

# Bases du chargement de données et de la visualisation 3D avec 3D Slicer

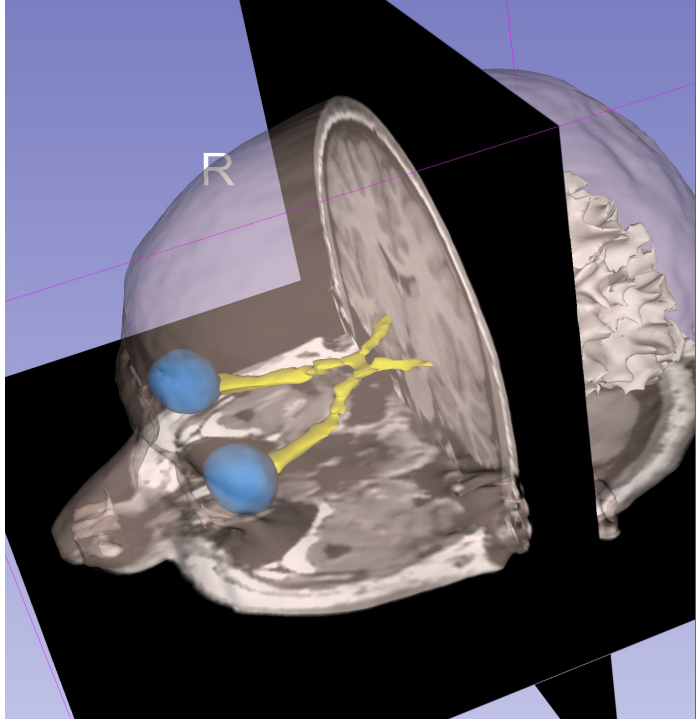
Sonia Pujol, Ph.D

Directrice de la Formation et de l'Enseignement  
de 3D Slicer

*Brigham and Women's Hospital  
Harvard Medical School*



# Objectif Général



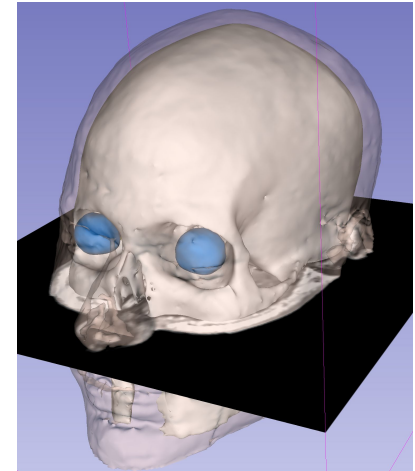
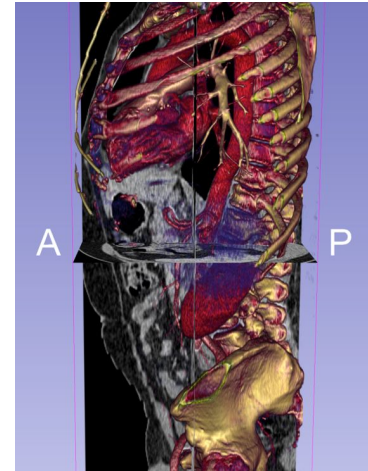
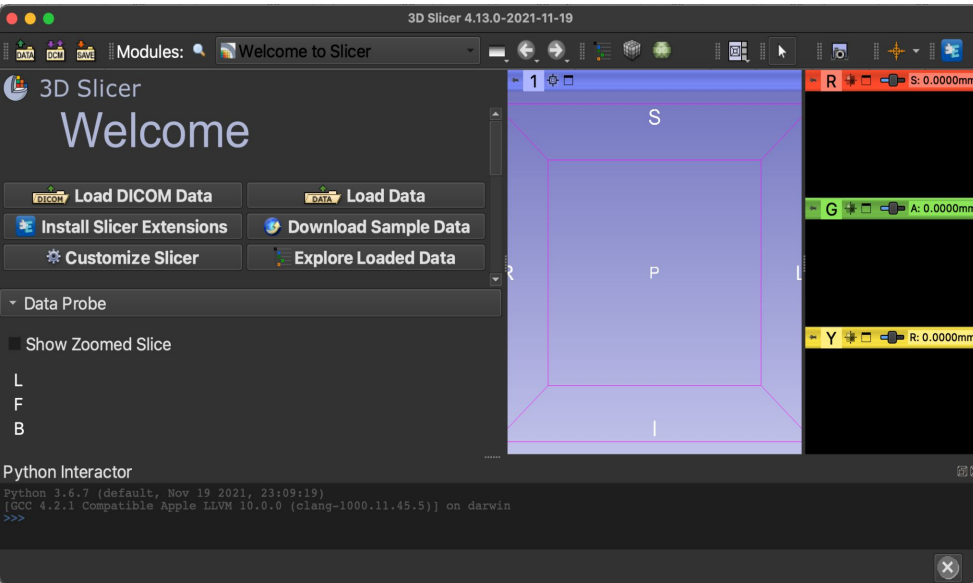
Ce tutoriel est une introduction aux principes de base du chargement et de la visualisation d'images DICOM et de modèles 3D dans 3D Slicer.

# Objectifs d'apprentissage

A l'issu de ce tutoriel, vous serez en mesure de

- charger et visualiser des images DICOM dans Slicer
- réaliser un rendu de volume de TDM
- charger et visualiser des modèles 3D reconstruits à partir de données d'IRM

Pour ce tutoriel, vous aurez besoin de

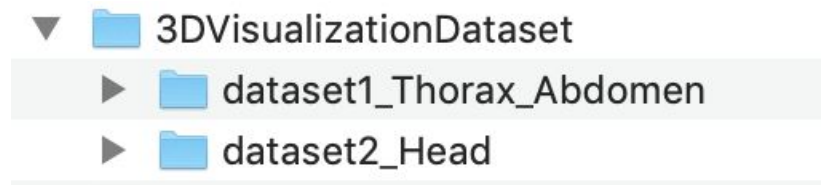


3DVisualizationDataset.zip

3D Slicer version 4.13/5.0

# Jeu de données du tutoriel

- Le fichier 3DVisualizationDataset.zip contient deux répertoires:
  - dataset1\_Thorax\_Abdomen
  - dataset\_2\_Head
- Dézippez le fichier 3DVisualizationDataset.zip sur votre ordinateur pour accéder aux jeux de données



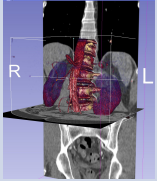
# Avis aux utilisateurs

- 3D Slicer est un logiciel libre et gratuit, distribué sous une licence de type BSD.
- Le logiciel n'est ni certifié FDA ni marqué CE, et est à usage de recherche uniquement.

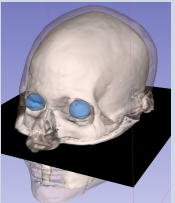
# Sommaire du tutoriel



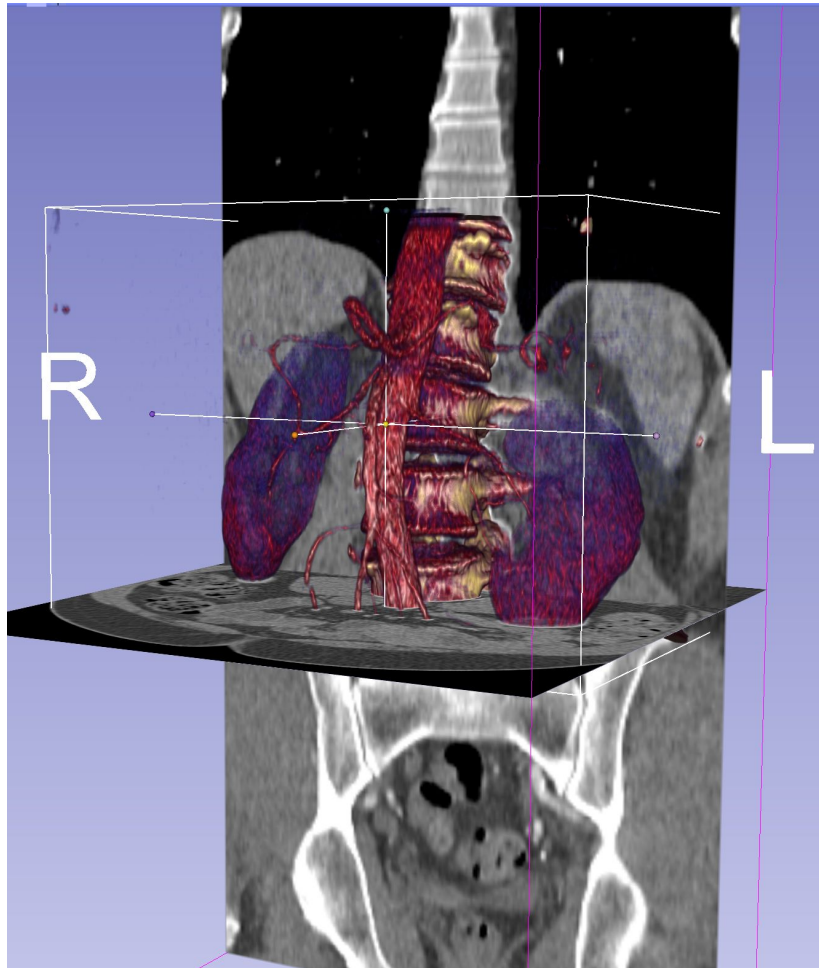
1ère Partie: Chargement et Visualisation de données DICOM



2ème Partie: Rendu de Volume (Volume Rendering)



3ème Partie: Chargement et Visualisation de modèles 3D



## 1ère Partie

Chargement de  
données DICOM



# Charger un volume DICOM

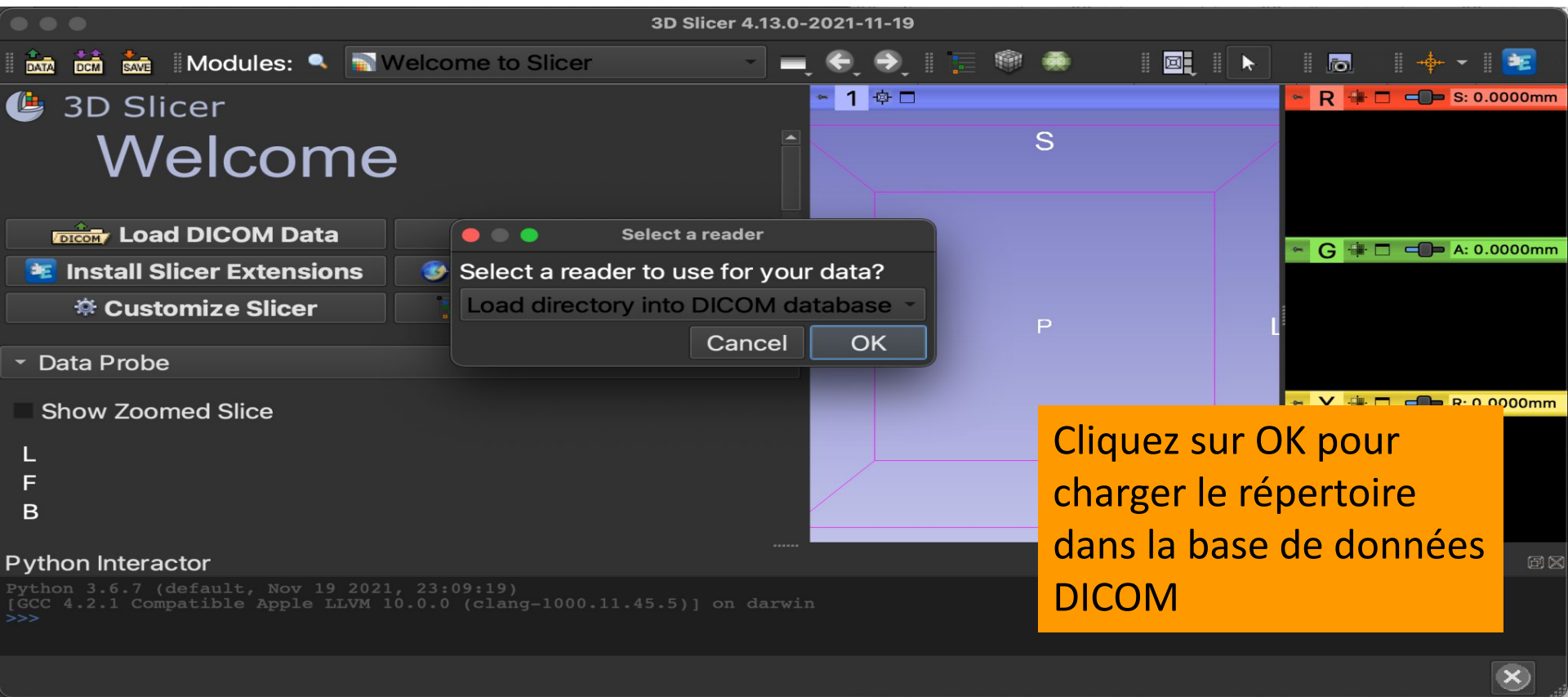
The screenshot shows the 3D Slicer 4.13.0-2021-11-19 interface. A file explorer window is open, displaying a directory structure:

- 3DVisualizationDataset (13 juillet 2020 à 18:24)
  - dataset1\_Thorax\_Abdomen (13 juillet 2020 à 18:20)
  - dataset2\_Head (13 juillet 2020 à 18:20)

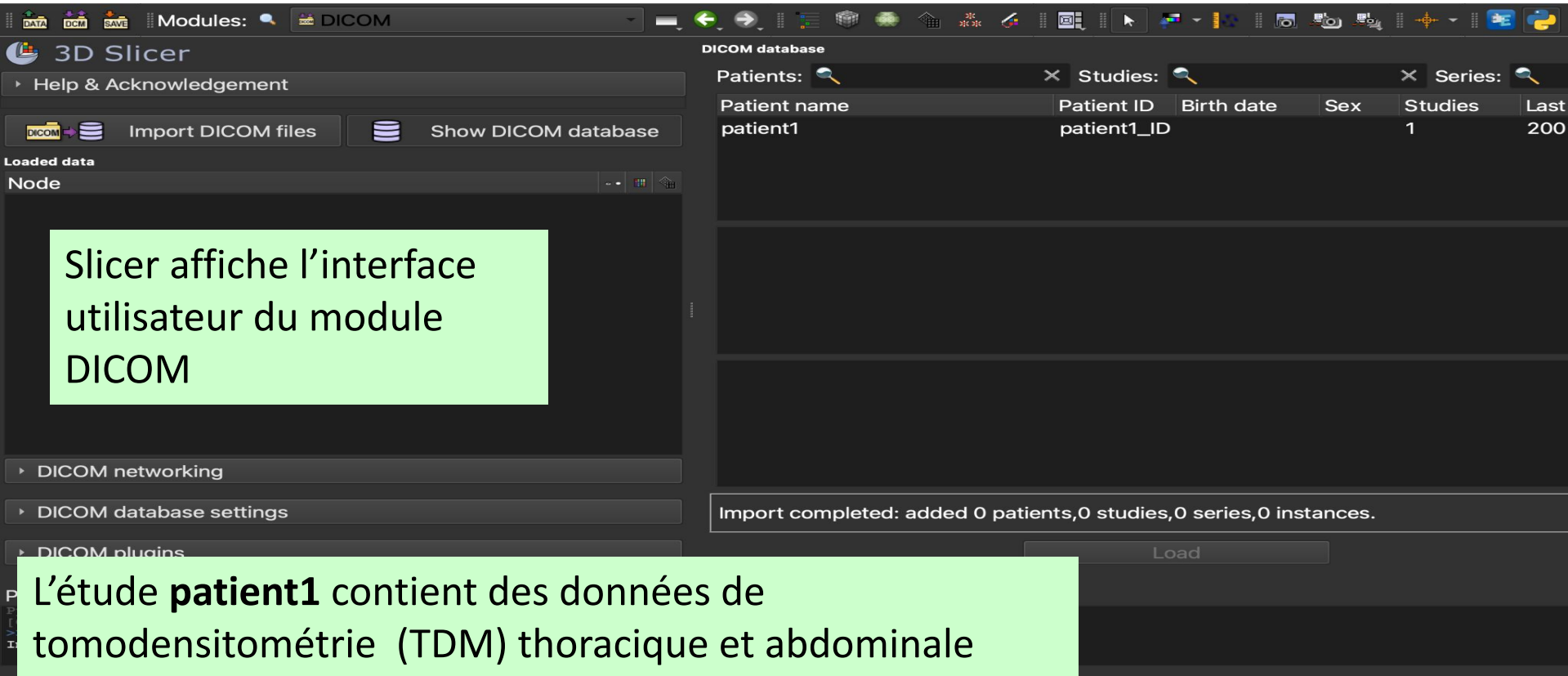
The 'dataset1\_Thorax\_Abdomen' folder is selected. The main interface shows the 'Welcome' screen with buttons for 'Load DICOM Data', 'Install Slicer Extensions', 'Customize Slicer', and 'Explore Loaded Data'. The 'Data Probe' section is visible, and the 'Python Interactor' at the bottom shows the Python environment details.

**Faites glisser le répertoire `dataset1_Thorax_Abdomen` dans Slicer**

# Charger un volume DICOM



# Charger un volume DICOM



The screenshot shows the 3D Slicer DICOM module interface. The top toolbar includes buttons for DATA, DCM, and SAVE. The 'Modules:' dropdown is set to 'DICOM'. The interface is divided into several panels:

- Left Panel:** Contains 'Help & Acknowledgement', 'Import DICOM files', and 'Show DICOM database' buttons. Below is the 'Loaded data' section with a 'Node' list.
- Right Panel:** Displays the 'DICOM database' with three tabs: 'Patients', 'Studies', and 'Series'. The 'Patients' tab is active, showing a table with the following data:

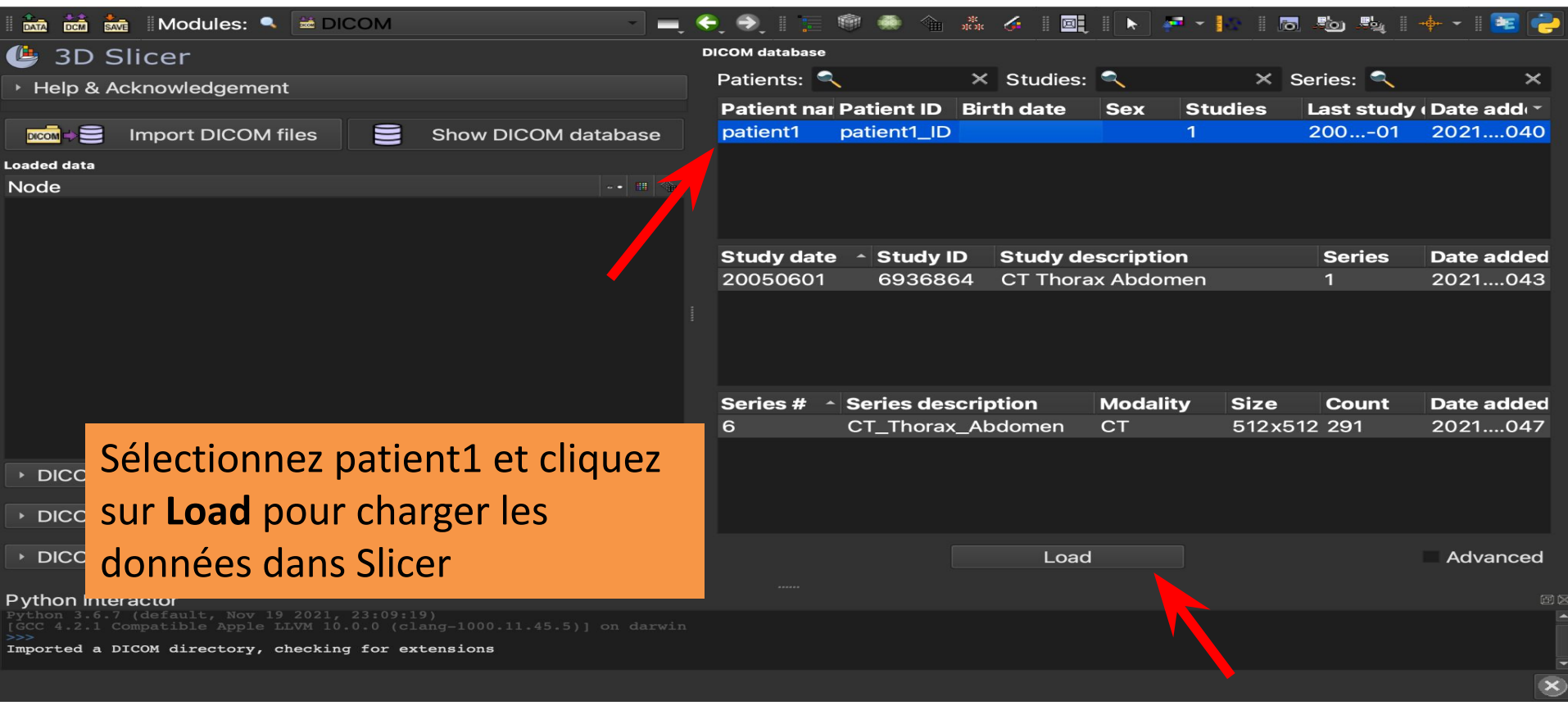
| Patient name | Patient ID  | Birth date | Sex | Studies | Last |
|--------------|-------------|------------|-----|---------|------|
| patient1     | patient1_ID |            |     | 1       | 200  |

At the bottom of the interface, a status message reads: 'Import completed: added 0 patients,0 studies,0 series,0 instances.' Below this message is a 'Load' button.

Slicer affiche l'interface utilisateur du module DICOM

L'étude **patient1** contient des données de tomographie par ordinateur (TDM) thoracique et abdominale

# Charger un volume DICOM



The screenshot shows the 3D Slicer DICOM database interface. The 'Patients' table is selected, and the row for 'patient1' is highlighted. A red arrow points from the 'Load' button at the bottom to the 'patient1' row. Another red arrow points from the 'Load' button to the 'Load' button itself.

3D Slicer

Modules: DICOM

Help & Acknowledgement

Import DICOM files Show DICOM database

Loaded data

Node

DICOM database

Patients: Studies: Series:

| Patient name | Patient ID  | Birth date | Sex | Studies | Last study | Date added |
|--------------|-------------|------------|-----|---------|------------|------------|
| patient1     | patient1_ID |            |     | 1       | 200...-01  | 2021...040 |

| Study date | Study ID | Study description | Series | Date added |
|------------|----------|-------------------|--------|------------|
| 20050601   | 6936864  | CT Thorax Abdomen | 1      | 2021...043 |

| Series # | Series description | Modality | Size    | Count | Date added |
|----------|--------------------|----------|---------|-------|------------|
| 6        | CT_Thorax_Abdomen  | CT       | 512x512 | 291   | 2021...047 |

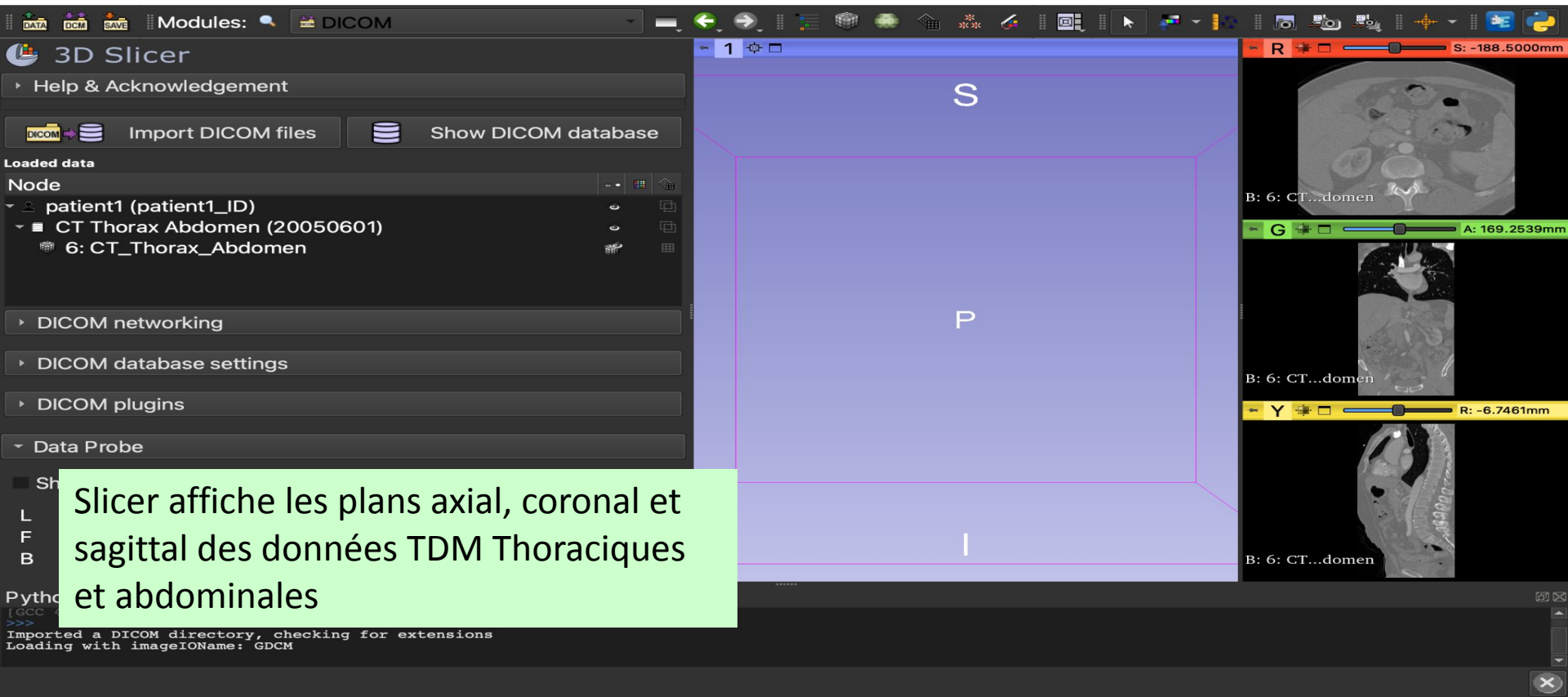
Load Advanced

Python Interactor

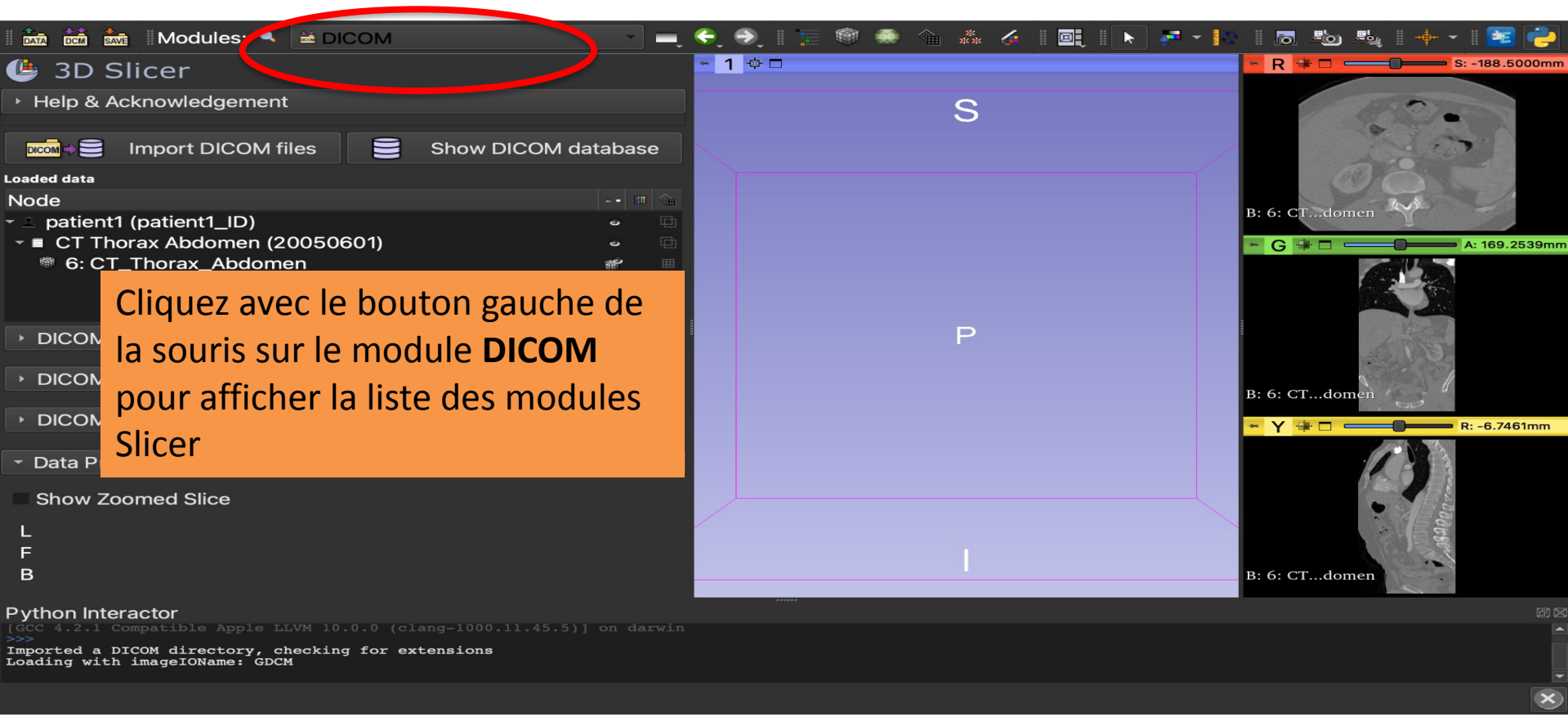
```
Python 3.6.7 (default, Nov 19 2021, 23:09:19)
[GCC 4.2.1 Compatible Apple LLVM 10.0.0 (clang-1000.11.45.5)] on darwin
>>>
Imported a DICOM directory, checking for extensions
```

Sélectionnez patient1 et cliquez sur **Load** pour charger les données dans Slicer

# Charger un volume DICOM



# Charger un volume DICOM



The screenshot displays the 3D Slicer software interface. The top toolbar contains several modules, with the **DICOM** module highlighted by a red oval. The main 3D view area is currently empty, showing a blue background with a purple wireframe box and the letters 'S', 'P', and 'I' indicating the Superior, Posterior, and Inferior directions. On the right side, there are three orthogonal views (axial, coronal, and sagittal) of a CT scan, each labeled '6: CT...domen'. The bottom left panel shows the 'Loaded data' section with a tree view containing 'patient1 (patient1\_ID)', 'CT Thorax Abdomen (20050601)', and '6: CT\_Thorax\_Abdomen'. The bottom right panel shows the 'Python Interactor' with the following text:

```
[GCC 4.2.1 Compatible Apple LLVM 10.0.0 (clang-1000.11.45.5)] on darwin
>> Imported a DICOM directory, checking for extensions
Loading with imageIOName: GDCM
```

An orange text box is overlaid on the interface, containing the following text:

Cliquez avec le bouton gauche de la souris sur le module **DICOM** pour afficher la liste des modules Slicer

# Charger un volume DICOM

The image shows the 3D Slicer software interface. On the left, the 'Modules' sidebar is open, and the 'Volumes' module is selected, indicated by a red arrow. The main window displays a 3D view of a CT scan volume, with three orthogonal slices (axial, coronal, and sagittal) visible on the right. The interface includes a top toolbar, a bottom status bar, and a Python Interactor at the bottom left.

**Sélectionner le module Volumes**

# Charger un volume DICOM

The screenshot displays the 3D Slicer software interface. On the left, the 'Display' panel is visible, showing the 'Window/Level' section. A red arrow points to the 'CT-Abdomen' preset icon, which is highlighted with a tooltip that reads 'CT-Abdomen View abdominal CT volume.' The main 3D view area is currently empty, with a large orange text box overlaid on it. On the right, three orthogonal views (axial, coronal, and sagittal) of a CT scan are visible, with their respective window/level sliders.

Active Volume: 6: CT\_Thorax\_Abdomen

Display

Lookup Table: Grey

Interpolate:

Window/Level:

Threshold: Off

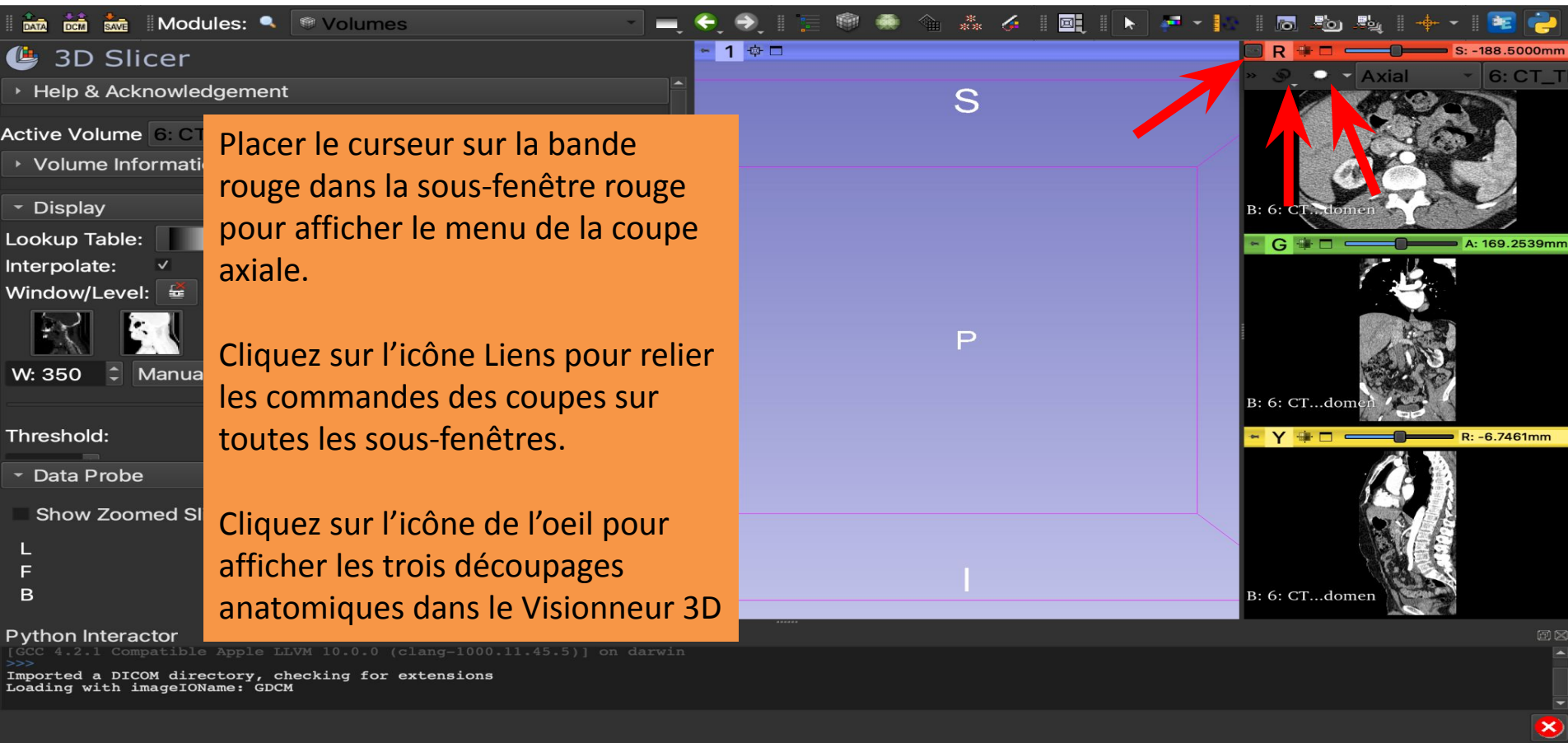
Python Interactor

```
[GCC 4.2.1 Compatible Apple LLVM 10.0.0 (clang-1000.11.45.5)] on darwin
>>> Imported a DICOM directory, checking for extensions
Loading with imageIOName: GDCM
```

Cliquez sur le Preset CT Abdomen pour ajuster automatiquement la fenêtre/le niveau d'intensité du jeu de données



# Charger un volume DICOM



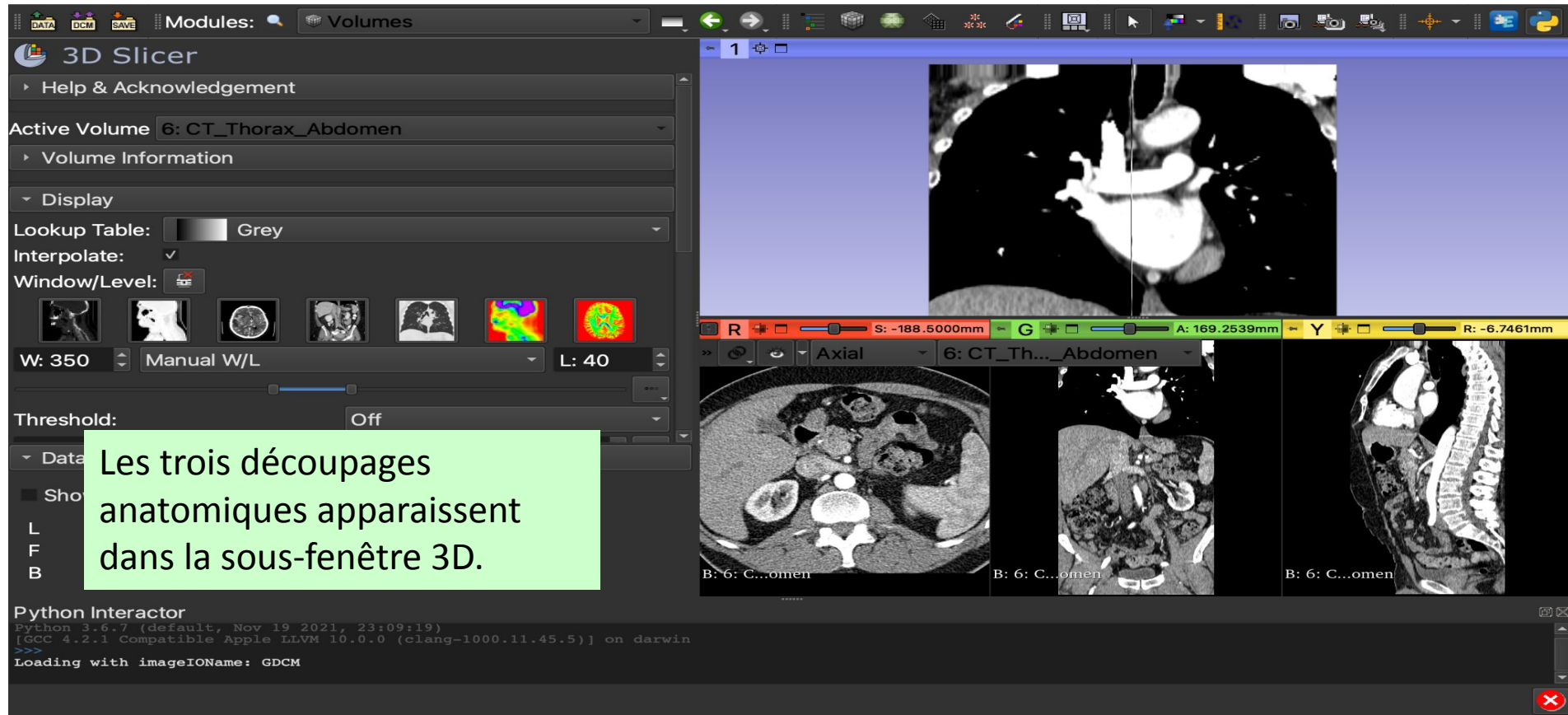
Placer le curseur sur la bande rouge dans la sous-fenêtre rouge pour afficher le menu de la coupe axiale.

Cliquez sur l'icône Liens pour relier les commandes des coupes sur toutes les sous-fenêtres.

Cliquez sur l'icône de l'oeil pour afficher les trois découpages anatomiques dans le Visionneur 3D

The screenshot shows the 3D Slicer interface. The main 3D viewer is a blue cube with 'S' (Superior), 'P' (Posterior), and 'I' (Inferior) labels. To the right, three orthogonal slices are visible: Axial (top, red bar), Coronal (middle, green bar), and Sagittal (bottom, yellow bar). Each slice has a red arrow pointing to a red bar at the top, which is the 'Link' icon. The interface also shows a left sidebar with 'Active Volume' and 'Display' settings, and a bottom 'Python Interactor' window.

# Visualiser des images DICOM



The screenshot displays the 3D Slicer software interface. The top-left sidebar contains the '3D Slicer' logo and a 'Help & Acknowledgement' link. Below this, the 'Active Volume' is set to '6: CT\_Thorax\_Abdomen'. The 'Volume Information' section is expanded, showing 'Display' settings: 'Lookup Table' is set to 'Grey', 'Interpolate' is checked, and 'Window/Level' is set to 'Manual W/L'. The 'W: 350' and 'L: 40' values are visible. The 'Threshold' is set to 'Off'. The main 3D view shows a grayscale volume rendering of a CT scan. Below the 3D view, a 2D window displays three anatomical slices: 'Axial', 'Coronal', and 'Sagittal'. The 'Axial' slice is selected, and the 'Coronal' and 'Sagittal' slices are visible. The 2D window also shows the '6: CT\_Th...\_Abdomen' volume. The bottom of the interface features a 'Python Interactor' window with the following text: 'Python 3.6.7 (default, Nov 19 2021, 23:09:19) [GCC 4.2.1 Compatible Apple LLVM 10.0.0 (clang-1000.11.45.5)] on darwin >>> Loading with imageIOName: GDCM'. A green text box is overlaid on the 3D view, containing the text: 'Les trois découpages anatomiques apparaissent dans la sous-fenêtre 3D.'

Les trois découpages anatomiques apparaissent dans la sous-fenêtre 3D.

# Visualiser des images DICOM

3D Slicer

Modules: Volumes

Active Volume 6: CT\_Thorax\_Abdomen

Volume Information

Display

Lookup Table: Interpolate:

Window/Level:

W: 350 Manual W/L L: 40

Threshold: Off

Data Probe

Show Zoomed Slice

L  
F  
B

Python Interactor

```
Python 3.6.7 (default, Nov 19 2021, 23:09:19)  
[GCC 4.2.1 Compatible Apple LLVM 10.0.0 (clang-1000.11.45.5)] on darwin  
>>>  
Loading with imageIOName: GDCM
```

Cliquez sur l'icône du menu de configuration de Slicer

R S: -188.5000mm G A: 169.2539mm Y R: -6.7461mm

Axial 6: CT\_Th...\_Abdomen

B: 6: C...omen

B: 6: C...omen

B: 6: C...omen

# Visualiser des images DICOM

The image shows the 3D Slicer software interface. On the left, the '3D Slicer' window displays the 'Display' settings for the active volume '6: CT\_Thorax\_Abdomen'. The 'Lookup Table' is set to 'Grey', 'Interpolate' is checked, and 'Window/Level' is set to 'Manual W/L' with 'W: 350' and 'L: 40'. The 'Threshold' is set to 'Off'. Below these settings, there are icons for different views: L, F, B, and a zoomed-in slice. The 'Python Interactor' at the bottom shows the command 'Loading with imageIOName: GDCM'. On the right, the 'View' menu is open, showing various visualization options. The 'Conventional Widescreen' option is highlighted in blue. Other options include 'Conventional Plot', 'Four-Up', 'Four-Up Table', 'Four-Up Plot', 'Four-Up Quantitative', 'Dual 3D', 'Triple 3D', '3D only', '3D Table', 'Plot only', 'Red slice only', 'Yellow slice only', 'Green slice only', 'Tabbed 3D', 'Tabbed slice', 'Compare', 'Compare Widescreen', 'Compare Grid', 'Three over three', 'Three over three Plot', 'Four over four', 'Two over two', 'Side by side', 'Four by three slice', and 'Four by two slice'. The 'Three by three slice' option is also visible at the top right of the menu.

3D Slicer

Active Volume: 6: CT\_Thorax\_Abdomen

Display

Lookup Table: Grey

Interpolate:

Window/Level: Manual W/L

W: 350 L: 40

Threshold: Off

Data Probe

Show Zoomed Slice

L  
F  
B

Python Interactor

```
Python 3.6.7 (default, Nov 19 2021, 23:09:19)
[GCC 4.2.1 Compatible Apple LLVM 10.0.0 (clang-1000.11.45.5)] on darwin
>>>
Loading with imageIOName: GDCM
```

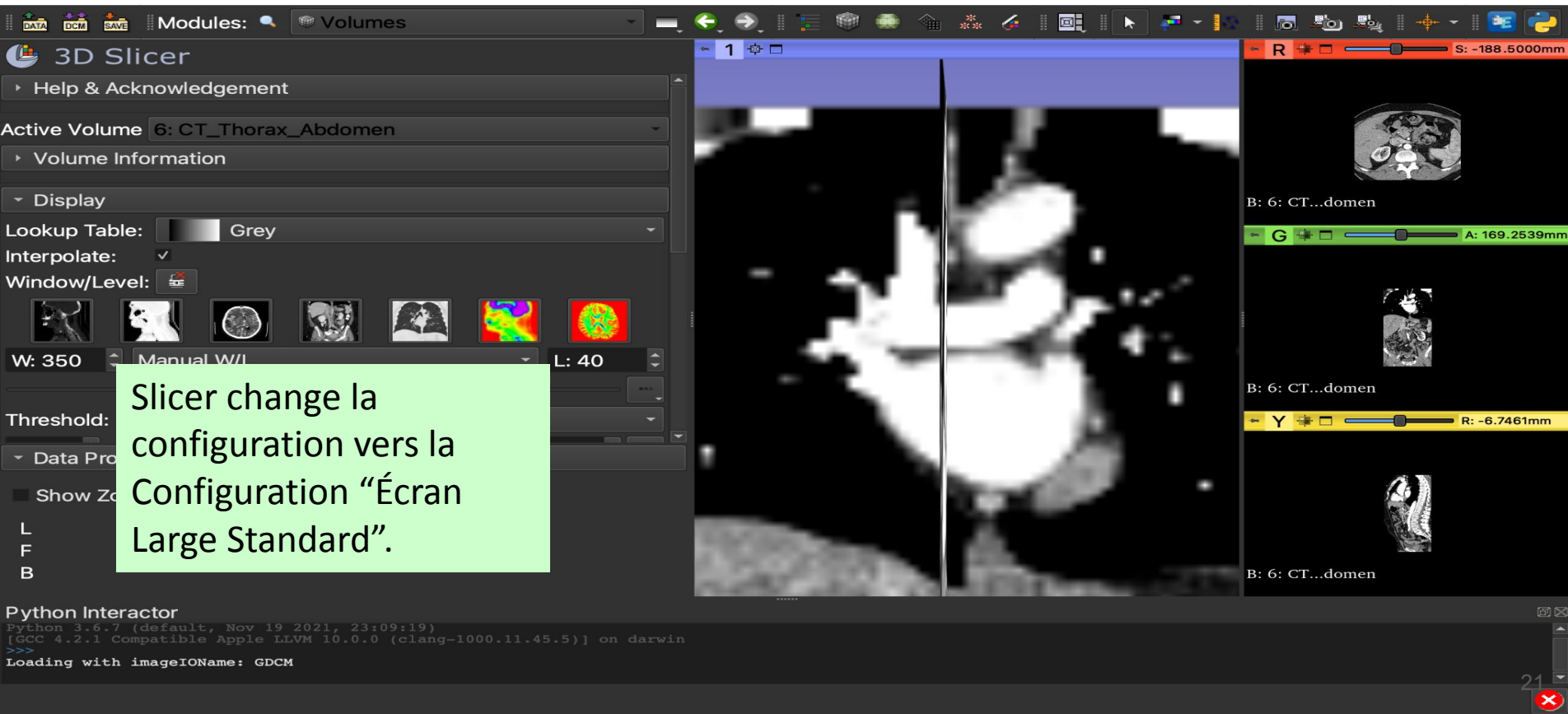
View

- Conventional
- Conventional Widescreen**
- Conventional Plot
- Four-Up
- Four-Up Table
- Four-Up Plot
- Four-Up Quantitative
- Dual 3D
- Triple 3D
- 3D only
- 3D Table
- Plot only
- Red slice only
- Yellow slice only
- Green slice only
- Tabbed 3D
- Tabbed slice
- Compare
- Compare Widescreen
- Compare Grid
- Three over three
- Three over three Plot
- Four over four
- Two over two
- Side by side
- Four by three slice
- Four by two slice

Three by three slice

Sélectionnez Conventional Widescreen

# Visualiser des images DICOM



The screenshot displays the 3D Slicer software interface. The main window shows a large axial CT scan slice of a thorax and abdomen. To the right, three smaller windows show the same volume in different planes: a coronal view (labeled 'R'), a sagittal view (labeled 'A'), and a third view (labeled 'R'). The interface includes a top toolbar with various icons, a left sidebar with 'Modules' and 'Volumes' tabs, and a bottom Python Interactor window.

Active Volume: 6: CT\_Thorax\_Abdomen

Display

Lookup Table: Grey

Interpolate:

Window/Level:

W: 350 Manual W/L L: 40

Threshold:

Show Z

L  
F  
B

Python Interactor

```
Python 3.6.7 (default, Nov 19 2021, 23:09:19)
[GCC 4.2.1 Compatible Apple LLVM 10.0.0 (clang-1000.11.45.5)] on darwin
>>>
Loading with imageIOName: GDICM
```

Slicer change la configuration vers la Configuration "Écran Large Standard".

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# Visualiser des images DICOM

3D Slicer

Active Volume: 6: CT\_Thorax\_Abdomen

Volume Information

Display

Lookup Table: Grey

Interpolate:

Window/Level:

W: 350 Manual W/L L: 40

Threshold: Off

Utilisez le bouton droit de la souris pour zoomer et dézoomer.

Python Interactor

```
Python 3.6.7 (default, Nov 19 2021, 23:09:19)
[GCC 4.2.1 Compatible Apple LLVM 10.0.0 (clang-1000.11.45.5)] on darwin
>>>
Loading with imageIOName: GDCM
```

Right sidebar: R, S: -188.500mm, G, A: 169.2539mm, Y, R: -6.7461mm, B: 6: CT...domen

# Visualiser des images DICOM

3D Slicer

Modules: Volumes

Active Volume: 6: CT\_Thorax\_Abdomen

Volume Information

Display

Lookup Table: Grey

Interpolate:

Window/Level: W: 350 Manual W/L L: 40

Threshold

Data P

Show

L

F

B

Python Interactor

```
Python 3.6.7 (default, Nov 19 2021, 23:09:19)
[GCC 4.2.1 Compatible Apple LLVM 10.0.0 (clang-1000.11.45.5)] on darwin
>>>
Loading with imageIOName: GDCM
```

Utilisez le bouton gauche de la souris dans le visionneur 3D pour faire pivoter les images.

S

P L

R

S: -188.5000mm

G

A: 169.2539mm

Y

R: -6.7461mm

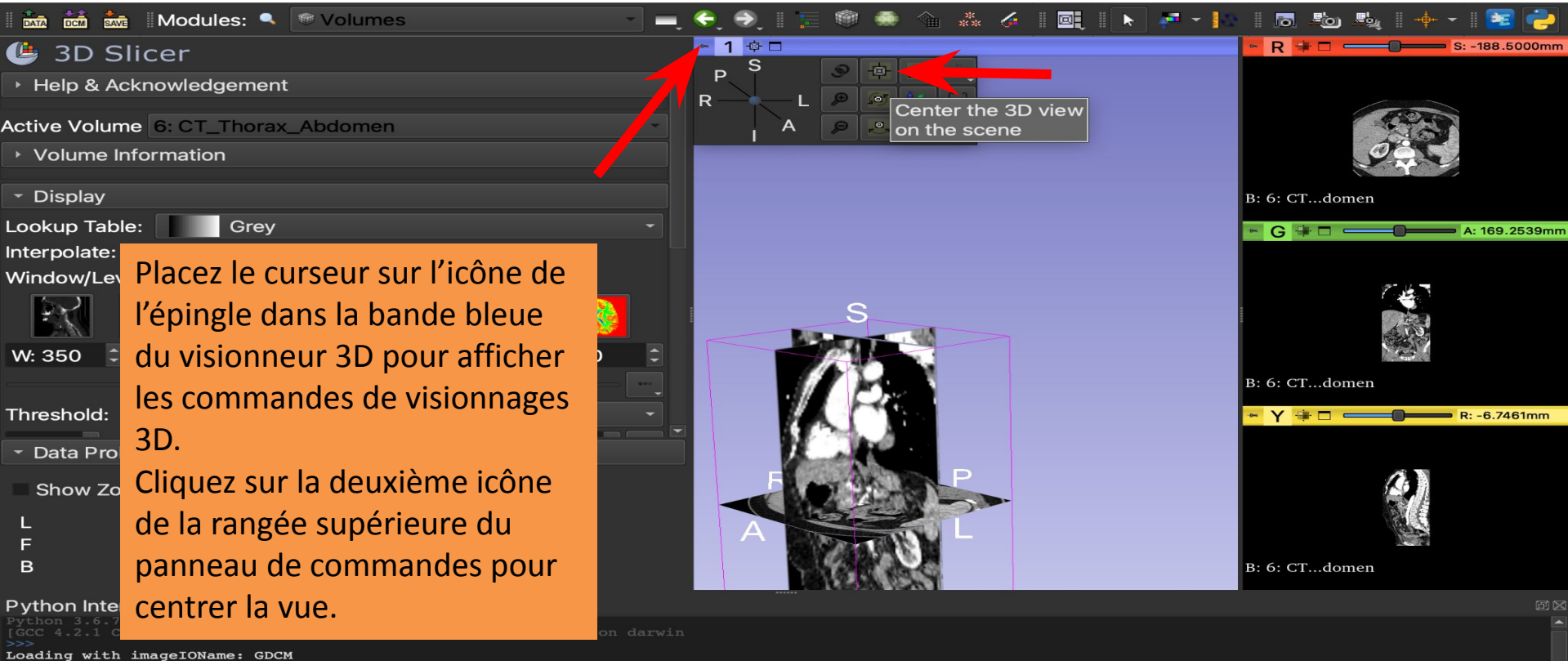
B: 6: CT...domen

B: 6: CT...domen

B: 6: CT...domen

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# Commandes du Visionneur 3D



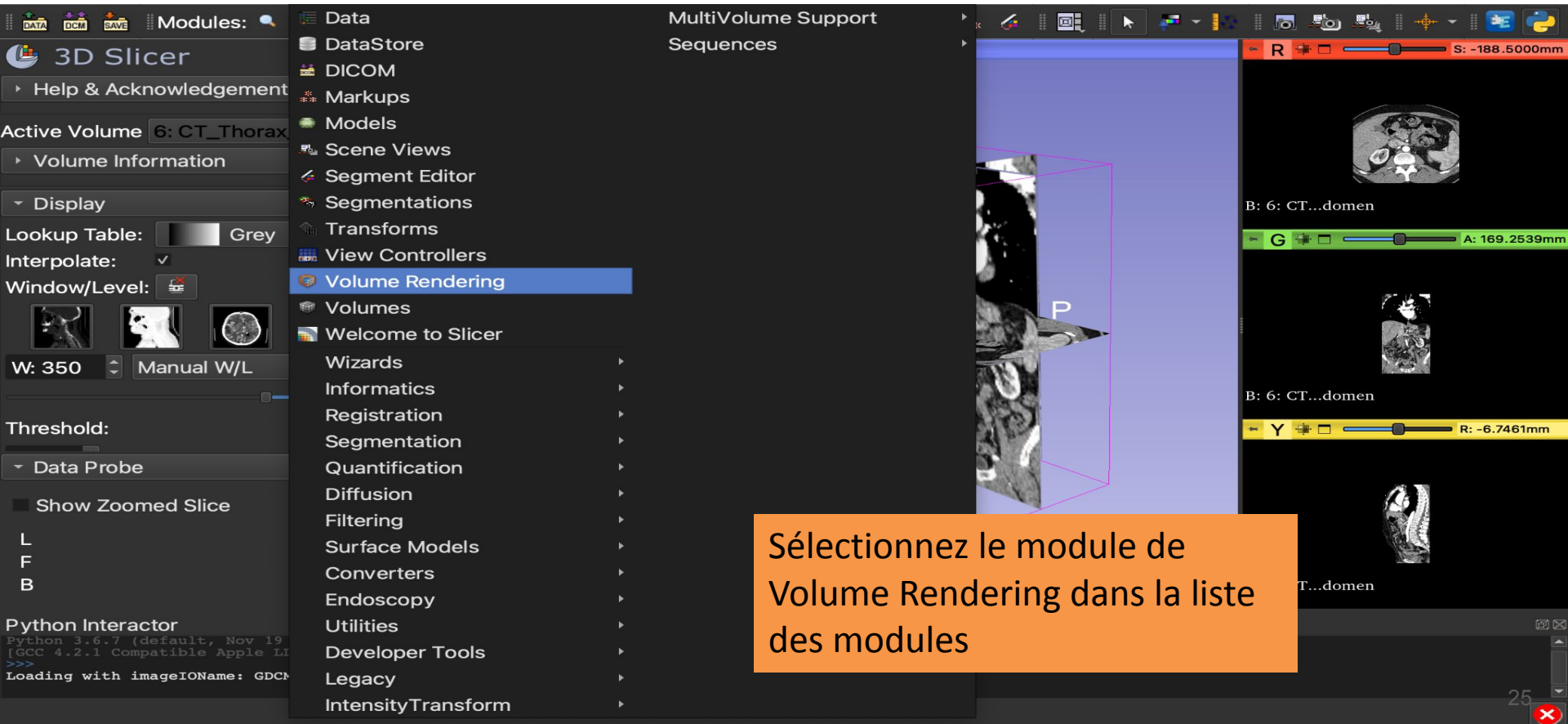
The screenshot displays the 3D Slicer software interface. The central 3D view shows a CT scan of a thorax and abdomen, oriented in a coronal plane. The view is centered on the scene, as indicated by a tooltip that says "Center the 3D view on the scene". The interface includes a top toolbar with various icons, a left sidebar with panels for "Help & Acknowledgement", "Volume Information", and "Display", and a right sidebar with three axial view windows. A red arrow points to the "Center" icon in the top toolbar, and another red arrow points to the "Center the 3D view on the scene" tooltip. An orange text box is overlaid on the left side of the interface.

Placez le curseur sur l'icône de l'épingle dans la bande bleue du visionneur 3D pour afficher les commandes de visionnages 3D.

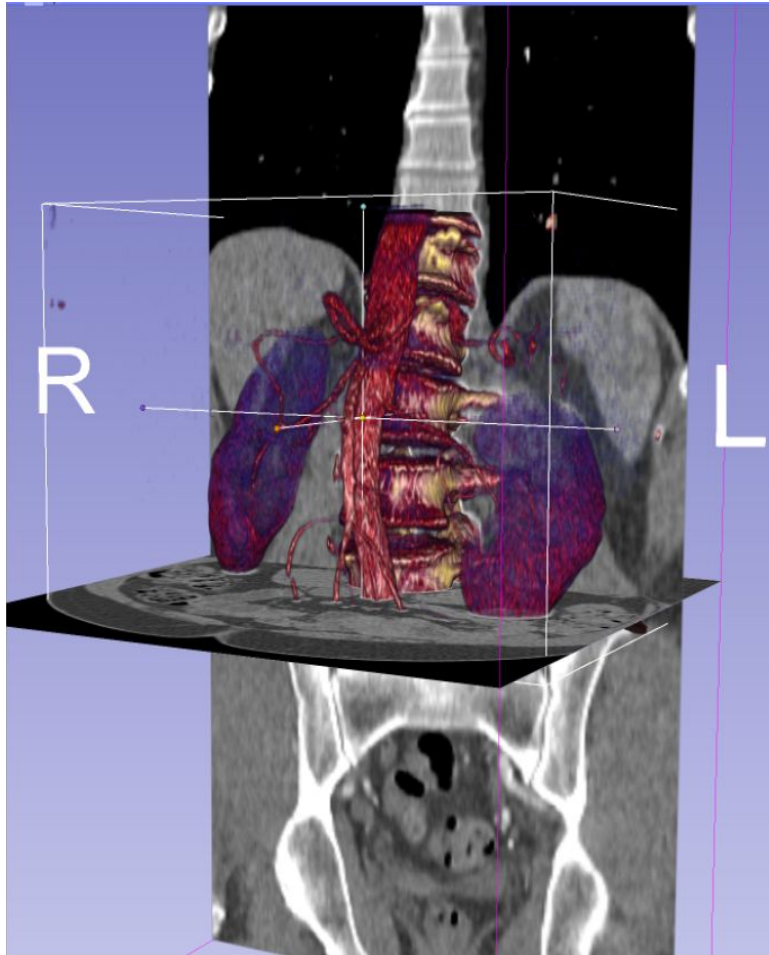
Cliquez sur la deuxième icône de la rangée supérieure du panneau de commandes pour centrer la vue.



# Commandes du Visionneur 3D



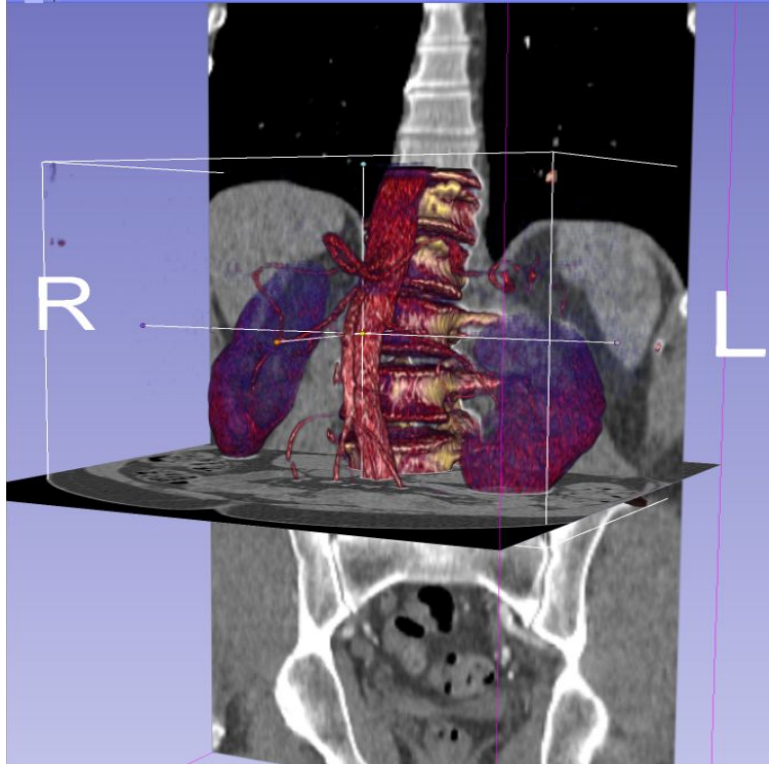
Sélectionnez le module de Volume Rendering dans la liste des modules



## Partie 2

## Le Volume Rendering

# Le Volume Rendering



- Les techniques de Volume Rendering permettent la visualisation 3D de jeux de données 3D
- Le module Volume Rendering de Slicer permet une visualisation 3D interactive des images DICOM.

# Le Volume Rendering

3D Slicer

Volume Rendering

Volume: 6: CT\_Thorax\_Abdomen

Display

Preset: **CT-Cardiac3**

Shift: **Volume**

Crop: **Volume**

Render: **Volume**

Adv: **Volume**

Data

Show

L

F

B

Python Interactor

```
Python 3.6.7 (default, Nov 19 2021, 23:09:19)
[GCC 4.2.1 Compatible Apple LLVM 10.0.0 (clang-1000.11.45.5)] on darwin
>>>
Loading with imageIOName: GDCM
```

S

F

P

A

I

R

S: -188.500mm

G

A: 169.2539mm

Y

R: -6.7461mm

B: 6: CT...domen

B: 6: CT...domen

B: 6: CT...domen

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Cliquez sur Preset dans l'onglet Affichage et sélectionnez le preset CT-Cardiac3.

# Le Volume Rendering

**3D Slicer**

Modules: Volume Rendering

Volume: 6: CT\_Thorax\_Abdomen

Display

Preset: CT-Cardiac3

Shift: [Slider]

Crop:  Enable  Display ROI

Rendering: VTK GPU Ray Casting

Advanced...

3D View: 1

Right Sidebar: Axial 6:...en, B: 6: C...omen, S: -188.5000mm

Right Sidebar: B: 6: C...omen, S: -188.5000mm

Right Sidebar: B: 6: C...omen, S: -188.5000mm

Right Sidebar: B: 6: C...omen, S: -188.5000mm

Python Interactor

>>> Imported a D...  
Loading with

3D View: L P

Yellow Text Box:

Sélectionnez la méthode VTK GPU Ray Casting Rendering.  
Cliquez sur l'icône de l'œil dans l'onglet Volume pour afficher l'image 3D dans la sous-fenêtre 3D.

# Le Volume Rendering

3D Slicer

Modules: Volume Rendering

Volume: 6: CT\_Thorax\_Abdomen

Display

Preset: CT-Cardiac3

Shift: [Slider]

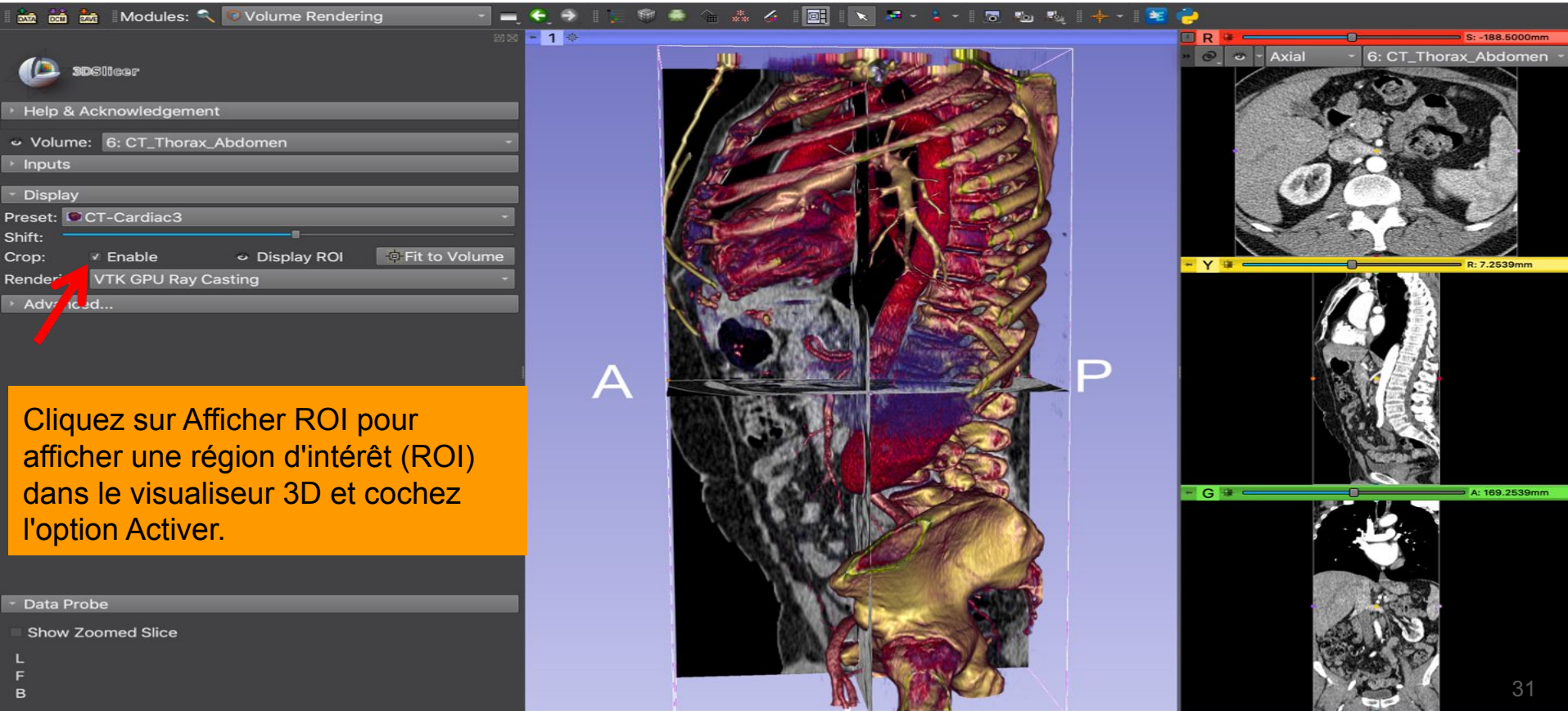
Crop:  Enable  Display ROI  Fit to Volume

Rendering: VTK GPU Ray Casting

Utilisez le curseur de déplacement pour modifier la fonction de transfert et afficher l'aorte.

Cliquez sur Afficher ROI pour afficher une région d'intérêt (ROI) dans le visualiseur 3D et cochez l'option Activer.

# Le Volume Rendering



Cliquez sur Afficher ROI pour afficher une région d'intérêt (ROI) dans le visualiseur 3D et cochez l'option Activer.

# Le Volume Rendering

1- Désactivez la visibilité des coupes axiales, sagittales et coronales dans le visualiseur 2D.

2- Positionnez la ROI autour du rein gauche en utilisant les poignées de couleur.

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# Le Volume Rendering

3D Slicer

Volume Rendering

Modules: Volume Rendering

Home & Acknowledgement

Volume: 6: CT\_Thorax\_Abdomen

Inputs

Display

Preset: CT-Cardiac3

Shift: [Slider]

Crop:  Enable  Display ROI

Rendering: VTK GPU Ray Casting

Advanced...

Python Interactor

```
>>>
Imported a DICOM directory, checking for extensions
Loading with imageIOName: GDCM
```

S

A

P

I

R: -7.0000mm

Sagittal 6...en

B: 6: C...omen

G: [Slider] R: -7.0000mm

B: 6: C...omen

Y: [Slider] R: -7.0000mm

Cliquez sur l'icône de l'œil pour afficher l'image 3D.

Slicer affiche l'image du rendu de volume du rein gauche

# Le Volume Rendering

3D Slicer

Modules: Volume Rendering

Volume: 6: CT\_Thorax\_Abdomen

Display

Preset: CT-Cardiac3

Shift: [Slider]

Crop:  Enable  Display ROI  Fit to Volume

Rendering: VTK GPU Ray Casting

Advanced...

Étendre la ROI pour générer une image du rendu de volume du rein droit.

R L

R: -7.000mm

Sagittal 6:...

B: 6: C...omen

G [Slider] R: -7.000mm

B: 6: C...omen

Y [Slider] R: -7.000mm

B: 6: C...omen

Python Interactor

```
>>>
Imported a DICOM directory, checking for extensions
Loading with imageIOName: GDCM
```

# Le Volume Rendering

3D Slicer 4.13.0-2021-11-19

File Edit View Help

- Add Data ⌘ O
- Download Sample Data
- DICOM
- Save ⌘ S
- Recently Loaded >
- Close Scene ⌘ W

3D Slicer 4.13.0-2021-11-19

Volume: 6: CT\_Thorax

Inputs

Display

Preset: CT-Cardiac3

Shift: [Slider]

Crop:  Enable  Display ROI

Rendering: VTK GPU Ray Casting

Advanced...

Data Probe

Show Zoom

L  
F  
B

Python Interactor

```
>>>
Imported a DICOM directory, checking for extensions
Loading with imageIOName: GDCM
```

Clickiez sur Fichier, [Fermer la scène] dans le menu principal.

Sagittal 6:...

B: 6: C...omen

R: -7.0000mm

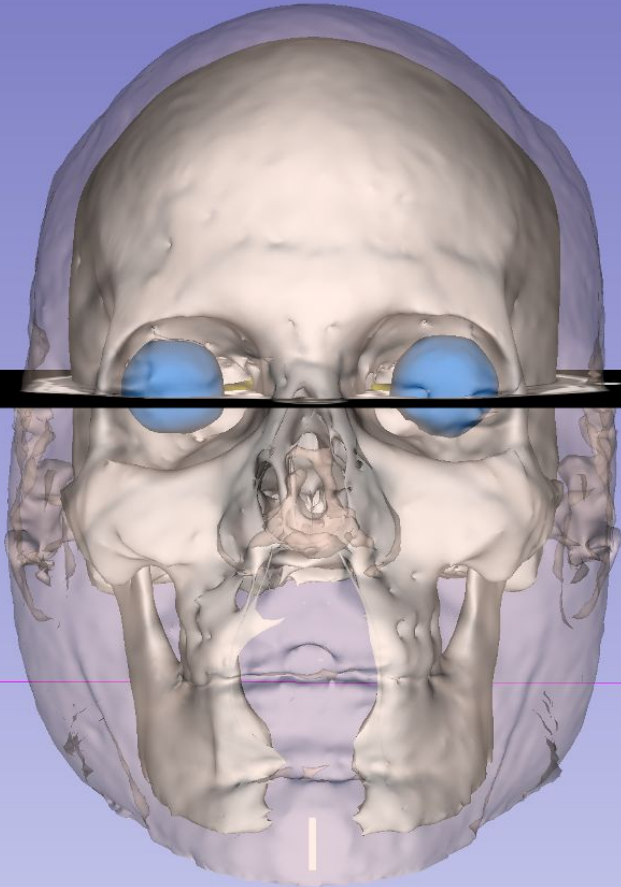
B: 6: C...omen

R: -7.0000mm

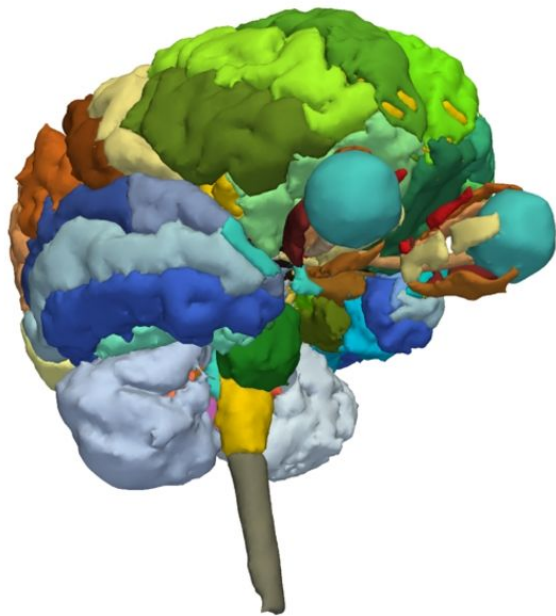
B: 6: C...omen

## Partie 3

### Chargement et visualisation des modèles 3D



# Tutoriel sur les données



- Le répertoire dataset2\_Head contient la scène Slicer appelée Head\_scene.mrb
- La scène contient des modèles 3D de l'atlas cérébral SPL développé par le département de radiologie du Brigham and Women's Hospital, Harvard Medical School (NIH P41 RR013218, NIH R01 MH05074).

- ▼ 3DVisualizationDataset
  - ▶ dataset1\_Thorax\_Abdomen
  - ▶ dataset2\_Head

## Scène sur slicer

- Slicer stocke toutes les données chargées dans un référentiel appelé scène.
- Chaque jeu de données, tel qu'un volume d'image, un modèle de surface ou un ensemble de points, est représenté par un nœud dans une scène Slicer.
- Tous les modules Slicer opèrent sur les données stockées dans une scène Slicer.

# Charger une scène

3D Slicer 4.13.0-2021-11-19

Modules: Volume Rendering

3D Slicer

Help & Acknowledgement

Volume: Select a Volume

Inputs

Display

Preset: Select a Preset

Shift: [Slider]

Crop:  Enable  Display ROI

Data Probe

Show Zoomed Slice

L  
F  
B

Python Interactor

```
>>>
Imported a DICOM dire
Loading with imageION
```

test

| Nom                     | Date de   |
|-------------------------|-----------|
| 3DVisualizationDataset  | 13 juille |
| dataset1_Thorax_Abdomen | 13 juille |
| dataset2_Head           | 13 juille |
| Head_Scene.mrb          | 13 juille |

Head\_Scene.mrb

Faites glisser et déposez le fichier Head\_Scene.mrb situé dans le répertoire dataset2\_Head dans Slicer.

R: 0.0000mm

Y: [Slider] R: 0.0000mm

# Charger une scène

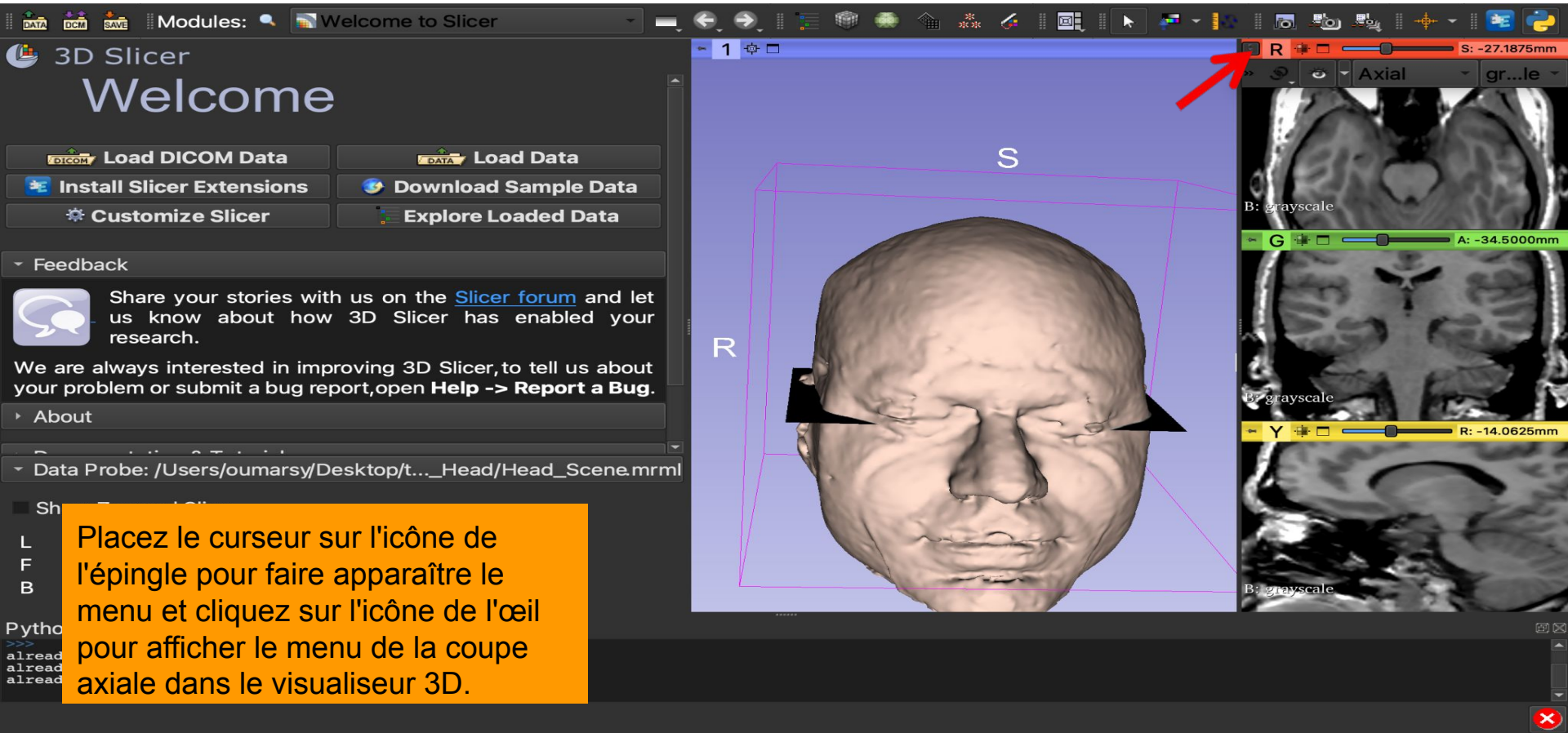
The screenshot displays the 3D Slicer software interface. The main window shows a 3D surface model of a human head. To the right, three 2D MRI slices are visible: an axial slice (S: -27.1875mm), a coronal slice (A: -34.5000mm), and a sagittal slice (R: -14.0625mm). The left sidebar contains the 'Volume Rendering' section with options for 'Preset', 'Shift', 'Crop', and 'Rendering'. The 'Data Probe' section is also visible. The bottom of the interface shows a Python Interactor window with the following text:

```
Python Interactor
Loading with imageIOName: GDCM
already has observer
already has observer
already has observer
```

Slicer affiche un modèle de surface  
3D de la tête et des coupes IRM 2D



# Visualisation des modèles 3D



Placez le curseur sur l'icône de l'épingle pour faire apparaître le menu et cliquez sur l'icône de l'œil pour afficher le menu de la coupe axiale dans le visualiseur 3D.

# Visualisation des modèles 3D

The image shows the Slicer software interface. On the left, a sidebar lists various modules, with 'Models' highlighted in blue. A red arrow points to this 'Models' module. The main window displays a 3D model of a human face, enclosed in a purple bounding box. The bounding box is labeled with 'S' at the top and 'L' on the right side. To the right of the main view, there are three axial MRI slices, each with a coordinate label: 'R: -27.1875mm', 'A: -34.5000mm', and 'R: -14.0625mm'. At the bottom right, a yellow text box contains the instruction: 'Sélectionnez le module "Modèles" dans la liste des modules'.

# Visualisation des modèles 3D

The screenshot displays the 3D Slicer interface. On the left, the 'Models' panel lists several 3D models, with 'Skin.vtk' highlighted in blue and a red arrow pointing to it. The central 3D view shows a realistic 3D model of a human head with a purple bounding box and labels 'S' (Superior) and 'R' (Right). On the right, three axial MRI slices are visible, each with a grayscale slider and a position indicator (e.g., 'S: -27.1875mm', 'A: -34.5000mm', 'R: -14.0625mm').

**Slicer affiche la liste des modèles 3D chargés dans la scène**

**Sélectionnez le modèle Skin.vtk**

```
Python Interpreter
>>>
already has observer
already has observer
already has observer
```

# Visualisation des modèles 3D

The image shows the 3D Slicer software interface. On the left, the 'Models' panel lists several objects: optic\_nerve\_L.vtk, optic\_nerve\_R.vtk, optic\_tract\_L.vtk, optic\_tract\_R.vtk, right\_eyeball.vtk, Skin.vtk (highlighted in blue), and skull\_bone.vtk. Below this, the 'Visibility' section shows the 'Opacity' slider set to 0.50, with a red arrow pointing to it. The 'View' is set to 'All' and the 'Color' is '#fcdce'. The main 3D view shows a skull model with skin and eye globes. The skin is semi-transparent, allowing the eye globes and the underlying skull bone to be visible. The skull bone is labeled 'S', the eye globes are labeled 'R' and 'L', and the front view is labeled 'A'. On the right, two axial MRI slices are shown. The top slice is labeled 'R' and 'S: -27.1875mm'. The bottom slice is labeled 'R' and 'R: -14.0625mm'. Both slices are in grayscale. The text 'B: grayscale' is visible on both slices.

3D Slicer

optics\_nerve\_L.vtk  
optics\_nerve\_R.vtk  
optics\_tract\_L.vtk  
optics\_tract\_R.vtk  
right\_eyeball.vtk  
Skin.vtk  
skull\_bone.vtk

Information

Display

Visibility

Visibility:  Opacity:  0.50

View: All

Color: #fcdce

3D Display

Data Probe: /Users/oumarsy/Desktop/t...\_Head/Head\_Scene.mrml

Show Zoomed Slice

L  
F  
B

Réduisez l'opacité du modèle Skin à l'aide du curseur de visibilité.

Les modèles de l'os du crâne et des globes oculaires apparaissent à travers la peau.

# Interaction avec les modèles 3D

3D Slicer

- optic\_nerve\_L.vtk
- optic\_nerve\_R.vtk
- optic\_tract\_L.vtk
- optic\_tract\_R.vtk
- right\_eyeball.vtk
- Skin.vtk
- skull\_bone.vtk**

Information

Display

Visibility

Visibility:  Opacity:  0.50

View: All

Color: #ffffff

3D Display

Data Probe: /Users/oumarsy/Desktop/t...Head/Head\_Scene.mrml

Show Zoomed Slice

S

R

L

A

B: grayscale

A: -34.5000mm

B: grayscale

R: -14.0625mm

Sélectionnez le modèle d'os du crâne et cliquez sur l'icône de l'œil pour désactiver sa visibilité.

Les modèles de la substance blanche et du nerf optique apparaissent à travers la peau.

# Interaction avec les modèles 3D

3D Slicer

- optic\_nerve\_L.vtk
- optic\_nerve\_R.vtk
- optic\_tract\_L.vtk
- optic\_tract\_R.vtk
- right\_eyeball.vtk
- Skin.vtk
- skull\_bone.vtk

Information

Display

Visibility

Visibility:  Opacity: 0.10

View: All

Color: #ffffff

3D Display

Data Probe: /Users/oumarsy/Desktop/t...\_Head/Head\_Scene.mrml

Show Zoomed Slice

L  
F  
B

Python Interactor

```
>>> already has observer  
>>> already has observer  
>>> already has observer
```

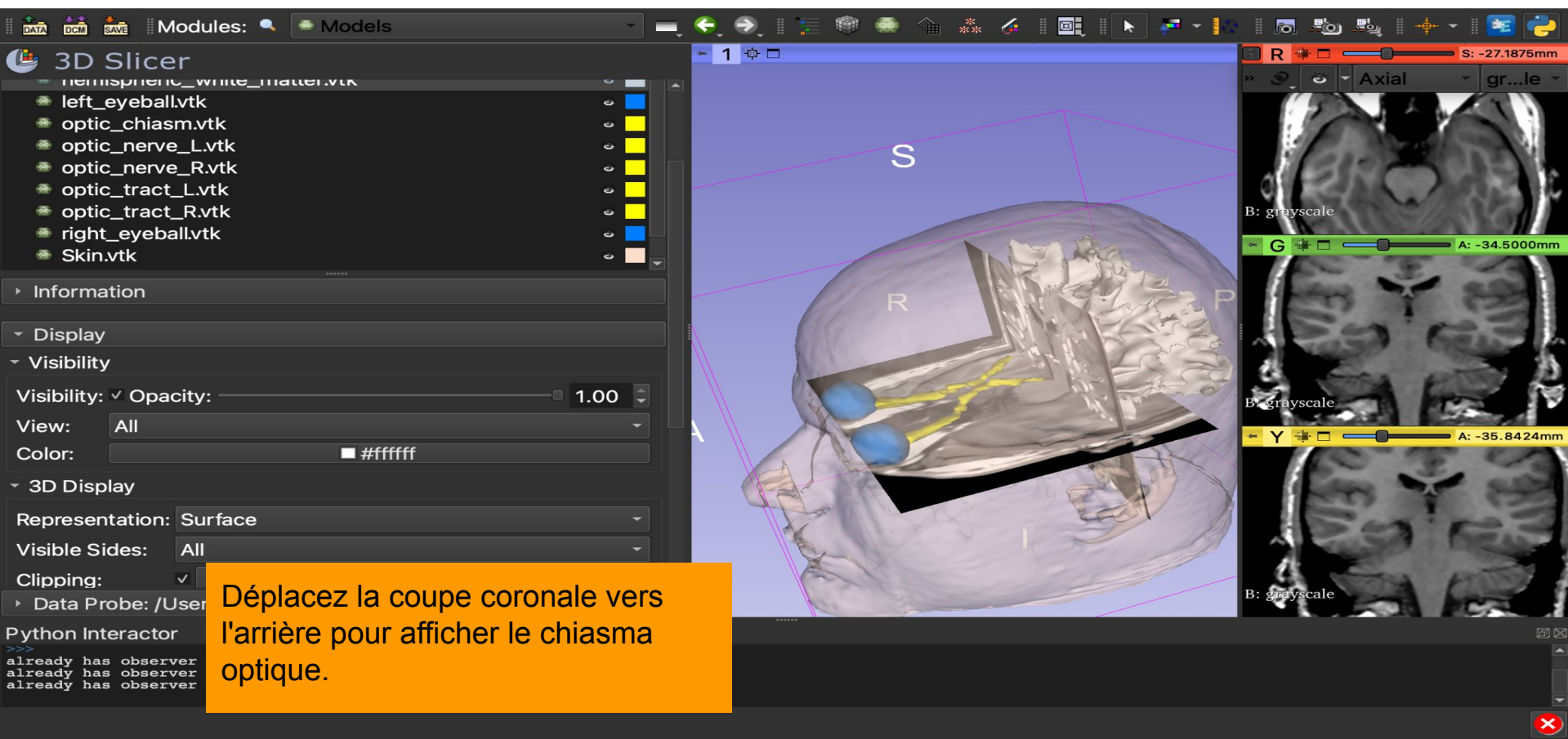
Clicker sur le menu ensuite sur l'icône de l'œil pour afficher la coupe coronale dans la sous-fenêtre 3D.

# Interaction avec les modèles 3D

The screenshot displays the 3D Slicer software interface. On the left, the 'Models' panel lists several 3D models, with 'hemispheric\_white\_mater.vtk' selected. A red arrow points to this model. Below the list, the '3D Display' section shows 'Representation: Surface' and 'Visible Sides: A', with another red arrow pointing to the 'Visible Sides' dropdown. The central 3D view shows a brain model with a semi-transparent skull and internal structures, including two blue spheres and yellow lines. The model is oriented with 'S' (Superior), 'R' (Right), 'P' (Posterior), and 'A' (Anterior) labels. On the right, three MRI slices are shown in grayscale, with 'Axial' orientation and 'gr...le' label. The top toolbar contains various navigation and manipulation tools. At the bottom, a Python Interactor window shows the command prompt with the text 'already has observer' repeated three times.

**Sélectionnez le modèle de matière blanche hémisphérique et sélectionnez l'option Clipping.**

# Interaction avec les modèles 3D



The screenshot displays the 3D Slicer interface. On the left, the 'Models' panel lists several 3D models: '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', and 'Skin.vtk'. Below this, the 'Display' and 'Visibility' panels are visible, with 'Opacity' set to 1.00 and 'View' set to 'All'. The '3D Display' panel shows 'Representation' set to 'Surface' and 'Visible Sides' set to 'All'. The main 3D view shows a semi-transparent skull model with a coronal slice. The slice is labeled with 'S' (Superior), 'R' (Right), and 'P' (Posterior). The optic chiasm and optic nerves are highlighted in yellow. On the right, three axial MRI slices are shown, labeled 'B: grayscale'. The top slice is at 'S: -27.1875mm' and the middle slice is at 'A: -34.5000mm'. The bottom slice is at 'A: -35.8424mm'. An orange text box at the bottom left contains the instruction: 'Déplacez la coupe coronale vers l'arrière pour afficher le chiasma optique.'



# Visualisation des modèles 3D

The screenshot displays the 3D Slicer interface. On the left, the 'Models' panel lists several 3D models: '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', and 'Skin.vtk'. The 'Display' and 'Visibility' panels are visible, with 'Visibility' set to 'Opacity: 1.00' and 'View' set to 'All'. The '3D Display' panel shows 'Representation: Surface' and 'Visible Sides: All'. The main 3D view shows a 3D model of the optic chiasm (yellow) and optic nerves (blue) within a skull model (gray). The model is oriented with 'R' (Right), 'L' (Left), 'A' (Anterior), and 'P' (Posterior) labels. The right side of the interface shows three axial MRI slices with 'B: grayscale' and 'A: -27.1875mm', 'A: -34.5000mm', and 'A: -35.8424mm' labels. The bottom left corner shows a Python Interactive console with the text 'Le Slicer affiche une vue 3D du chiasma optique.'

3D Slicer

Models

- 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

Information

Display

Visibility

Visibility:  Opacity: 1.00

View: All

Color: #ffffff

3D Display

Representation: Surface

Visible Sides: All

Clipping:  Configure...

Data Probe: //Users/umery/Desktop/Head/Head\_Scene.mrml

Python Interactive

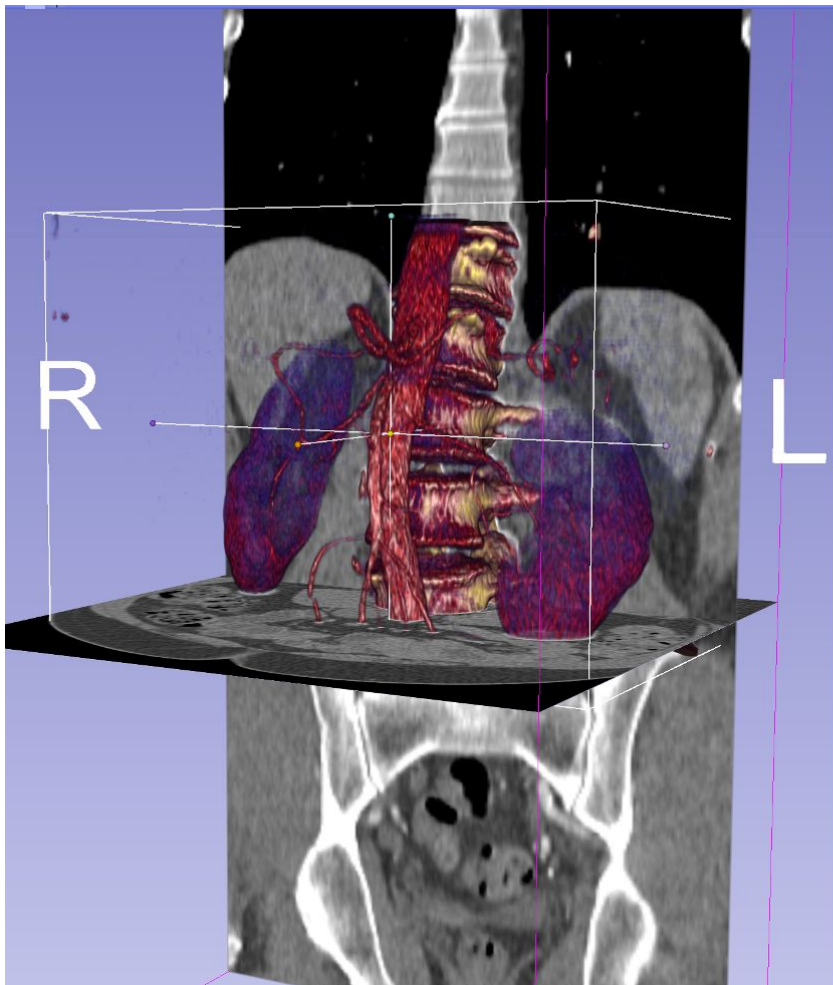
```
>>>
already has
already has
already has
```

Le Slicer affiche une vue 3D du chiasma optique.

# Conclusion

- 3D Slicer propose des fonctionnalités avancées pour le chargement et la visualisation de données d'imagerie médicale 3D.
- Le tutoriel montre comment utiliser le volume rendering et la modélisation de surface pour une visualisation interactive des données de TDM et d'IRM.

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



# Remerciements



Neuroimage Analysis  
Center  
(NIBIB P41 EB015902)

Chan  
Zuckerberg  
Initiative 

Chan Zuckerberg Initiative



Silicon Valley Foundation