

Slicer3 minute tutorial

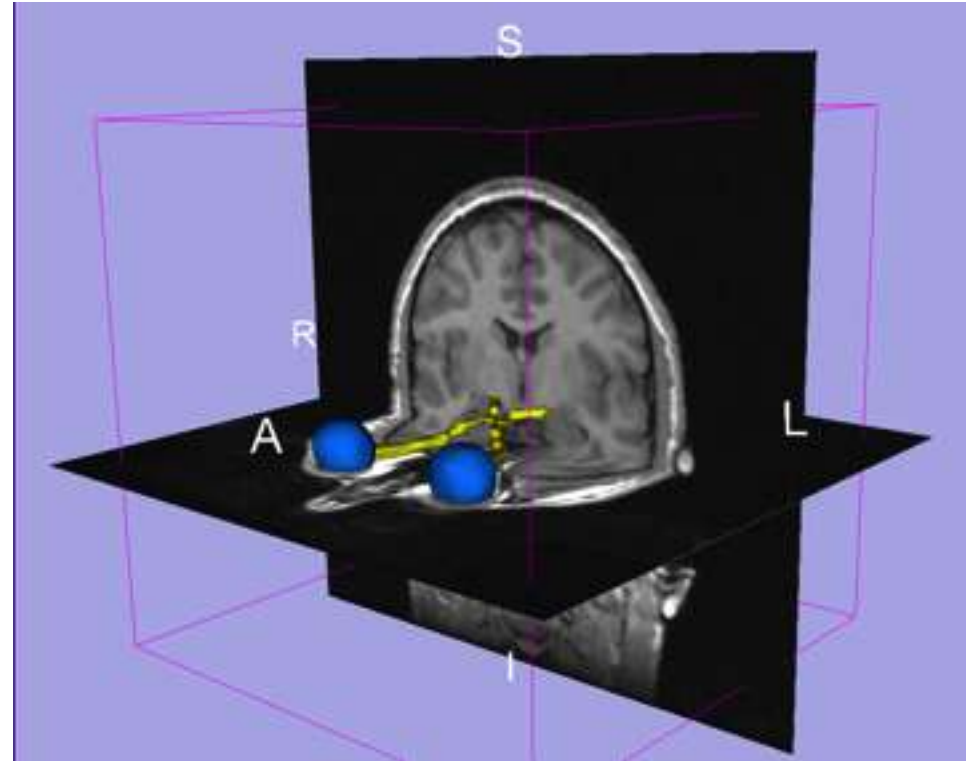
Sonia Pujol, Ph.D.

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 Slicer3.6 software from the Slicer web site

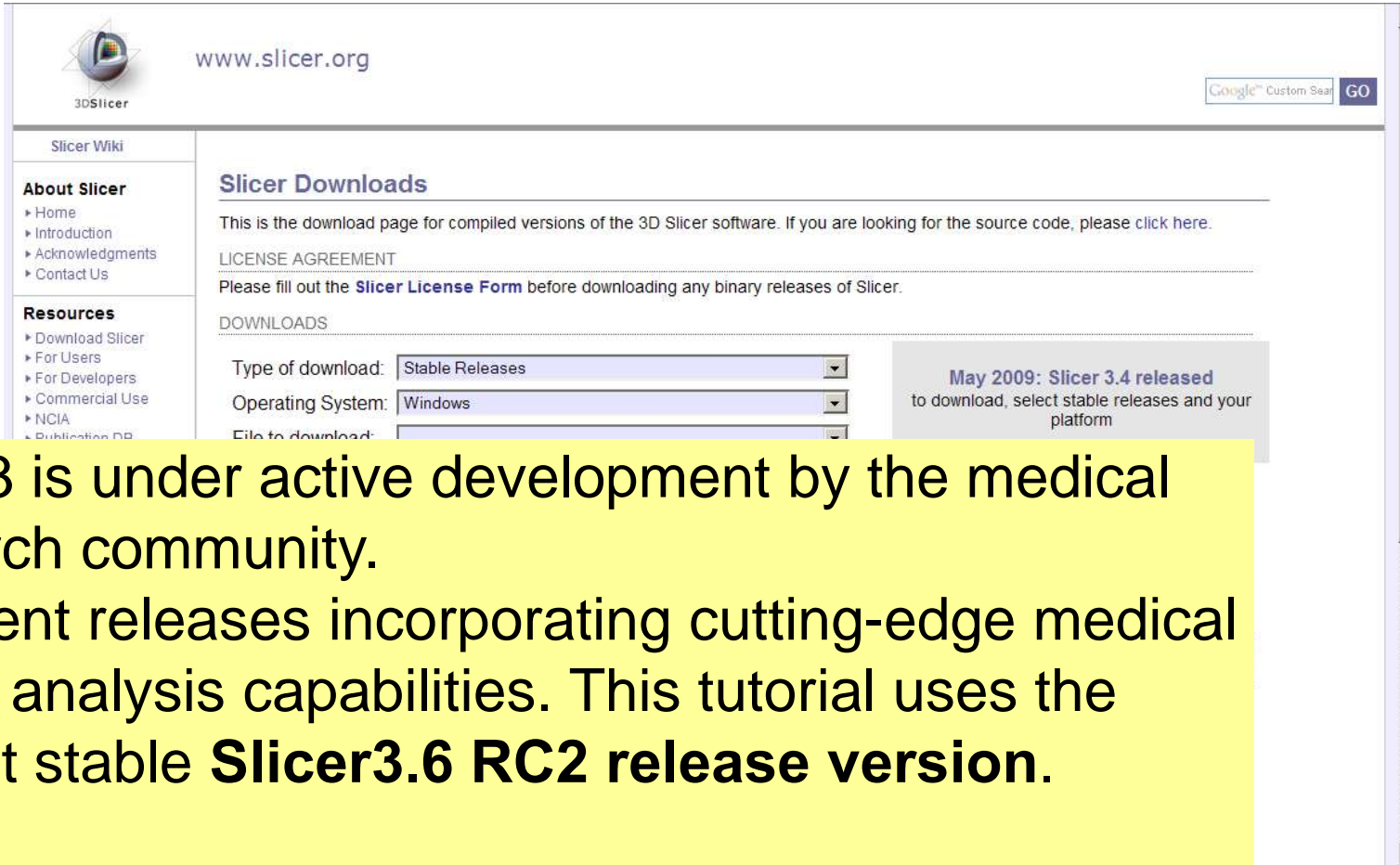
<http://www.slicer.org/pages/Special:SlicerDownloads>



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 Slicer3.6



The screenshot shows the 'Slicer Downloads' page on the 3DSlicer website. The page includes a navigation menu on the left with sections for 'About Slicer' (Home, Introduction, Acknowledgments, Contact Us) and 'Resources' (Download Slicer, For Users, For Developers, Commercial Use, NCI, Publication DB). The main content area features a 'Slicer Downloads' heading, a paragraph about downloading compiled versions, a 'LICENSE AGREEMENT' section with a link to the license form, and a 'DOWNLOADS' section with dropdown menus for 'Type of download' (set to 'Stable Releases'), 'Operating System' (set to 'Windows'), and 'File to download'. A grey callout box on the right states: 'May 2009: Slicer 3.4 released to download, select stable releases and your platform'.

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 **Slicer3.6 RC2 release version**.



The screenshot shows the website www.slicer.org with a search bar and a navigation menu. A yellow callout box highlights the instruction: "Select the type of download 'Stable Releases'". A red arrow points to the "Type of download" dropdown menu, which is currently set to "Stable Releases". Below this, the "Operating System" is set to "Windows" and the "File to download" dropdown is empty. A "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 the download form, there is a "NOTES" section with a list of bullet points. To the right of the notes is a collage of images related to Slicer 3.4, including a central image with the text "Slicer 3.4".

www.slicer.org

Google™ Custom Search GO

Select the type of download 'Stable Releases'

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

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

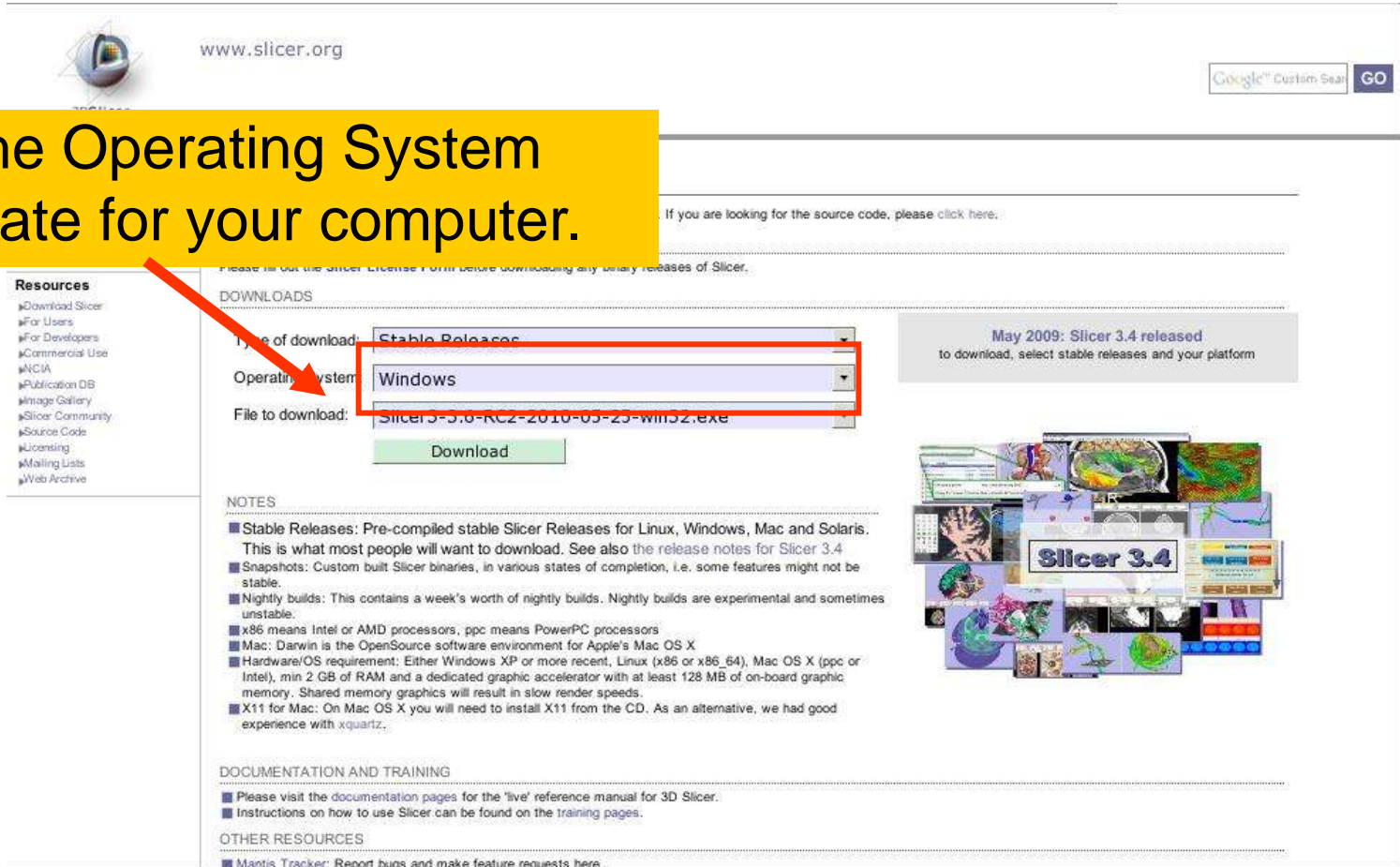
May 2009: Slicer 3.4 released to download, select stable releases and your platform

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.

Slicer 3.4

Download Slicer3.6



The screenshot shows the website www.slicer.org with a search bar and a navigation menu. A yellow callout box with the text "Select the Operating System appropriate for your computer." has a red arrow pointing to the "Operating system" dropdown menu. The dropdown menu is open, showing "Windows" selected. Below the dropdown, the "File to download:" field shows "Slicer-3.6-RC2-2010-05-25-win32.exe" and a "Download" button is visible. The page also includes a "Resources" sidebar, a "NOTES" section with details about stable releases, snapshots, and nightly builds, and a "DOCUMENTATION AND TRAINING" section. A banner for "May 2009: Slicer 3.4 released" is also present.

www.slicer.org

Google™ Custom Search GO

If you are looking for the source code, please click here.

Please fill out the Slicer License Form before downloading any binary releases of Slicer.

Resources

- Download Slicer
- For Users
- For Developers
- Commercial Use
- NCIA
- Publication DB
- Image Gallery
- Slicer Community
- Source Code
- Licensing
- Mailing Lists
- Web Archive

DOWNLOADS

Type of download: Stable Releases

Operating system: Windows

File to download: Slicer-3.6-RC2-2010-05-25-win32.exe

Download

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DOCUMENTATION AND TRAINING

- Please visit the documentation pages for the 'live' reference manual for 3D Slicer.
- Instructions on how to use Slicer can be found on the training pages.


OTHER RESOURCES

- Mantis Tracker:** Report bugs and make feature requests here

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



Select the Slicer3.6 release and click on **Download**.



Google™ Custom Search

looking for the source code, please click here.

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CONTACT US

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OTHER RESOURCES

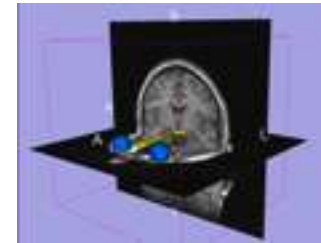
- Mantis Tracker: Report bugs and make feature requests here



Download the material

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

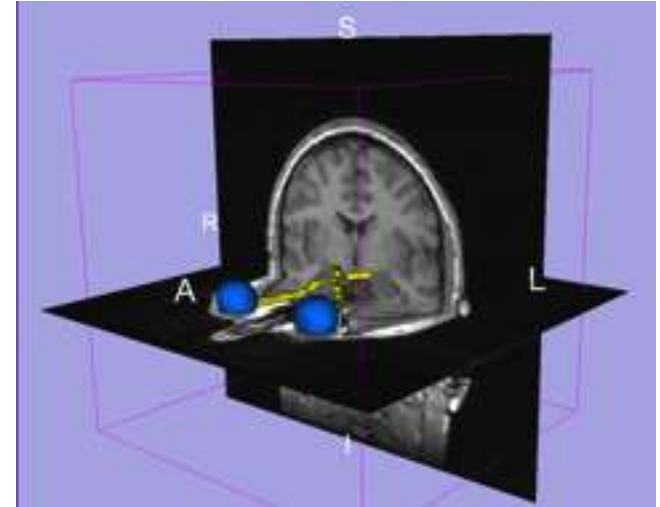
- Download the training dataset:
Slicer3minuteDataset.zip



<http://www.slicer.org/slicerWiki/index.php/Slicer3.6: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>

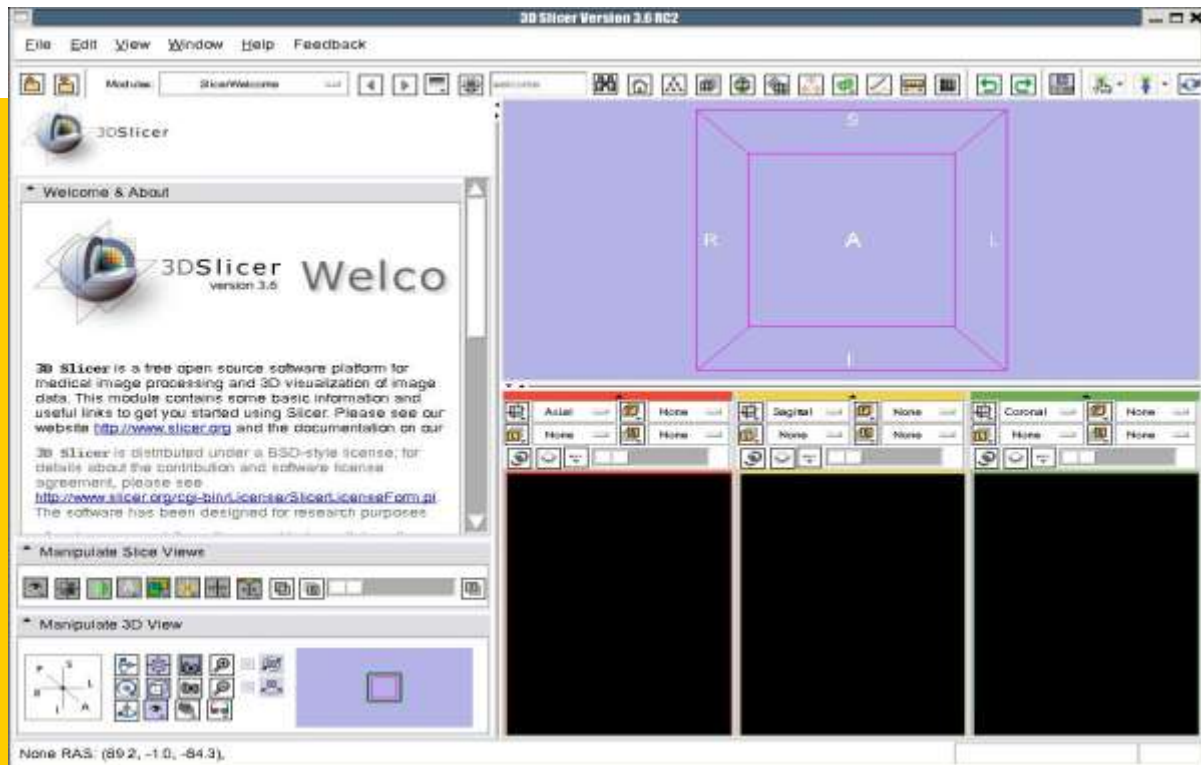


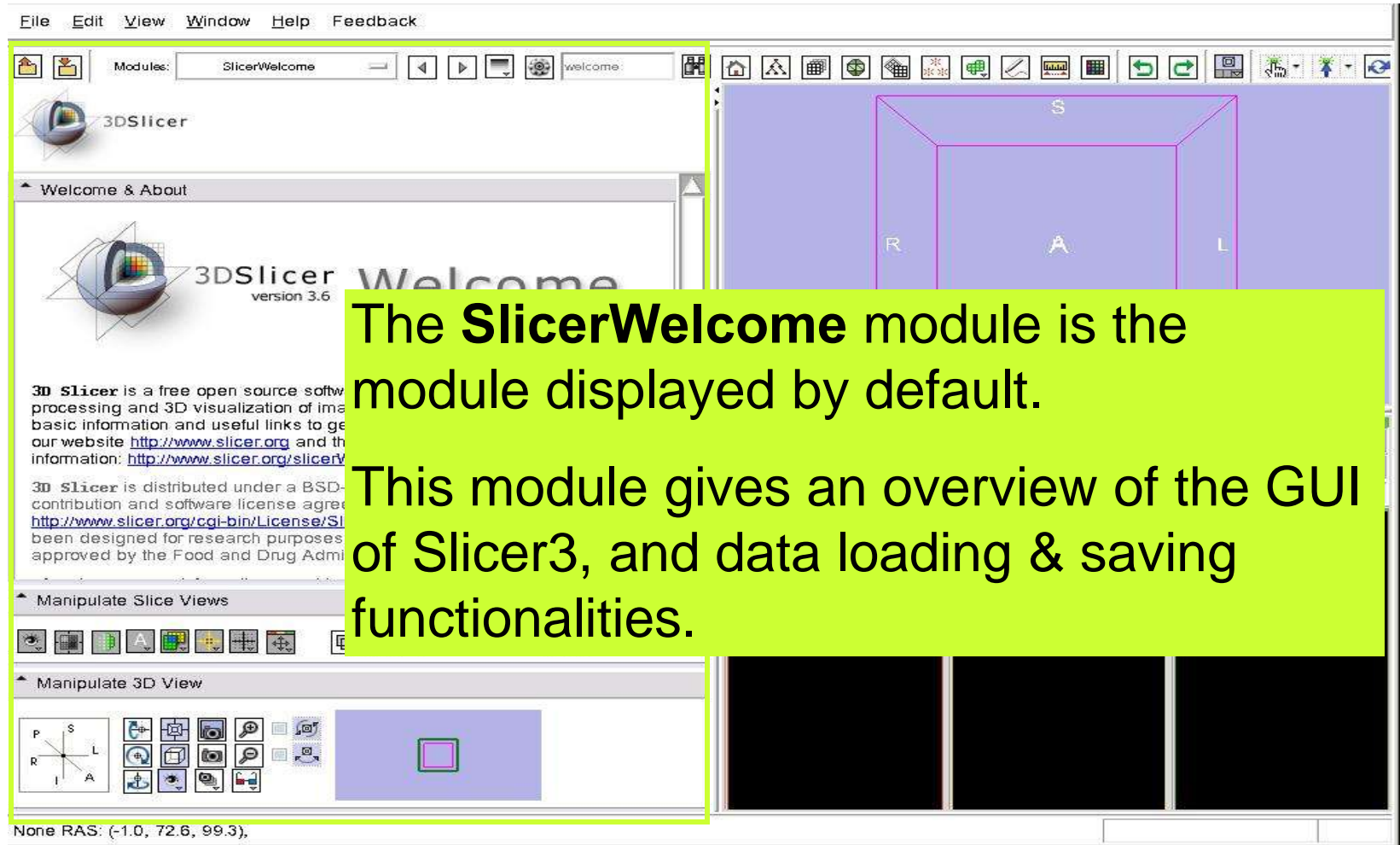


Start Slicer3

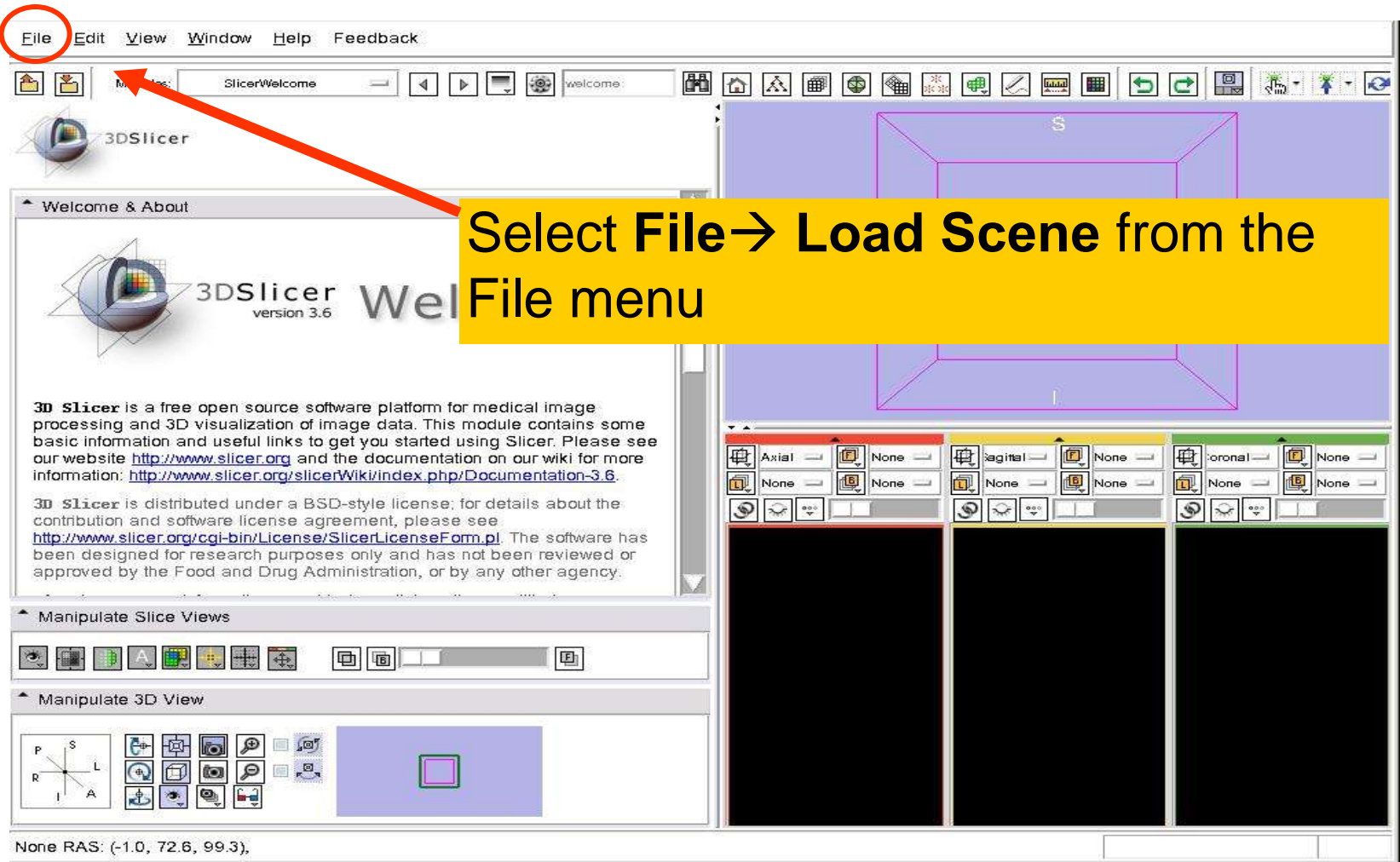
Linux/Mac users
Launch the Slicer3 executable located in the Slicer3.6 directory

Windows users
Select
Start → All Programs
→ Slicer3 3.6-RC2 2010-05-25 → Slicer3





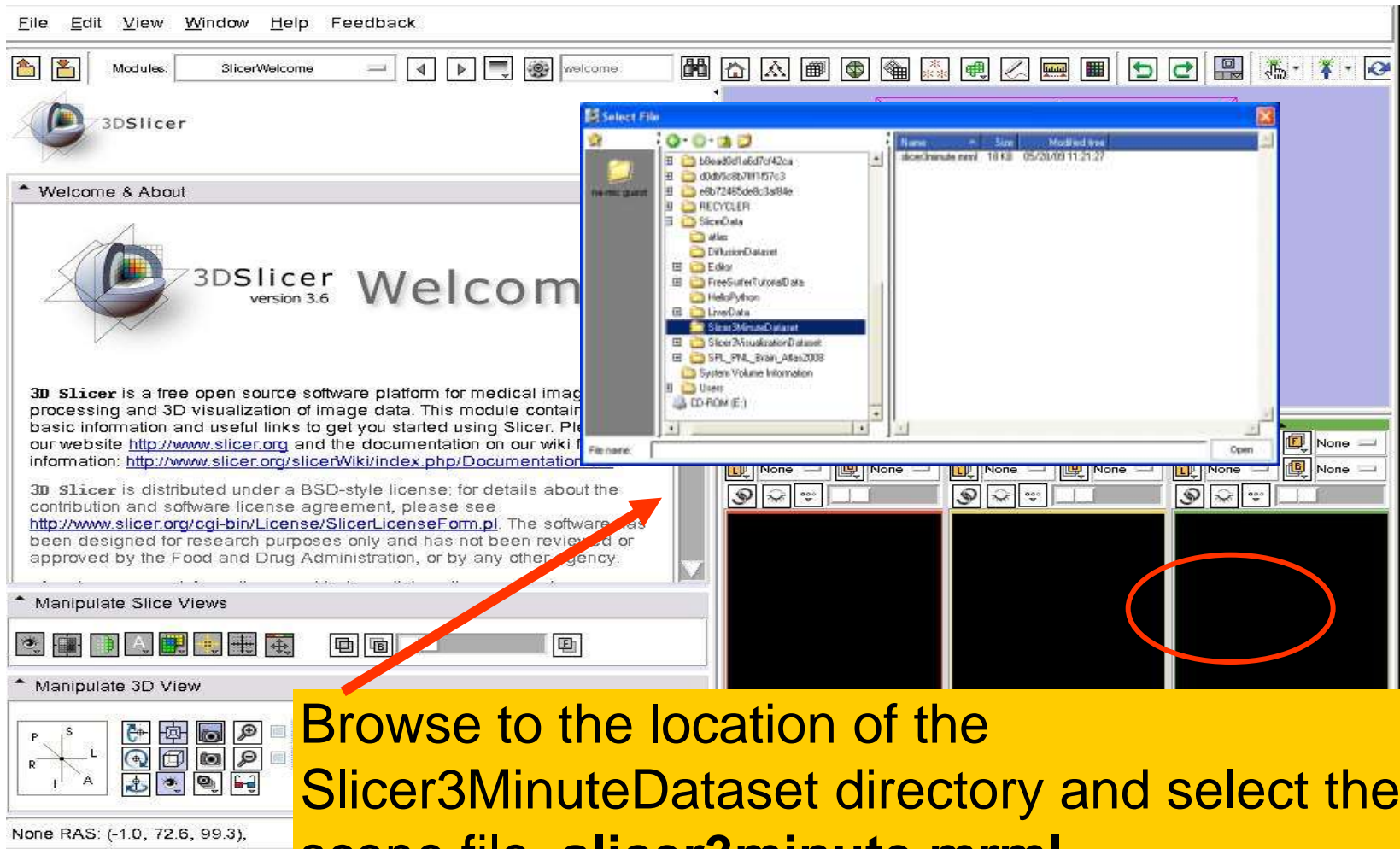
Loading a 3D Scene



Select File → Load Scene from the File menu

The screenshot shows the 3DSlicer interface. The 'File' menu is circled in red, and a red arrow points from it to a yellow box 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, and a 3D view area with three orthogonal slices (Axial, Sagittal, Coronal) and various manipulation tools.

Loading a 3D Scene

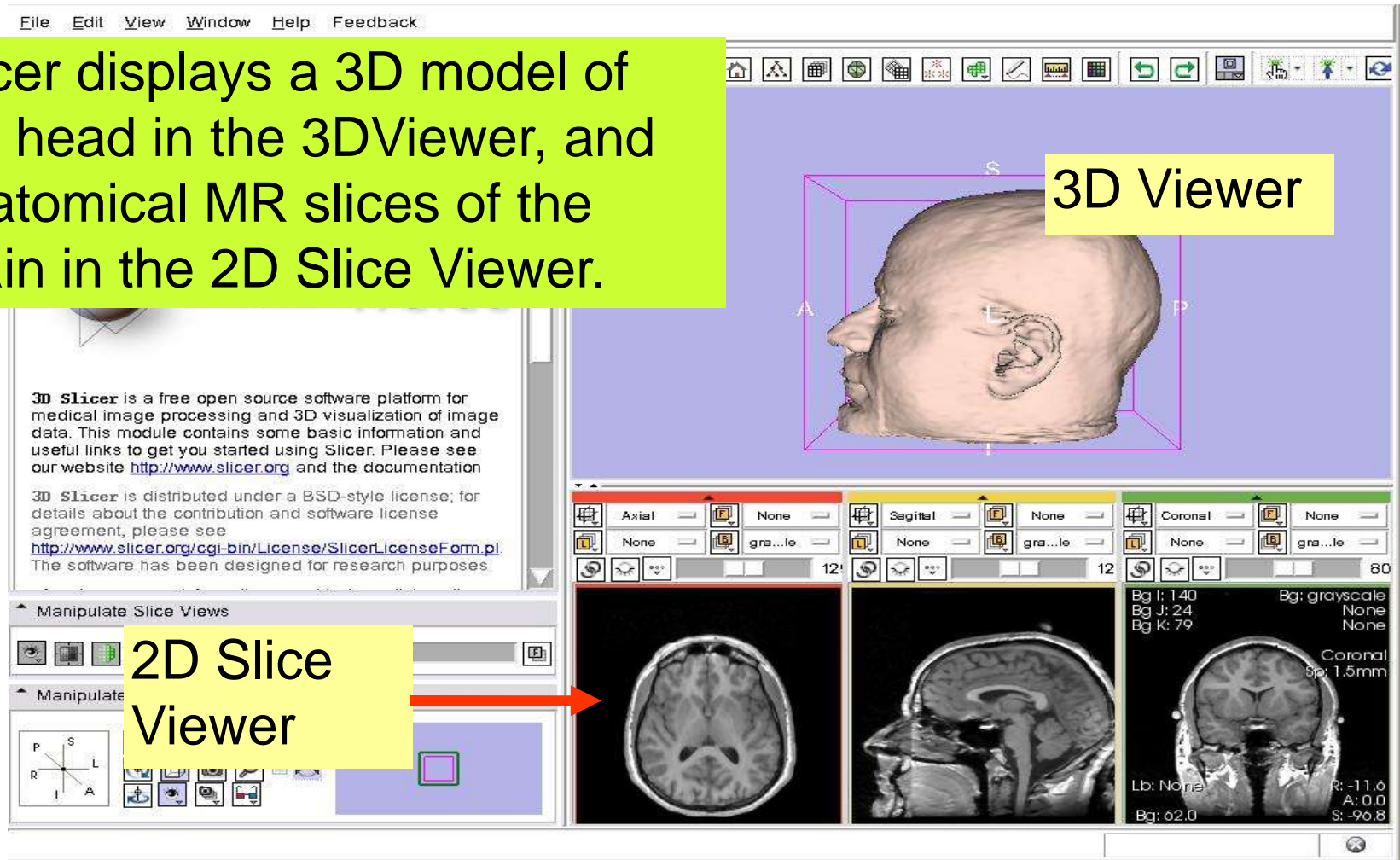


Browse to the location of the Slicer3MinuteDataset directory and select the scene file **slicer3minute.mrml**

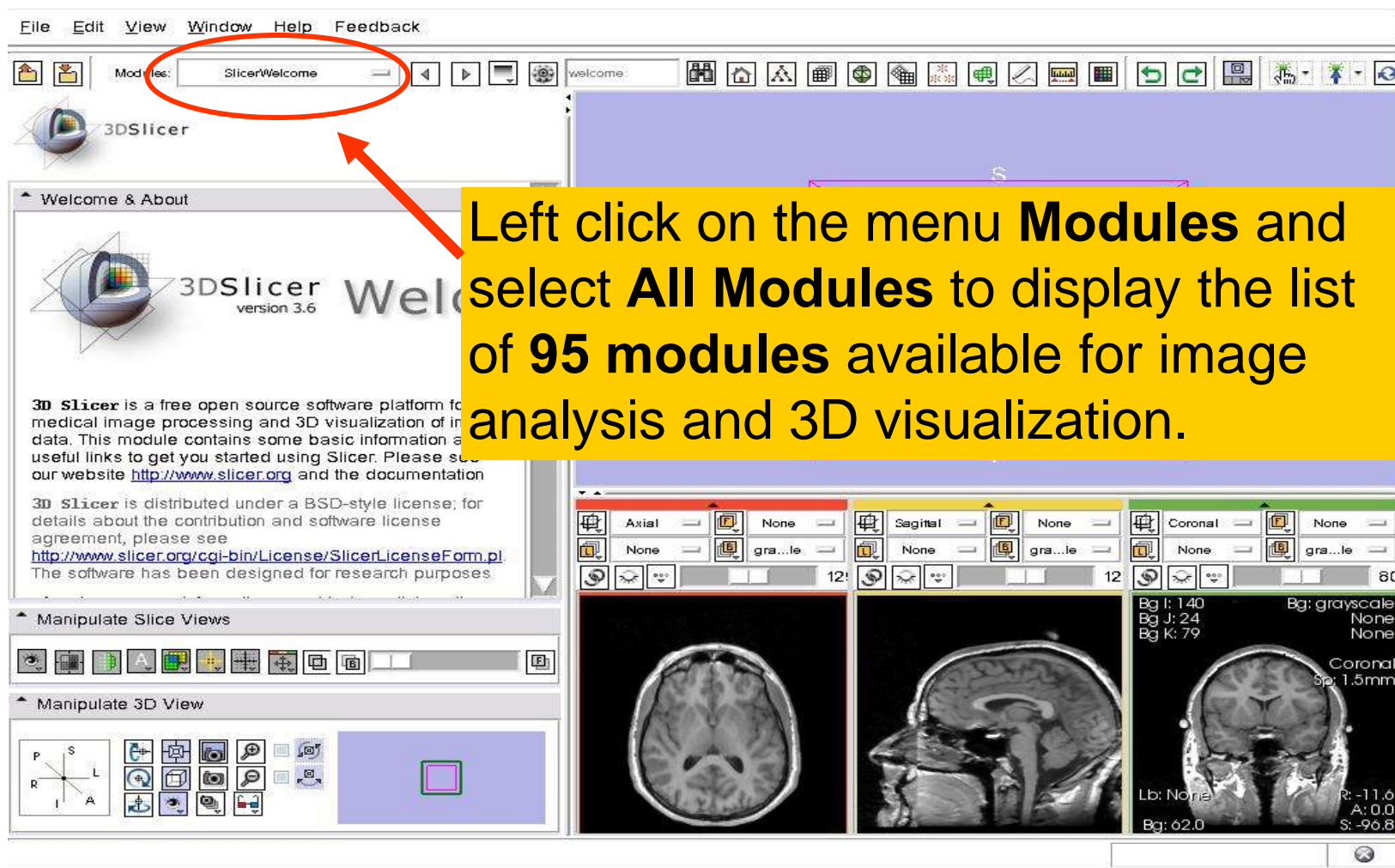
Click on **Open** to load the scene

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



File Edit View **Modules** Help Feedback

Modules: SlicerWelcome

3DSlicer

Welcome & About

3DSlicer version 3.6

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 about the software. Useful links to get you started using Slicer. Please see our website <http://www.slicer.org> and the documentation.

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.

Manipulate Slice Views

Manipulate 3D View

Axial None None

Sagittal None None

Coronal None None

Bg I: 1.40 Bg J: 24 Bg K: 79

Bg: grayscale

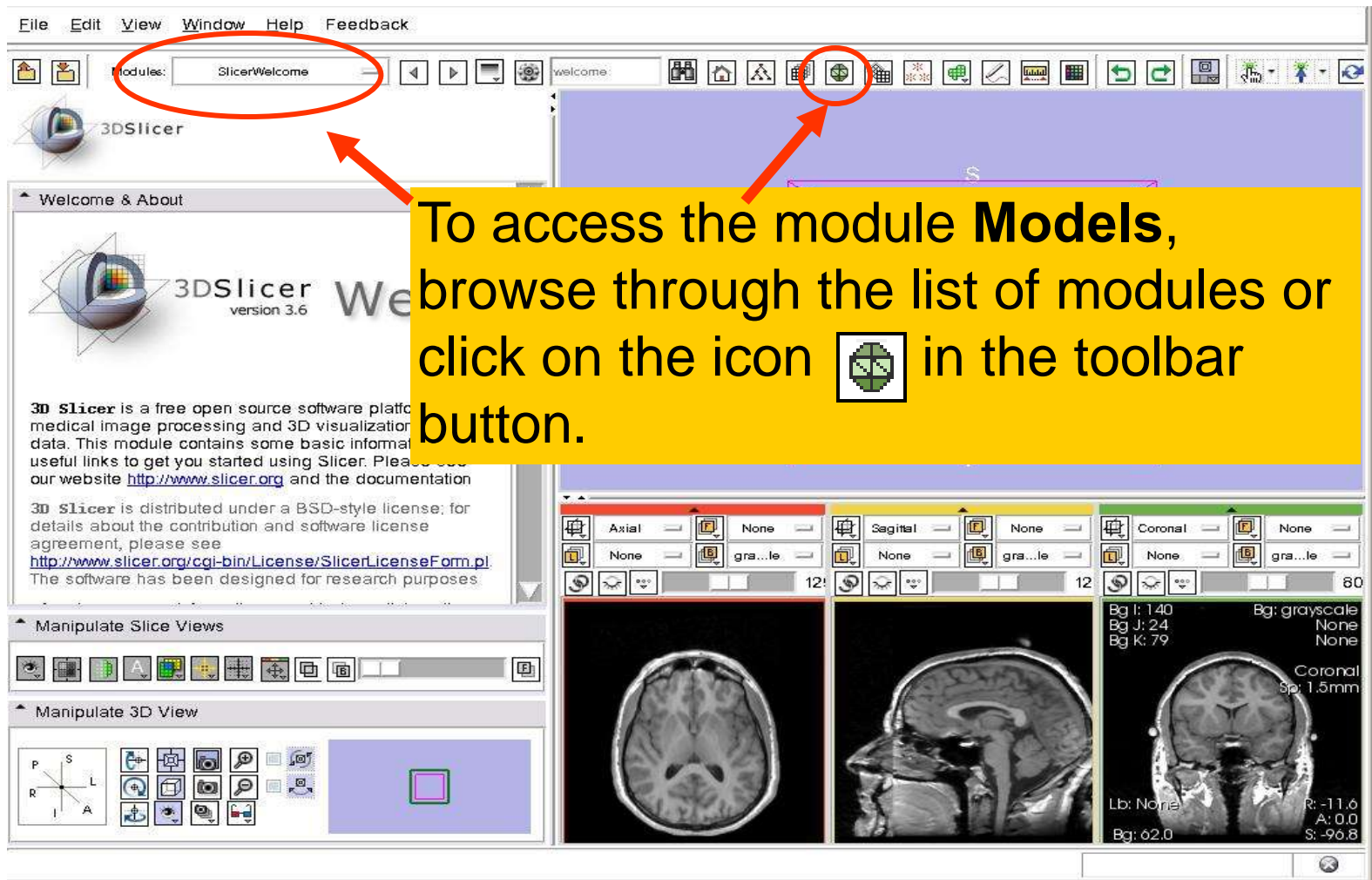
Coronal Sp: 1.5mm


Lb: None R: -11.6 A: 0.0 S: -96.8

Bg: 62.0

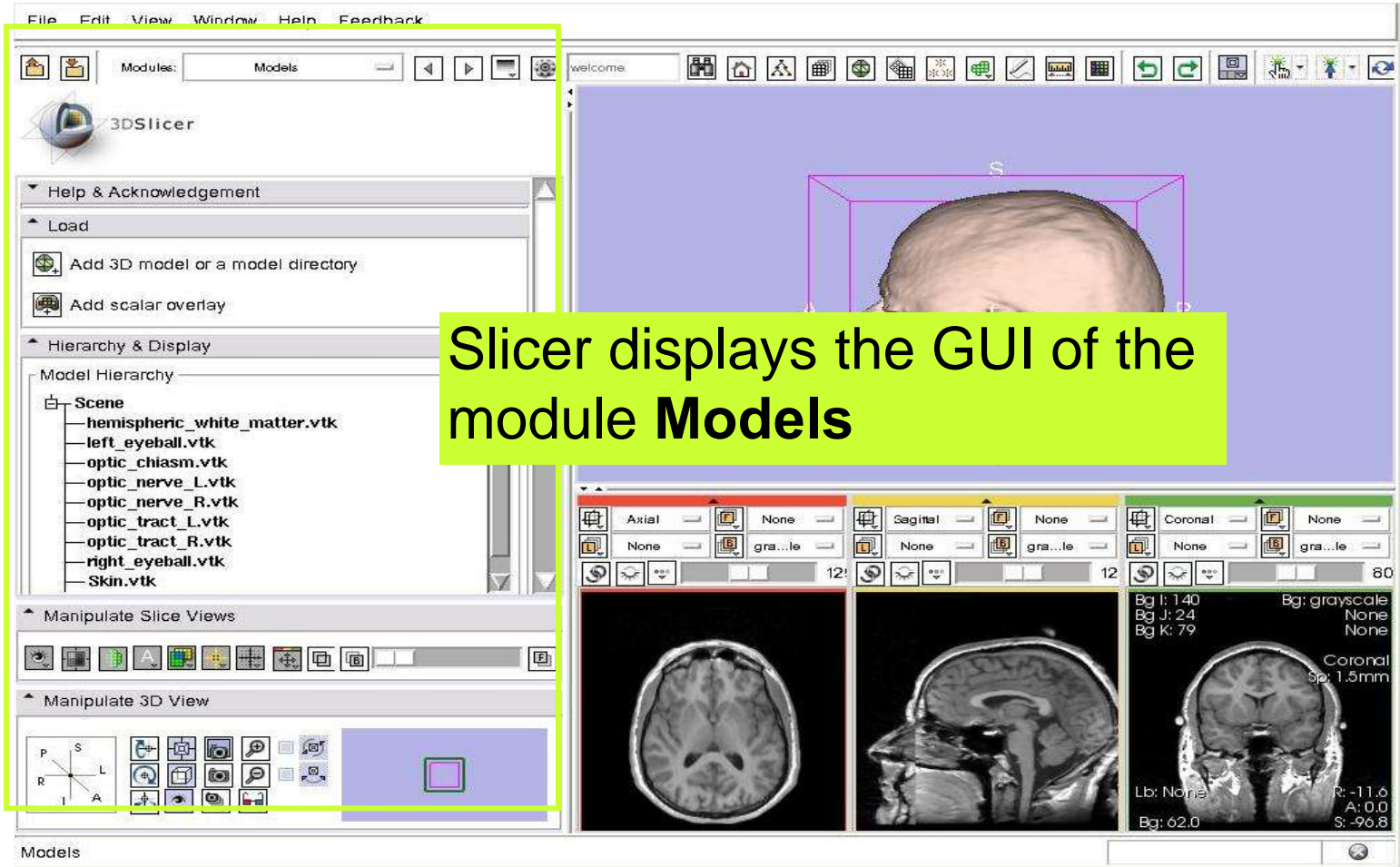
Left click on the menu **Modules** and select **All Modules** to display the list of **95 modules** available for image analysis and 3D visualization.

Loading a 3D Scene



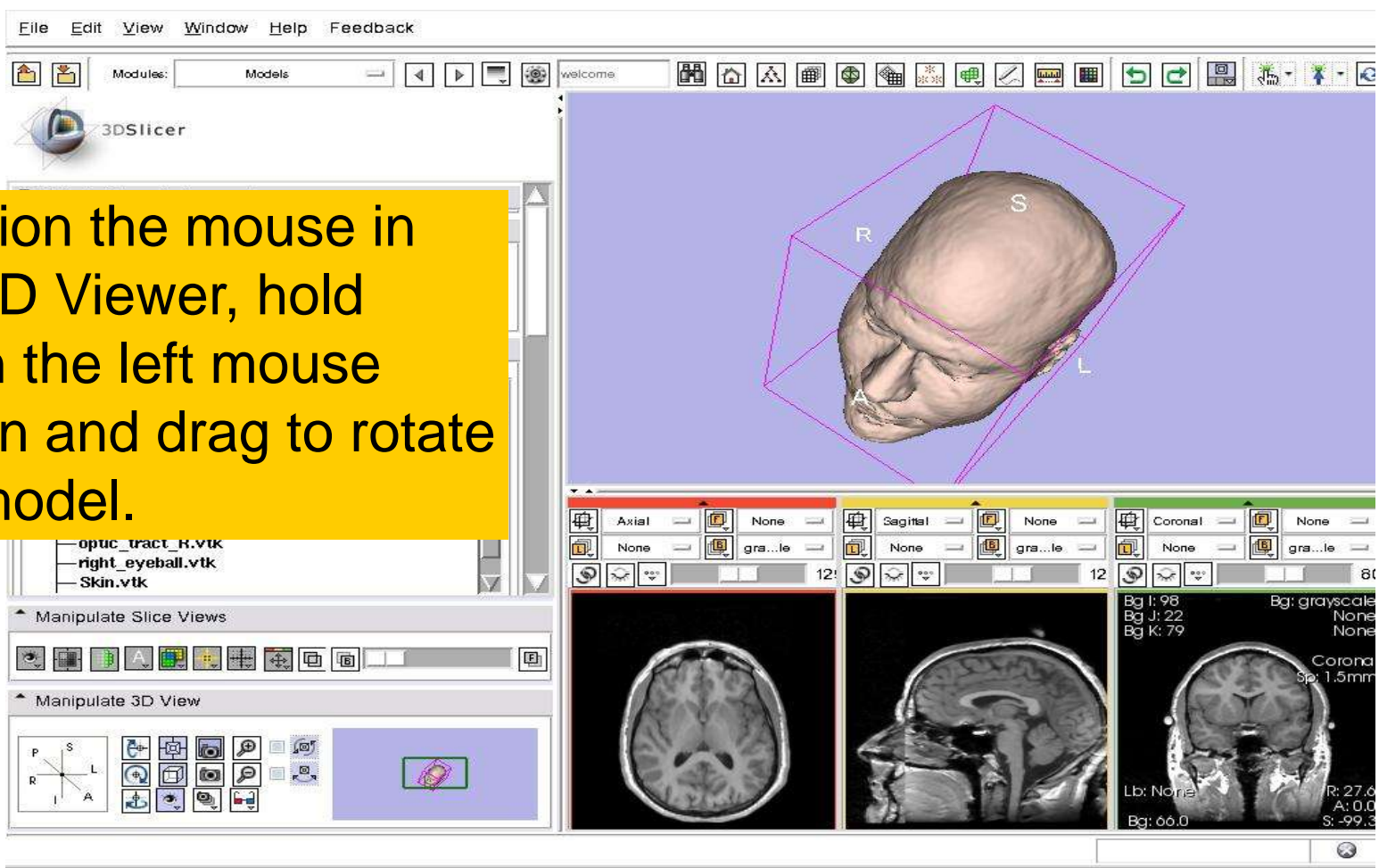
The screenshot shows the 3DSlicer software interface. The 'Modules' dropdown menu is circled in red and labeled with a red arrow. The 'Models' icon in the toolbar is also circled in red and labeled with a red arrow. A yellow text box contains the following text: 'To access the module **Models**, browse through the list of modules or click on the icon  in the toolbar button.'


Loading a 3D Scene

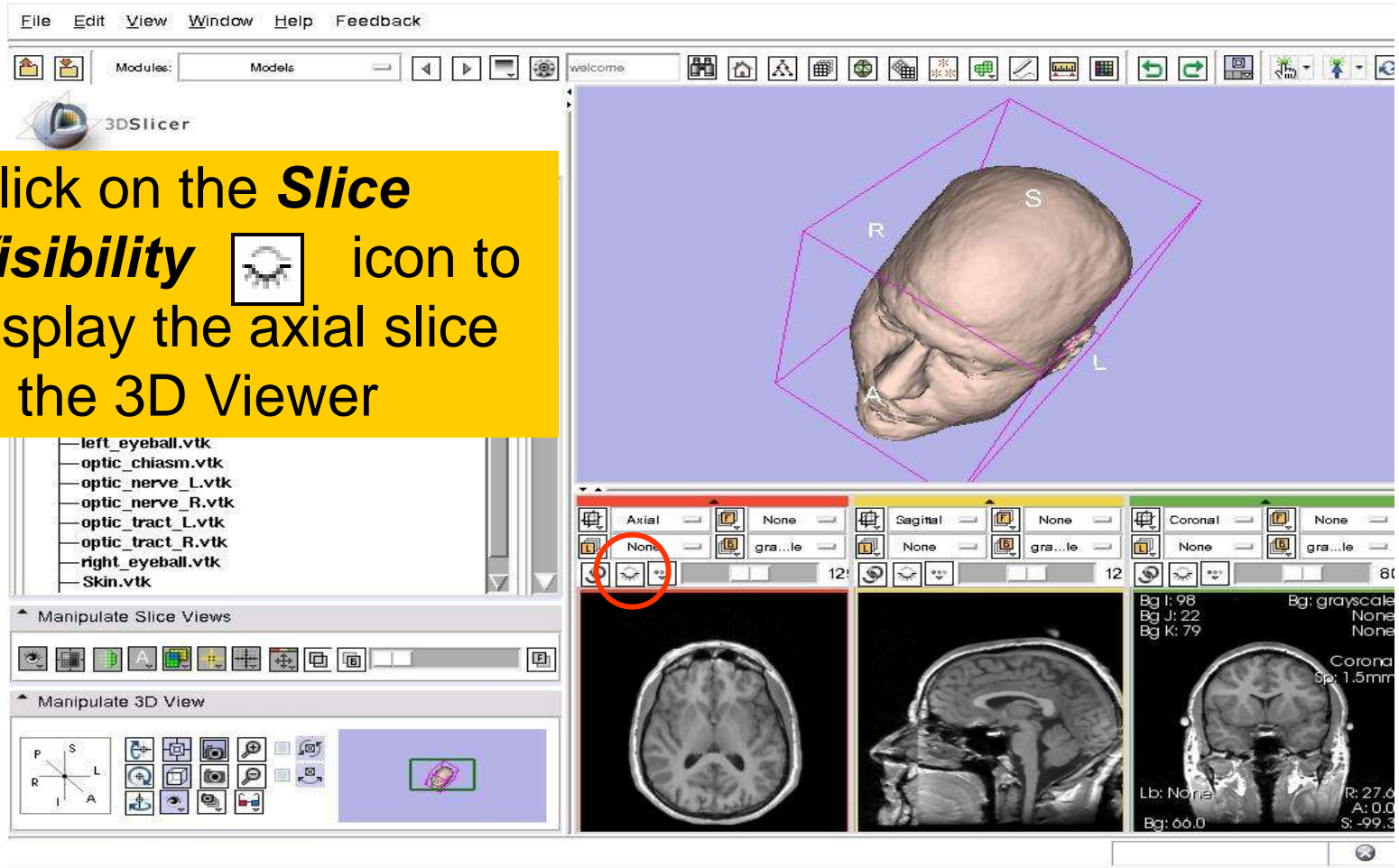


3D Visualization

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

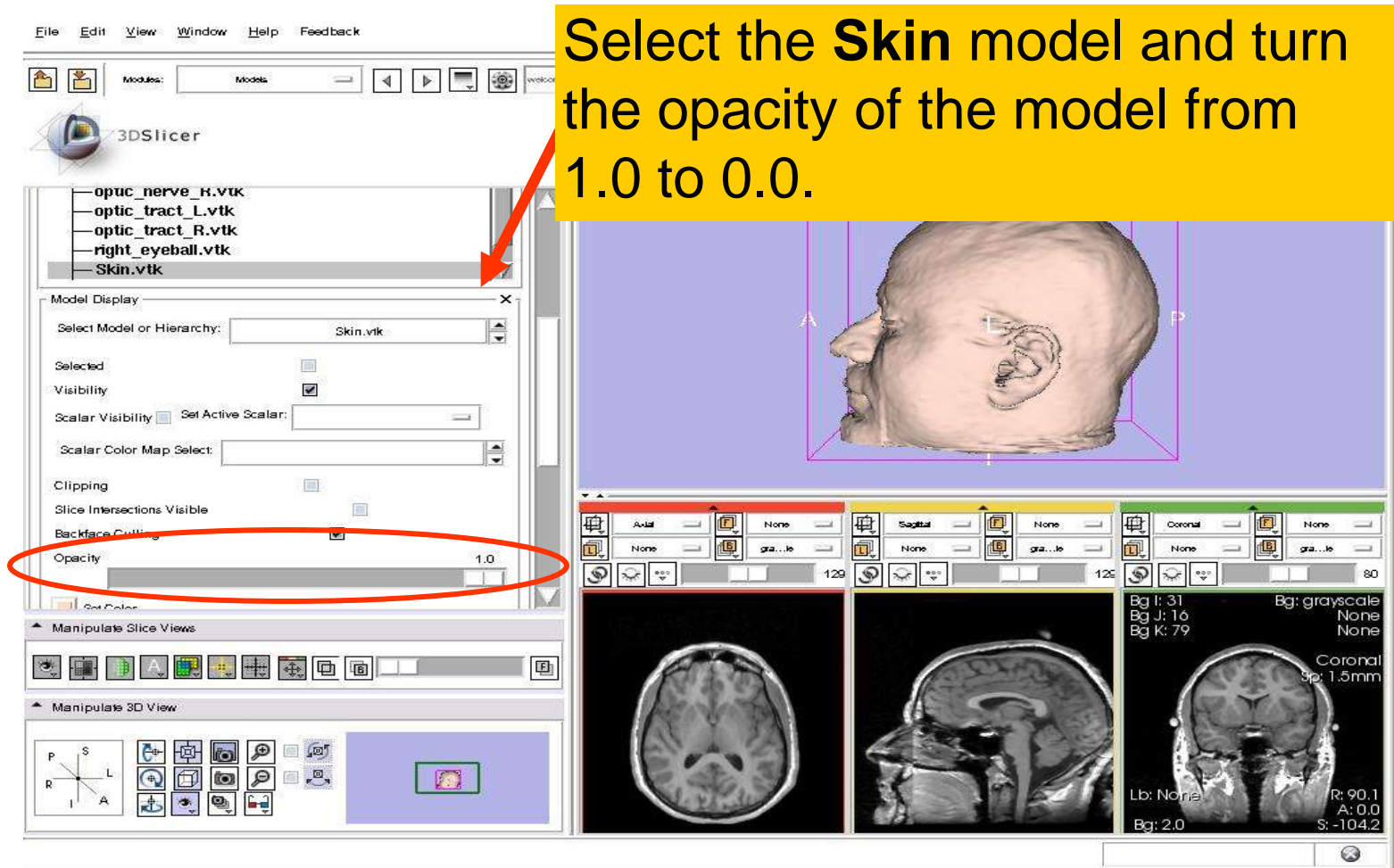


Click on the ***Slice Visibility***  icon to display the axial slice in the 3D Viewer



3D Visualization

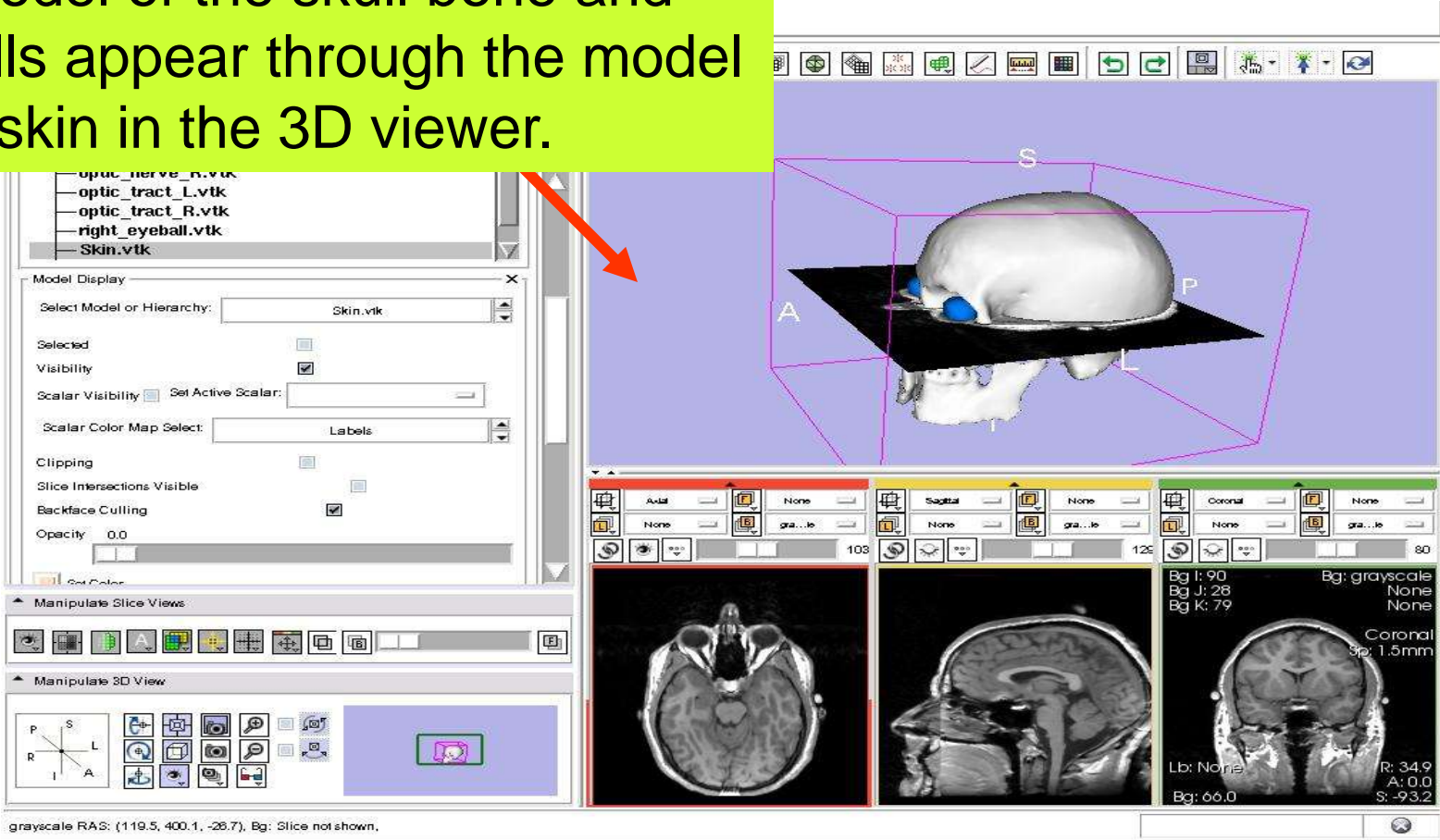
Select the **Skin** model and turn the opacity of the model from 1.0 to 0.0.



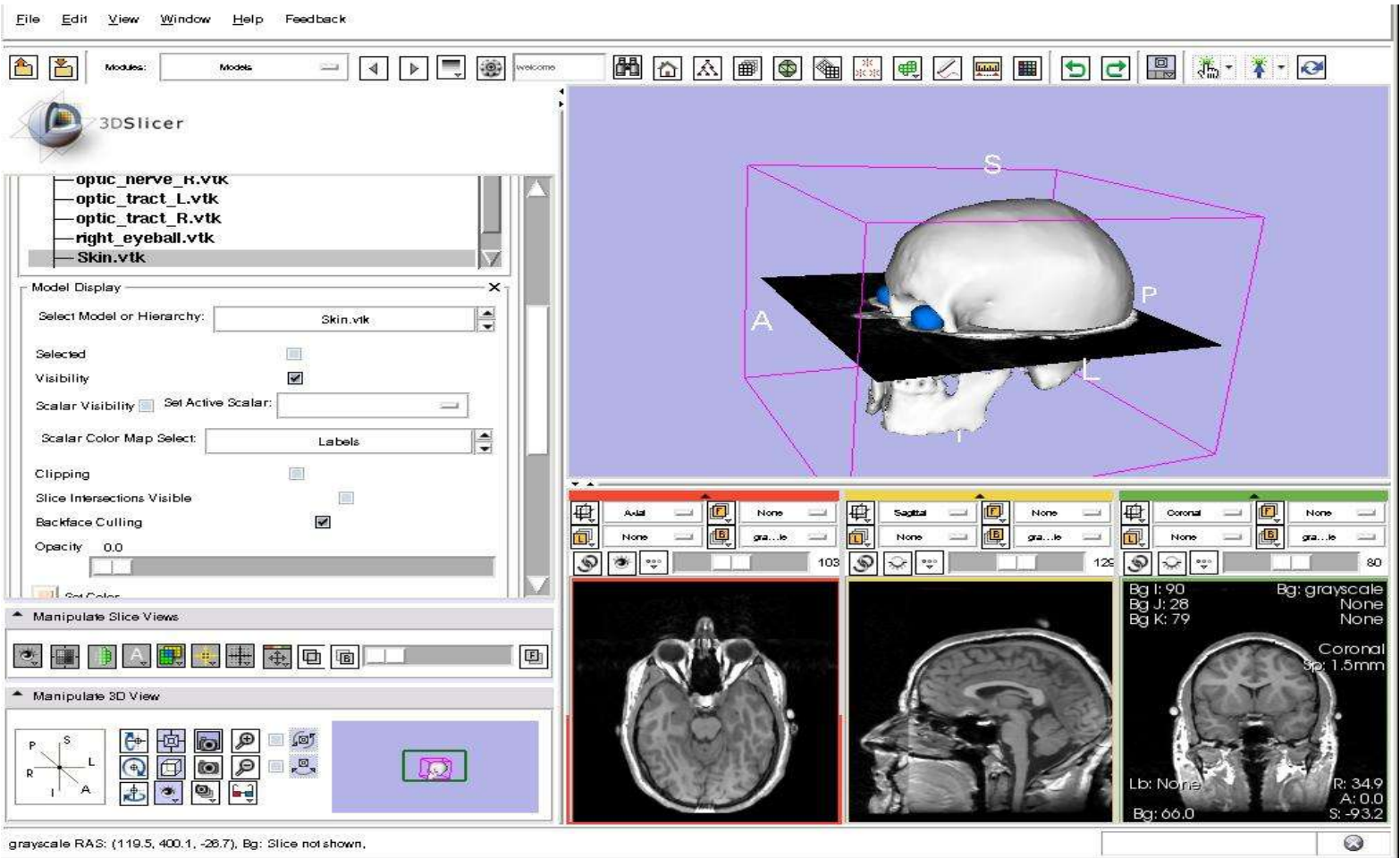
The screenshot displays the 3DSlicer software interface. On the left, the 'Model Display' panel shows the 'Skin.vtk' model selected. The 'Opacity' slider is highlighted with a red oval and set to 0.0. A red arrow points from the yellow instruction box to the 'Skin.vtk' model in the list. The main 3D view shows a 3D model of a human head in profile. Below the 3D view, there are three slice view windows: Axial, Sagittal, and Coronal. The Coronal slice view shows a brain slice with a 1.5mm thickness. The interface includes a menu bar at the top (File, Edit, View, Window, Help, Feedback) and a toolbar with various icons for navigation and manipulation.

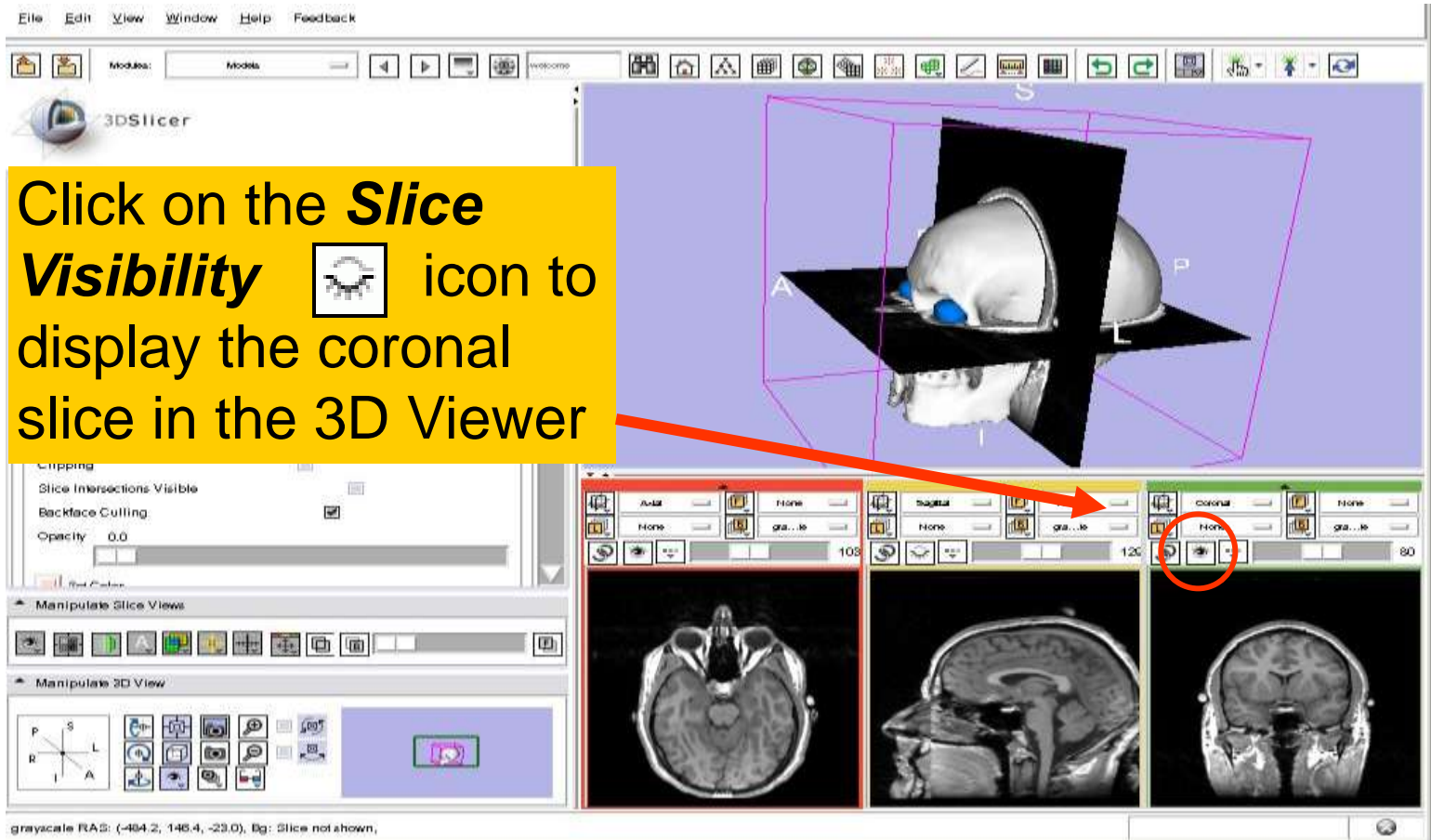
3D Visualization


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



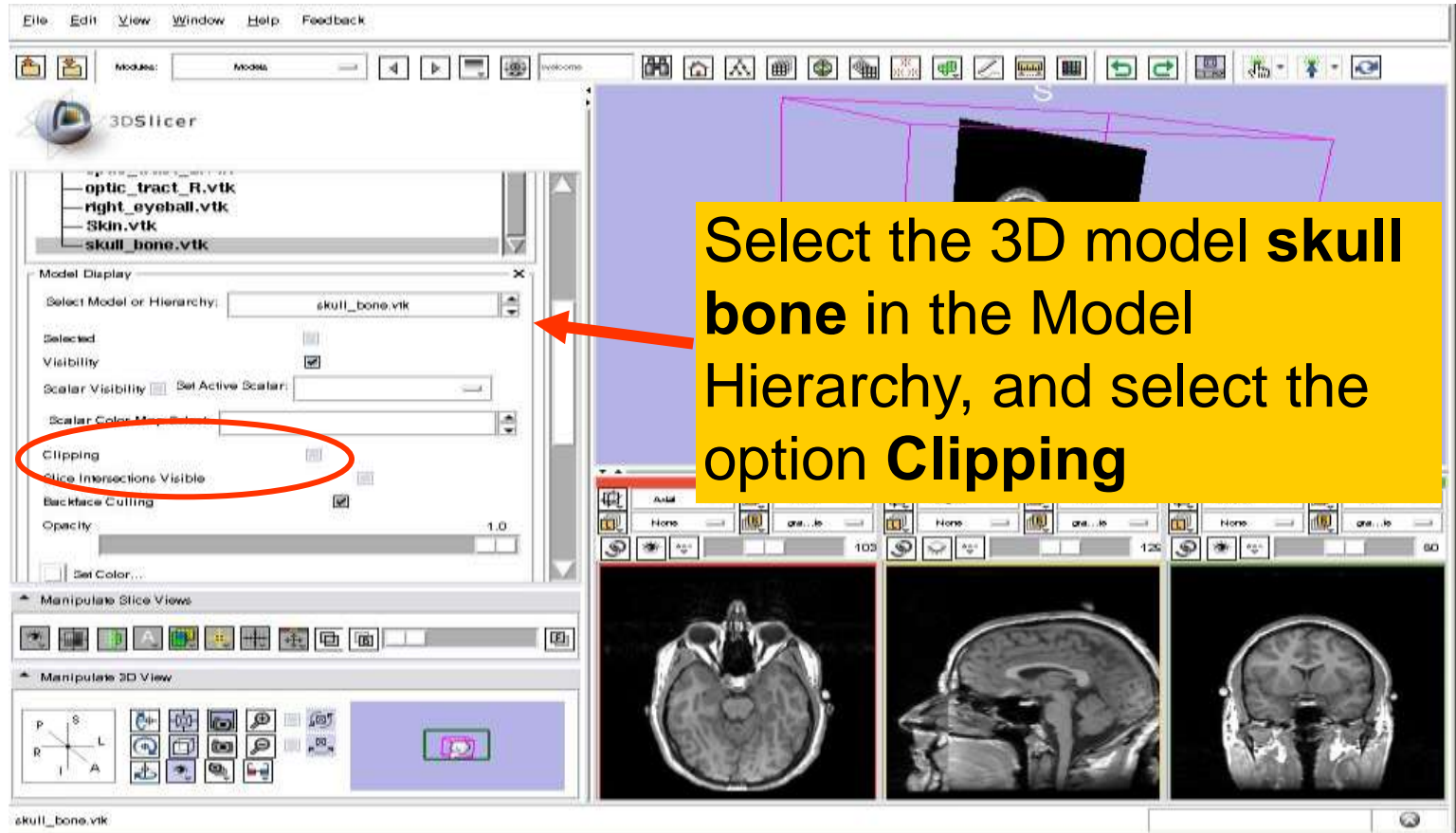
3D Visualization

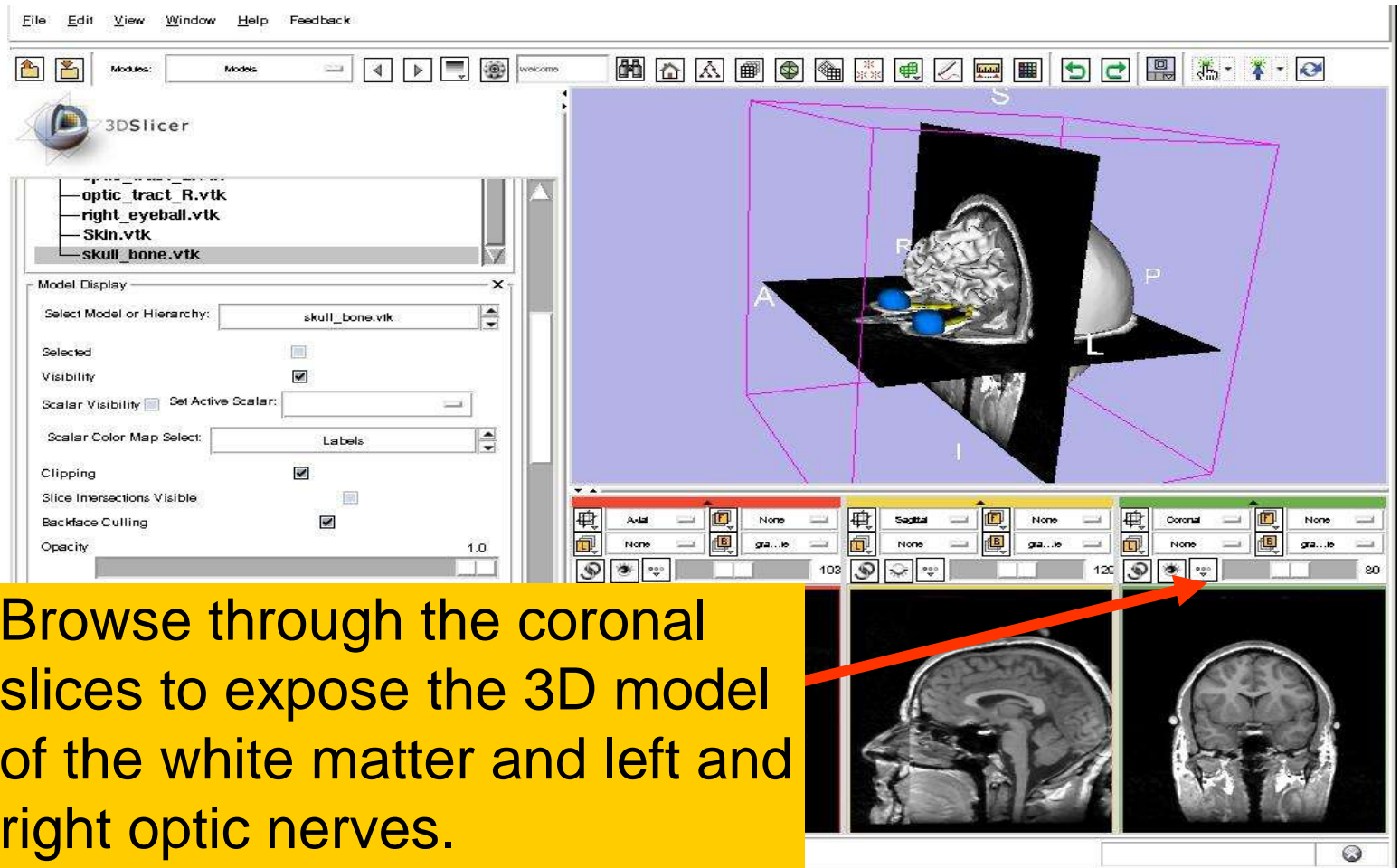




Click on the ***Slice Visibility***  icon to display the coronal slice in the 3D Viewer

The screenshot shows the 3DSlicer interface with a 3D skull model. A yellow callout box highlights the 'Slice Visibility' icon in the bottom right panel. The interface includes a menu bar (File, Edit, View, Window, Help, Feedback), a toolbar, and a 3D viewer showing a skull model with a coronal slice. The bottom right panel shows three slice views: Axial, Sagittal, and Coronal. The Coronal slice view is highlighted with a red circle, and a red arrow points from the callout box to this icon.



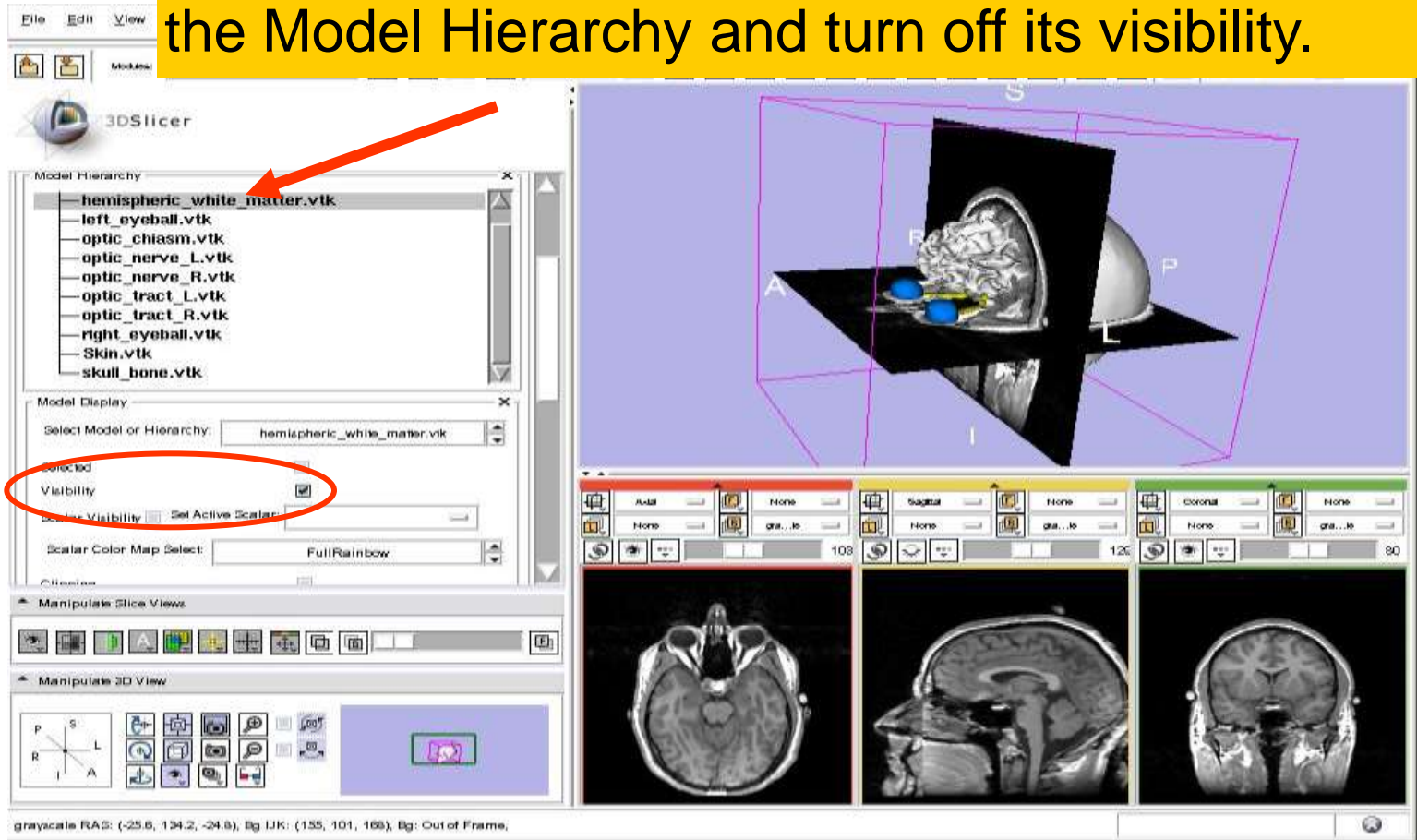


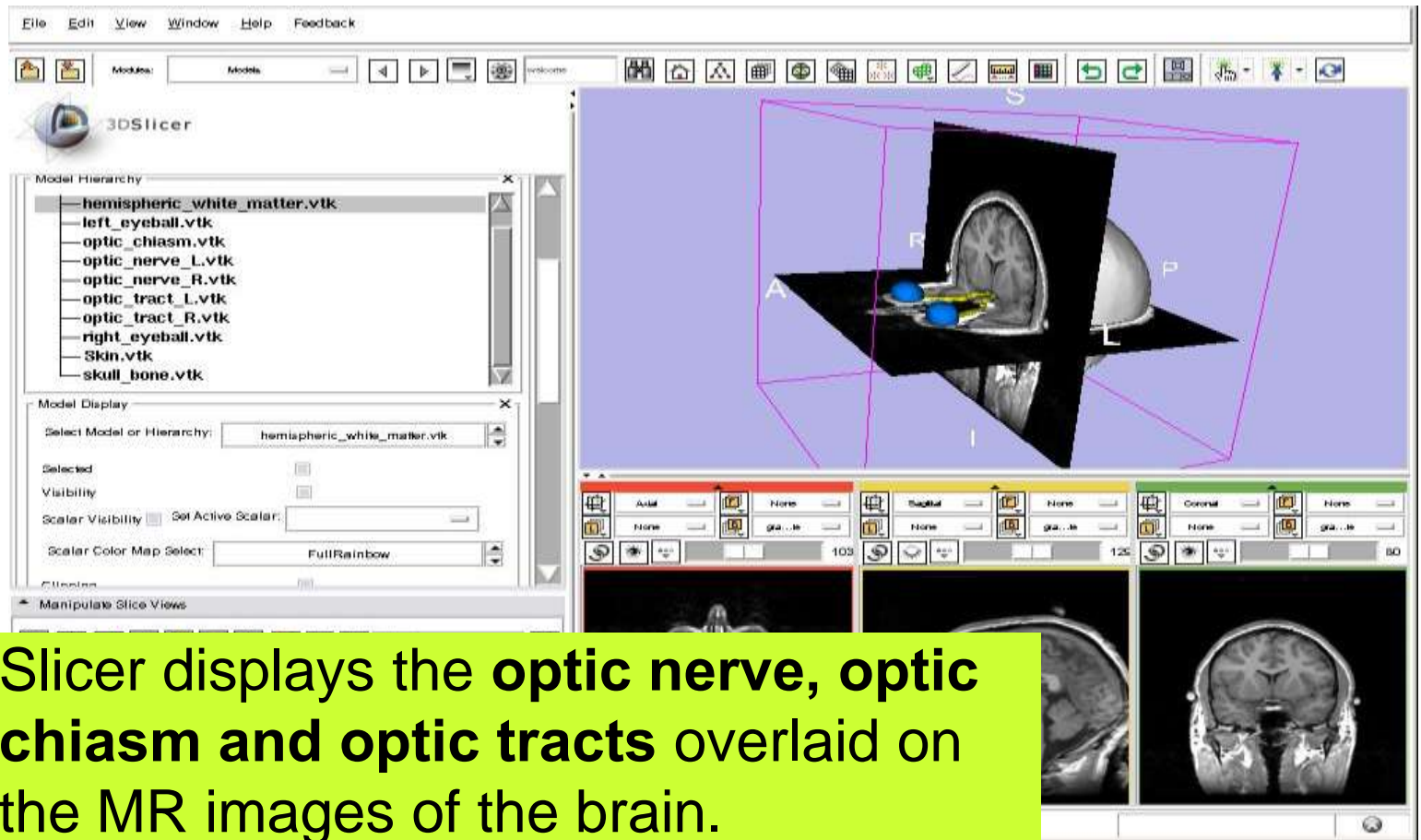
The screenshot displays the 3DSlicer software interface. The main 3D view shows a skull model with two blue spheres representing optic nerves. The model is oriented with axes labeled S (Superior), I (Inferior), A (Anterior), and P (Posterior). The left sidebar shows a list of loaded models: optic_tract_R.vtk, right_eyeball.vtk, Skin.vtk, and skull_bone.vtk. The 'Model Display' panel for 'skull_bone.vtk' is visible, showing options for visibility, scalar visibility, and clipping. Below the 3D view, there are three panels for different slice views: Axial, Sagittal, and Coronal. The Coronal panel is active, showing two coronal slices of the brain. A yellow callout box with black text is overlaid on the bottom left, and a red arrow points from the text to the Coronal slice view.

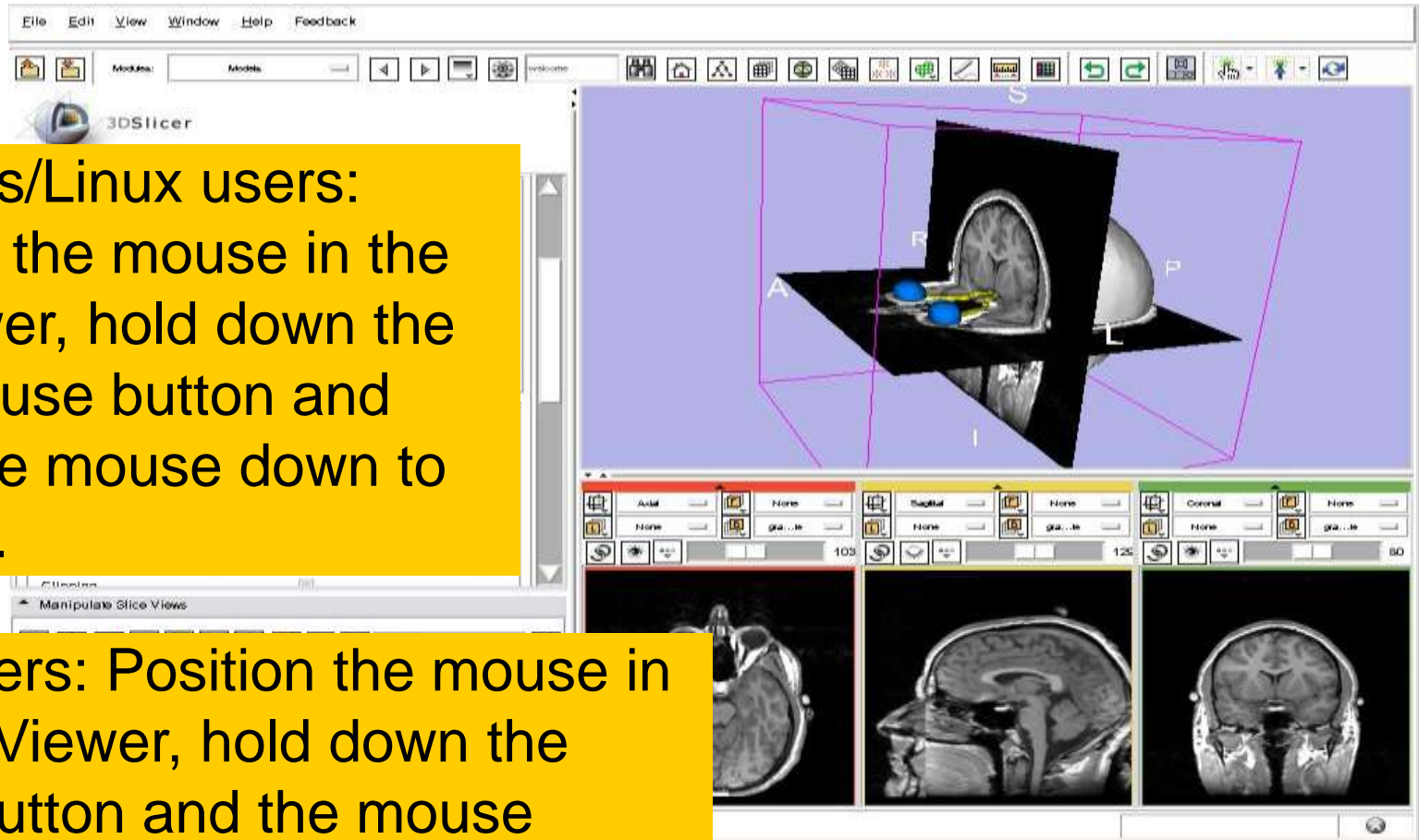
Browse through the coronal slices to expose the 3D model of the white matter and left and right optic nerves.

3D Visualization

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



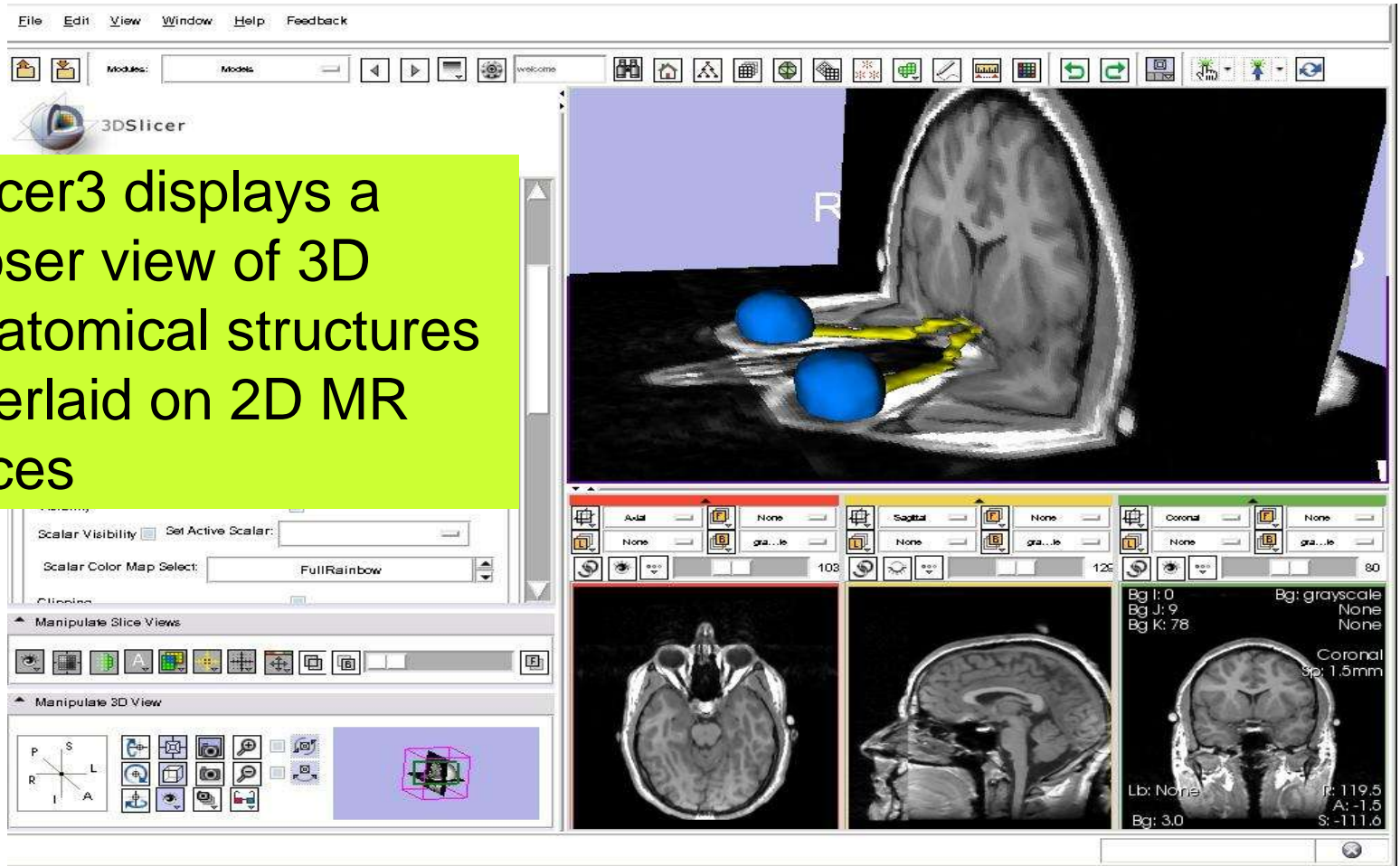




Windows/Linux users:
Position the mouse in the
3D Viewer, hold down the
right mouse button and
move the mouse down to
zoom in.

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.

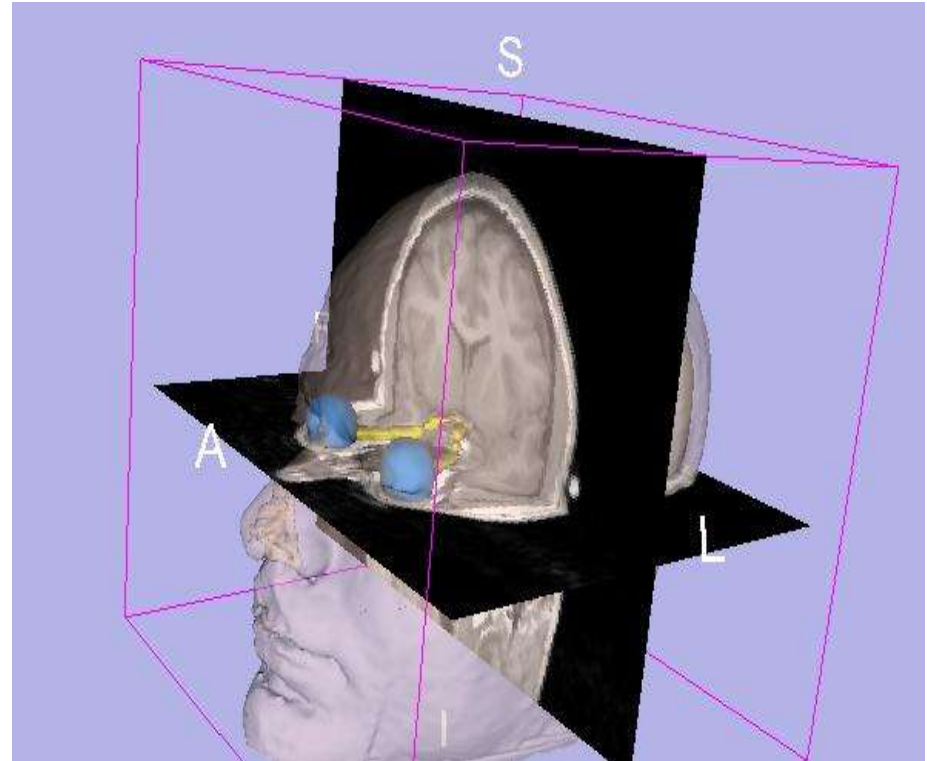
Slicer3 displays a closer view of 3D anatomical structures overlaid on 2D MR slices





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**.



spujol@bwh.harvard.edu



Acknowledgments



National Alliance for Medical Image Computing

NIH U54EB005149



Neuroimage Analysis Center

NIH P41RR013218