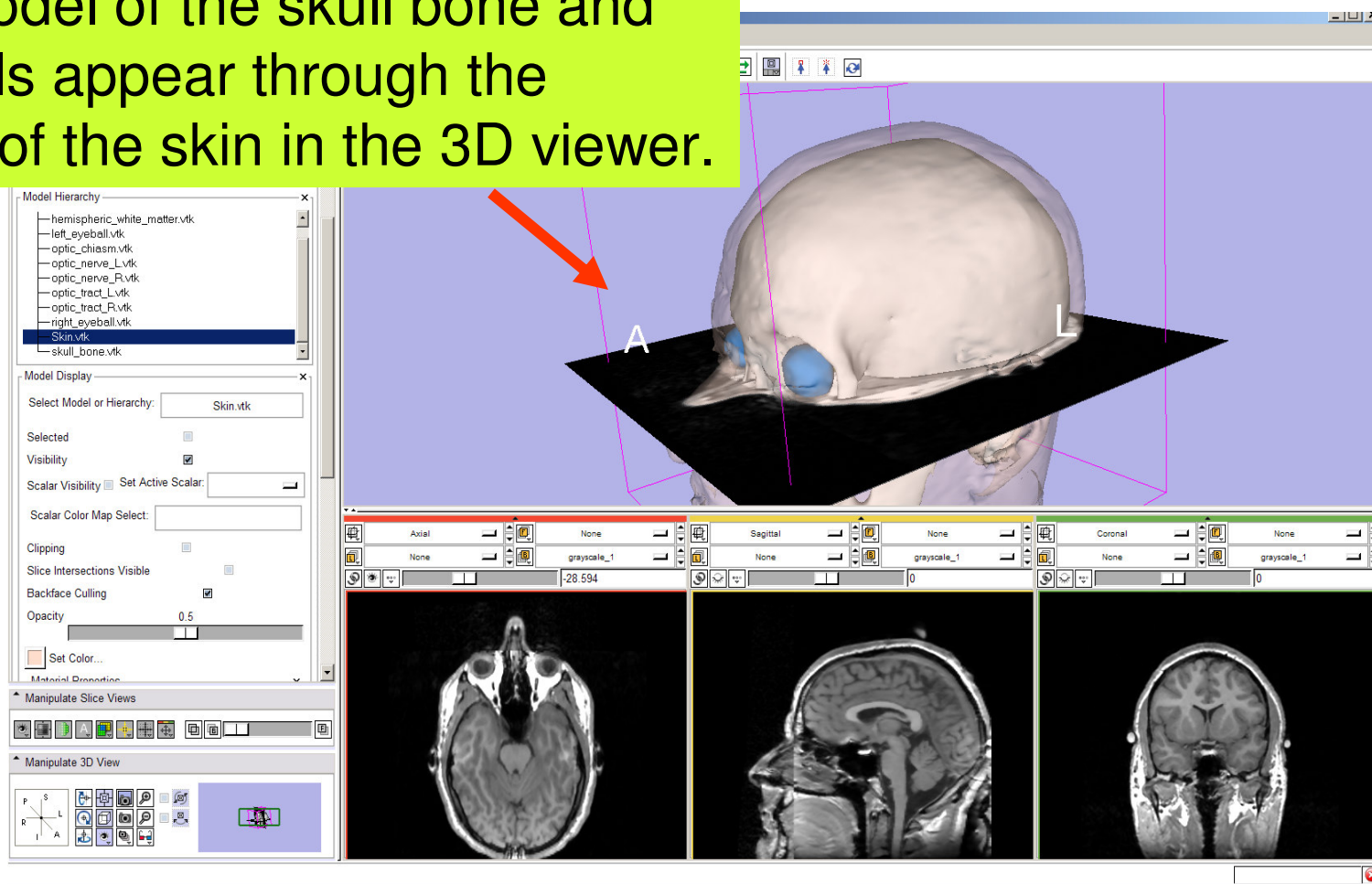
3D Visualization

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



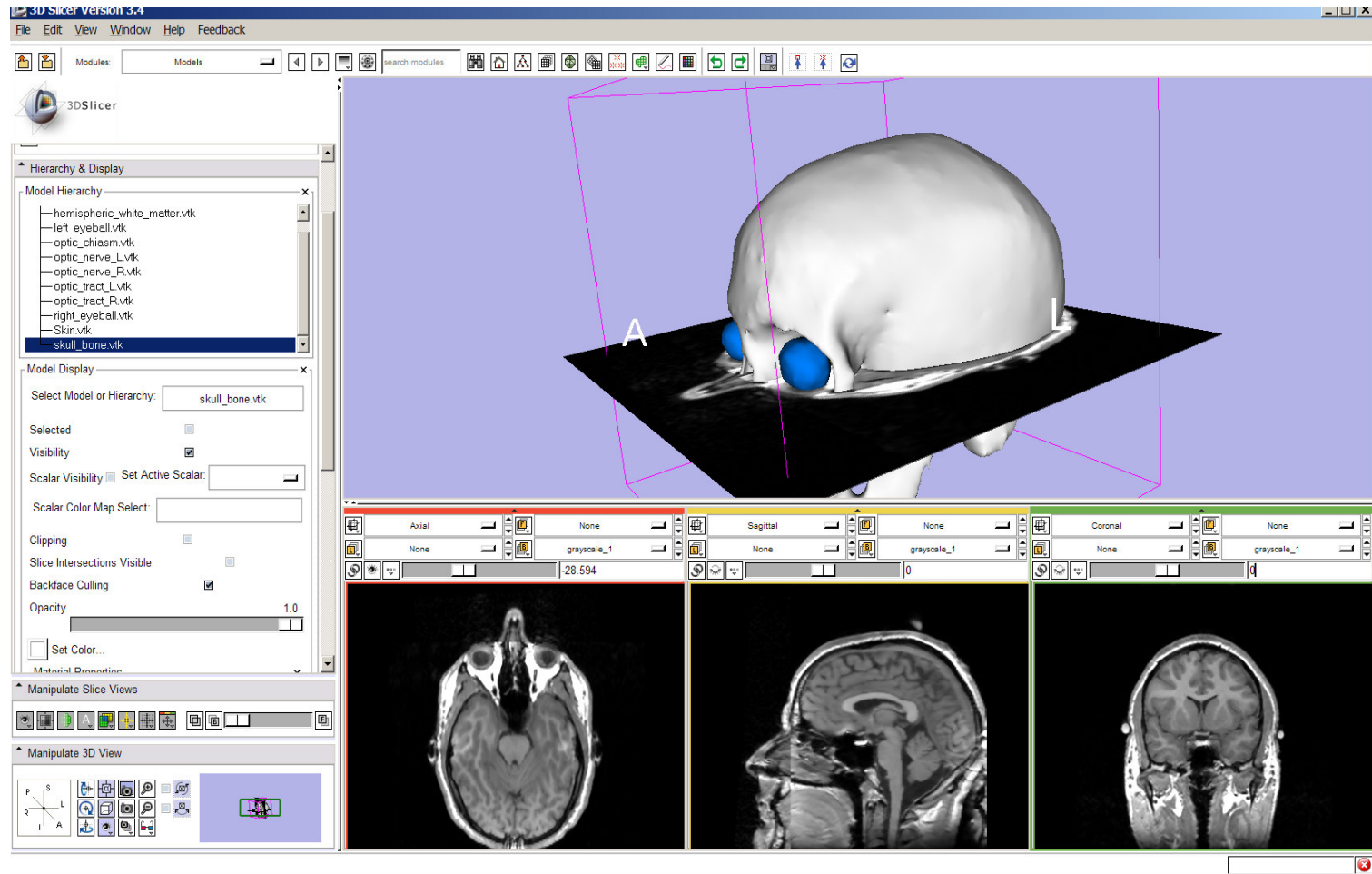



The model of the skull bone and eyeballs appear through the model of the skin in the 3D viewer.

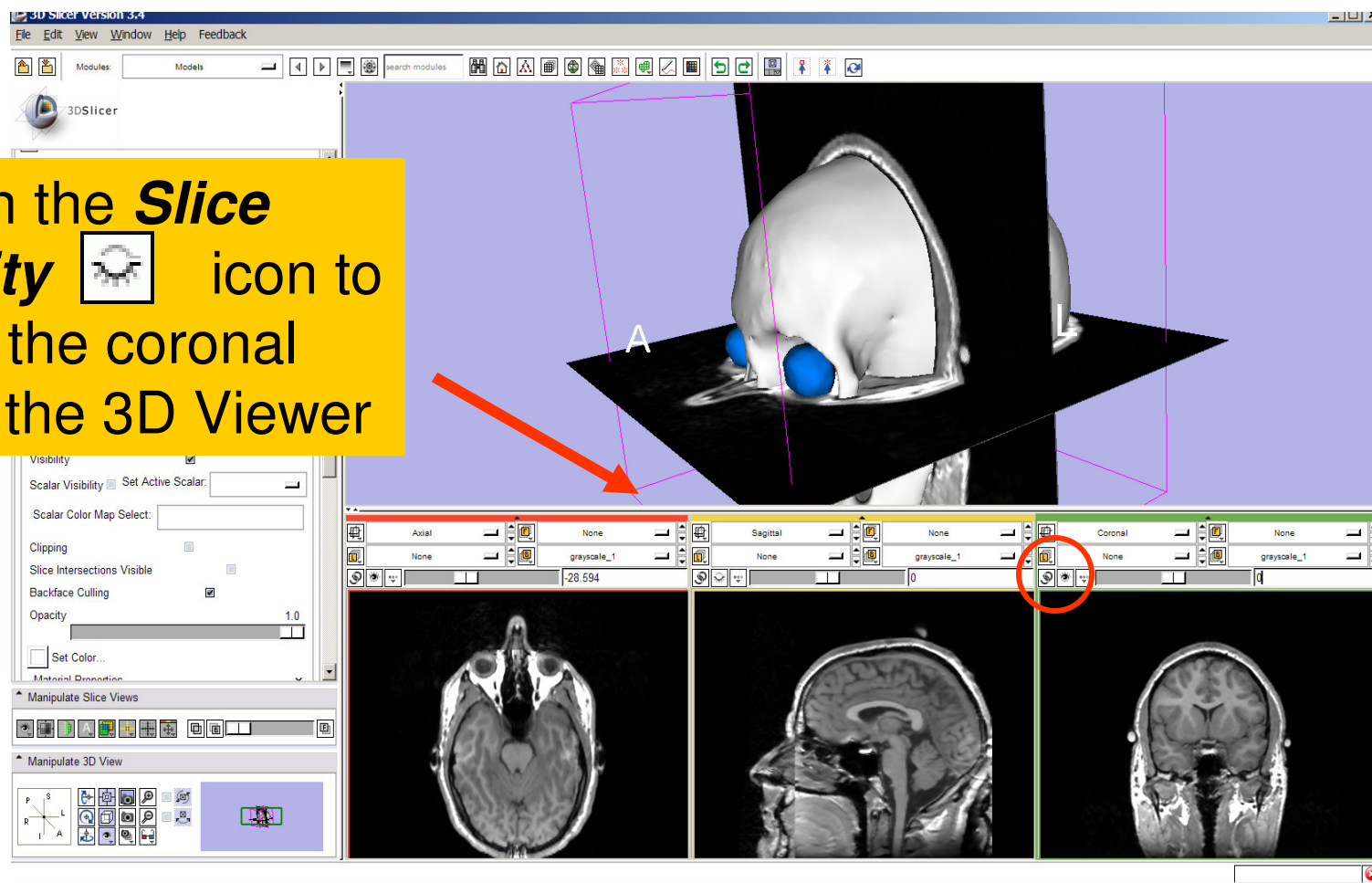


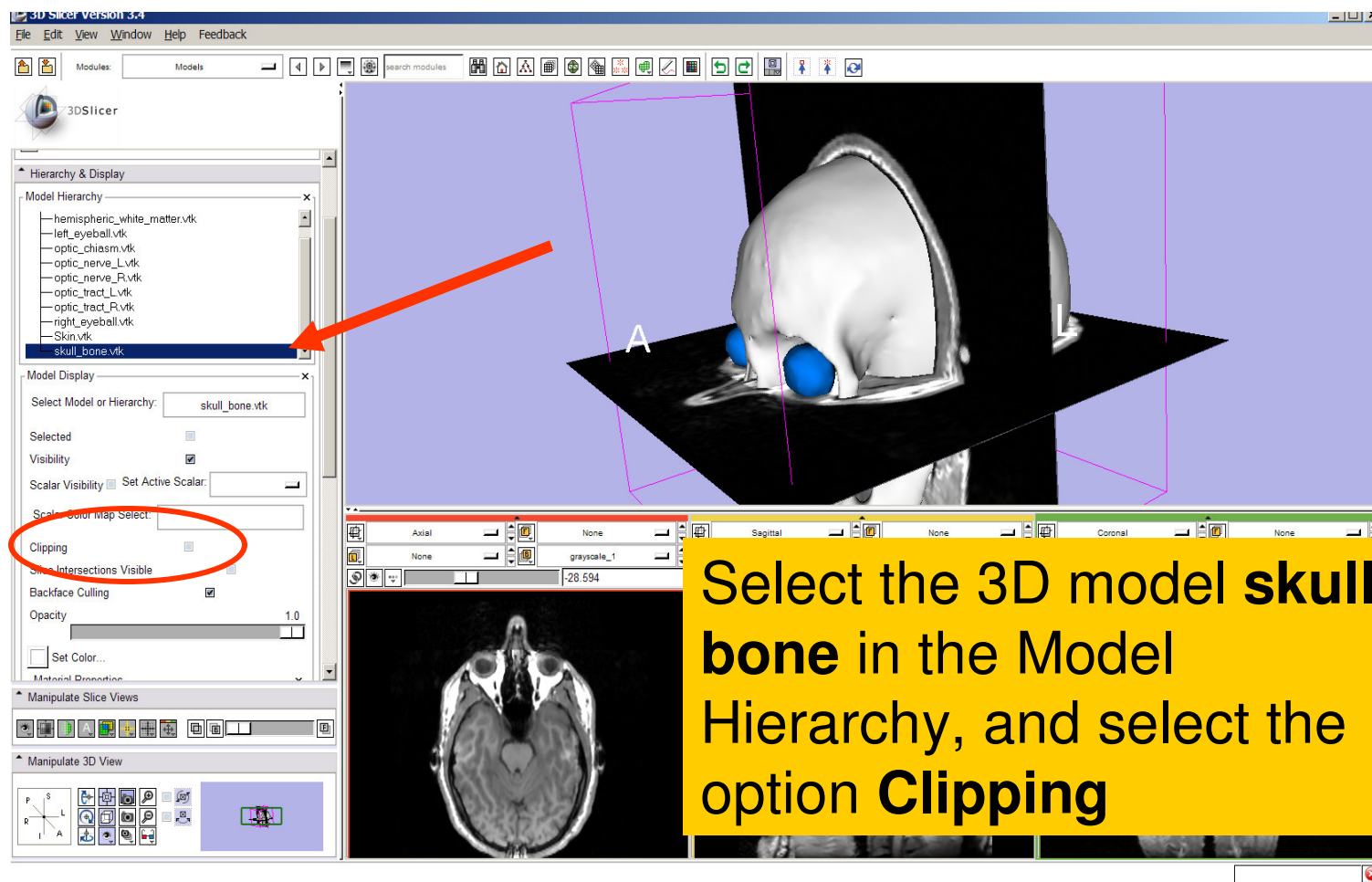


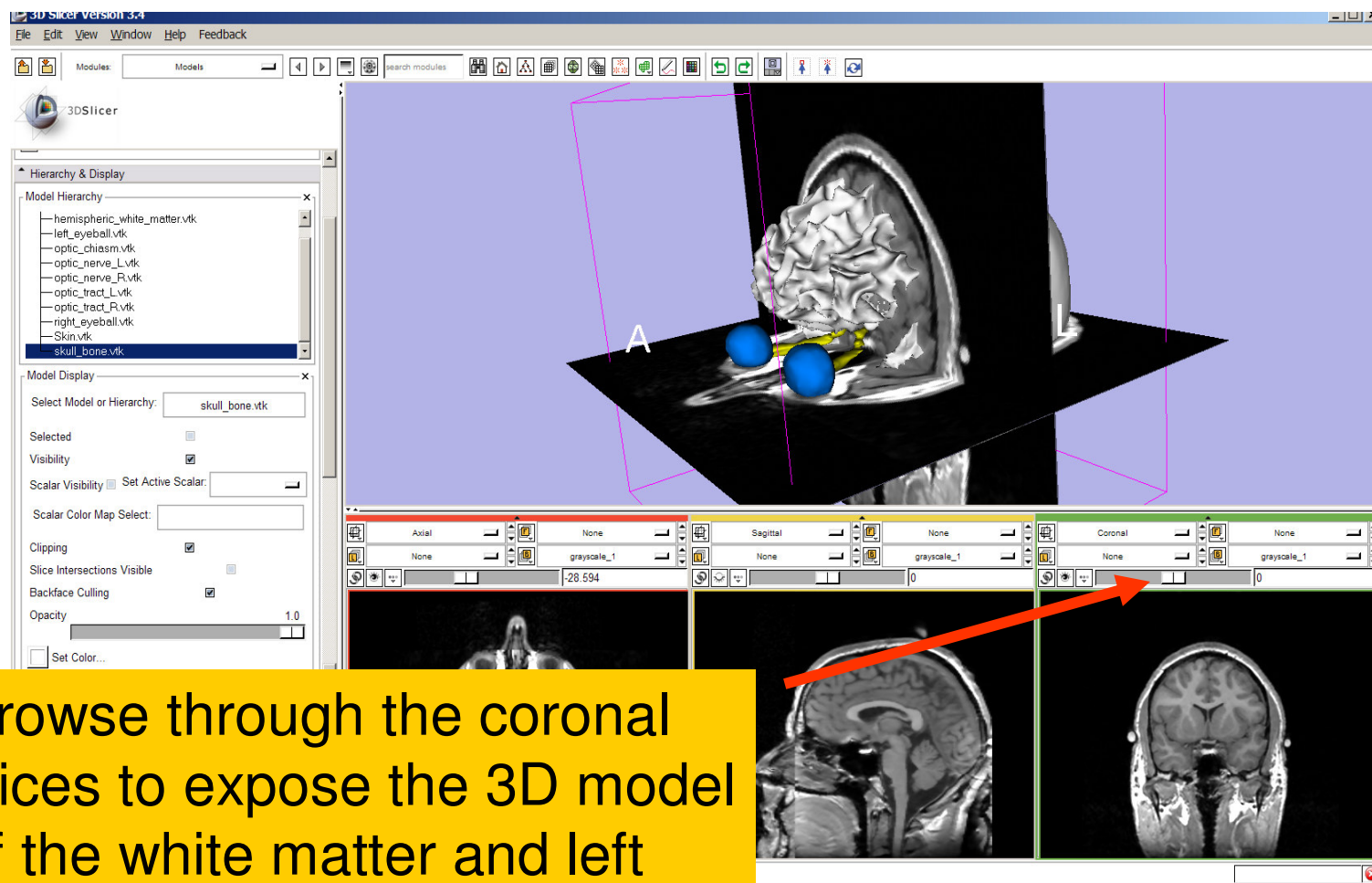
3D Visualization



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



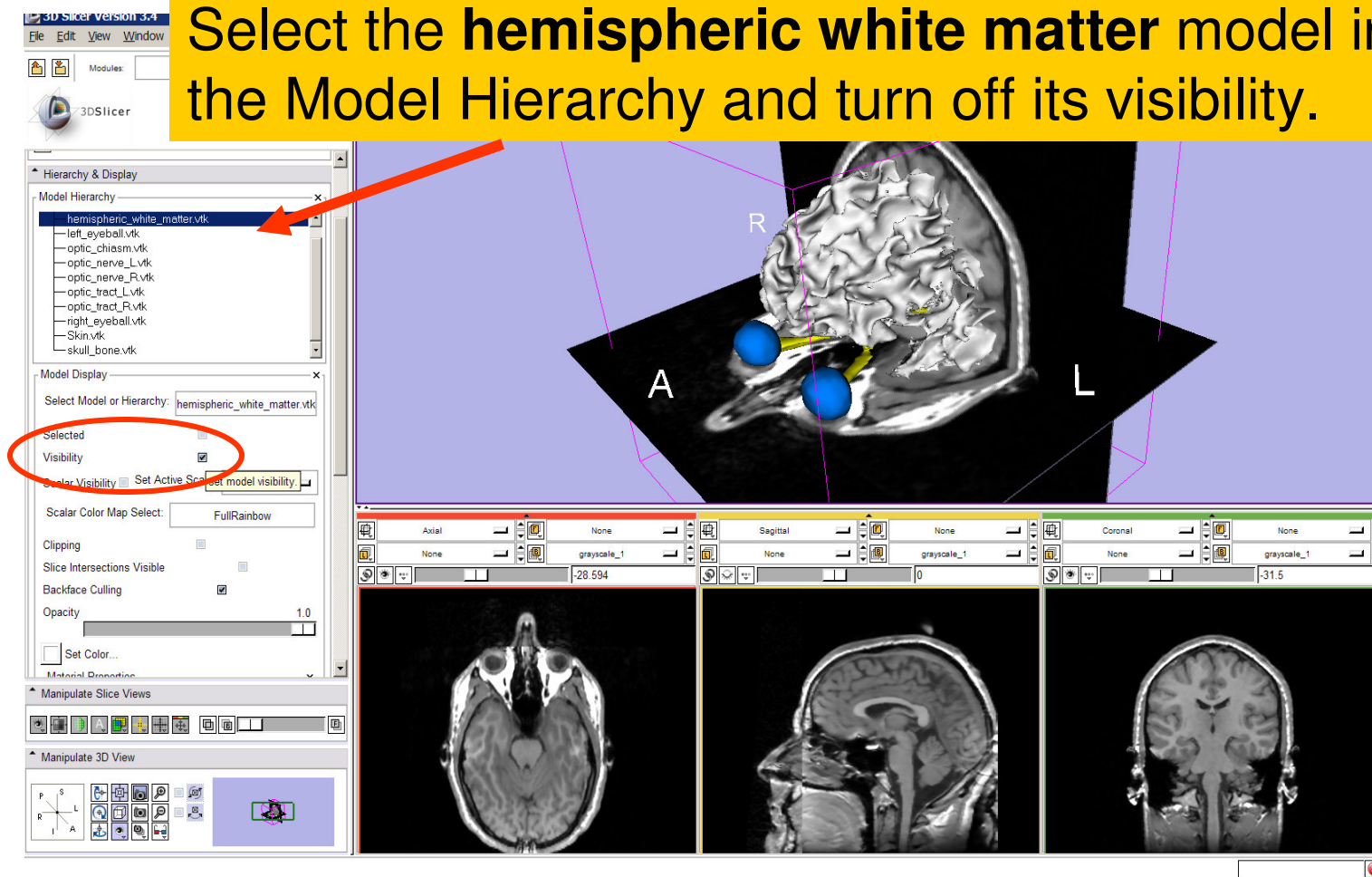


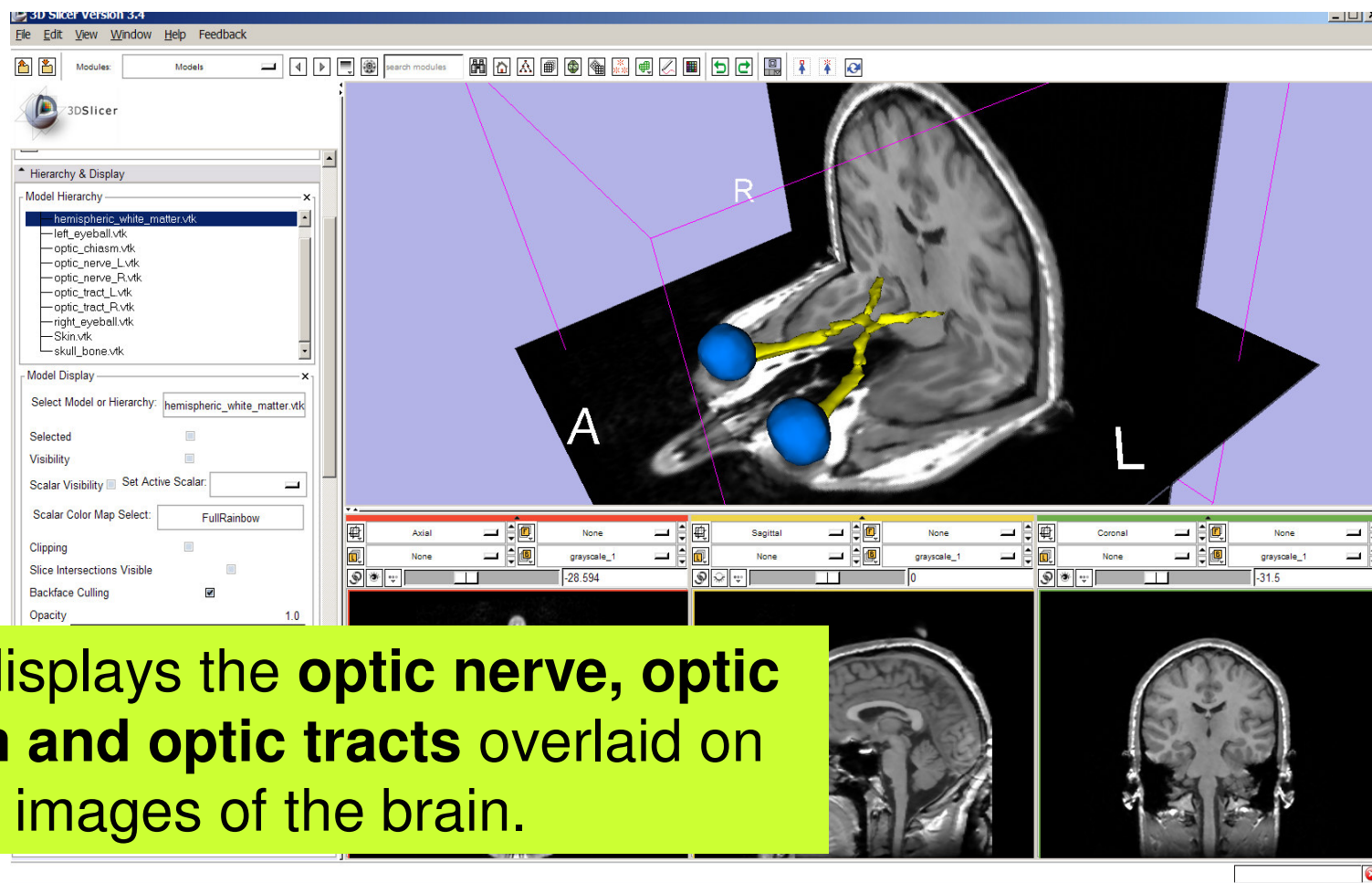


Browse through the coronal slices to expose the 3D model of the white matter and left and right optic nerves.

3D Visualization

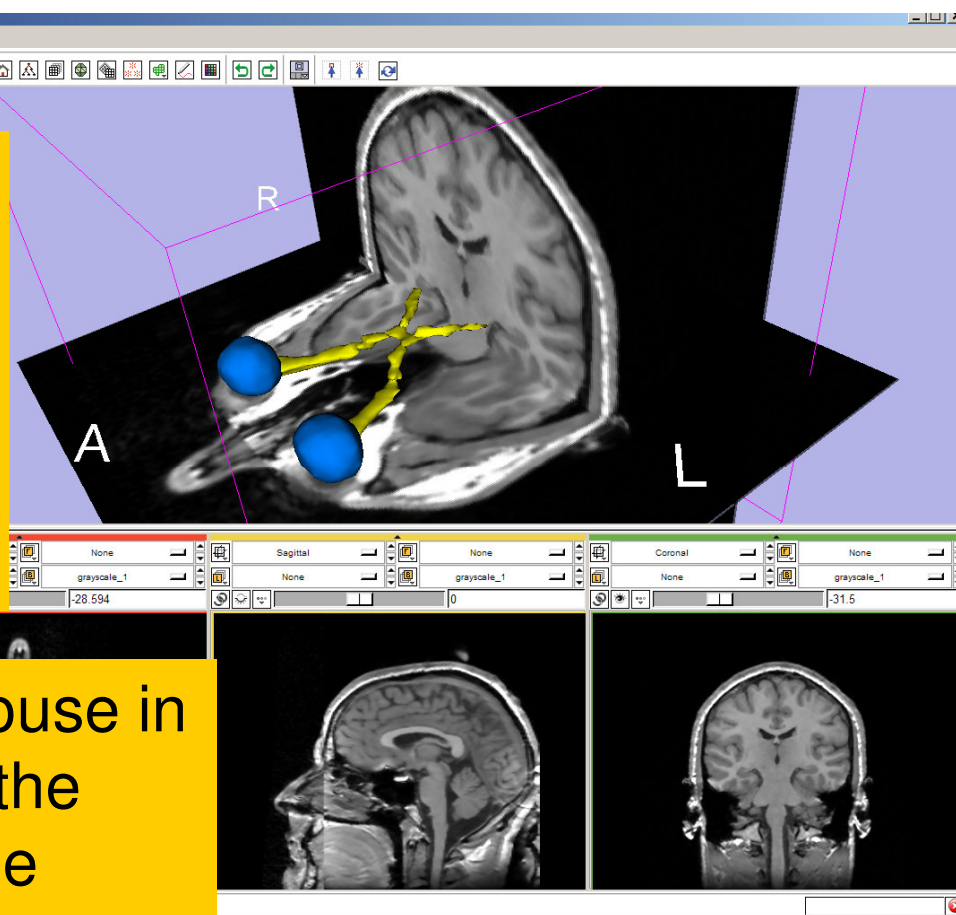
Select the **hemispheric white matter** model in the Model Hierarchy and turn off its visibility.





Slicer displays the **optic nerve, optic chiasm and optic tracts** overlaid on the MR images of the brain.

Windows/Linux users:
Position the mouse in the
3D Viewer, hold down the
right mouse button and
move the mouse down to
zoom in.

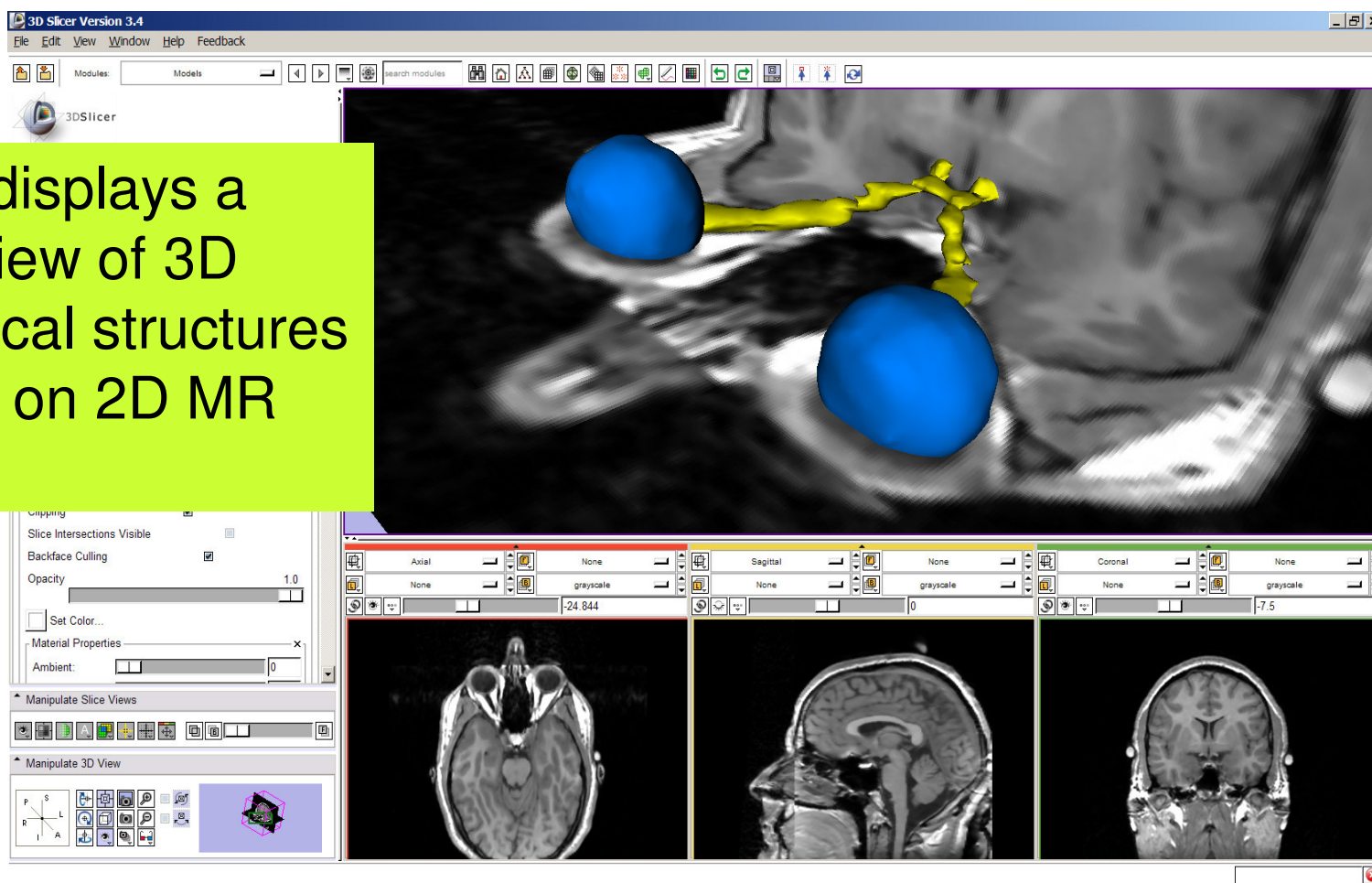


Mac users: Position the mouse in
the 3D Viewer, hold down the
apple button and the mouse
button and move the mouse
down to zoom in.



3D Visualization

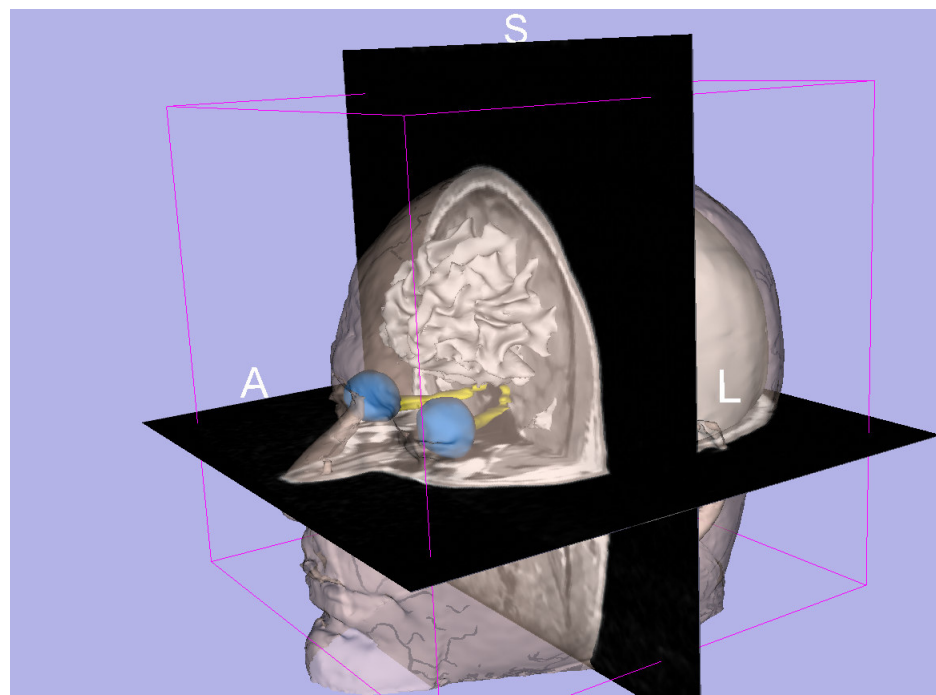
Slicer3 displays a closer view of 3D anatomical structures overlaid on 2D MR slices





Slicer3 minute tutorial

- Slicer3 is an **open-source software** for image analysis and 3D visualization
- Slicer3 core functionalities, **95 available modules** and built-in libraries represent more than **2.8 million lines of code**
- Slicer3 is a **multi-institution effort** to share the latest advances in image analysis with the **scientific and clinical community**.



www.slicer.org



Acknowledgments



National Alliance for Medical Image Computing

NIH U54EB005149



Neuroimage Analysis Center

NIH P41RR013218