

# Slicer3 minute tutorial

Sonia Pujol, Ph.D.

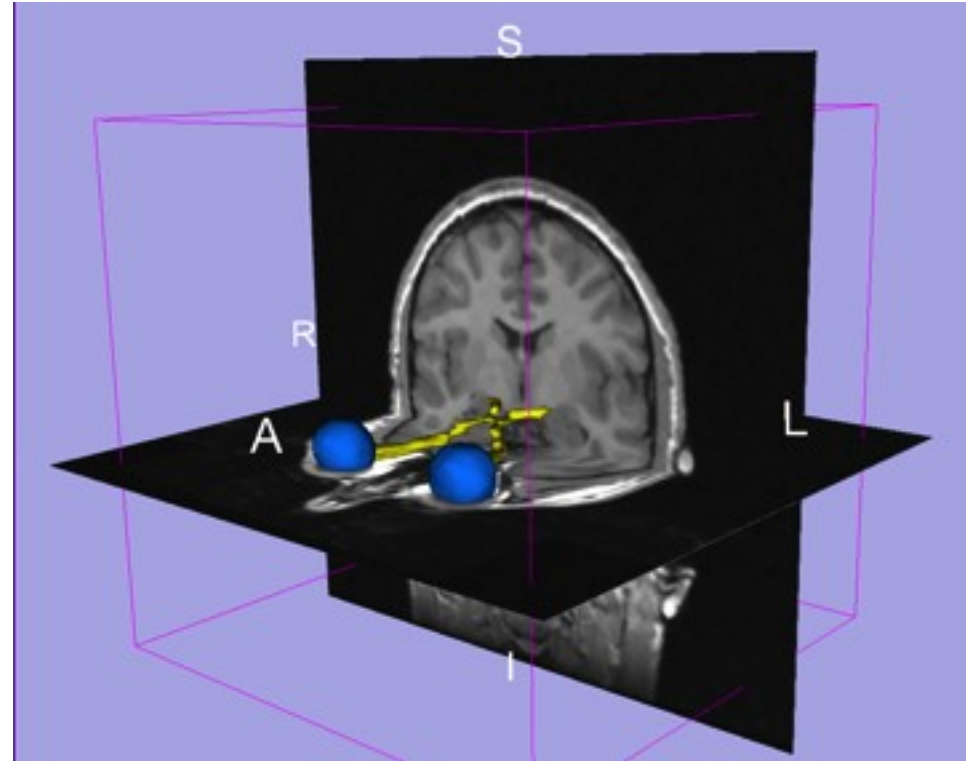
Surgical Planning Laboratory  
Harvard Medical School



# Slicer3 minute tutorial

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

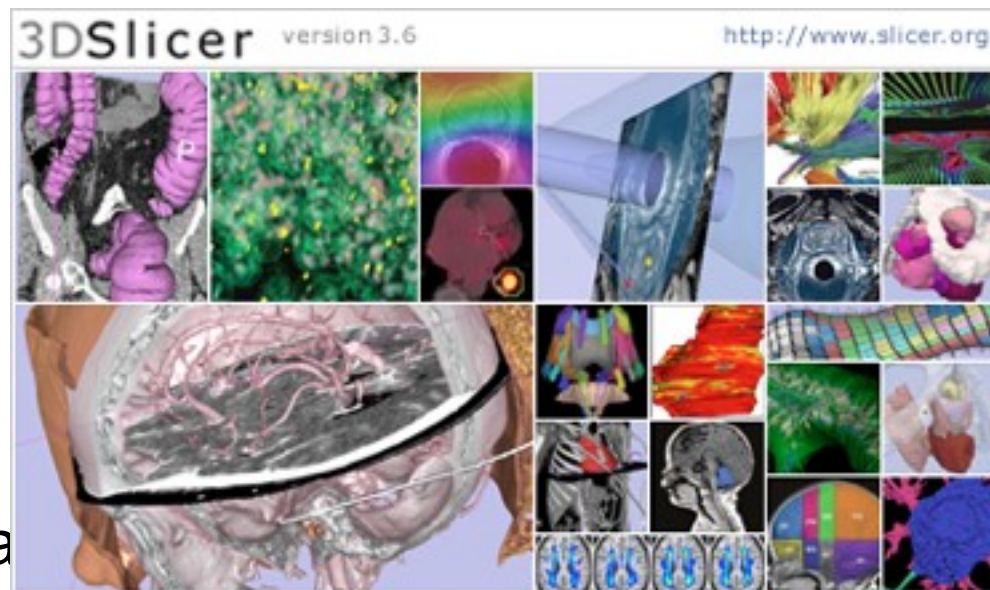




# The Slicer3 software

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- 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

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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

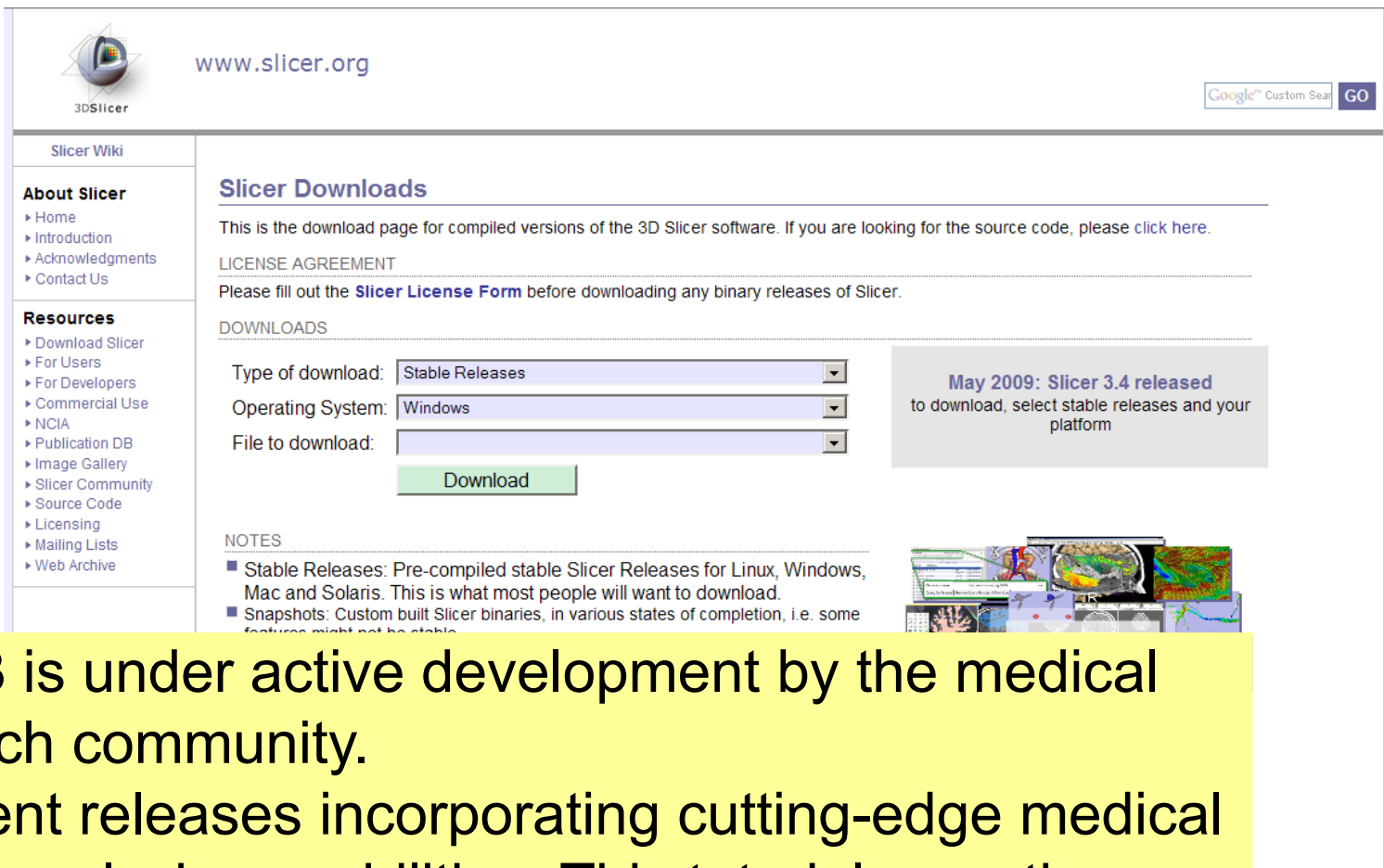
<http://www.slicer.org/pages/Special:SlicerDownloads>



## **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 has a header with the 3DSlicer logo and the URL 'www.slicer.org'. A Google Custom Search bar is in the top right. A left sidebar contains links for 'Slicer Wiki', 'About Slicer' (Home, Introduction, Acknowledgments, Contact Us), and 'Resources' (Download Slicer, For Users, For Developers, Commercial Use, NCIA, Publication DB, Image Gallery, Slicer Community, Source Code, Licensing, Mailing Lists, Web Archive). The main content area is titled 'Slicer Downloads' and includes a paragraph about downloading compiled versions, a 'LICENSE AGREEMENT' section with a link to the 'Slicer License Form', and a 'DOWNLOADS' section with three dropdown menus: 'Type of download:' (Stable Releases), 'Operating System:' (Windows), and 'File to download:'. A green 'Download' button is below these. A grey box on the right says 'May 2009: Slicer 3.4 released to download, select stable releases and your platform'. At the bottom, a 'NOTES' section lists 'Stable Releases' and 'Snapshots'. A collage of medical image analysis visualizations is at the bottom right.

www.slicer.org

Google™ Custom Search GO

Slicer Wiki

**About Slicer**

- ▶ Home
- ▶ Introduction
- ▶ Acknowledgments
- ▶ Contact Us

**Resources**

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

## Slicer Downloads

This is the download page for compiled versions of the 3D Slicer software. If you are looking for the source code, please [click here](#).

**LICENSE AGREEMENT**

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

**DOWNLOADS**

Type of download:

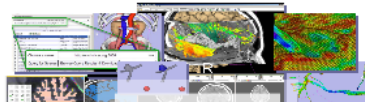
Operating System:

File to 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.



Slicer3 is under active development by the medical research community. Frequent releases incorporating cutting-edge medical image analysis capabilities. This tutorial uses the current **Slicer3.6.1 release version**.



www.slicer.org

Google™ Custom Search **GO**

Select the type of download  
**‘Nightly Builds’**

## Resources

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

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

## DOWNLOADS

Type of download: **Nightly Builds**

Operating System: **All**

File to download:

**Download**

**June 2010: Slicer 3.6 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. See also [the release notes](#).
- **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, Darwin is for Mac OS X, 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 (512 or more recommended). 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.

## 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](#).





# Download Slicer3.6

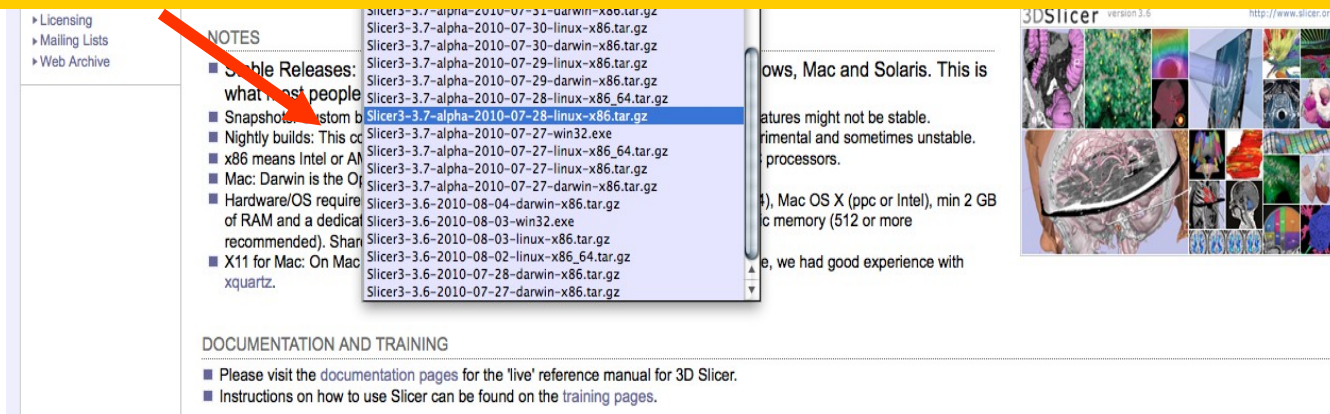
## Select the corresponding release:

[http://www.na-mic.org/Slicer/Download/Nightly/Slicer3-3.6-2010-08-16-linux-x86\\_64.tar.gz](http://www.na-mic.org/Slicer/Download/Nightly/Slicer3-3.6-2010-08-16-linux-x86_64.tar.gz)

<http://www.na-mic.org/Slicer/Download/Nightly/Slicer3-3.6-2010-08-16-linux-x86.tar.gz>

<http://www.na-mic.org/Slicer/Download/Nightly/Slicer3-3.6-2010-08-16-win32.exe>

<http://www.na-mic.org/Slicer/Download/Nightly/Slicer3-3.6-2010-08-16-darwin-x86.tar.gz>



► Licensing  
► Mailing Lists  
► Web Archive

**NOTES**

- **Stable Releases:** what most people want
- Snapshot: custom builds
- Nightly builds: This collection of builds is updated daily
- x86 means Intel or AMD processors
- Mac: Darwin is the Operating System (OS X, Mac OS X (ppc or Intel), min 2 GB of RAM and a dedicated graphics card (recommended). Share your experience with us.
- X11 for Mac: On Mac OS X, you need to install Xquartz.

Slicer3-3.7-alpha-2010-07-31-darwin-x86.tar.gz  
Slicer3-3.7-alpha-2010-07-30-linux-x86.tar.gz  
Slicer3-3.7-alpha-2010-07-30-darwin-x86.tar.gz  
Slicer3-3.7-alpha-2010-07-29-linux-x86.tar.gz  
Slicer3-3.7-alpha-2010-07-29-darwin-x86.tar.gz  
Slicer3-3.7-alpha-2010-07-28-linux-x86\_64.tar.gz  
Slicer3-3.7-alpha-2010-07-28-linux-x86.tar.gz  
Slicer3-3.7-alpha-2010-07-27-win32.exe  
Slicer3-3.7-alpha-2010-07-27-linux-x86\_64.tar.gz  
Slicer3-3.7-alpha-2010-07-27-linux-x86.tar.gz  
Slicer3-3.7-alpha-2010-07-27-darwin-x86.tar.gz  
Slicer3-3.6-2010-08-04-darwin-x86.tar.gz  
Slicer3-3.6-2010-08-03-win32.exe  
Slicer3-3.6-2010-08-03-linux-x86.tar.gz  
Slicer3-3.6-2010-08-02-linux-x86\_64.tar.gz  
Slicer3-3.6-2010-07-28-darwin-x86.tar.gz  
Slicer3-3.6-2010-07-27-darwin-x86.tar.gz

**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](#).

3DSlicer version 3.6 <http://www.slicer.org>

Windows, Mac and Solaris. This is a preview of the software. Features might not be stable. Experimental and sometimes unstable. For research purposes only.

Mac OS X (ppc or Intel), min 2 GB of RAM and a dedicated graphics card (recommended). Share your experience with us.

we had good experience with

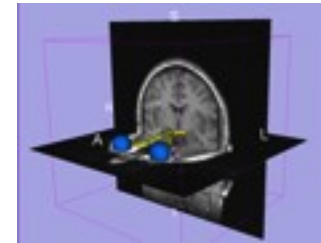


# Download the material

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

- Download the training dataset:  
**Slicer3minuteDataset.zip**



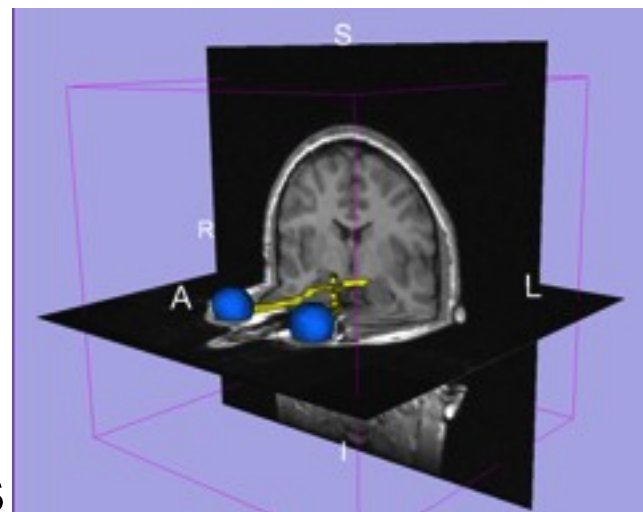
<http://www.slicer.org/slicerWiki/index.php/Slicer3.6:Training>



# Tutorial Dataset

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- 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>





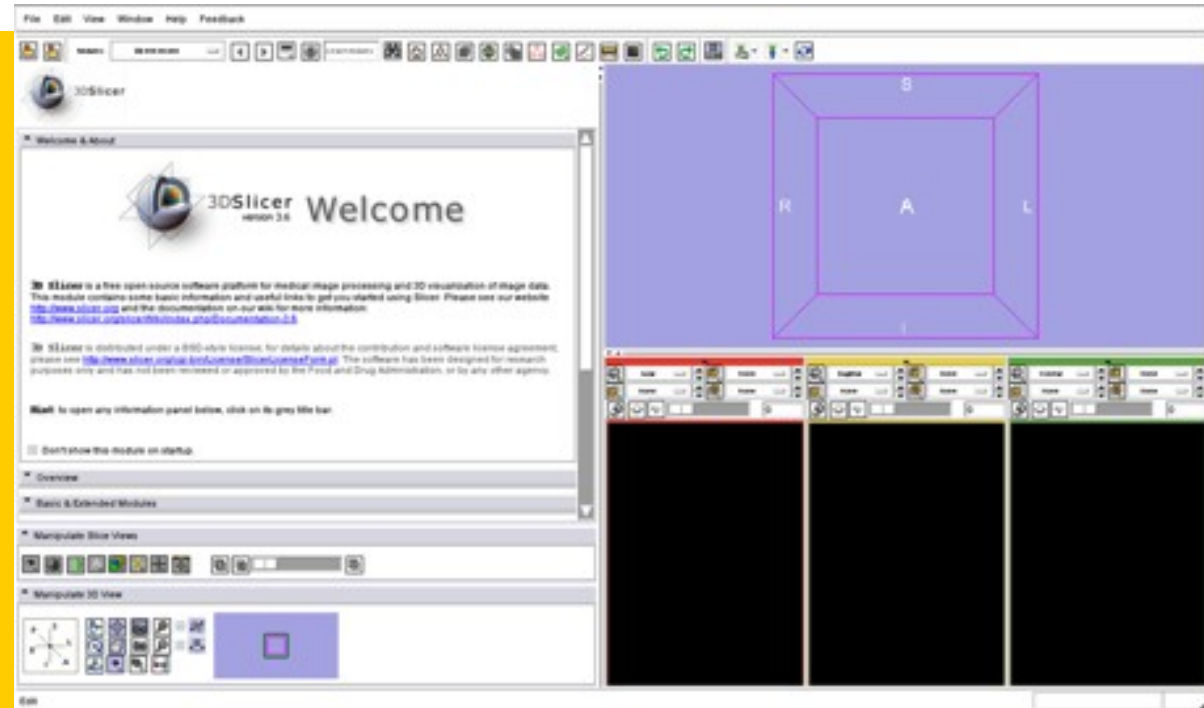
# Start Slicer3

## Linux/Mac users

Launch the Slicer3  
executable located in  
the Slicer3.6 directory

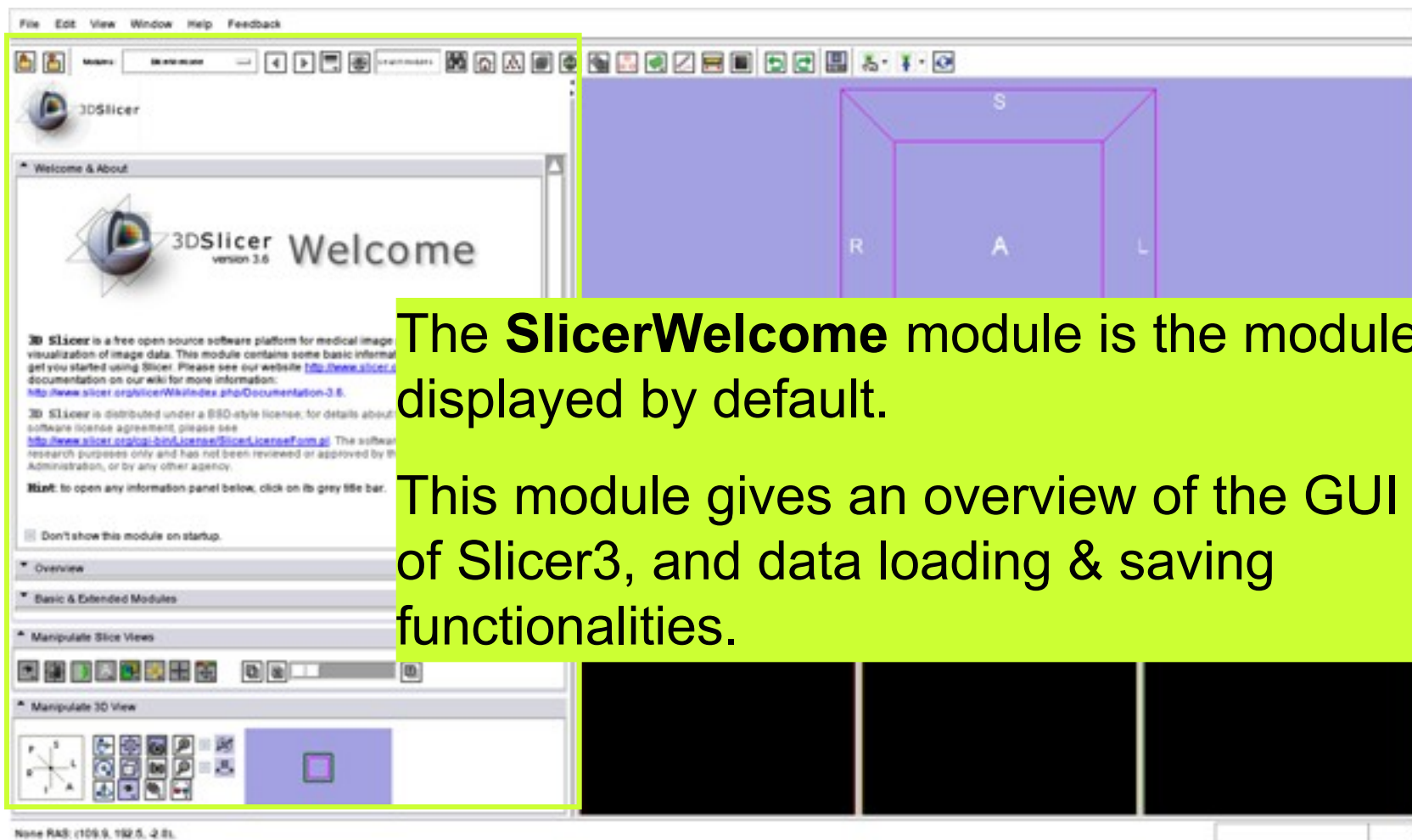
## Windows users

Select  
Start → All Programs  
→ Slicer3-3.6-2010-08-16 → Slicer3





# Slicer Welcome

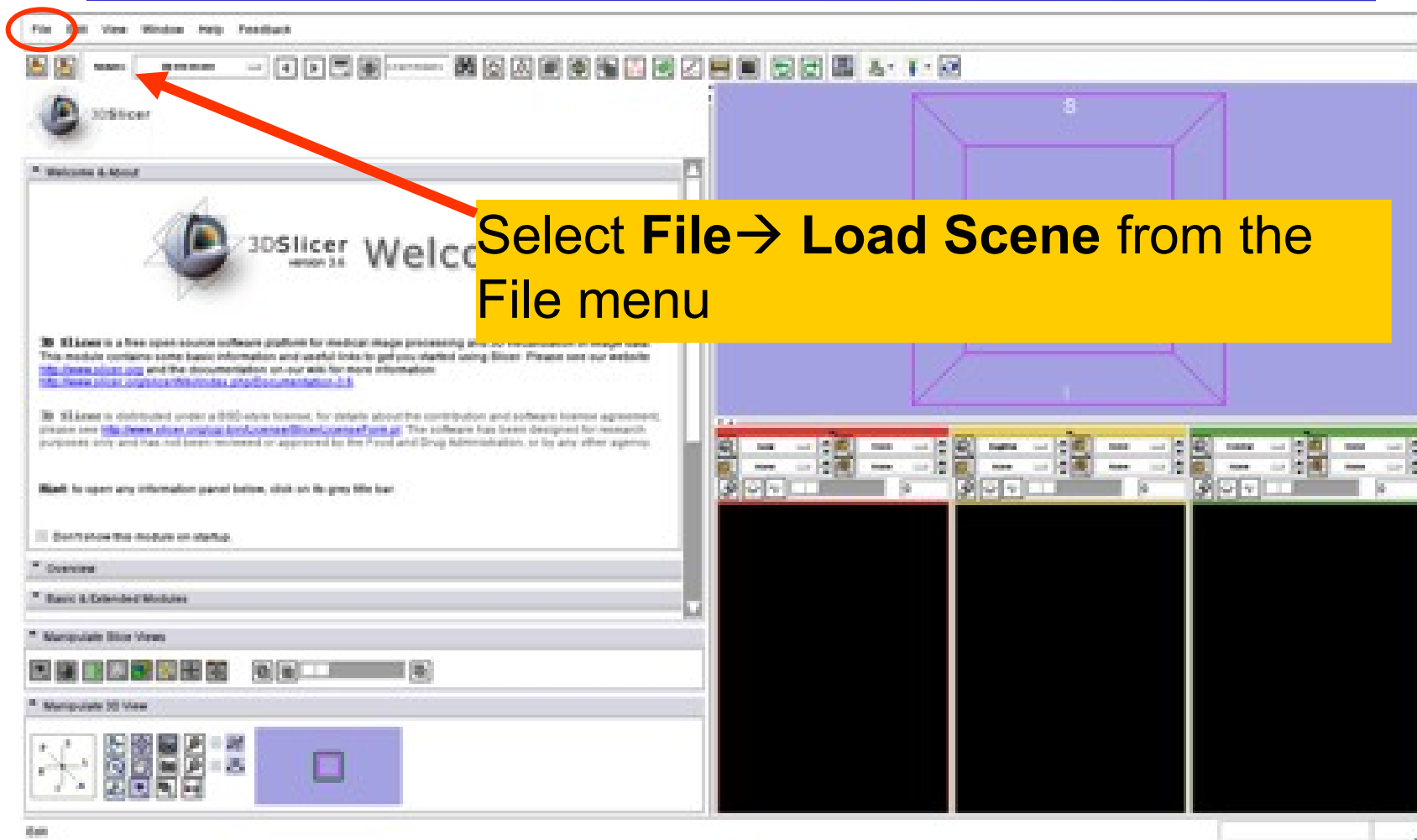


The **SlicerWelcome** module is the module displayed by default.

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

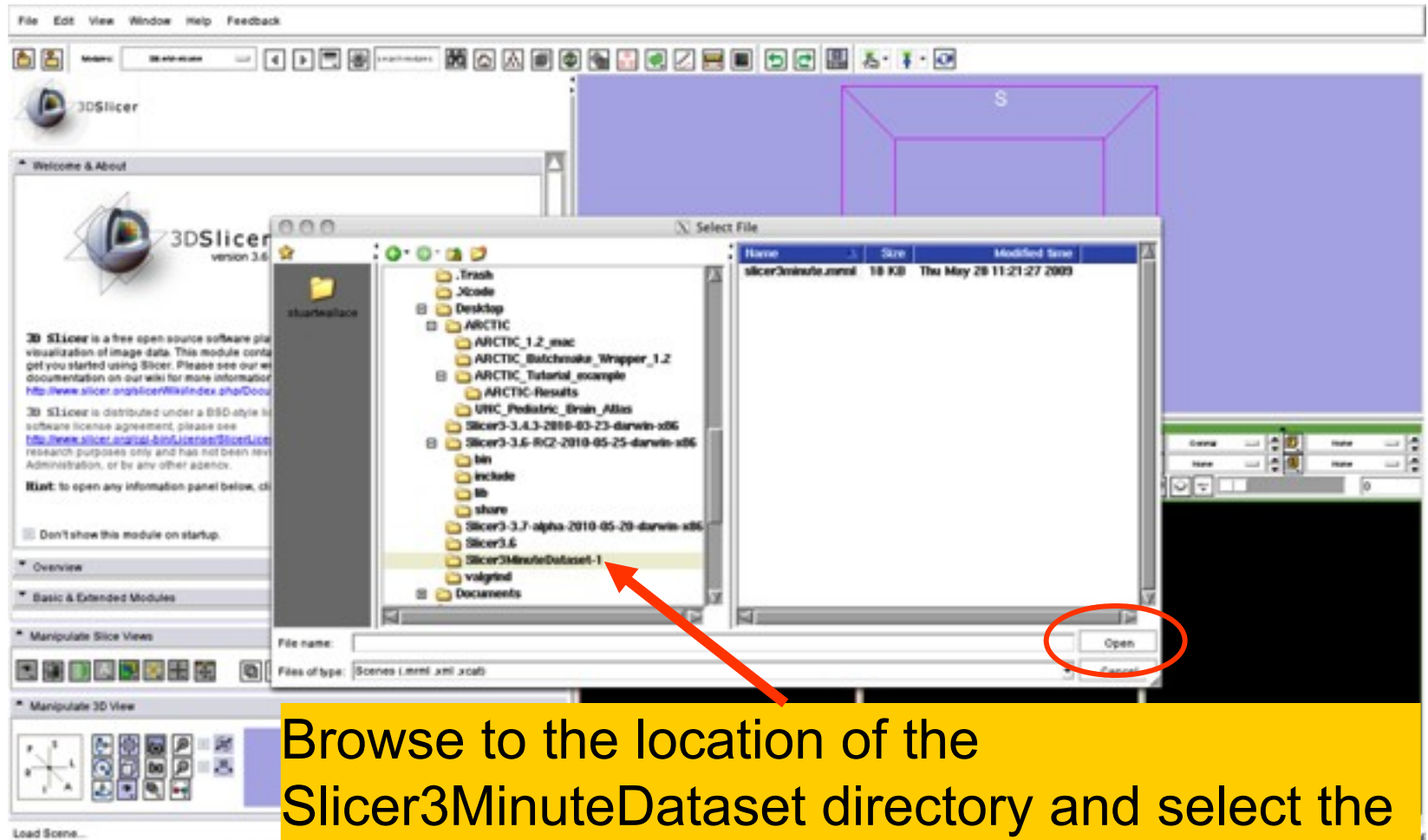


# Loading a 3D Scene





# Loading a 3D Scene



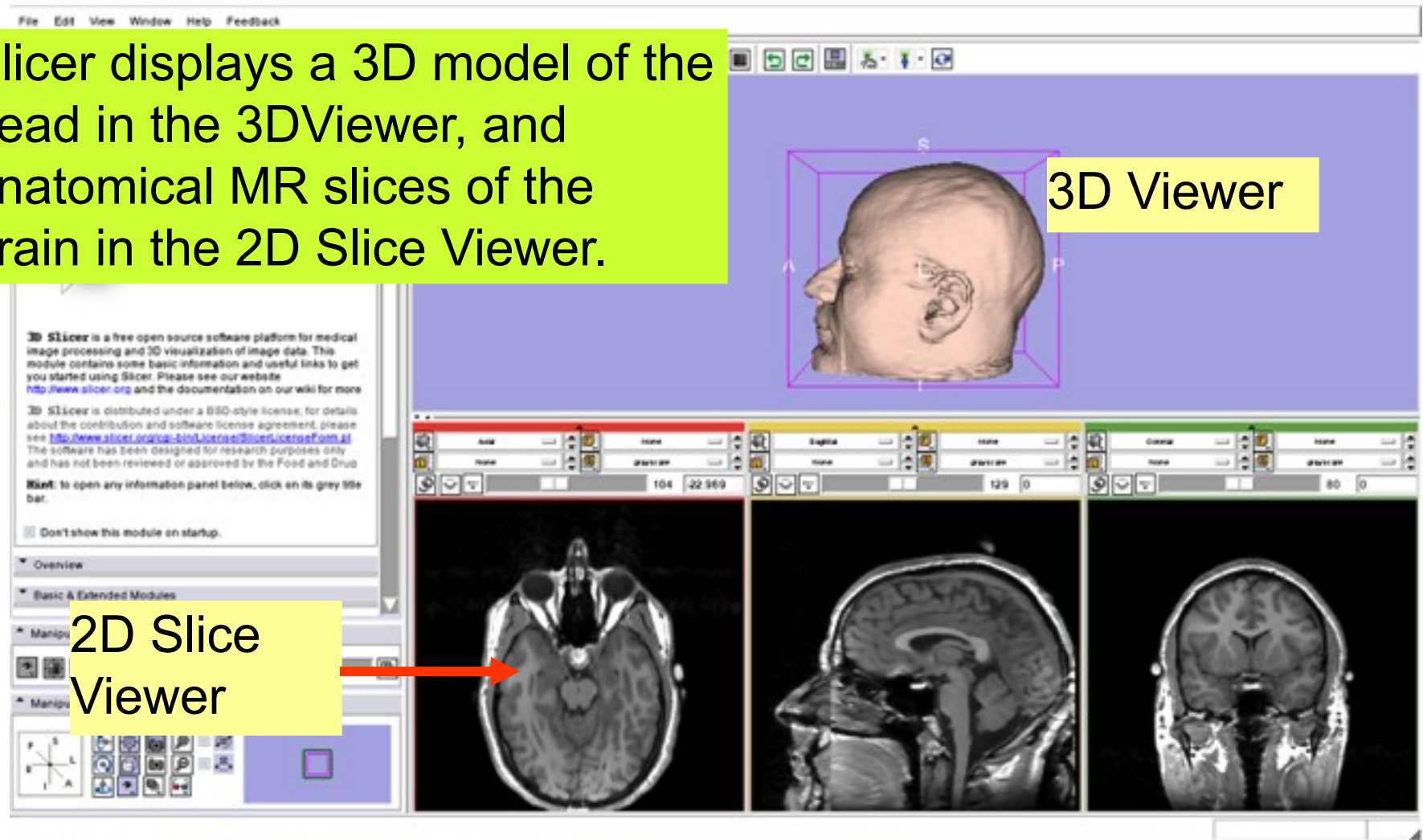
Browse to the location of the Slicer3MinuteDataset directory and select the scene file **slicer3minute.mrml**

Click on **Open** to load the scene



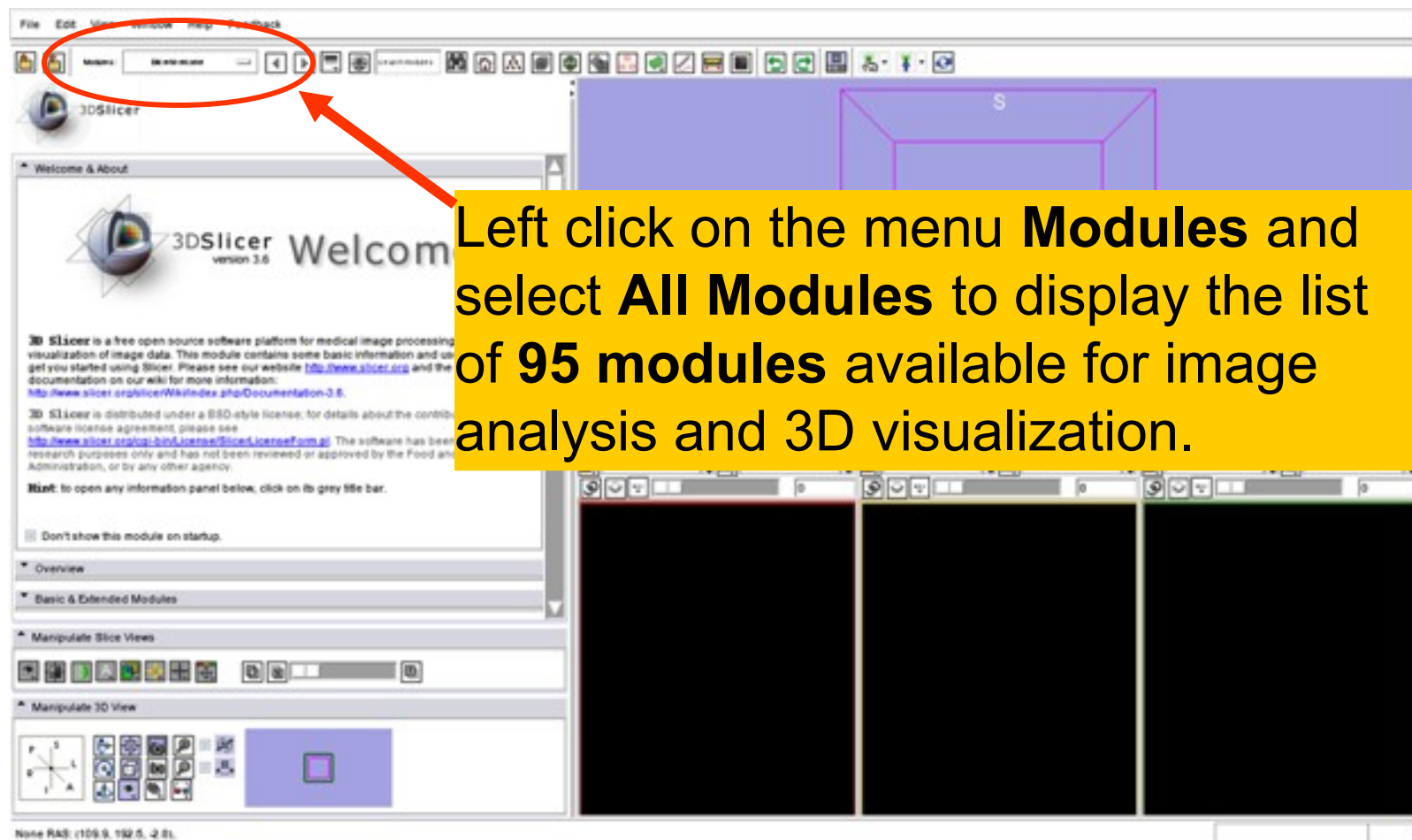
# Loading a 3D Scene

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





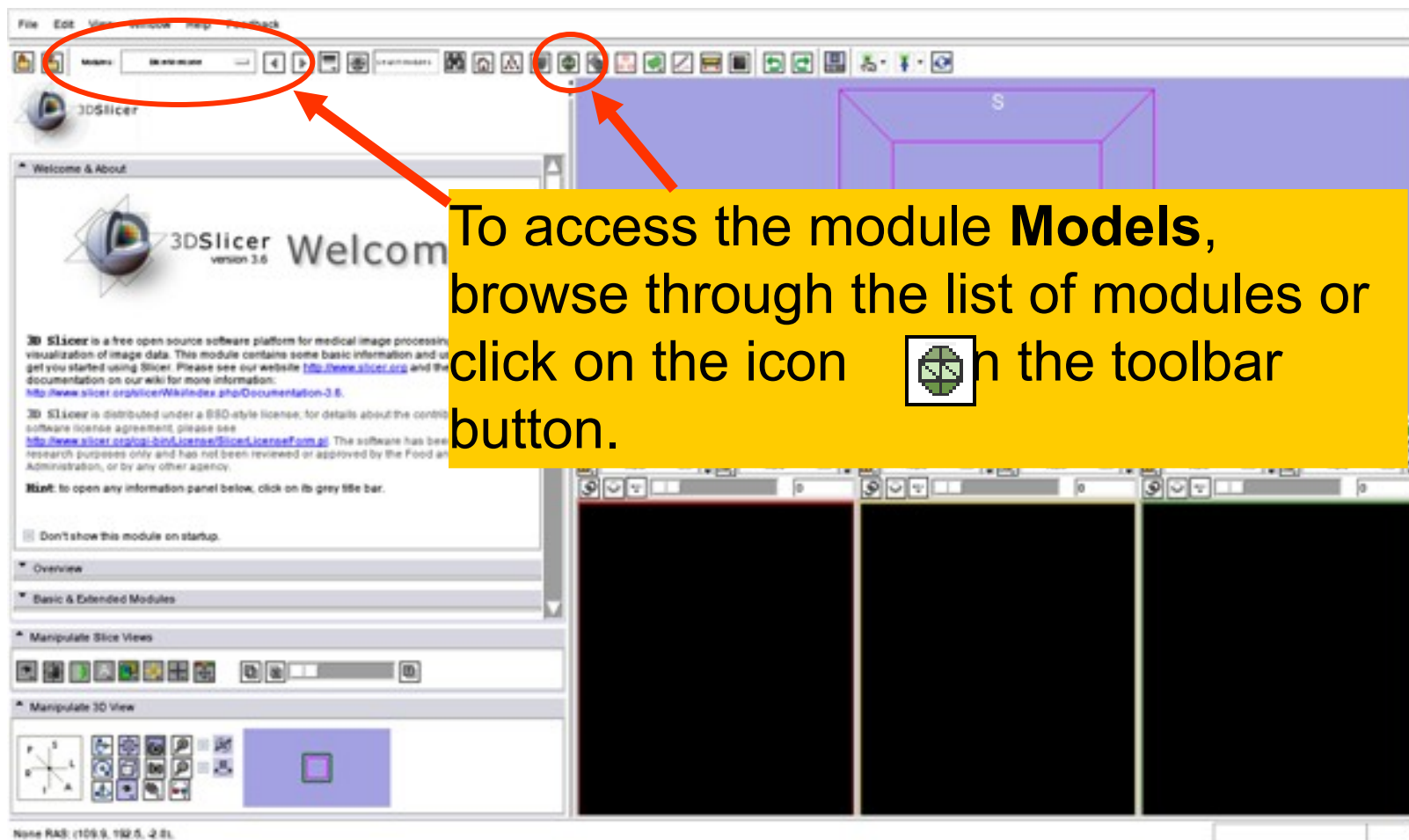
# Loading a 3D Scene





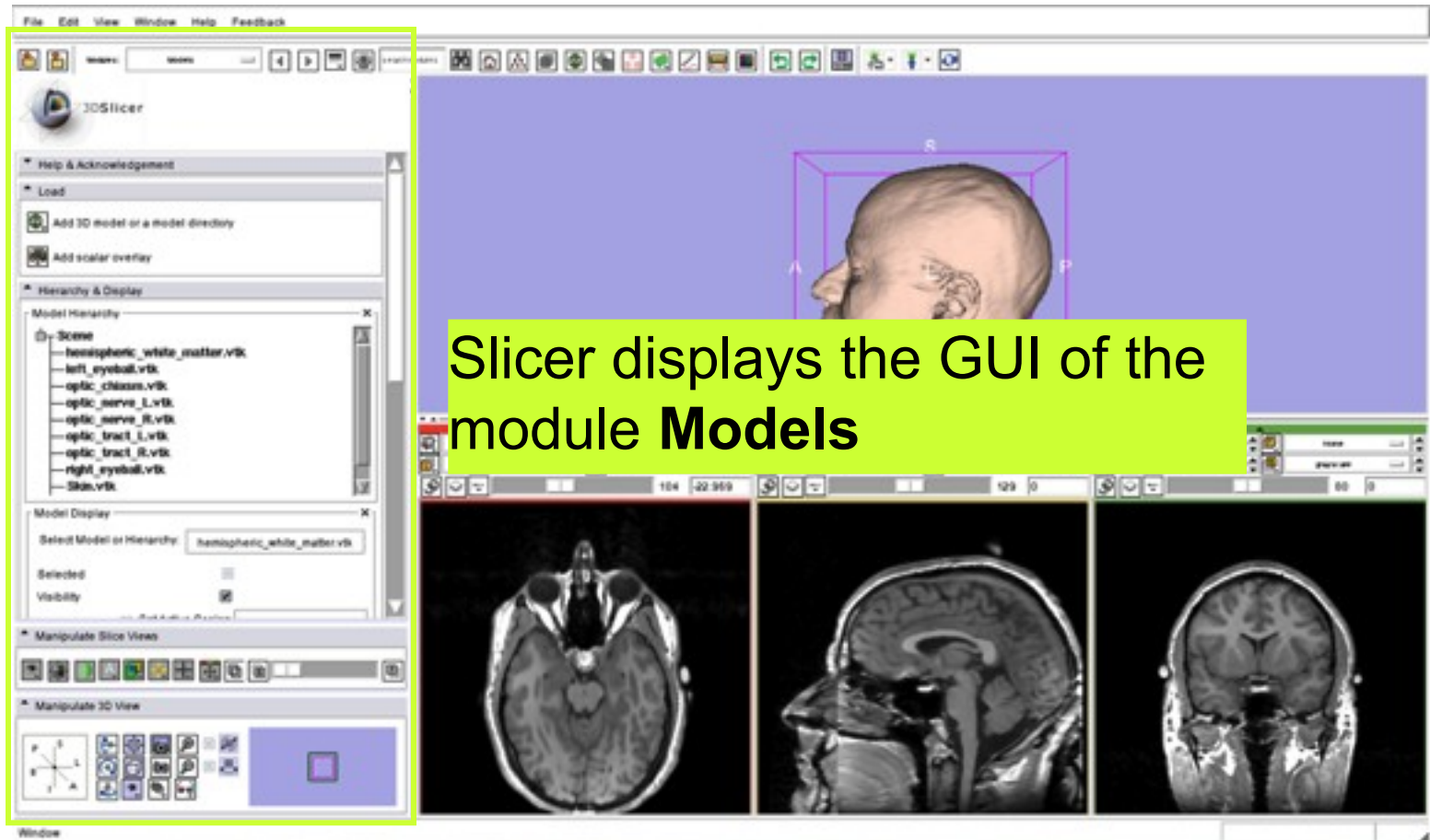


# Loading a 3D Scene



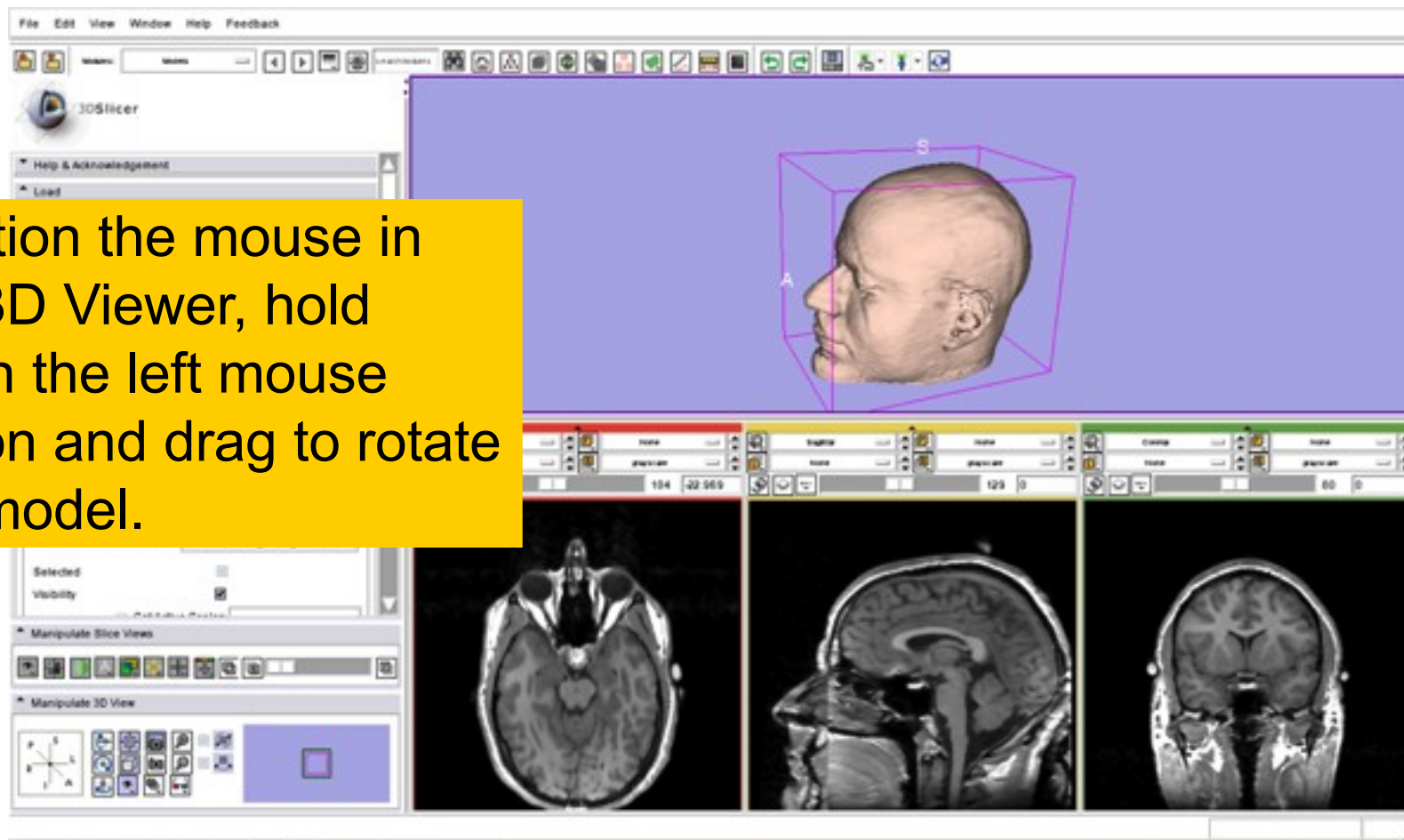


# Loading a 3D Scene



# 3D Visualization

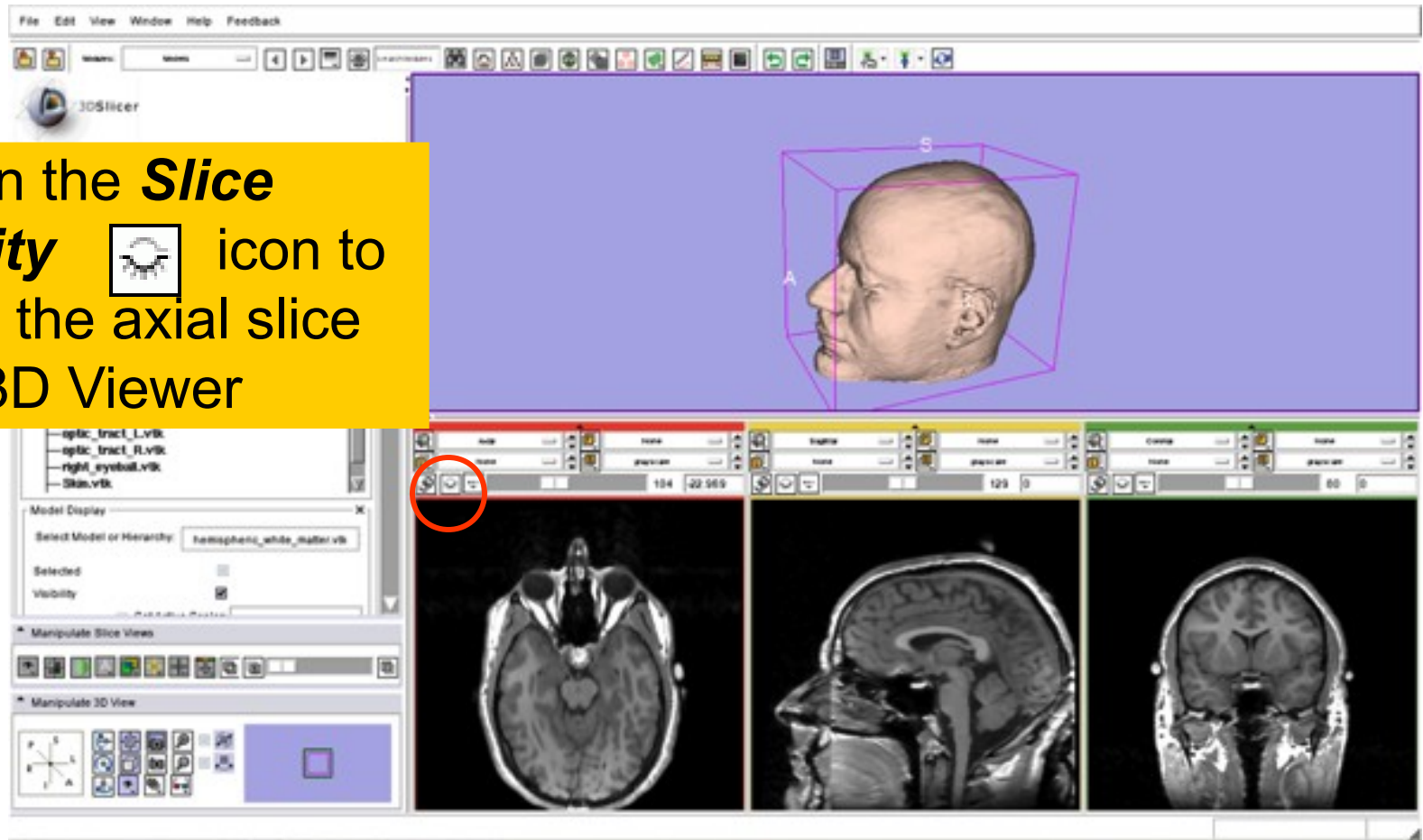
Position the mouse in the 3D Viewer, hold down the left mouse button and drag to rotate the model.



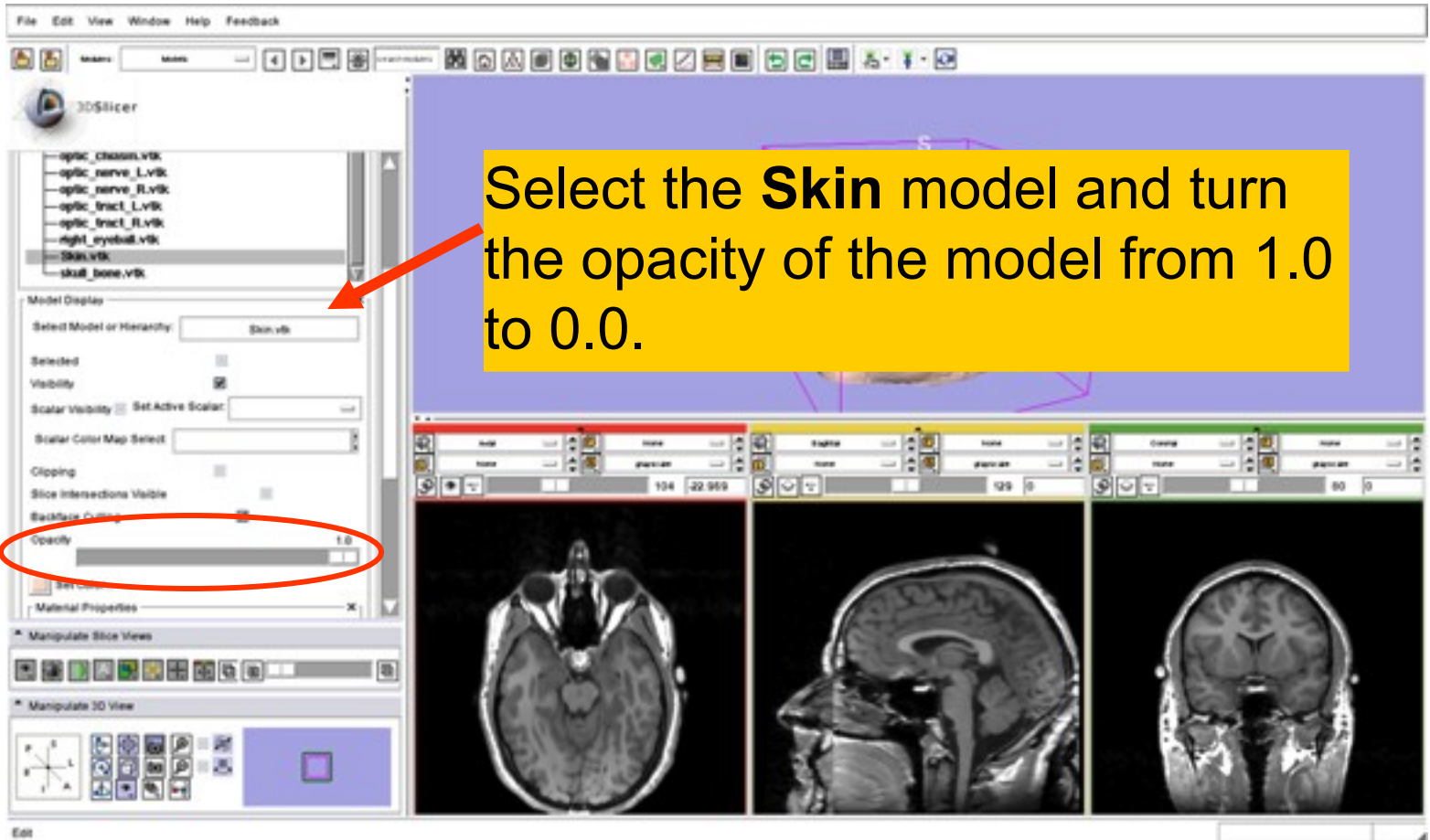


# 3D Visualization

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



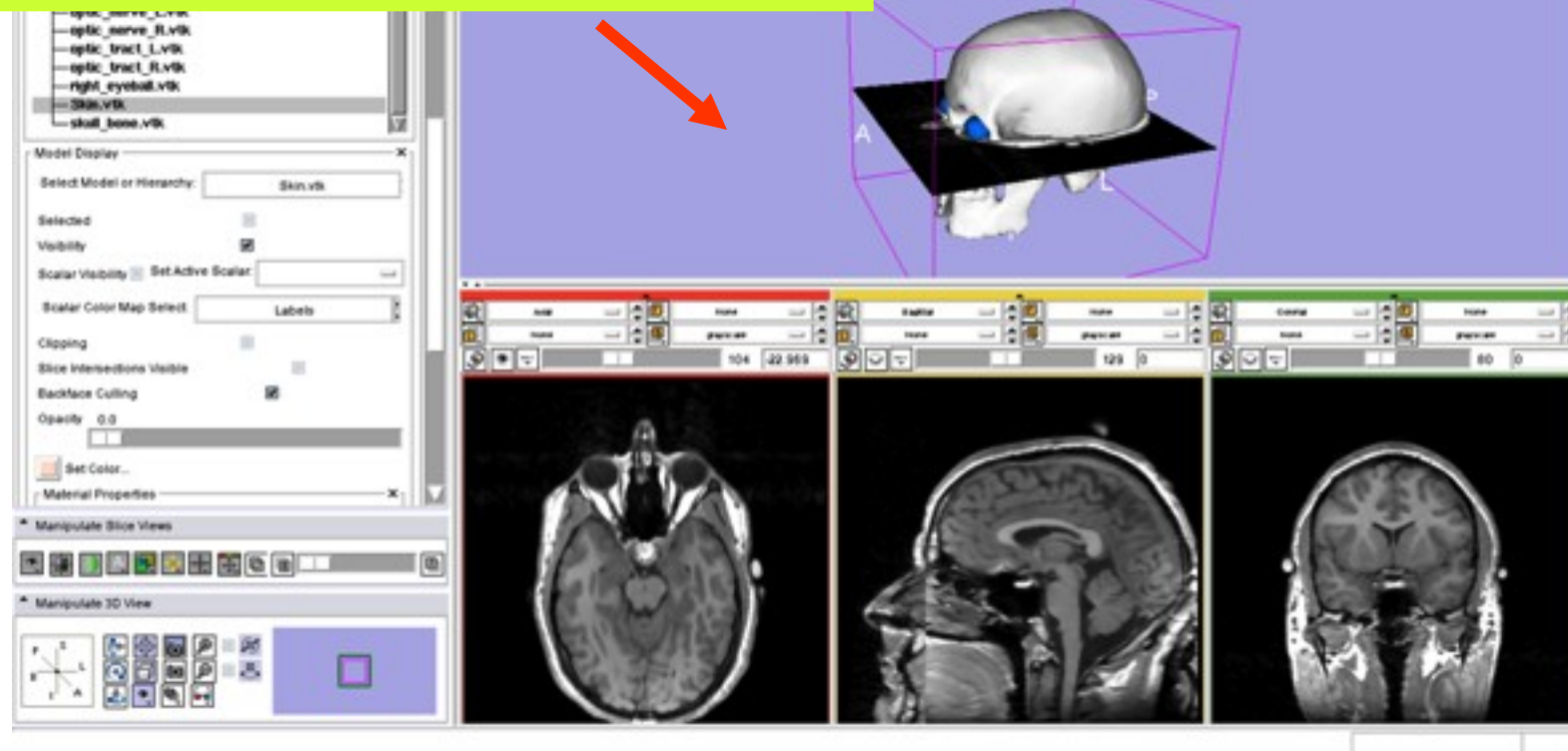
# 3D Visualization



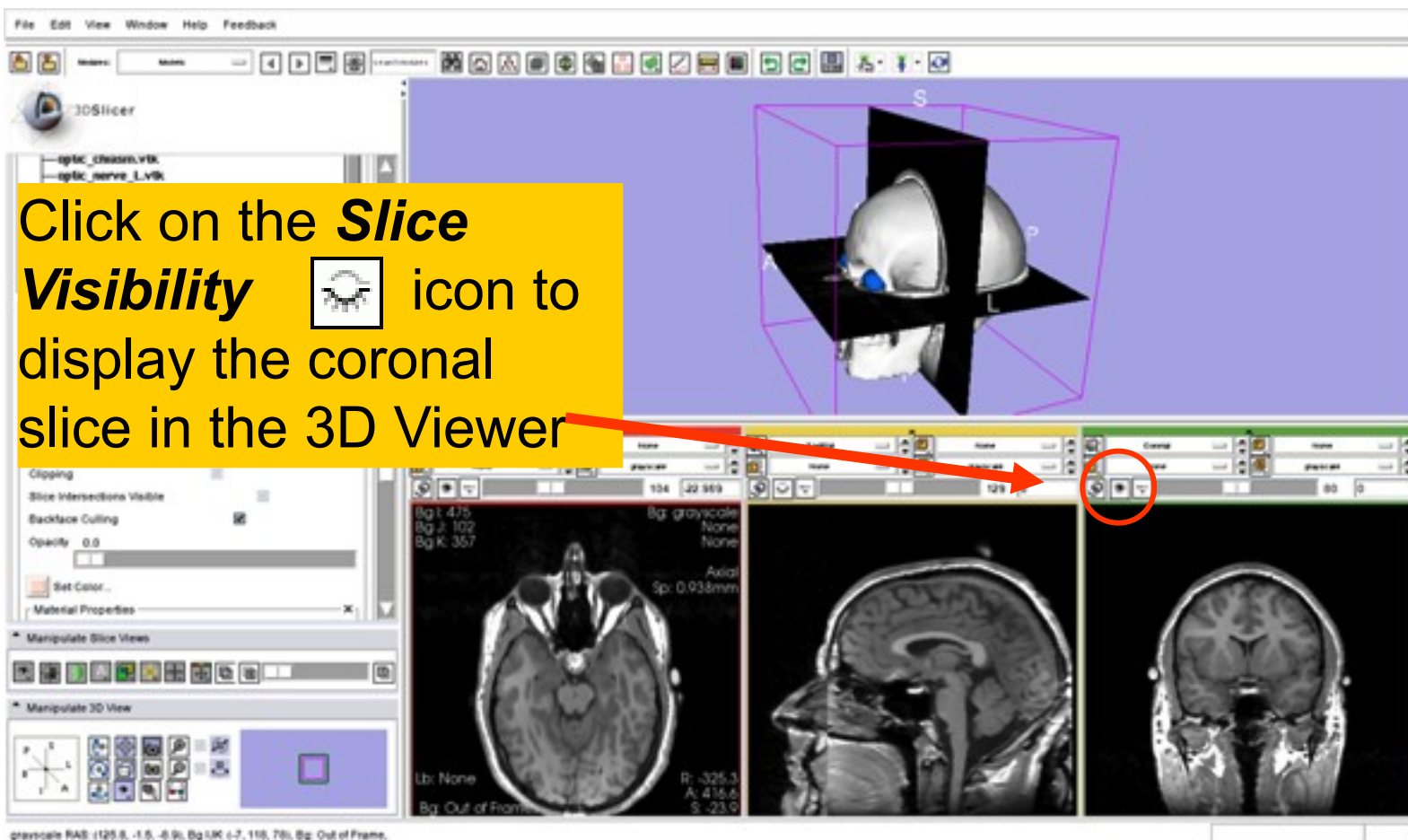


# 3D Visualization

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

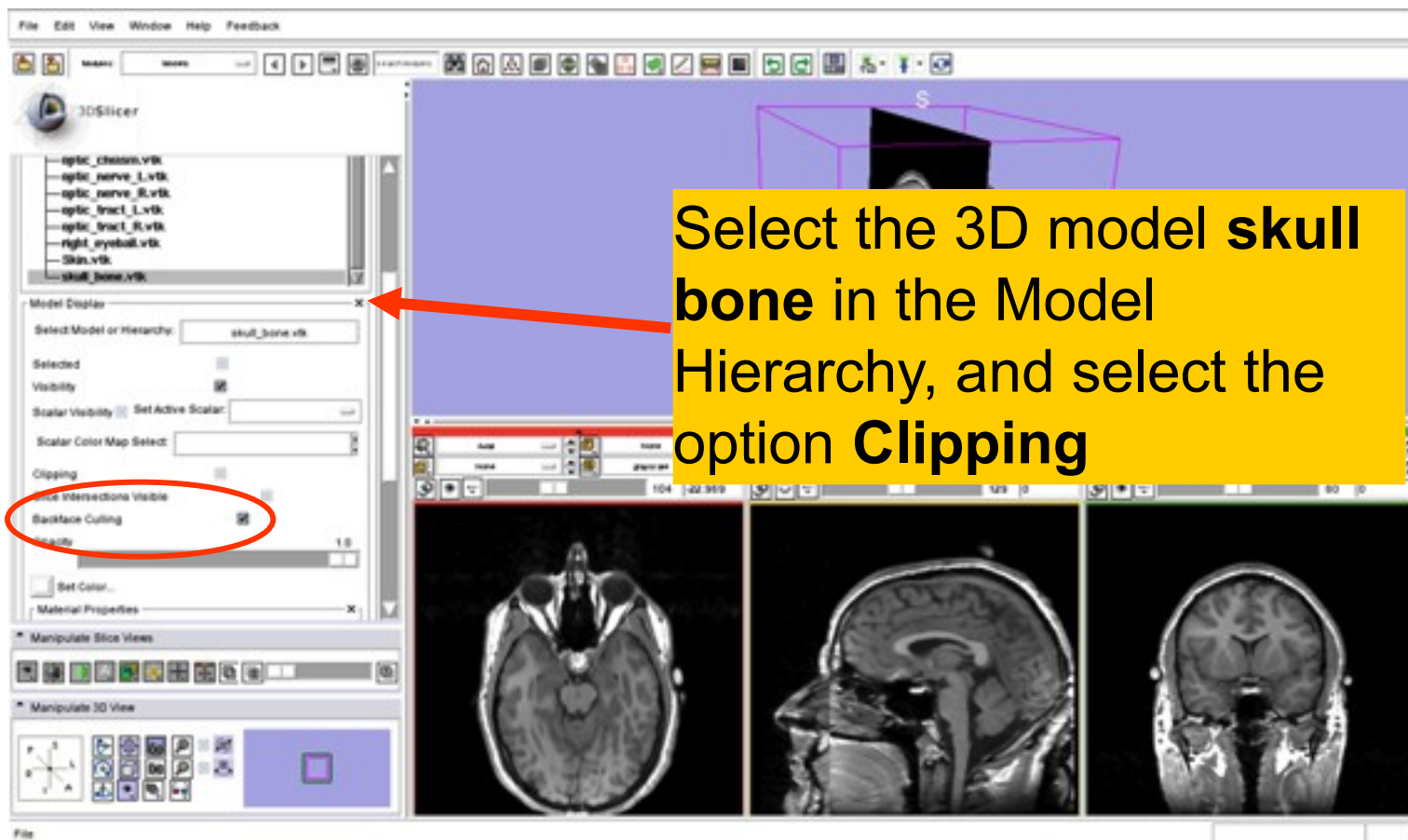


# 3D Visualization

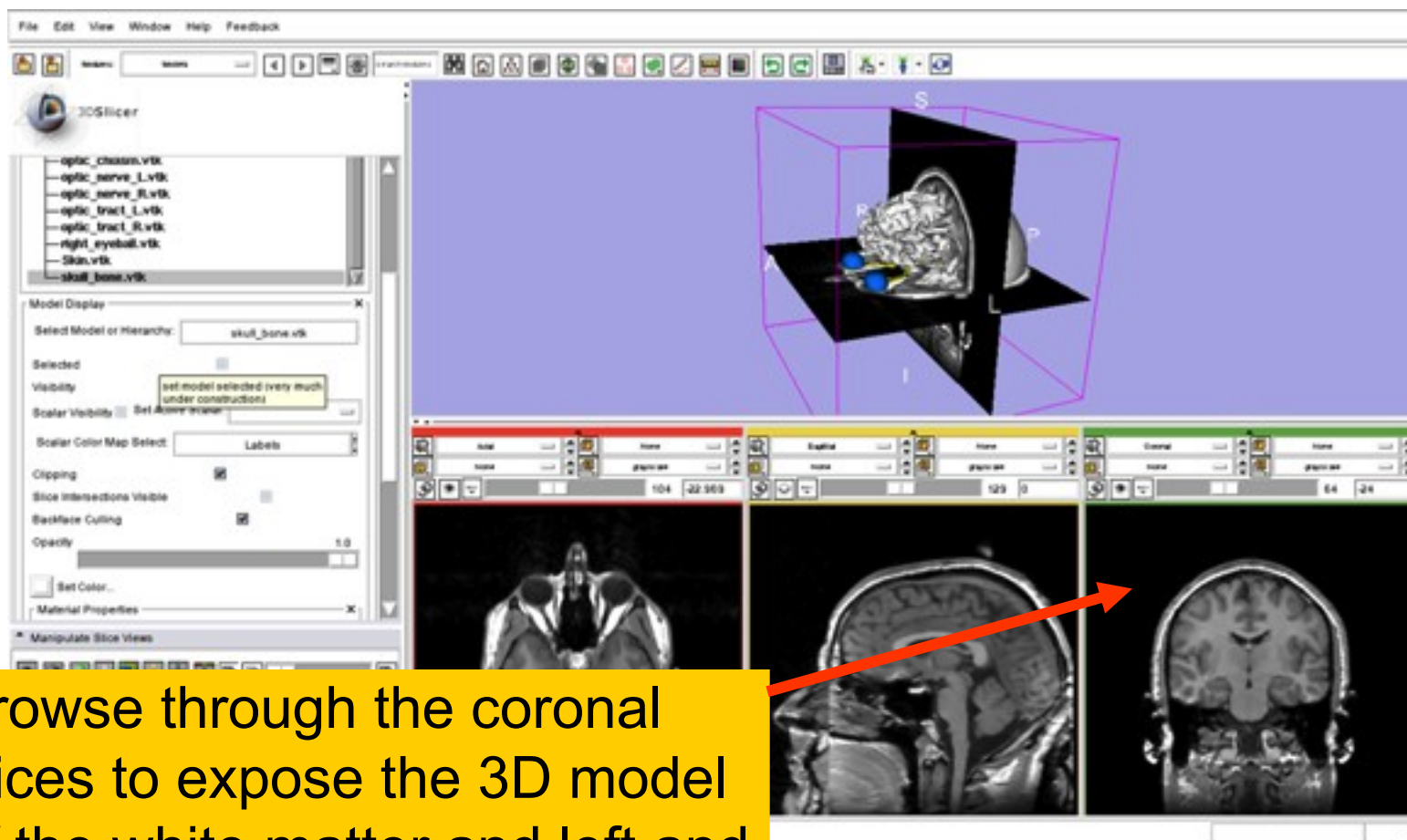




# 3D Visualization



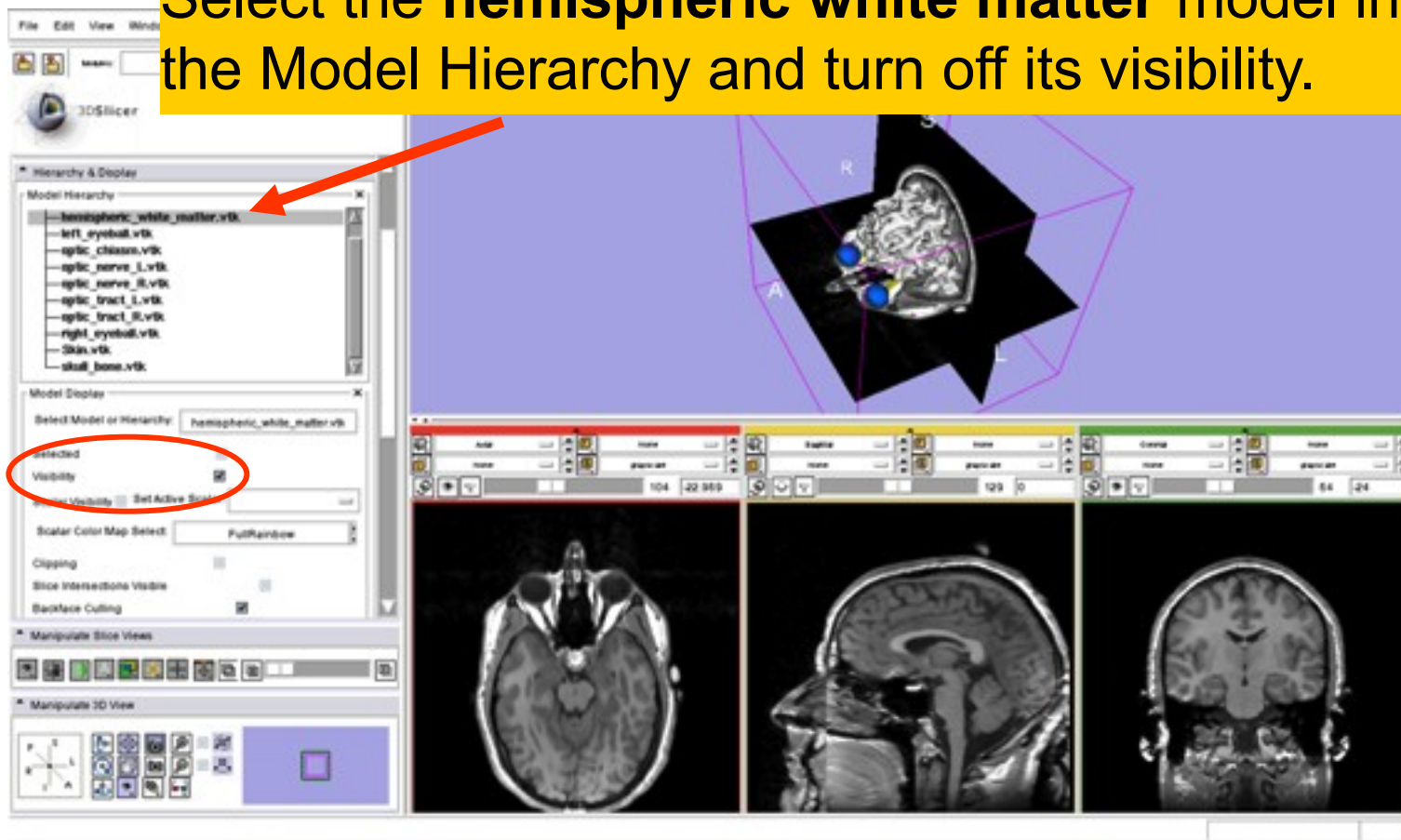
# 3D Visualization



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

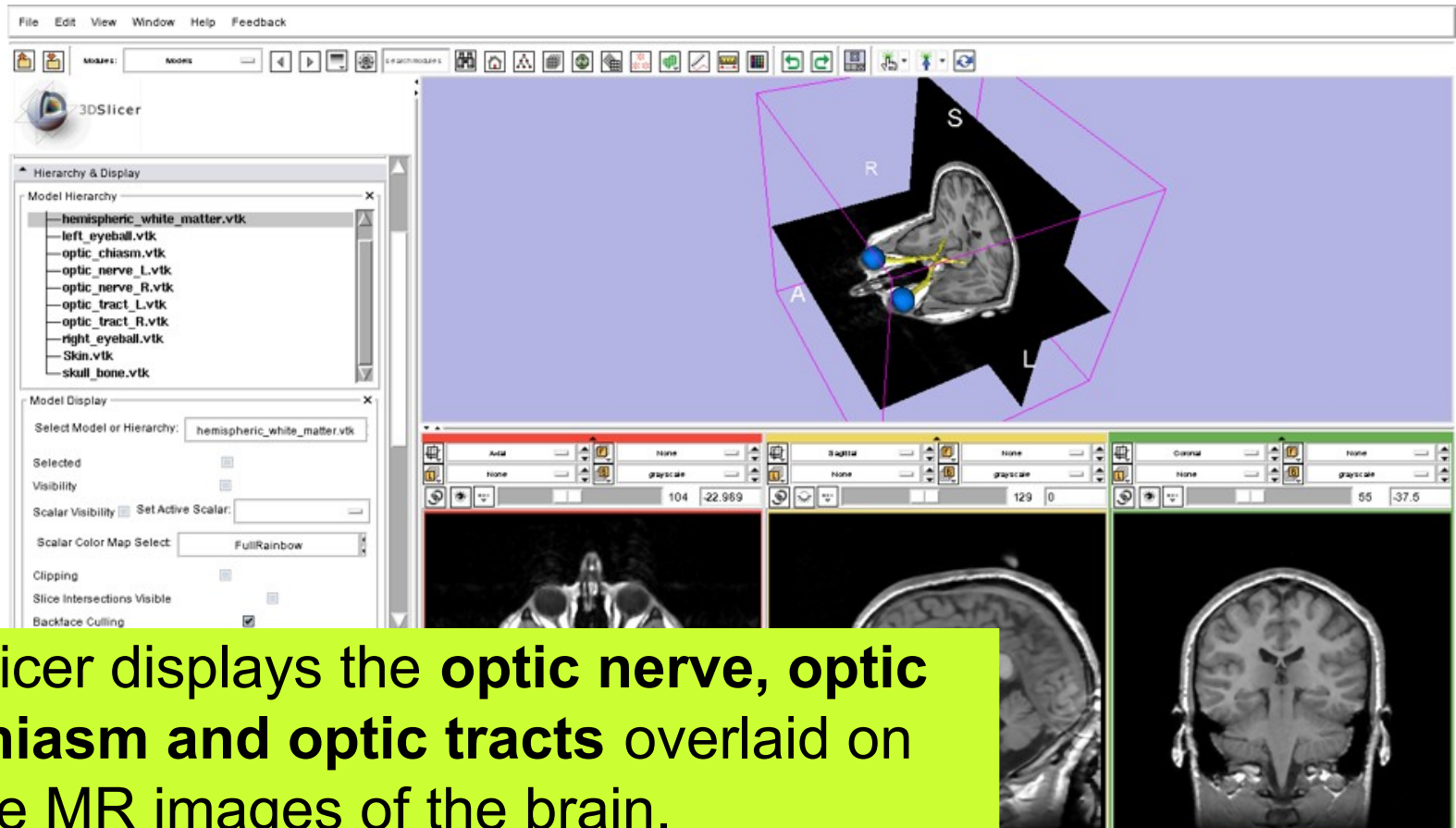
# 3D Visualization

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





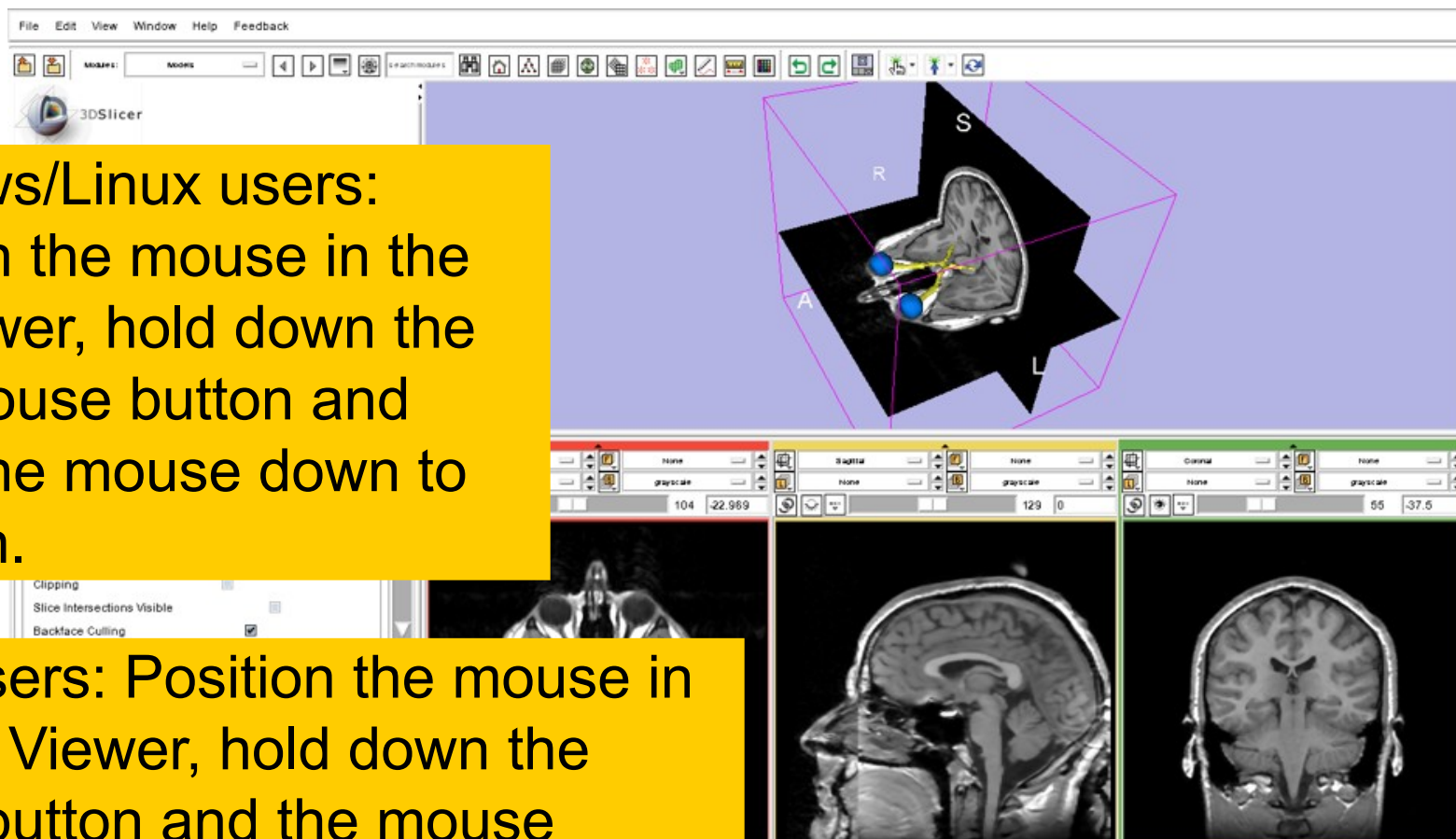
# 3D Visualization



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



# 3D Visualization



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

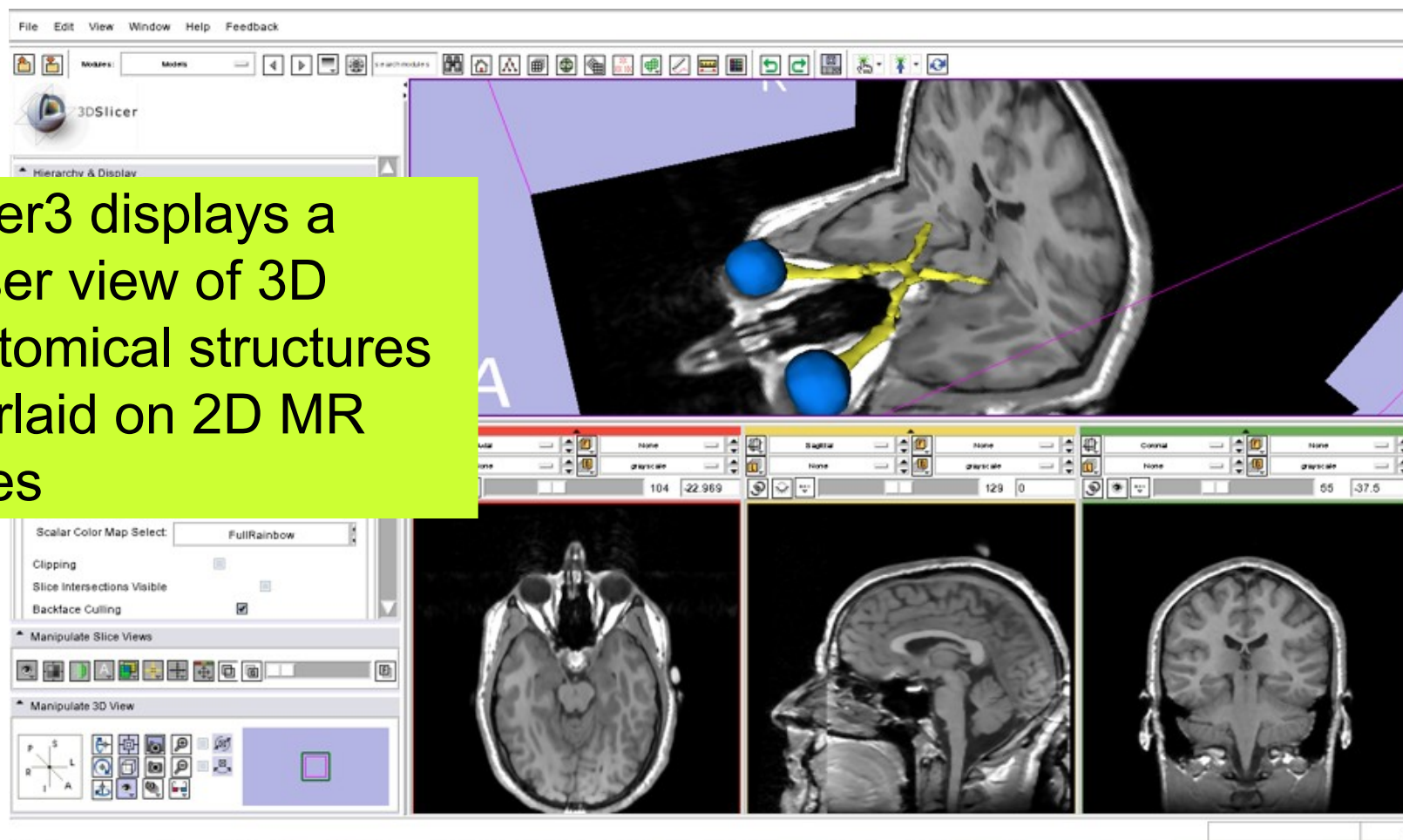
Mac users: Position the mouse in  
the 3D Viewer, hold down the  
apple button and the mouse  
button and move the mouse down  
to zoom in.





# 3D Visualization

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

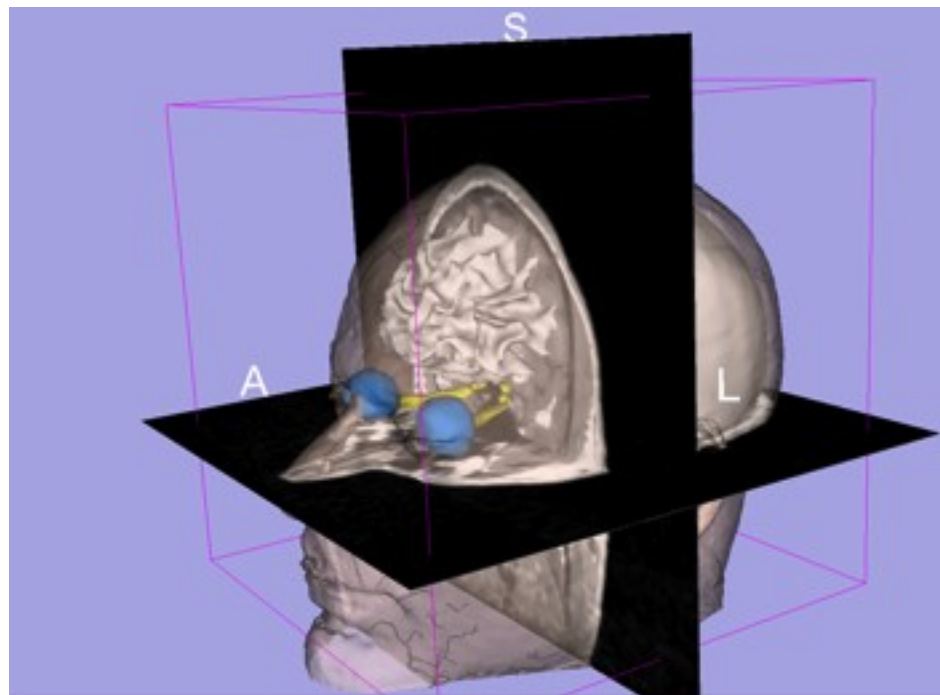






# Slicer3 minute tutorial

- 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**.



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# Acknowledgments

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**Neuroimage Analysis Center**

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