

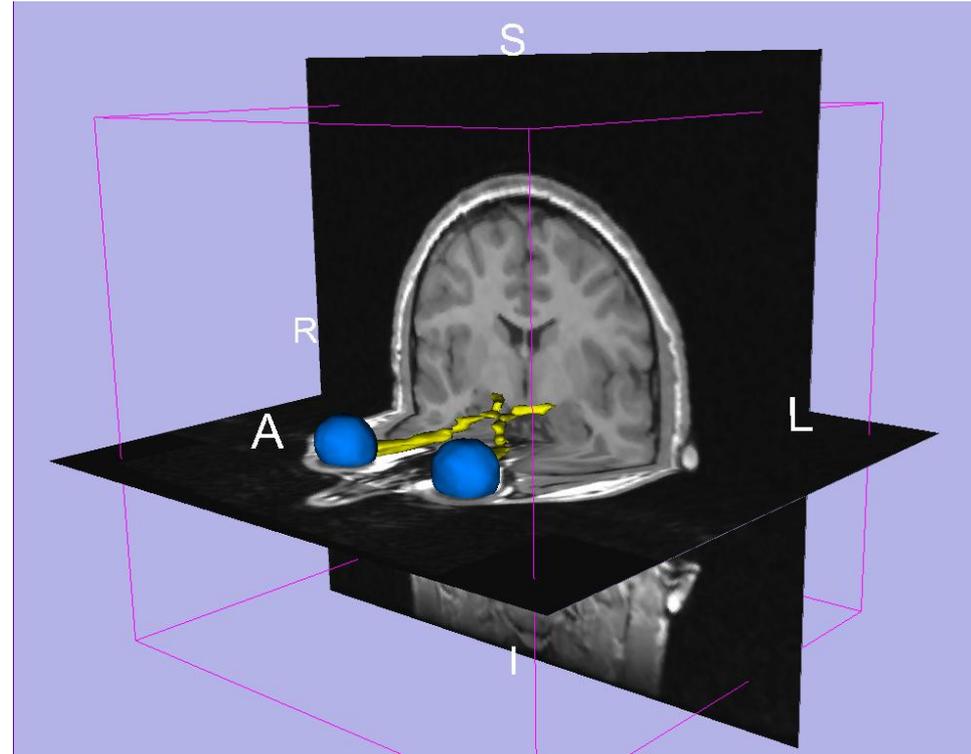
# Slicer3チュートリアル

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Surgical Planning Laboratory  
Harvard Medical School

# Slicer3チュートリアル

このチュートリアルは  
Slicer3における3Dでのビ  
ジュアライゼーションを簡  
潔に紹介



- 画像解析のためのエンドユーザー向けアプリケーション
- オープンソースソフトウェア
- 臨床研究と工学研究の両者に卓越したソフトウェア環境



- Slicerの対応しているOS環境はWindows, Linux, Mac OSX.
- 下記のwebサイトよりダウンロード

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



## 免責条項

使用者は添付ライセンス内の内容と関連法に遵守してslicerを使用すること



www.slicer.org

Slicer Wiki

## ダウンロードのタイプとして 'Stable Releases'を選択

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

Type of download:	Stable Releases
Operating System:	Windows 32-bit
File to download:	Slicer3-3.6.3-2011-03-04-win32.exe
<input type="button" value="Download"/>	

### 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 [quartz](#).
- Collaboration with the University of Szeged in Hungary has resulted in a port of slicer3 to the current generation of the Oracle (formerly Sun) Solaris operating system. More information, including binary downloads, is available at the [Solaris page](#).

### 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
- [Slicer4 Dashboard](#): Latest build results for Slicer 4 (alpha).
- [Slicer3 Dashboard](#): Latest build results for Slicer 3
- [Source Code](#): This page points to the source code repositories.
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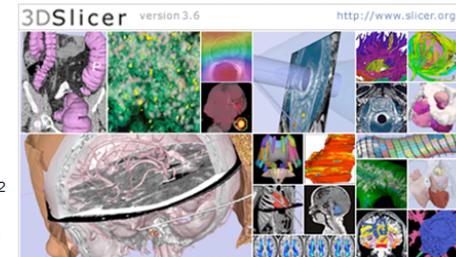
### DOWNLOAD STATISTICS

- See [here](#) for 3D Slicer download statistics.

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

Releases of Slicer.

**March 2011: Slicer 3.6.3 released**  
to download, select stable releases and your platform





www.slicer.org

## ダウンロード先のPCのOSを選択

source code, please click here.

- ▶ Acknowledgments
- ▶ Contact Us

### Resources

- ▶ Download Slicer
- ▶ For Users
- ▶ For Developers
- ▶ Commercial Use
- ▶ NCI
- ▶ Publication DB
- ▶ Image Gallery
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- ▶ Web Archive

### LICENSE AGREEMENT

Please read the [Slicer License Agreement](#) before downloading any binary releases of Slicer.

### DOWNLOADS

Type to download:

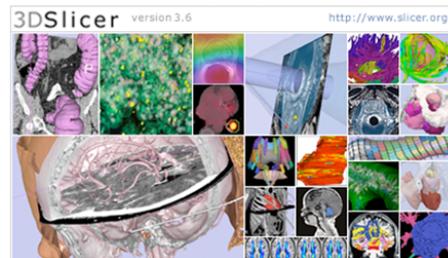
Operating System:

File to download:

**March 2011: Slicer 3.6.3 released**  
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- See [here](#) for 3D Slicer download statistics.



www.slicer.org

“Slicer3-3.6”の最新版を選択し、Downloadをクリックする

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

Binary releases of Slicer.

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DOWNLOADS

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Operating System:

File to download:

**March 2011: Slicer 3.6.3 released**  
to download, select stable releases and your platform

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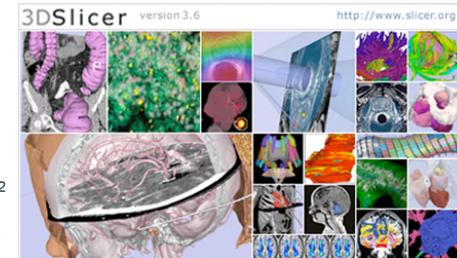
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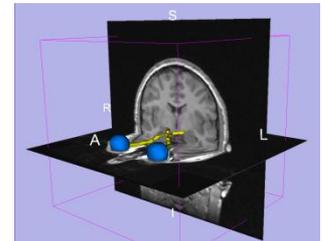




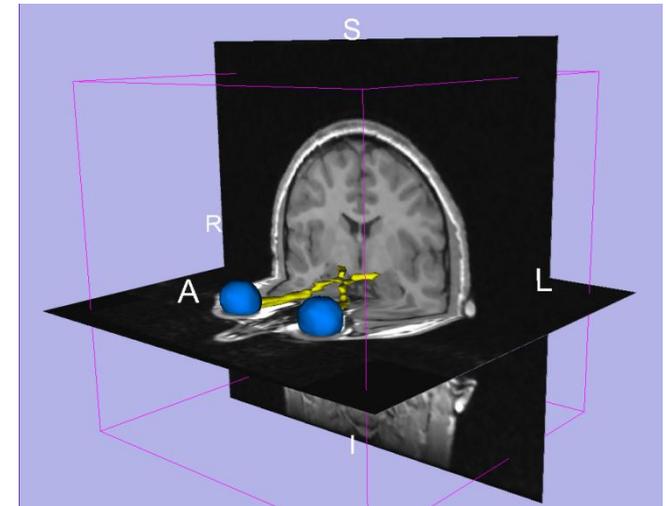
# トレーニングデータ

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このチュートリアルで使用するトレーニングデータ：  
**Slicer3minuteDataset.zip**を下記のwebサイトからダウンロード  
→<http://www.slicer.org/slicerWiki/index.php/Slicer3.6:Training>



- **Slicer3 minute dataset**
  - 脳のMR画像
  - 解剖学的な構造の3D再構成
  
- この脳データはTalos等によって作成されたSPLの脳アトラスの一部
  - 脳アトラスの詳細



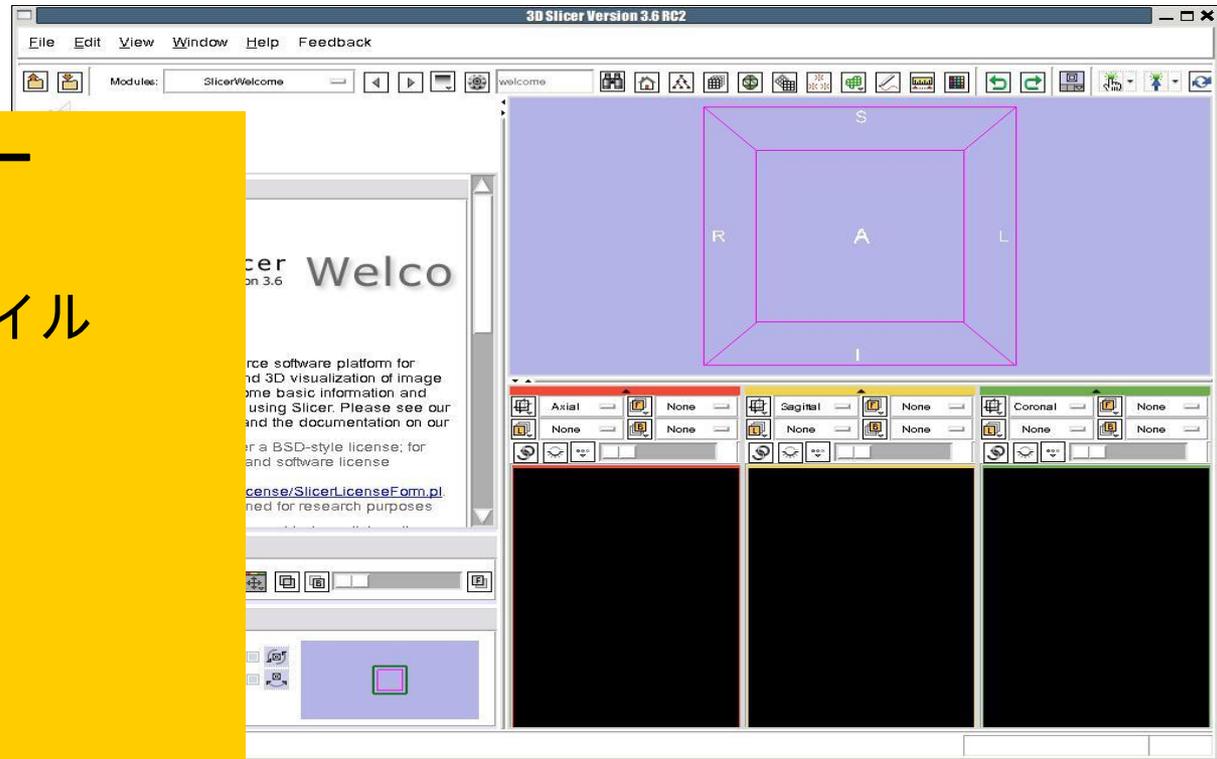
<http://www.spl.harvard.edu/publications/item/view/1265>

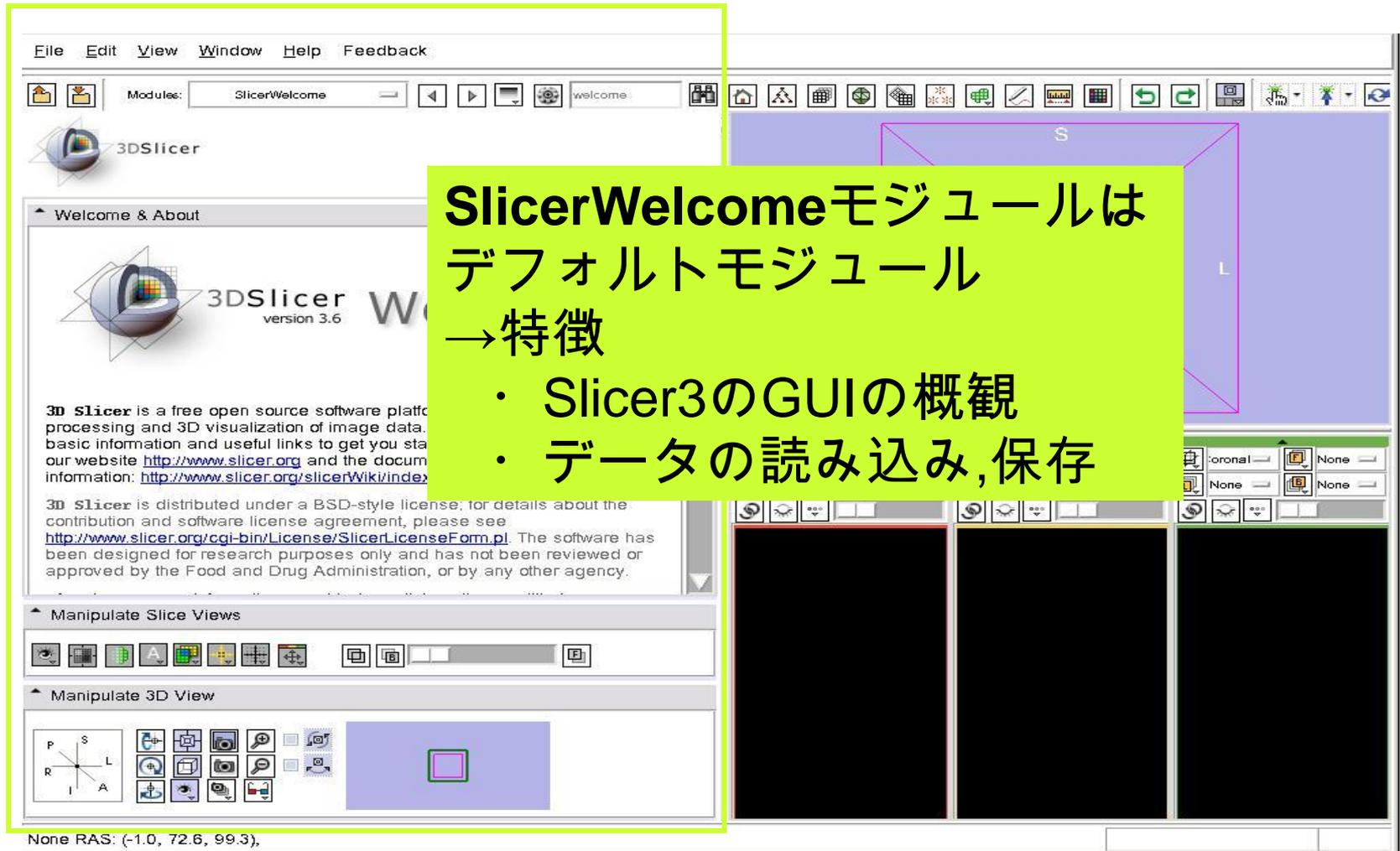
- **Linux/Mac ユーザー**

Slicer3.6のディレクトリ  
にあるSlicer3の実行ファイル  
を起動

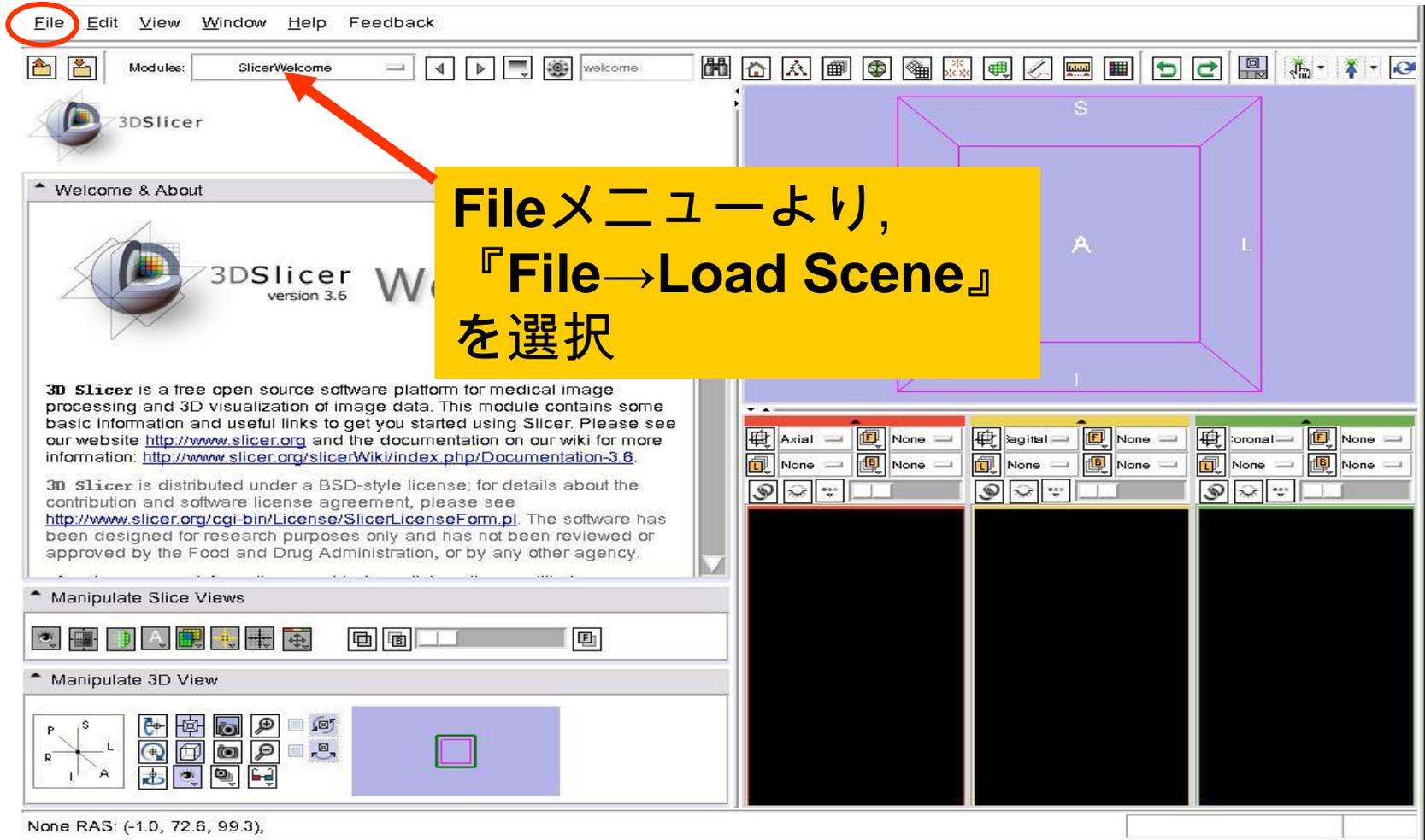
- **Windows ユーザー**

『スタート→  
すべてのプログラム→  
Slicer3 3.6 2011-03-04→Slicer3  
』



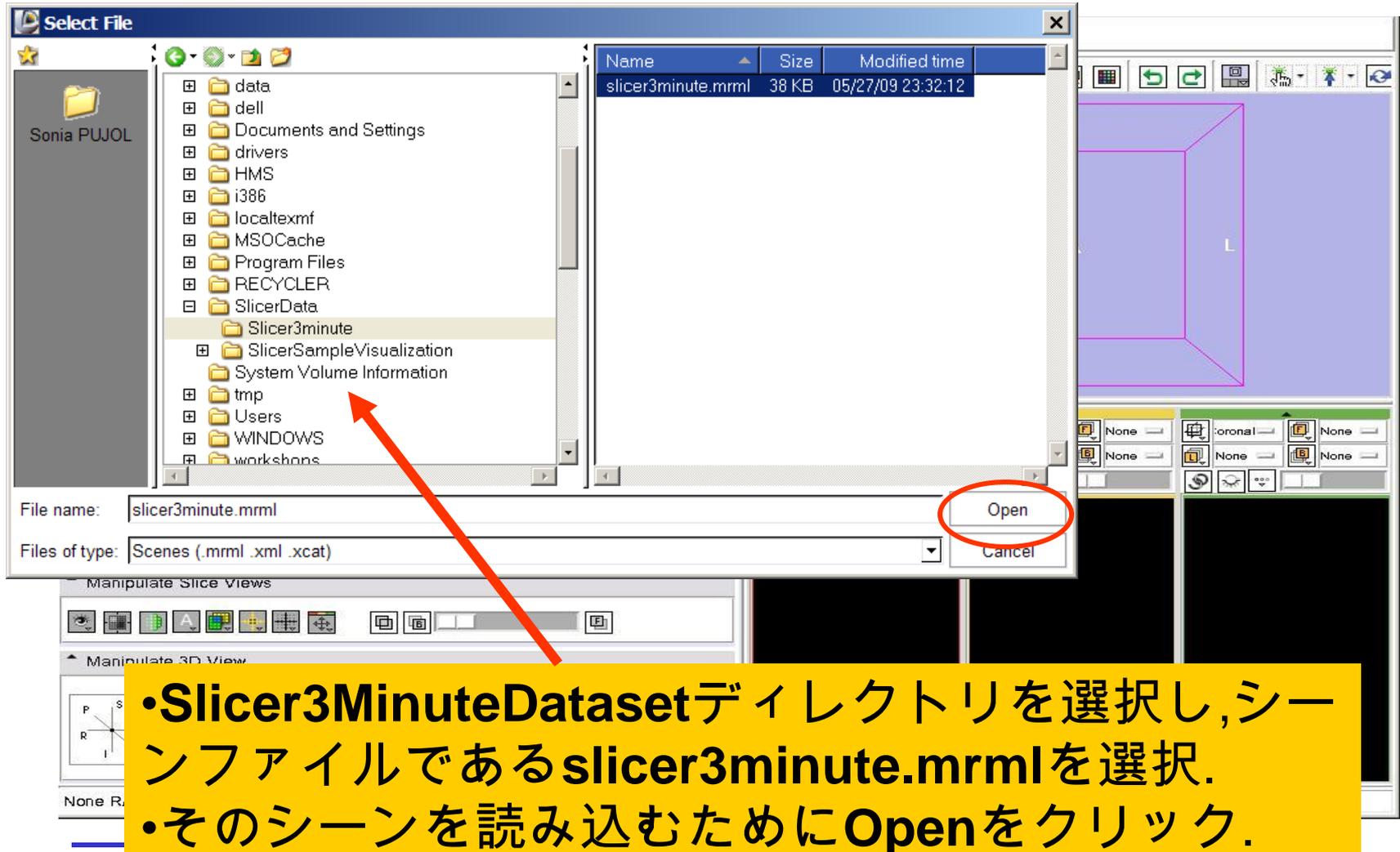


# 3Dシーンの読み込み



The screenshot shows the 3DSlicer software interface. The 'File' menu is circled in red in the top-left corner. A red arrow points from a yellow callout box to the 'File' menu. The callout box contains the text: **Fileメニューより、『File→Load Scene』を選択**. The interface includes a menu bar (File, Edit, View, Window, Help, Feedback), a toolbar with various icons, and a main workspace with three viewports (Axial, Sagittal, Coronal) and a 3D view. The 3D view shows a purple wireframe box with axes labeled S, A, and L. The status bar at the bottom left displays 'None RAS: (-1.0, 72.6, 99.3)'.

# 3Dシーンの読み込み



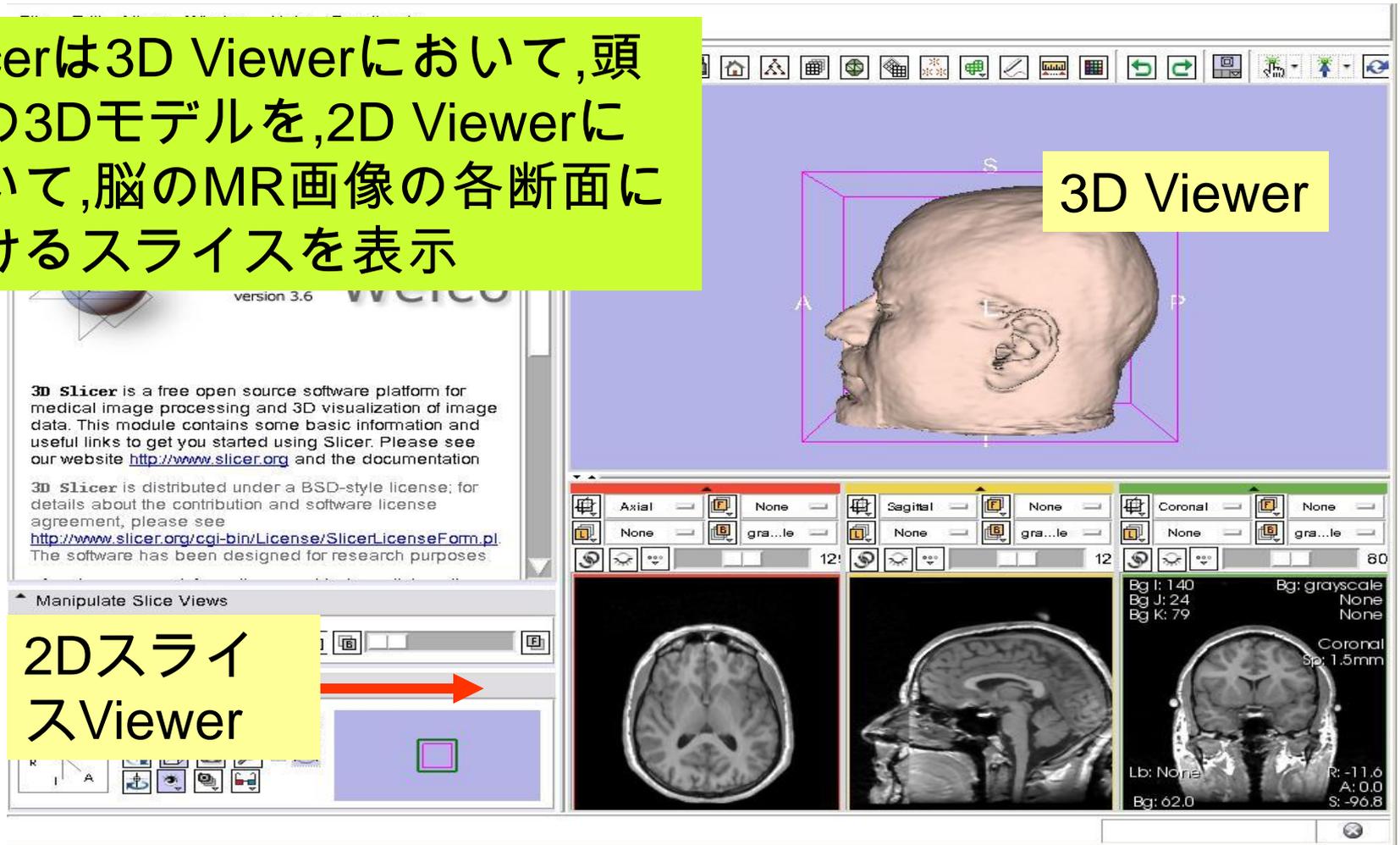
File name: slicer3minute.mrml  
Files of type: Scenes (.mrml .xml .xcats)

Open  
Cancel

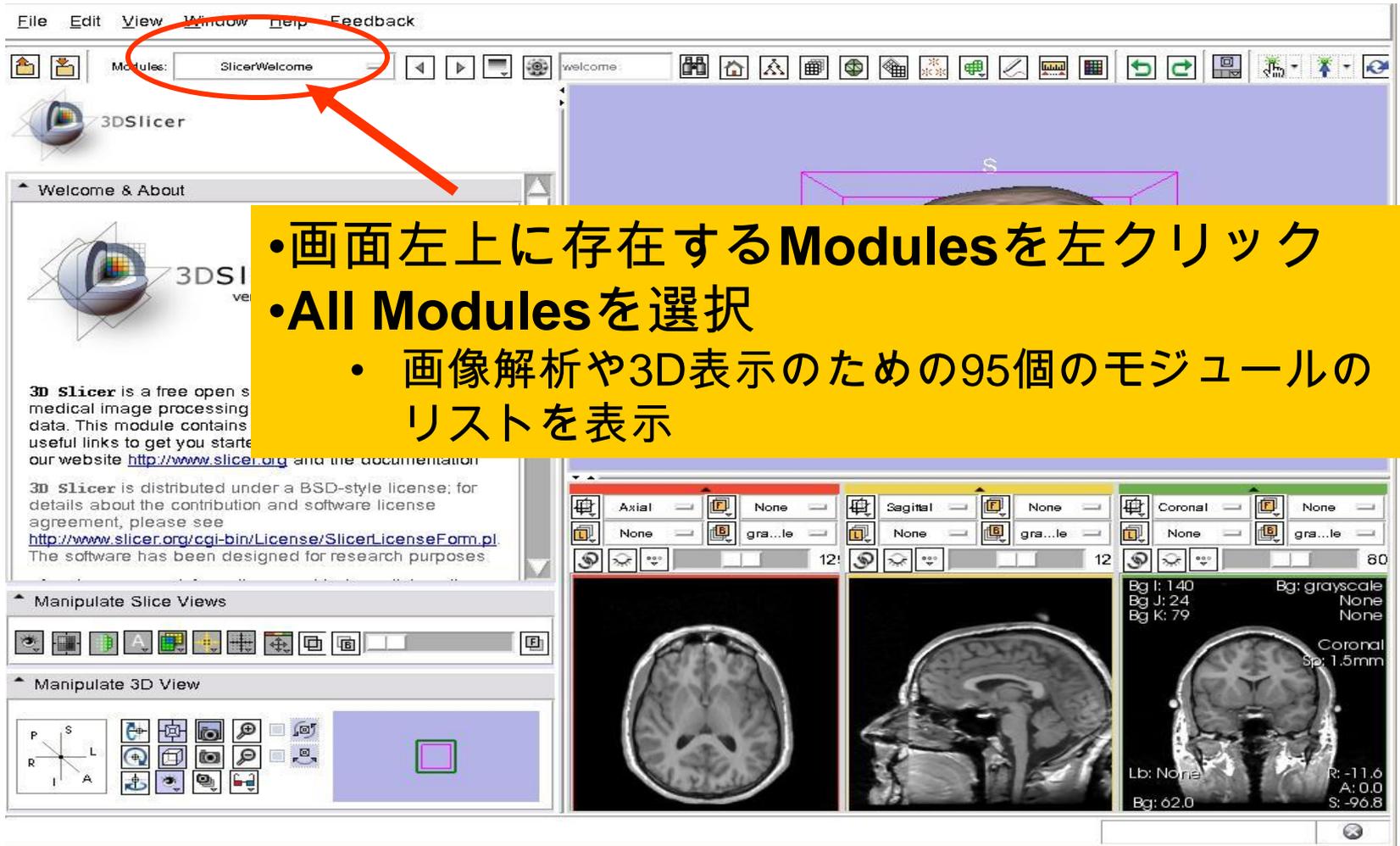
- **Slicer3MinuteDataset**ディレクトリを選択し,シーンファイルであるslicer3minute.mrmlを選択.
- そのシーンを読み込むために**Open**をクリック.

# 3Dシーンの読み込み

Slicerは3D Viewerにおいて、頭部の3Dモデルを、2D Viewerにおいて、脳のMR画像の各断面におけるスライスを表示



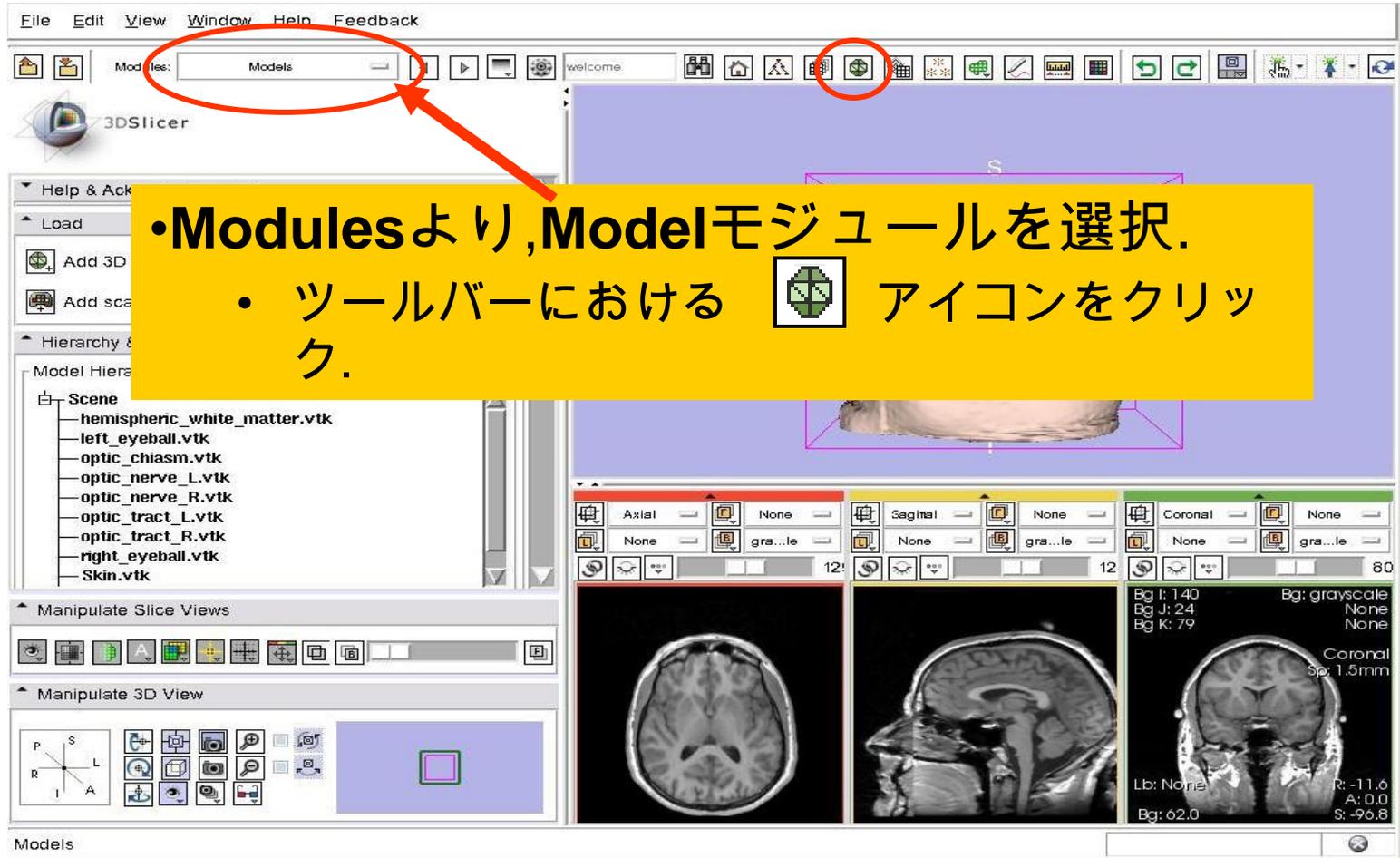
# 3Dシーンの読み込み



The screenshot shows the 3DSlicer software interface. The 'Modules' menu is highlighted with a red circle and an arrow pointing to the 'SlicerWelcome' module. The main 3D view displays a brain model with a purple bounding box. The interface includes a menu bar (File, Edit, View, Window, Help, Feedback), a toolbar, and a 'Welcome & About' panel on the left. The bottom right shows three orthogonal views (Axial, Sagittal, Coronal) of the brain model.

- 画面左上に存在する**Modules**を左クリック
- All Modules**を選択
  - 画像解析や3D表示のための95個のモジュールのリストを表示

# 3Dシーンの読み込み



File Edit View Window Help Feedback

Models

3DSlicer

Help & Ack

Load

- Add 3D
- Add sca

Hierarchy &

Model Hiera

- Scene
  - hemispheric\_white\_matter.vtk
  - left\_eyeball.vtk
  - optic\_chiasm.vtk
  - optic\_nerve\_L.vtk
  - optic\_nerve\_R.vtk
  - optic\_tract\_L.vtk
  - optic\_tract\_R.vtk
  - right\_eyeball.vtk
  - Skin.vtk

Manipulate Slice Views

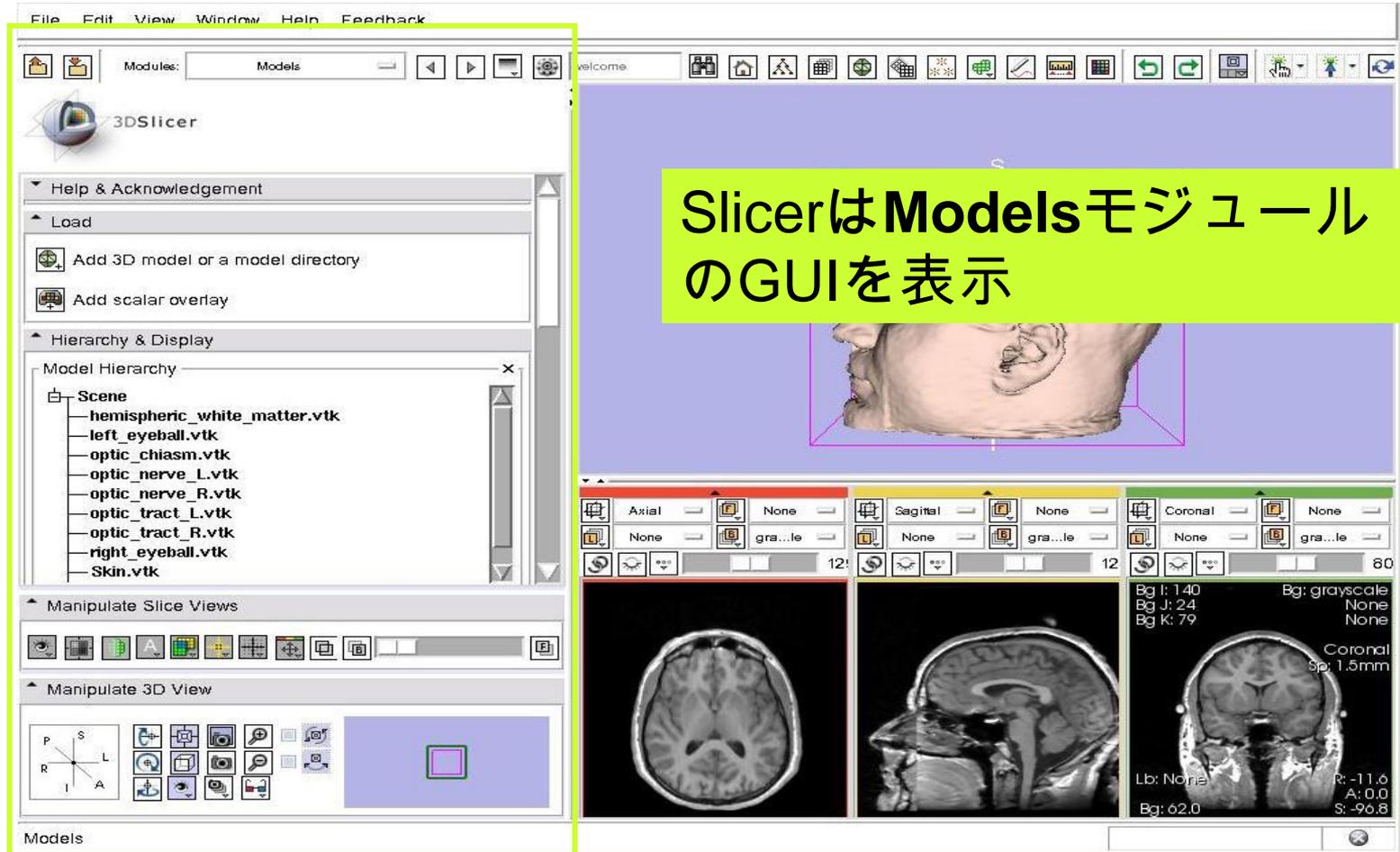
Manipulate 3D View

Models

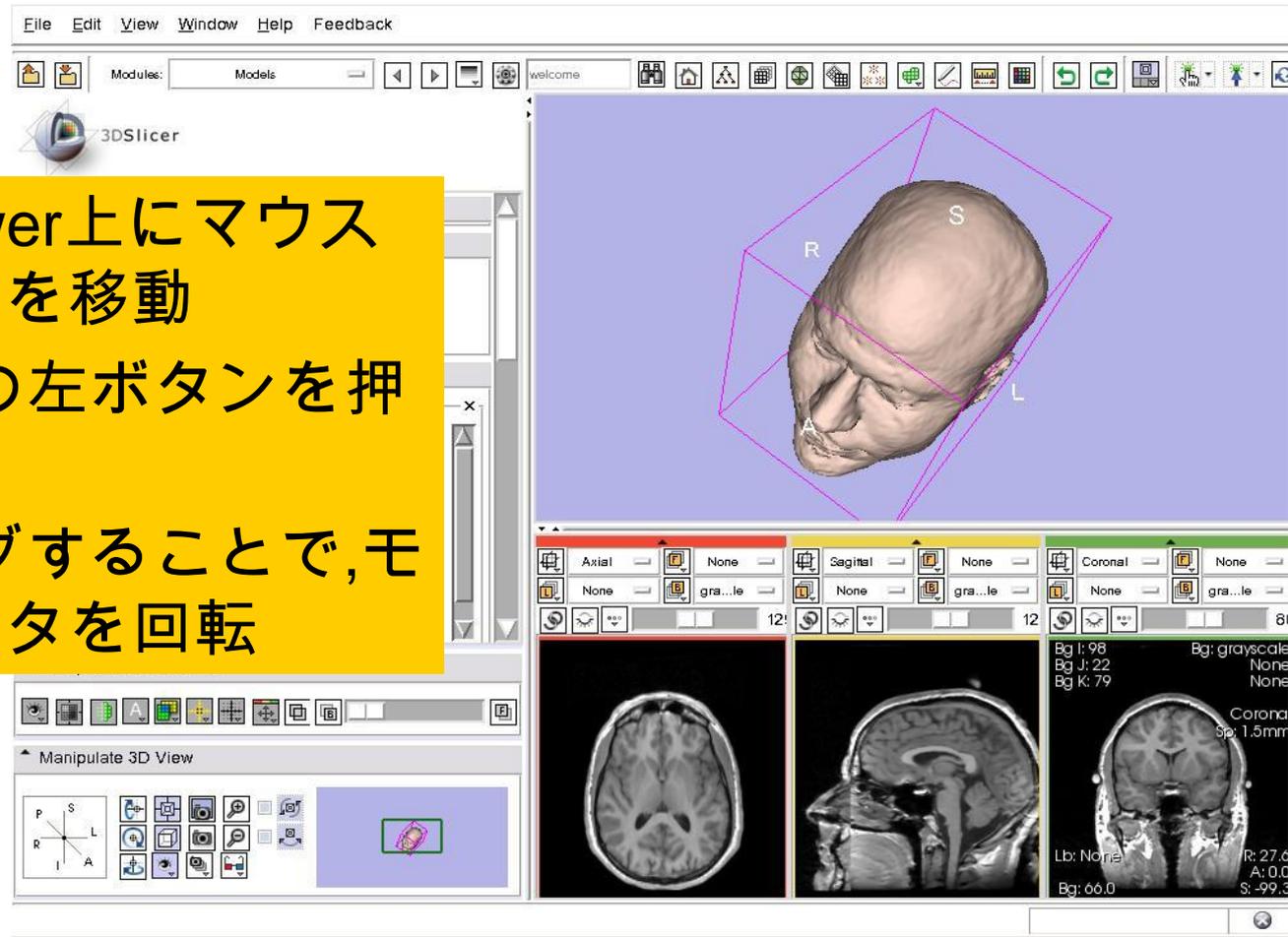
• **Modulesより, Modelモジュールを選択.**

- ツールバーにおける  アイコンをクリック.

# 3Dシーンの読み込み



- 3D Viewer上にマウスポインタを移動
- マウスの左ボタンを押し続ける
- ドラッグすることで、モデルデータを回転





The screenshot displays the 3DSlicer software interface. At the top, there is a menu bar with 'File', 'Edit', 'View', 'Window', 'Help', and 'Feedback'. Below the menu bar is a toolbar with various icons. The main window shows a 3D model of a brain with a pink wireframe box around it, labeled with 'R', 'S', and 'L'. A yellow text box is overlaid on the 3D view, containing the text: '3D Viewerにおいてアキシャル断面におけるスライスを表示するために, Slice Visibility アイコンをクリック'. Below the 3D view, there are three panels for slice views: Axial, Sagittal, and Coronal. The Axial panel has a red circle around the 'Slice Visibility' icon (an eye with a slash). The bottom right panel shows technical data for the Coronal slice: 'Bg I: 98', 'Bg J: 22', 'Bg K: 79', 'Bg: grayscale', 'None', 'None', 'Coronal', 'Spt: 1.5mm', 'Lb: None', 'R: 27.6', 'A: 0.0', 'S: -99.3'.

File Edit View Window Help Feedback

Modules: Models

3DSlicer

Help & Acknowledgement

Load

3D Viewerにおいてアキシャル断面におけるスライスを表示するために, Slice Visibility アイコンをクリック

optic\_nerve\_L.vtk  
optic\_nerve\_R.vtk  
optic\_tract\_L.vtk  
optic\_tract\_R.vtk  
right\_eyeball.vtk  
Skin.vtk

Manipulate Slice Views

Manipulate 3D View

Axial Sagittal Coronal

None None None

None gra...le None gra...le None gra...le

12: 12: 80

Bg I: 98 Bg: grayscale  
Bg J: 22 None  
Bg K: 79 None  
Coronal  
Spt: 1.5mm  
Lb: None R: 27.6  
A: 0.0  
Bg: 66.0 S: -99.3

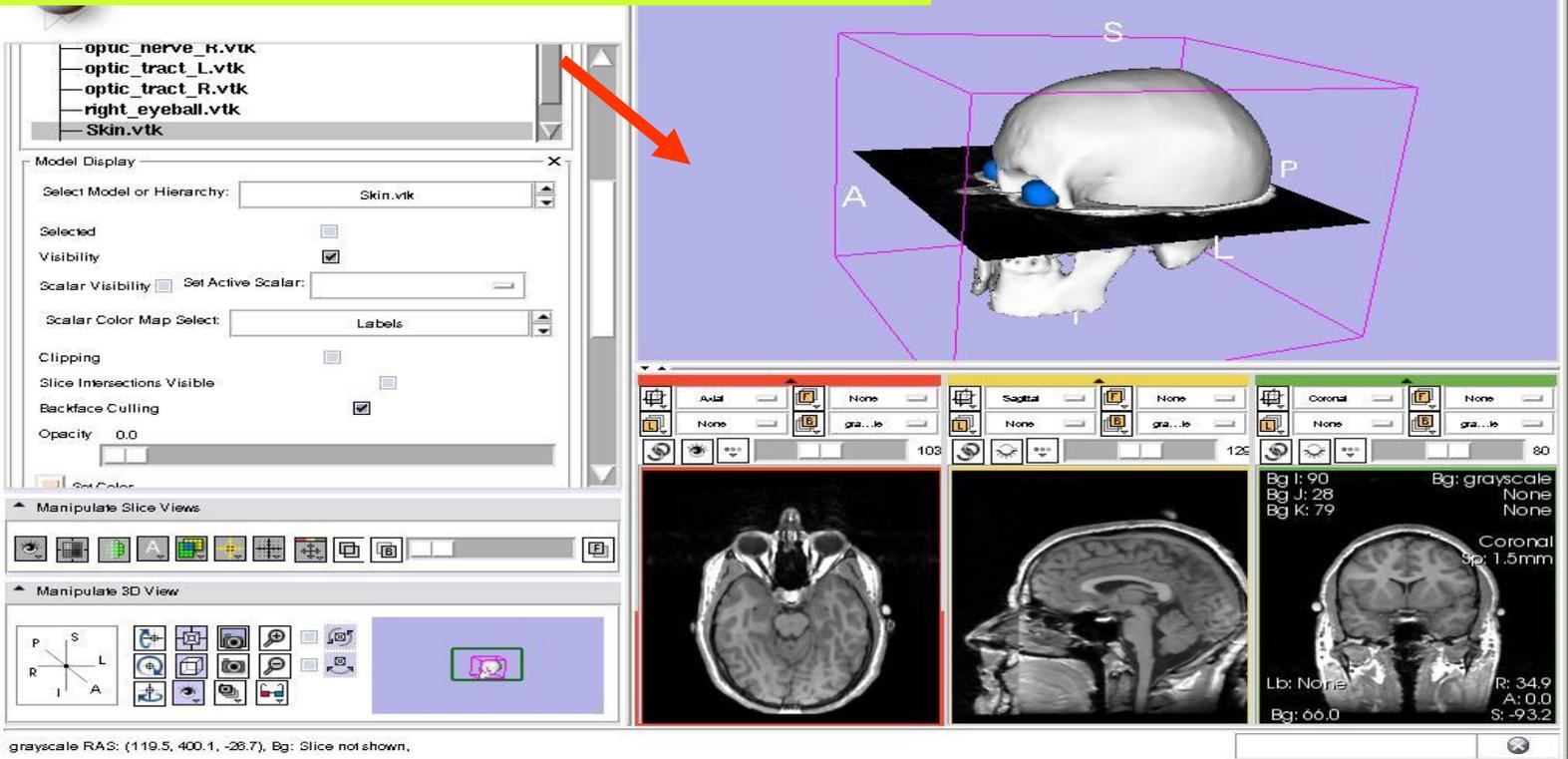


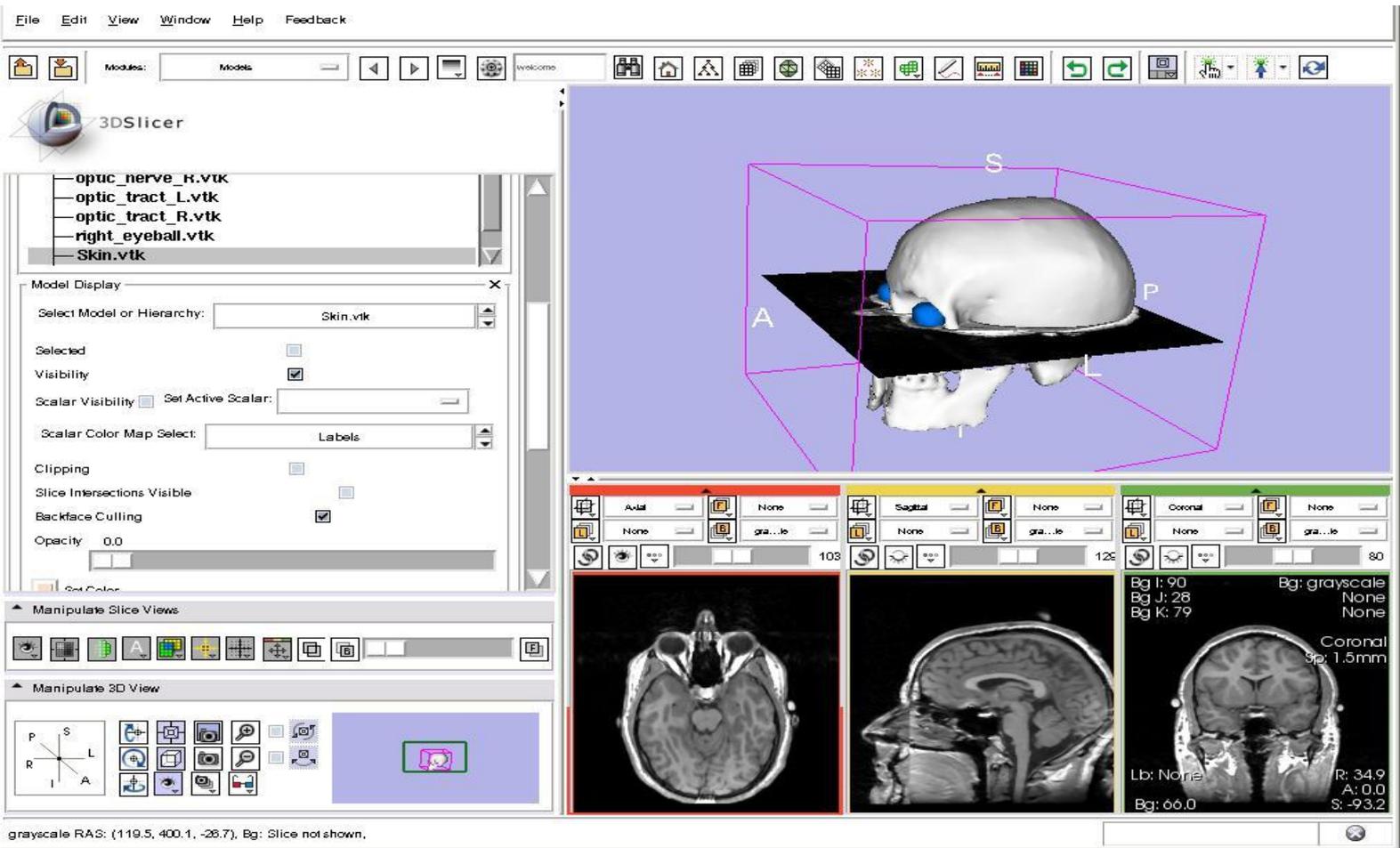
The screenshot shows the 3DSlicer interface with a list of models on the left. The 'Skin.vtk' model is selected. A red arrow points to the 'Skin.vtk' dropdown menu in the 'Model Display' section. Below it, the 'Opacity' slider is set to 1.0 and is circled in red. A yellow text box contains the following instructions:

- モデル階層においてSkinモデル(Skin.vtk)を選択.
- モデルのオパシティ(不透明度)を1.0から0.0に変更.

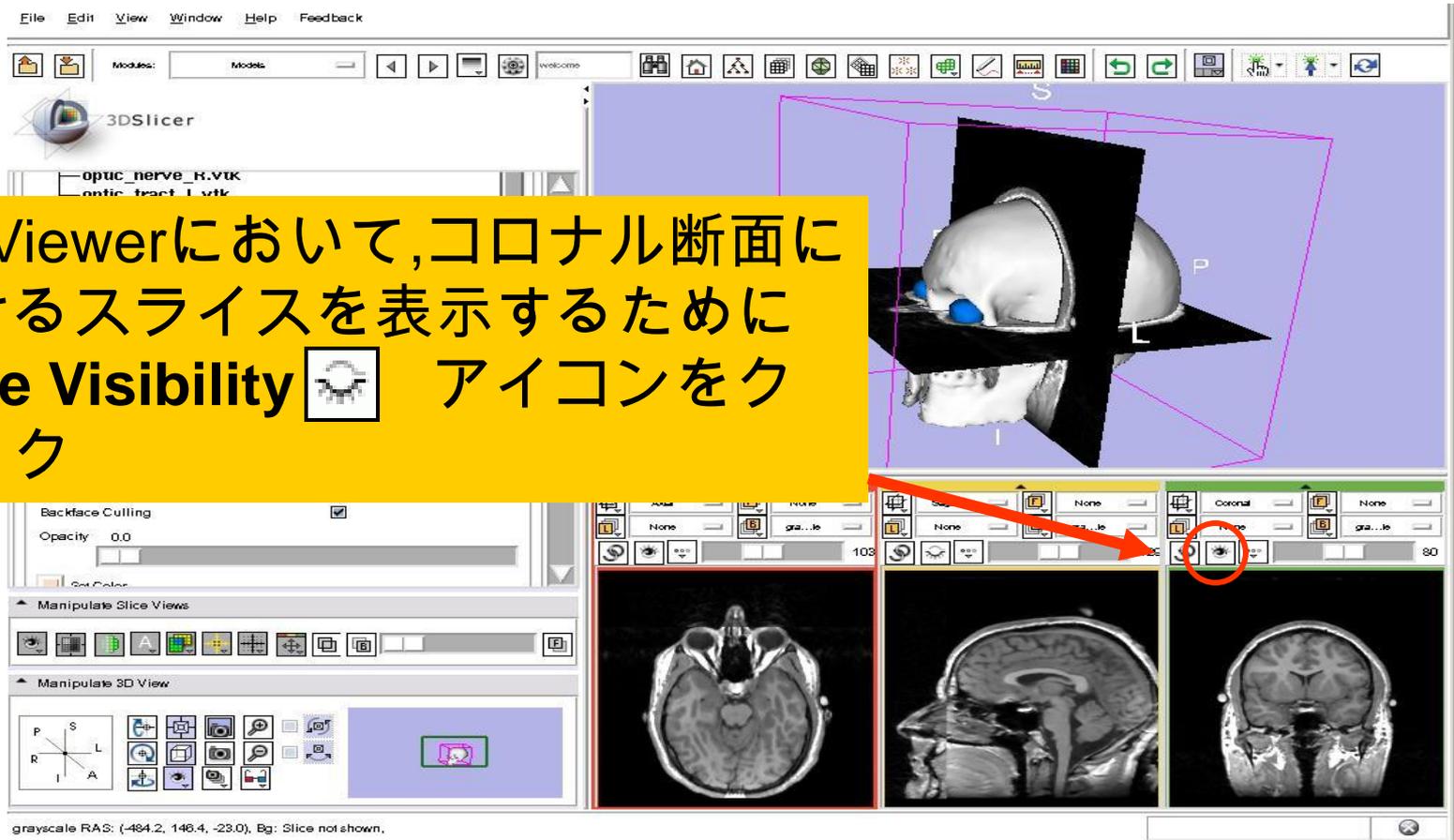
The interface also shows three orthogonal views (Axial, Sagittal, Coronal) at the bottom right, with their respective settings and a 3D view manipulation toolbar at the bottom left.

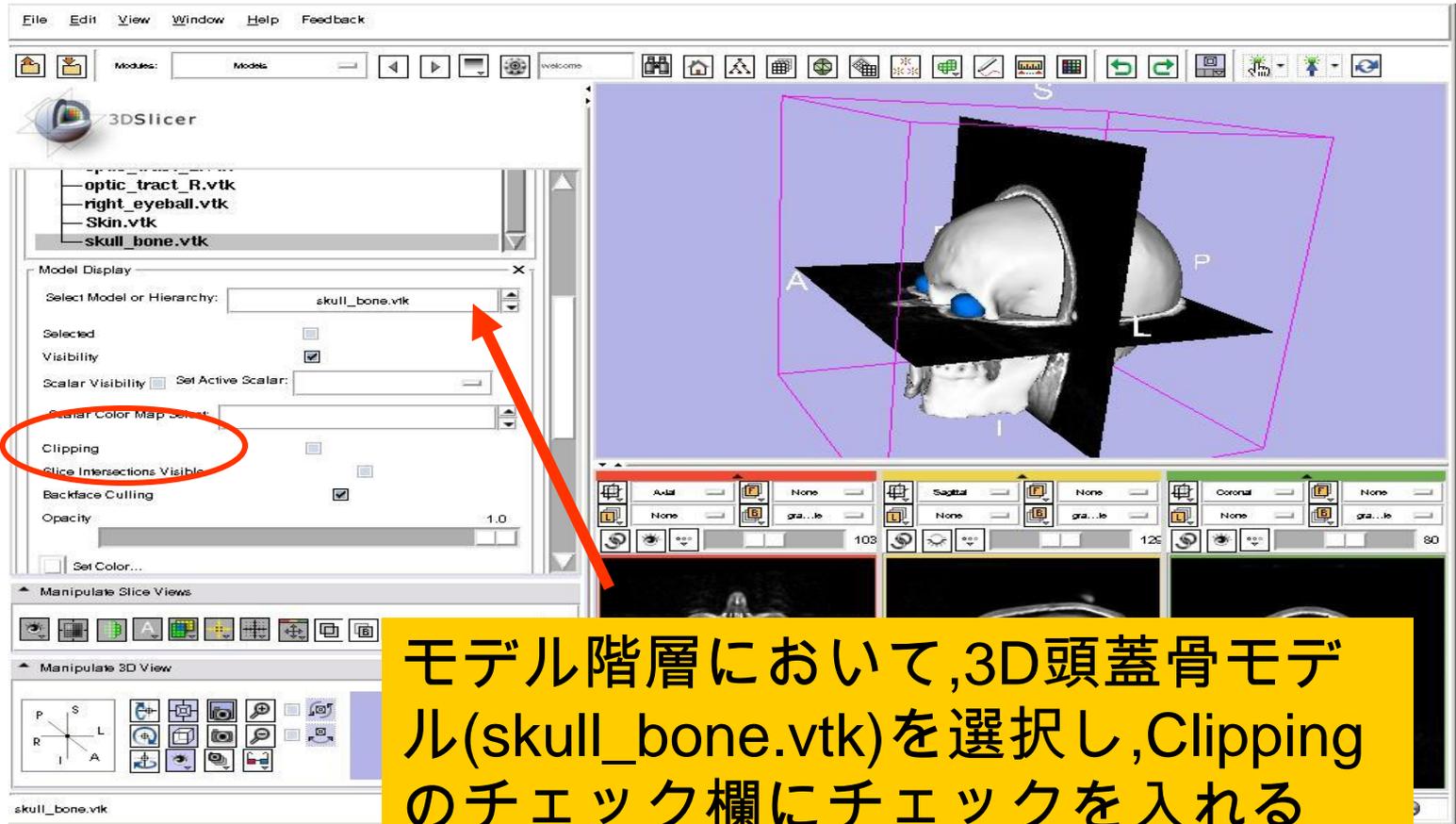
3D Viewerにおいて頭蓋骨と眼球のモデルが肌のモデルを通して現れる





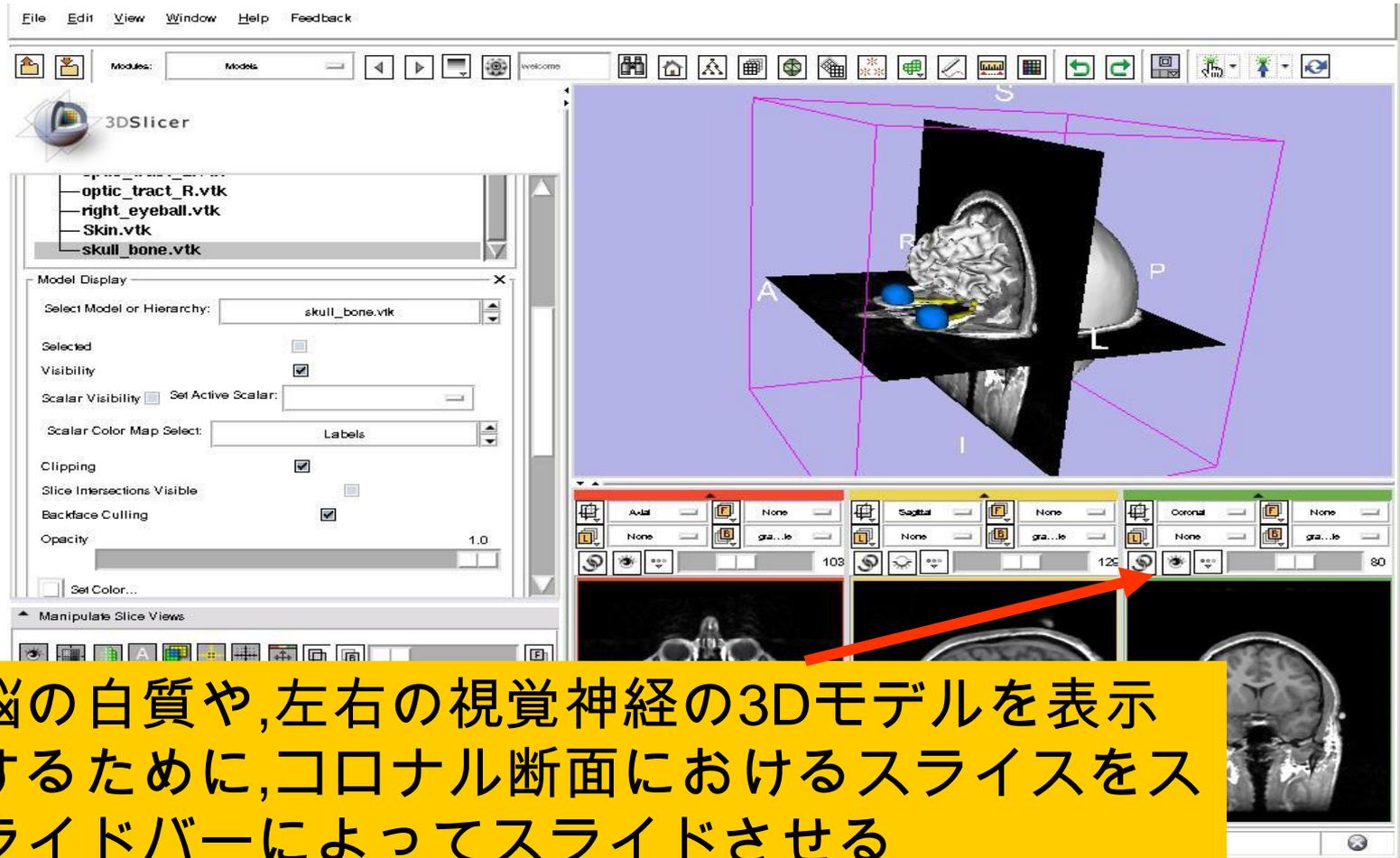
3D Viewerにおいて,コロナル断面におけるスライスを表示するために  
**Slice Visibility**  アイコンをクリック  
リック





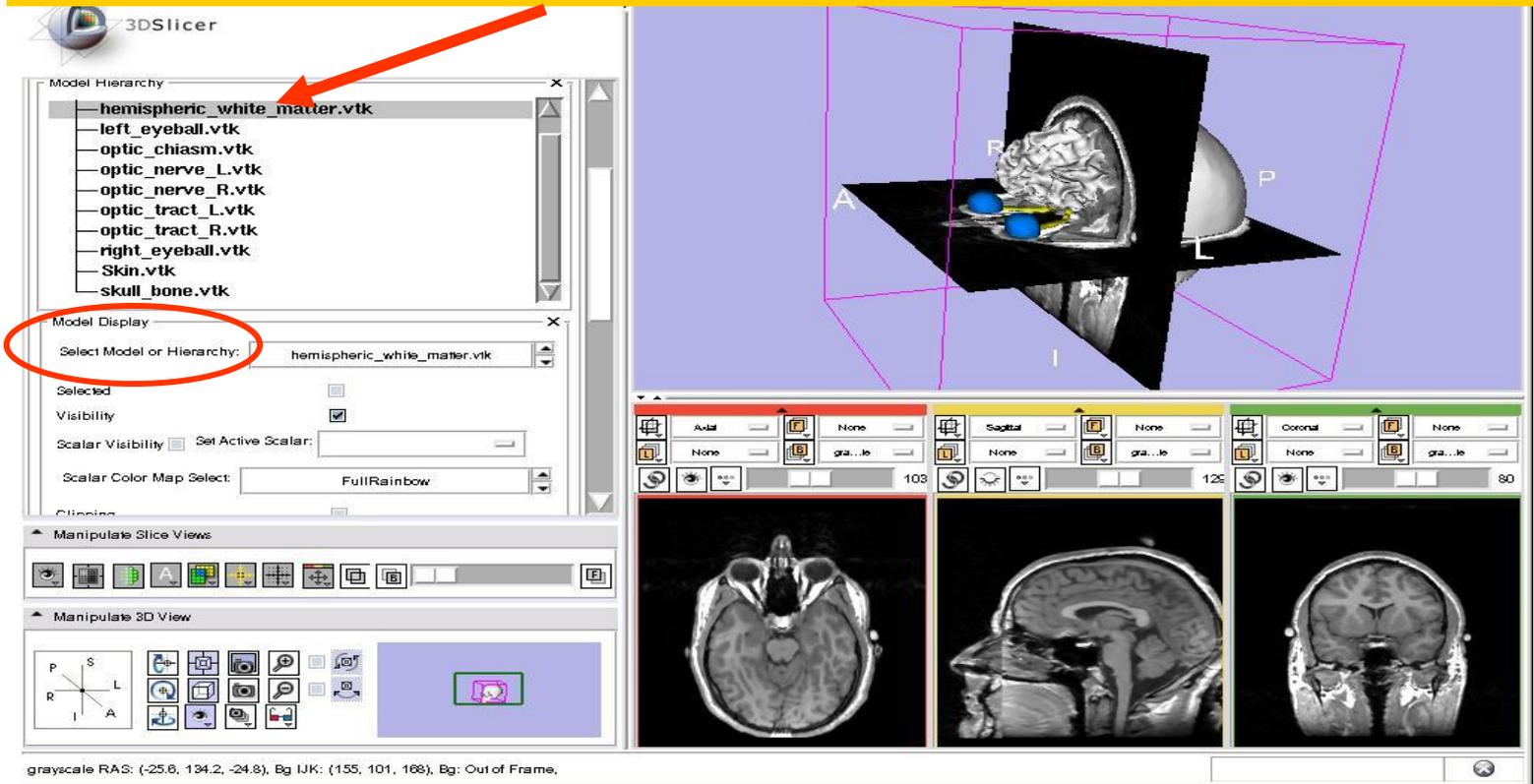
The screenshot shows the 3DSlicer interface. On the left, the 'Model Display' panel is open, showing a list of models including 'skull\_bone.vtk'. The 'Clipping' checkbox is circled in red, and a red arrow points from it to the 3D view. The 3D view shows a skull model with three black clipping planes (Axial, Sagittal, Coronal) and a pink wireframe bounding box. Below the 3D view are three slice view windows (Axial, Sagittal, Coronal) with their respective checkboxes and 'grayscale' options. At the bottom, a yellow box contains the following text:

モデル階層において,3D頭蓋骨モデル(skull\_bone.vtk)を選択し,Clippingのチェック欄にチェックを入れる



脳の内質や、左右の視覚神経の3Dモデルを表示するために、コロナル断面におけるスライスを手動スライダーによってスライドさせる

モデル階層において, `hemispheric_white_matter.vtk` を選択し, そのVisibilityのチェック欄を外す.

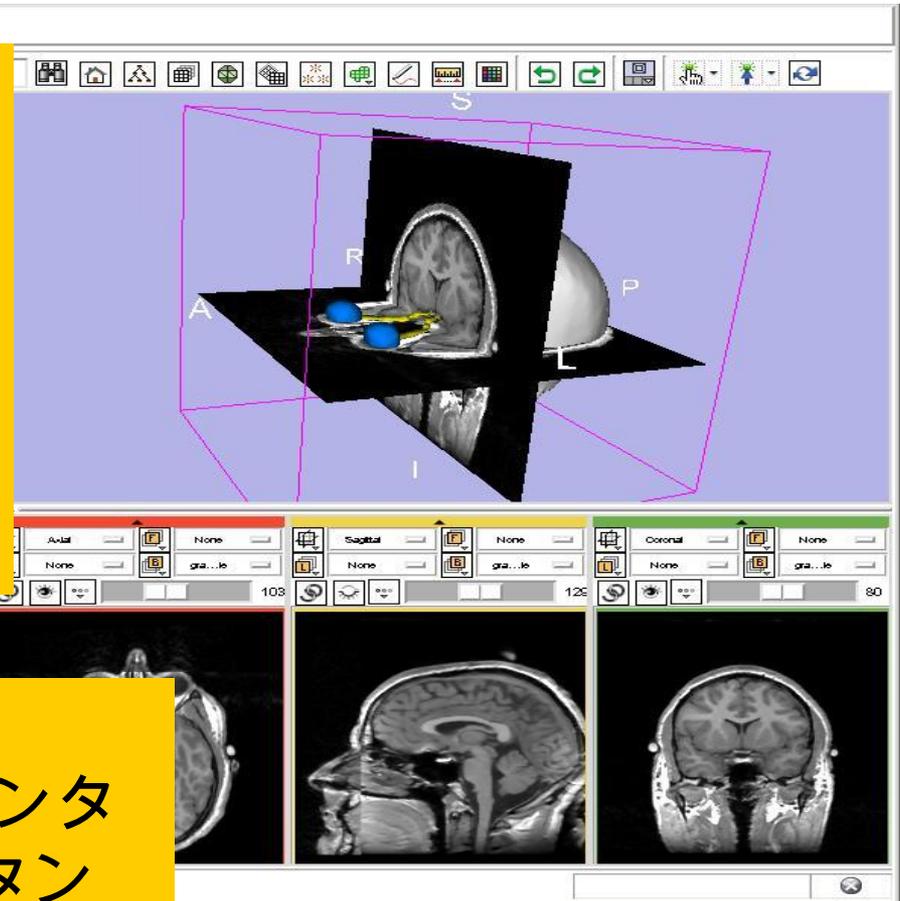




脳のMR画像からオーバーレイされた  
視神経, 視神経交叉, 視索(視神経交叉と  
脳を結ぶ通路)を表示

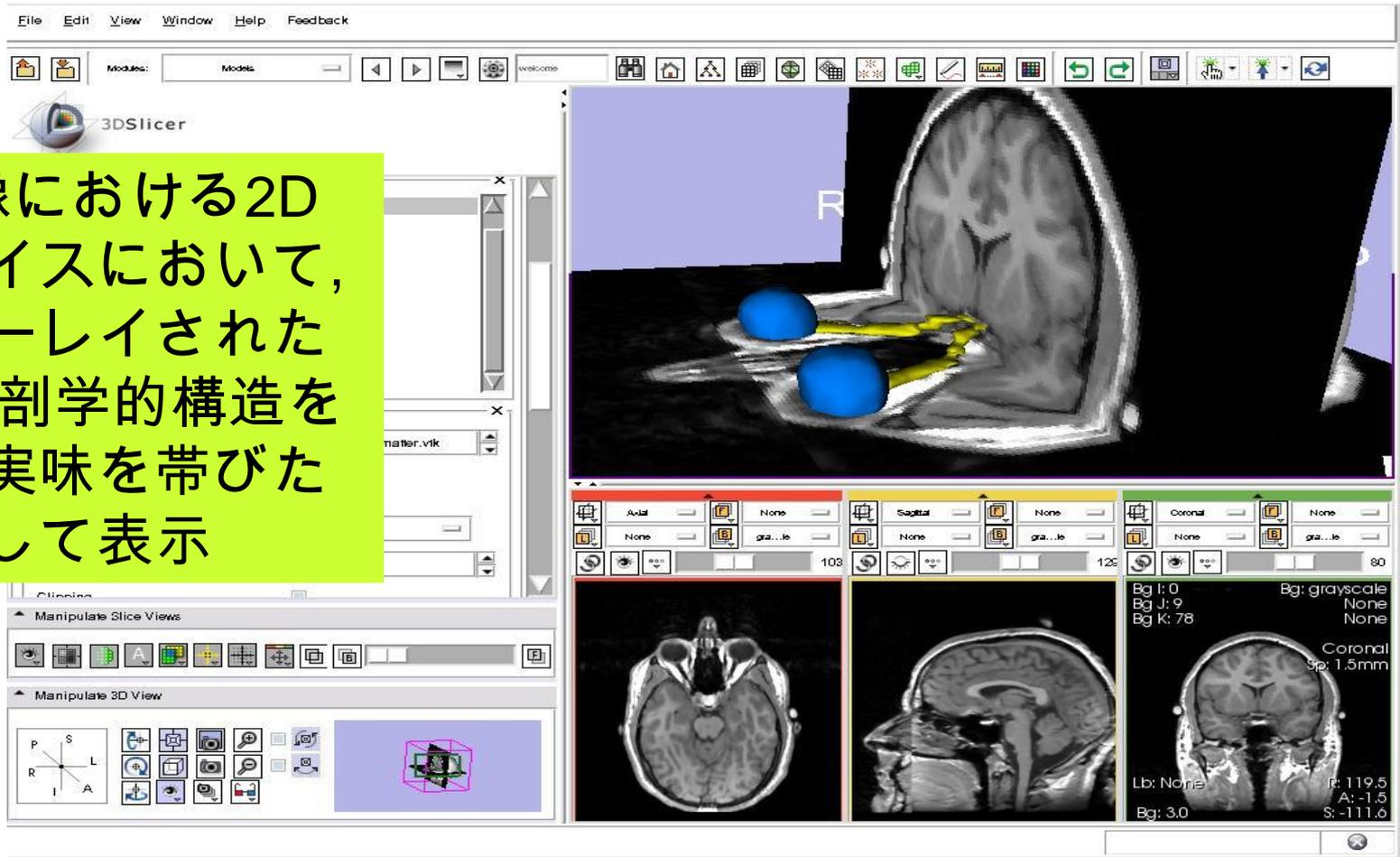
## •Windows/Linuxユーザー

3D Viewer上にマウスポインタを移動させ、マウスの右ボタンを押し続けたまま、マウスを下へ移動させるとズームして見ることができる



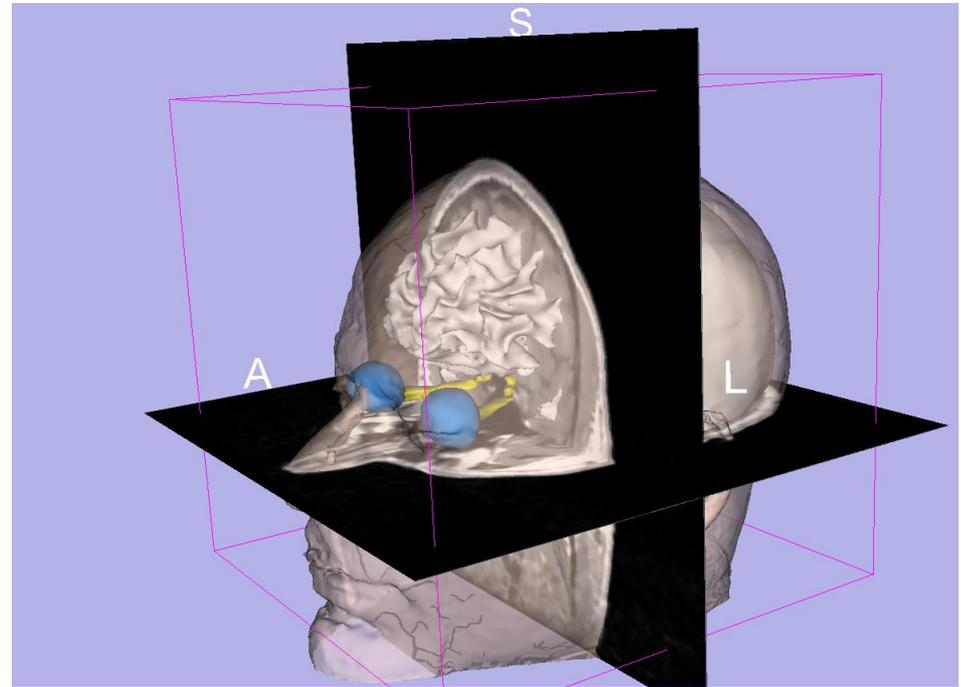
## •Macユーザー

3D Viewer上にマウスポインタを移動させ、アップルボタンを押し続けたまま、マウスを下へ移動させるとズームして見ることができる



MR画像における2Dのスライスにおいて、オーバーレイされた3Dの解剖学的構造をより現実味を帯びた外観として表示

- オープンソースソフトウェア
- 95個の利用可能な機能と組み込まれたライブラリは280万行以上で表されている
- 臨床研究と工学研究の両者に卓越したソフトウェア環境



[spujol@bwh.harvard.edu](mailto:spujol@bwh.harvard.edu)



謝辭

---



**National Alliance for Medical Image Computing**

NIH U54EB005149



**Neuroimage Analysis Center**

NIH P41RR013218

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監守：波多 伸彦 \*

\* Surgical Plannning Laboratory, Harvard Medical School

\*\* 知的画像処理研究室, 立命館大学