

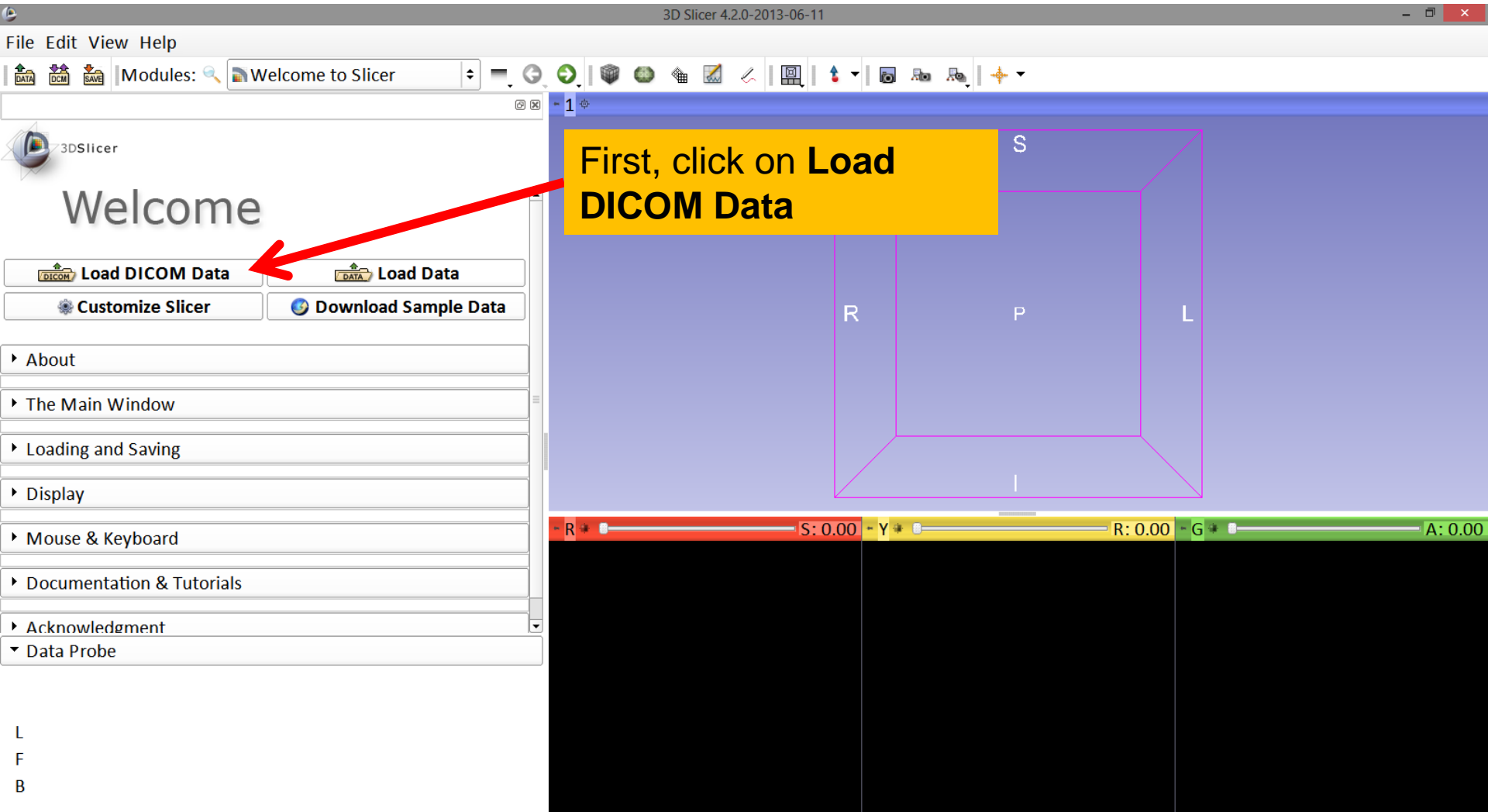


# 3D Visualization of DICOM Images for Radiology Applications Tutorial

Sonia Pujol, Ph.D.

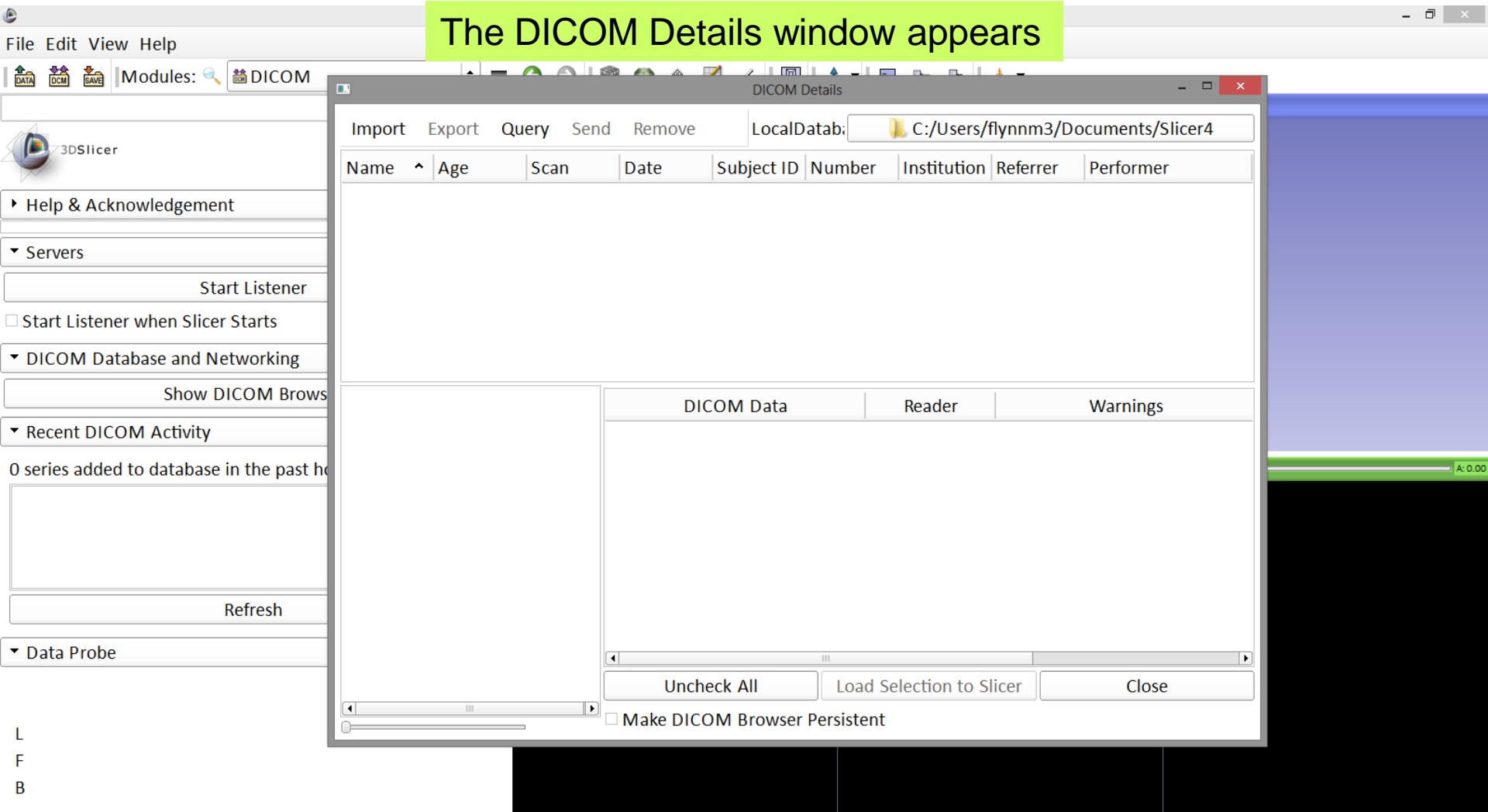
Surgical Planning Laboratory  
Harvard University

# Loading a DICOM volume



# Loading a DICOM volume

The DICOM Details window appears



# Loading a DICOM volume

3D Slicer 4.2.0-2013-07-08

File Edit View Help

Modules: DICOM

3DSlicer

Help & Acknowledgement

Servers

Start Listener

Start Listener when Slicer Starts

DICOM Database and Networking

Show DICOM Brows

Recent DICOM Activity

0 series added to database in the past h

Refresh

Data Probe

L  
F  
B

DICOM Details

Import Export Query Send » LocalDatabase: C:/Users/flynnm3/Desktop/3Dvisualization\_DICOM\_Data-Par

Name	Age	Scan	Date	Study ID	Number	Institution	Referrer	Performer
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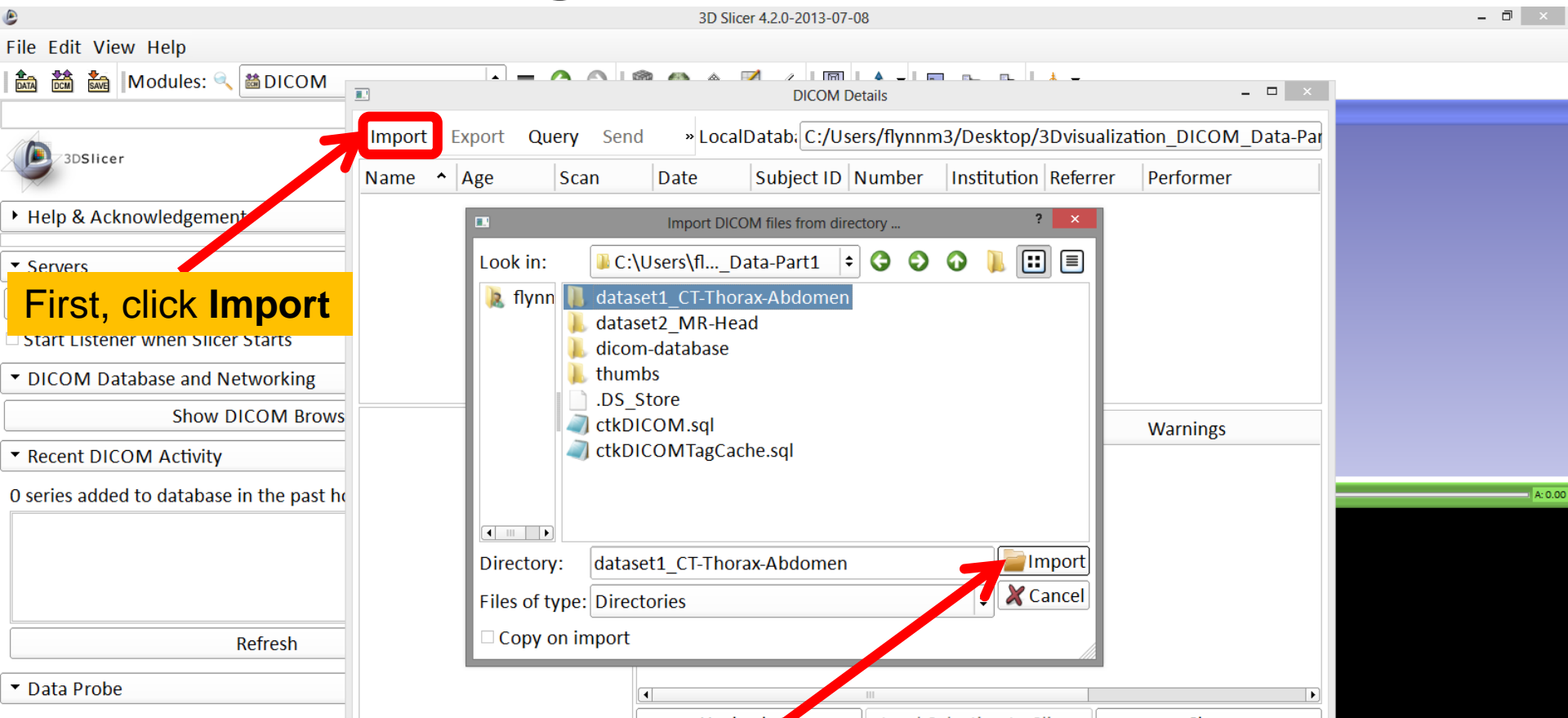
DICOM Data Reader Warnings

Uncheck All Load Selection to Slicer Close

Make DICOM Browser Persistent

Click on **LocalDatabase** and select the folder **3Dvisualization\_DICOM\_Data-Part1**

# Loading a DICOM volume



Then, locate and select the folder **dataset1\_CT-Thorax-Abdomen** in the **3Dvisualization\_DICOM\_Data-Part1** directory, then click **Import** to import the selected volume

# Loading a DICOM volume

The screenshot shows the 3D Slicer interface. The 'DICOM Details' window is open, displaying a table of DICOM data. The table has columns for Name, Age, Scan, Date, Subject ID, Number, Institution, Referrer, and Performer. The first row contains the text 'patient1' in the Name column, which is highlighted with a red box. A dialog box titled 'DICOM Directory Import' is overlaid on the table, showing a message: 'Directory import completed.' Below the message, it lists: '1 New Patients', '1 New Studies', '1 New Series', and '291 New Instances'. An 'OK' button is visible at the bottom right of the dialog box, with a red arrow pointing to it. A yellow text box is overlaid on the bottom left of the screenshot, containing instructions.

A window indicating the completion of the DICOM volumes appears, as well as the **patient1** dataset. Click **OK** to close the window, then click on the **patient1** dataset

# Loading a DICOM volume

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DICOM Details

Import Export Query Send » LocalDatab: C:/Users/flynnm3/Desktop/3Dvisualization\_DICOM\_Data-Par

Name	Age	Scan	Date	Subject ID	Number	Institution	Referrer	Pe
patient1								patient1...
CT_Thorax_Abdomen			2005-06-...		6936864	oEfZQhR...		
CT_Thorax_Abdomen CT		6	2005-06-...	HEART	14			

CT\_Thorax\_Abdomen

DICOM Data	Reader	Warnings
<input checked="" type="checkbox"/> 6: CT_Thorax_Abdomen	Scalar Volume	
<input type="checkbox"/> 6: CT_Thorax_Abdomen for...	Scalar Volume	
<input type="checkbox"/> 6: CT_Thorax_Abdomen for...	Scalar Volume	
<input type="checkbox"/> 6: CT_Thorax_Abdomen for...	Scalar Volume	
<input type="checkbox"/> 6: CT_Thorax_Abdomen for...	Scalar Volume	
<input type="checkbox"/> 6: CT_Thorax_Abdomen for...	Scalar Volume	
<input type="checkbox"/> 6: CT_Thorax_Abdomen for...	Scalar Volume	
<input type="checkbox"/> 6: CT_Thorax_Abdomen for...	Scalar Volume	

Uncheck All Load Selection to Slicer Close

Make DICOM Browser Persistent

The file hierarchy appears after **patient1** is selected. Click on **CT\_Thorax\_Abdomen**, then click on **CT\_Thorax\_Abdomen CT**.

# Loading a DICOM volume

Once **CT\_Thorax\_Abdomen CT** is selected, the snapshots of the DICOM images of the file are displayed in the bottom-left corner of the DICOM Details window. Click **Load Selection to Slicer** to load the volume to Slicer

The screenshot shows the 3D Slicer interface. The DICOM Details window is open, displaying a list of DICOM data and a grid of image thumbnails. The thumbnails are arranged in a 4x3 grid, with the first thumbnail in the top-left corner highlighted by a blue border. A red box encloses the entire grid of thumbnails. A red arrow points from the text above to the 'Load Selection to Slicer' button at the bottom of the window.

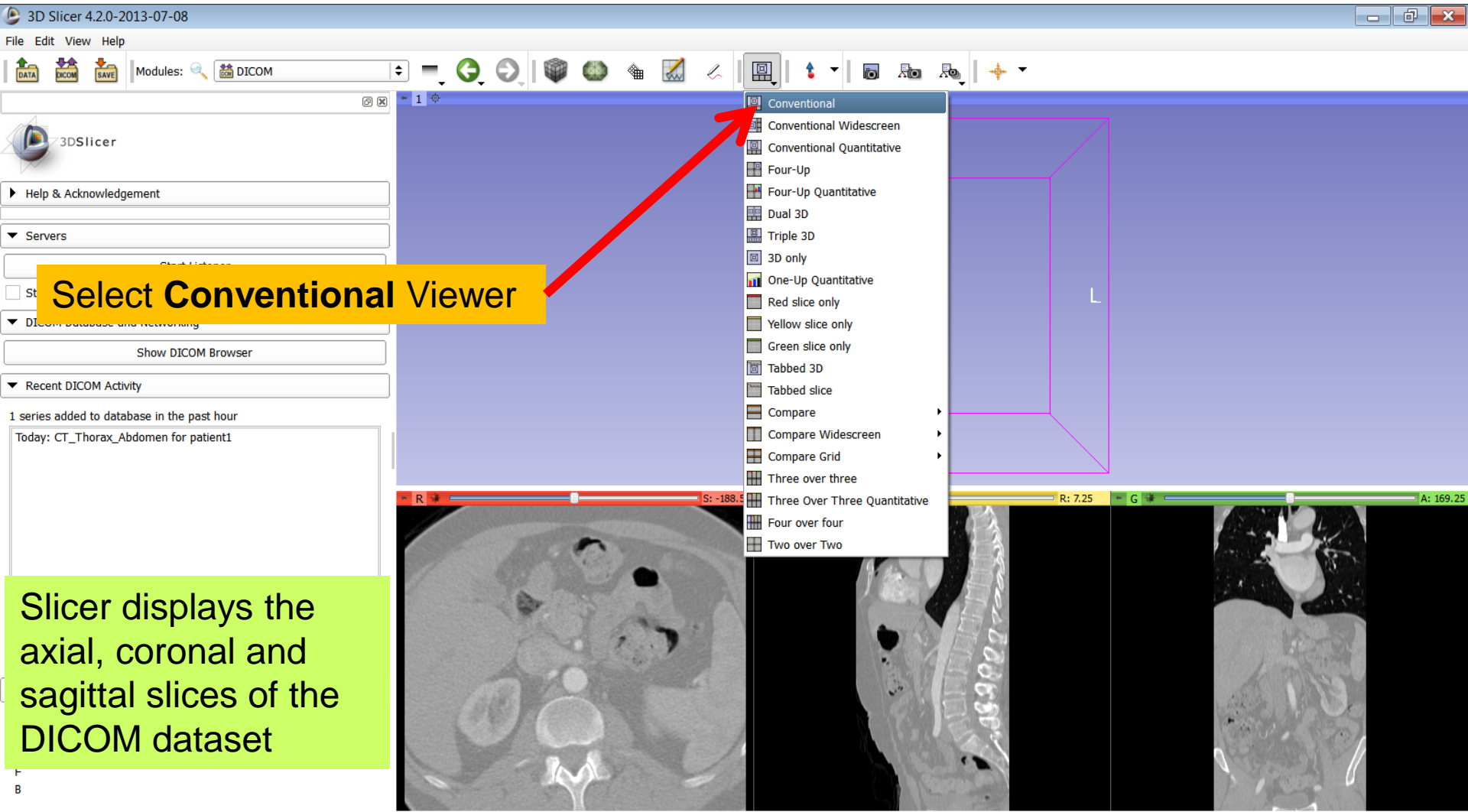
DICOM Data	Reader	Warnings
<input checked="" type="checkbox"/> 6: CT_Thorax_Abdomen	Scalar Volume	
<input type="checkbox"/> 6: CT_Thorax_Abdomen for...	Scalar Volume	
<input type="checkbox"/> 6: CT_Thorax_Abdomen for...	Scalar Volume	
<input type="checkbox"/> 6: CT_Thorax_Abdomen for...	Scalar Volume	
<input type="checkbox"/> 6: CT_Thorax_Abdomen for...	Scalar Volume	
<input type="checkbox"/> 6: CT_Thorax_Abdomen for...	Scalar Volume	
<input type="checkbox"/> 6: CT_Thorax_Abdomen for...	Scalar Volume	
<input type="checkbox"/> 6: CT_Thorax_Abdomen for...	Scalar Volume	

Buttons: Uncheck All, Load Selection to Slicer, Close

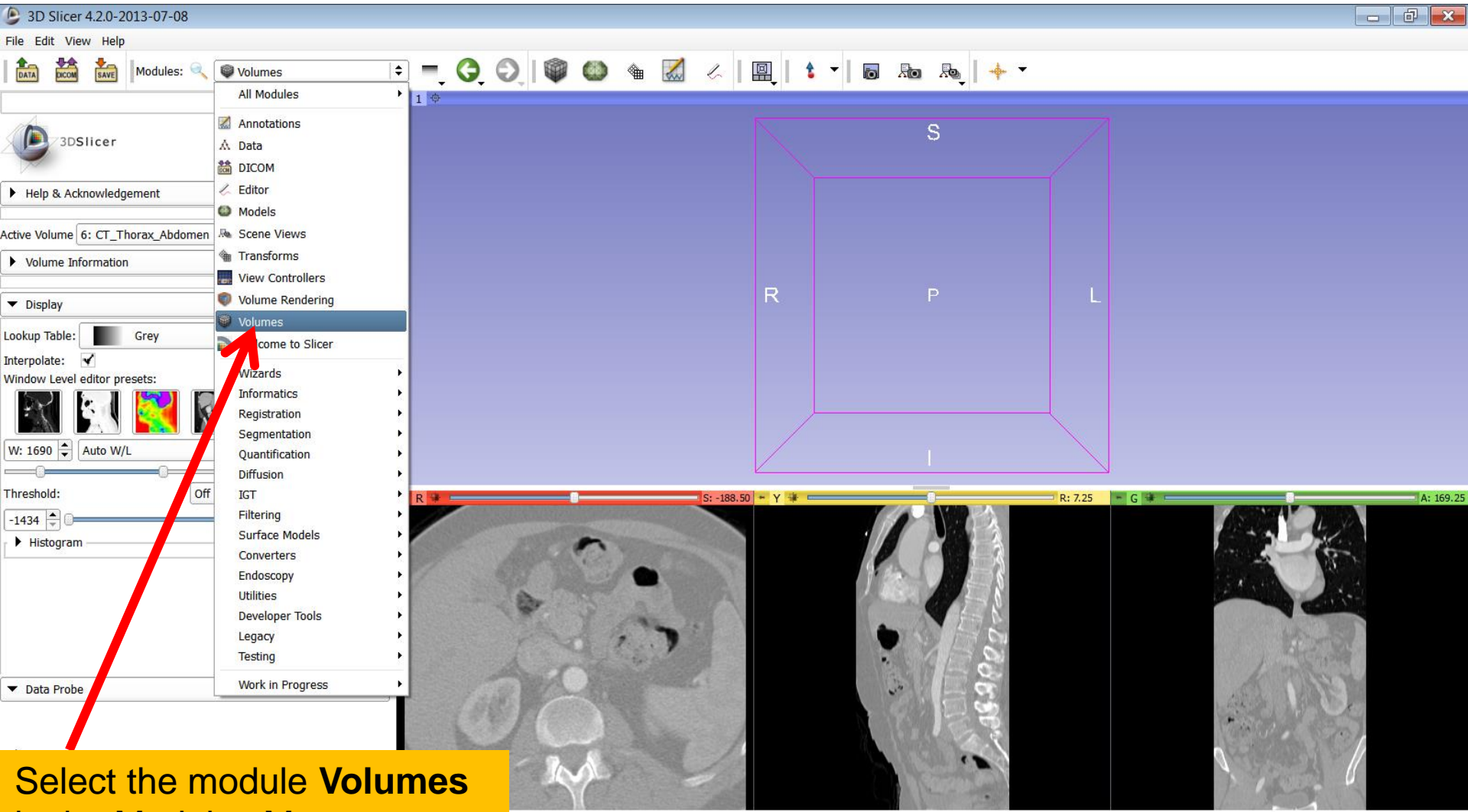
Make DICOM Browser Persistent



# Loading a DICOM volume



# Loading a DICOM volume



Select the module **Volumes** in the Modules Menu

# Loading a DICOM volume

3D Slicer 4.2.0-2013-07-08

File Edit View Help

Modules: Volumes

3DSlicer

Active Volume: 6: CT\_Thorax\_Abdomen

Volume Information

Display

Lookup Table: Grey

Interpolate:

Window Level editor presets:

W: 350 Manual W/L

Threshold: Off

-1434 3480

Histogram

Data Probe

L  
F  
B

S

L

R: -188.50 Y: 7.25 G: 169.25

CT-abdomen: View abdominal CT volume.

Under the **Window Level Editor Presets**, click on **CT-abdomen**, or adjust manually the Window and Level using the Manual W/L slider

# Loading a DICOM volume

3D Slicer 4.2.0-2013-07-08

File Edit View Help

Modules: Volumes

Active Volume: 6: CT\_Thorax\_Abdomen

Volume Information

Display

Lookup Table: Grey

Interpolate:

Window Level editor presets:

W: 350 Manual W/L L: 40

Threshold: Off

-1434 3480

Histogram

Data Probe

Position the mouse cursor over the red banner in the Red Viewer to display the slice menu. Click on the **Link Icon** to link the three slice controls across all Slicer Viewers

Link/Unlink the slice controls (except scales) across all Slice Viewers.

L

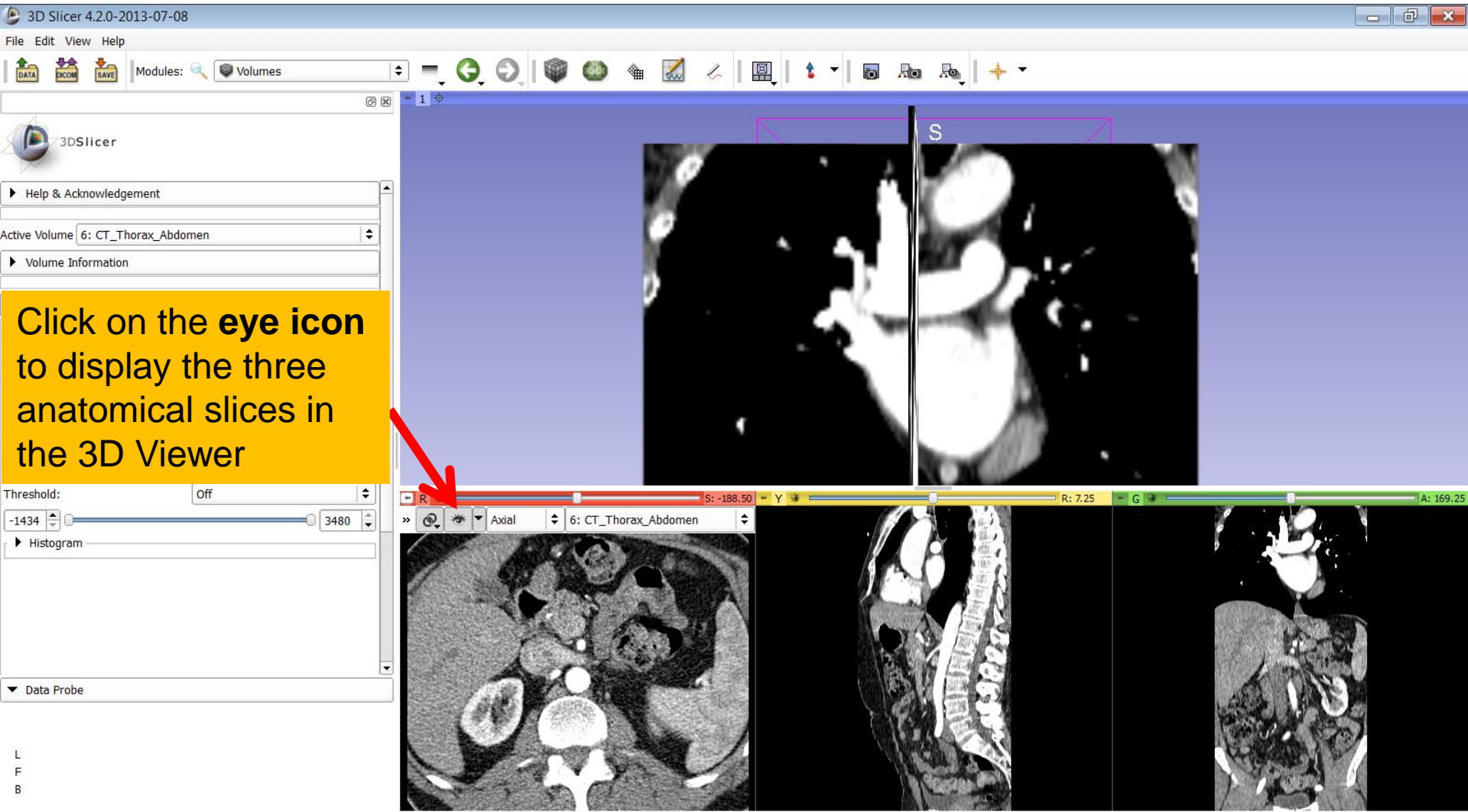
F

B

R: -100.50 Y G R: 7.25 A: 169.25

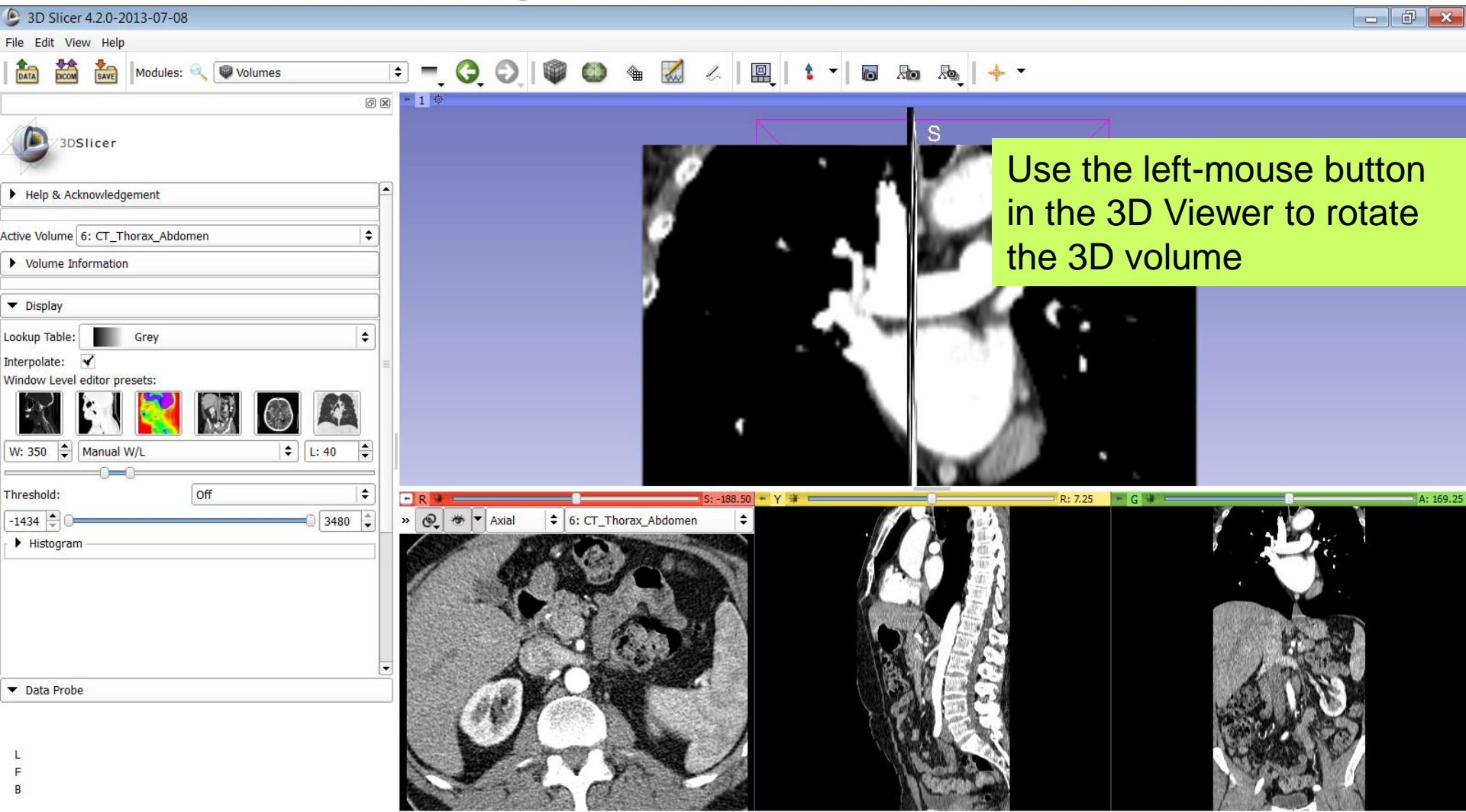
Axial 6: CT\_Thorax\_Abdomen

# Loading a DICOM volume

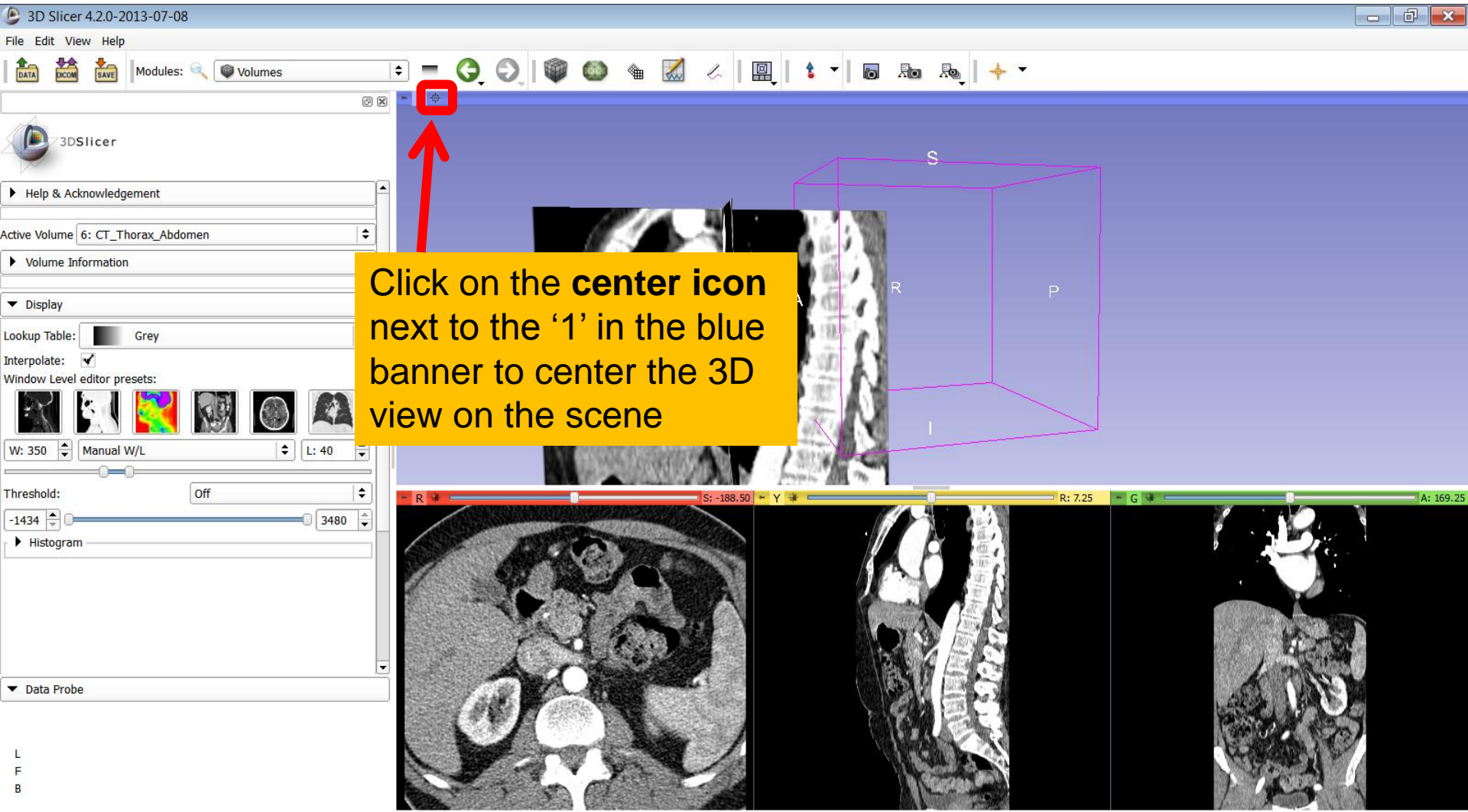




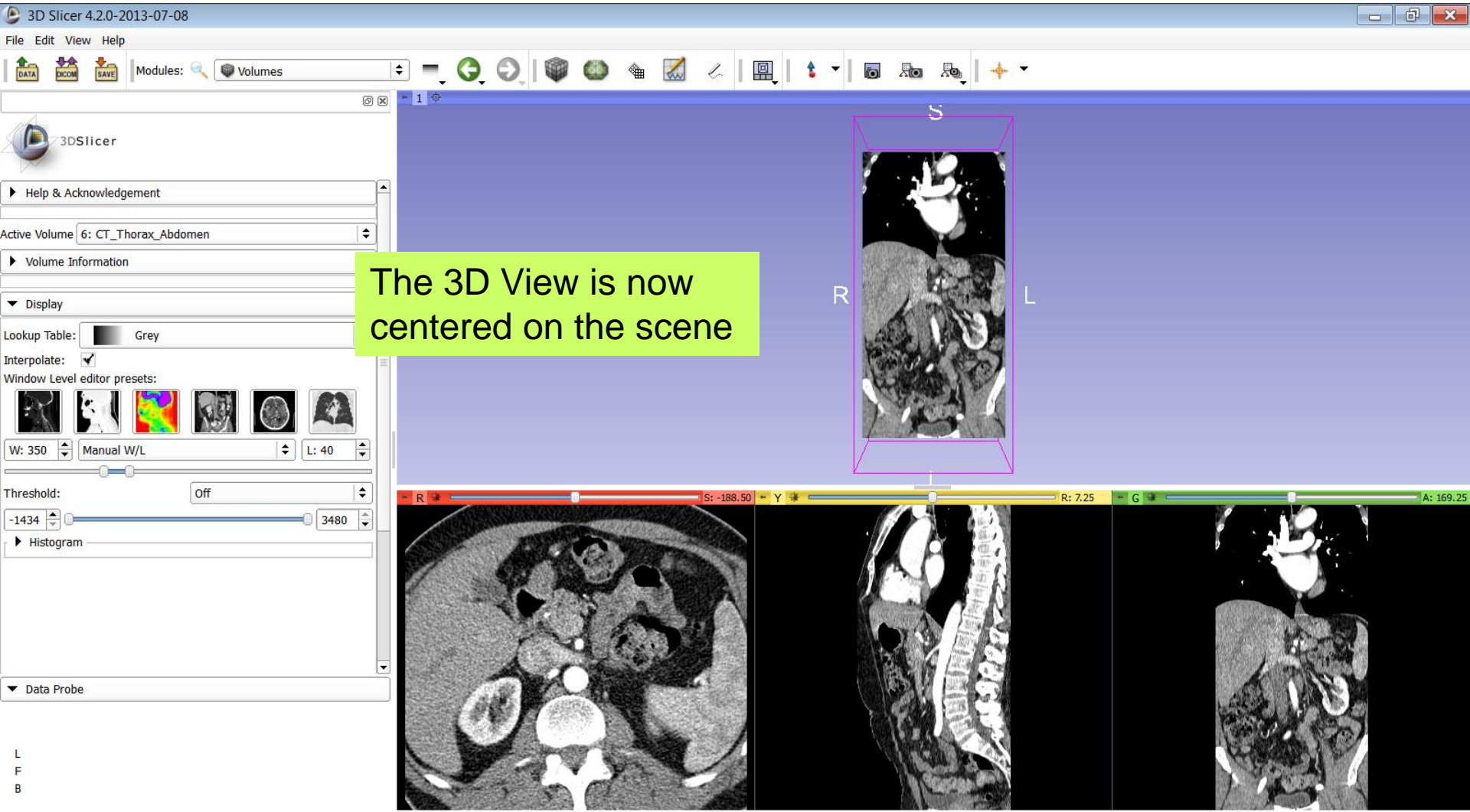
# Loading a DICOM volume



# Loading a DICOM volume



# Loading a DICOM volume





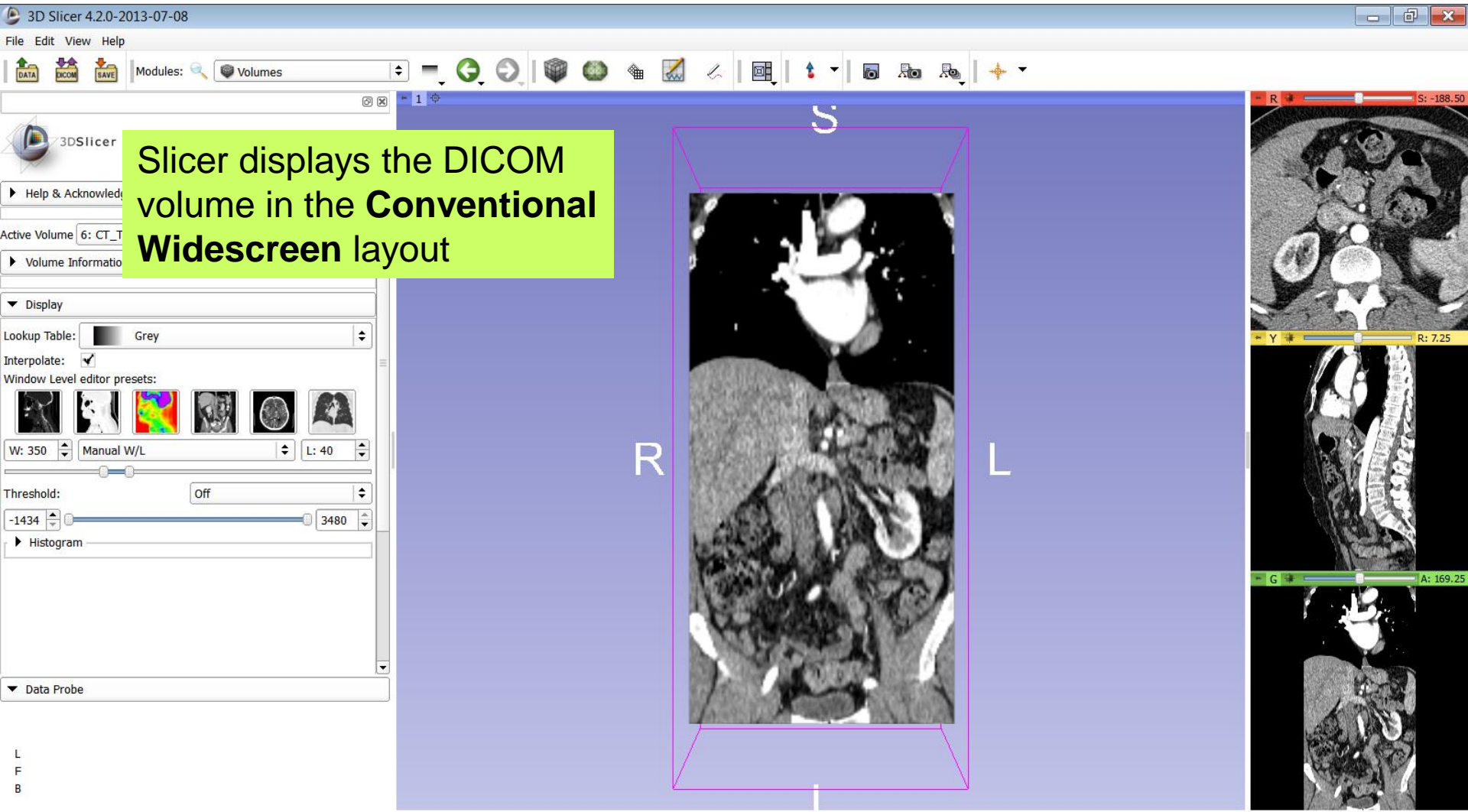
# Loading a DICOM volume

The screenshot shows the 3D Slicer interface with the 'Slicer' layout menu open. The menu is located in the top toolbar, circled in red, and lists various layout options. A red arrow points to the 'Conventional Widescreen' option. The background shows a CT scan volume loaded in the Slicer layout, with three viewports: a coronal view, a sagittal view, and an axial view. The left sidebar contains the 'Volume Information' and 'Display' panels, showing the active volume as '6: CT\_Thorax\_Abdomen' and various display settings like 'Lookup Table: Grey' and 'Interpolate: checked'.

- Conventional
- Conventional Widescreen
- Conventional Quantitative
- Four-Up
- Four-Up Quantitative
- Dual 3D
- Triple 3D
- 3D only
- One-Up Quantitative
- Red slice only
- Yellow slice only
- Green slice only
- Tabbed 3D
- Tabbed slice
- Compare
- Compare Widescreen
- Compare Grid
- Three over three
- Three Over Three Quantitative
- Four over four
- Two over Two

Click on the **Slicer** layout menu icon, and select the **Conventional Widescreen** layout

# Loading a DICOM volume



# Loading a DICOM volume

The screenshot displays the 3D Slicer interface with a CT volume of the thorax and abdomen. The main view shows a sagittal slice with 'S' at the top, 'R' on the left, and 'I' at the bottom. A purple wireframe box outlines the volume. To the right, three smaller views show axial, sagittal, and coronal slices, with red, yellow, and green arrows pointing to their respective sliders. A yellow box contains the text: 'Use the red slice, yellow slice and green slice sliders to slice through the volume in all three anatomical directions'. The left sidebar shows the 'Volumes' module with 'Active Volume: 6: CT\_Thorax\_Abdomen' and various display settings.

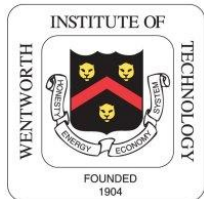
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