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Title Shedding light on a Picasso

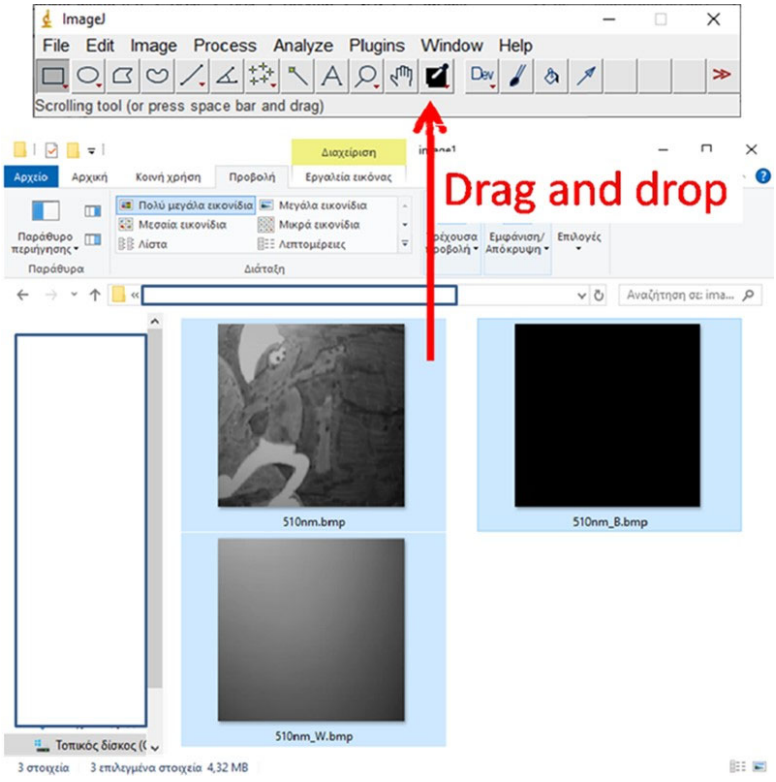
Graph of intensity

Following the next steps, you can construct a graph of the average value of intensity per wavelength for specific areas of the painting. Bear in mind that you should have the normalized images to follow these steps.

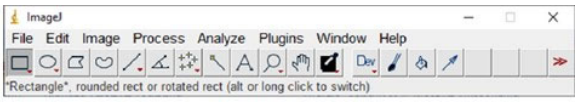
Procedure

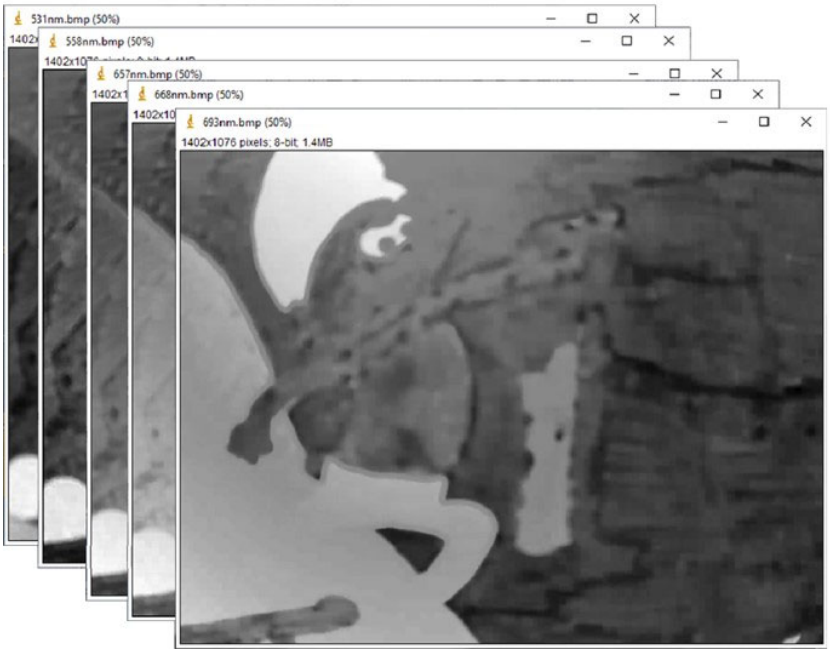
Step 1

Drag and drop the normalized images into ImageJ.



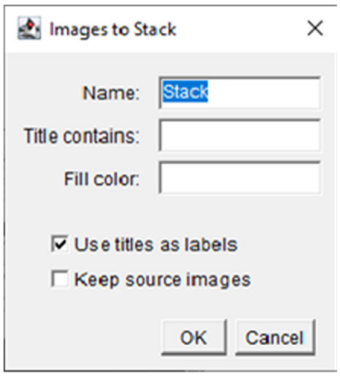
Note: the images should be arranged from the smallest wavelength (bottom) to the largest wavelength (top windows). If the images are not in that order, you can change their order by clicking on them one by one.



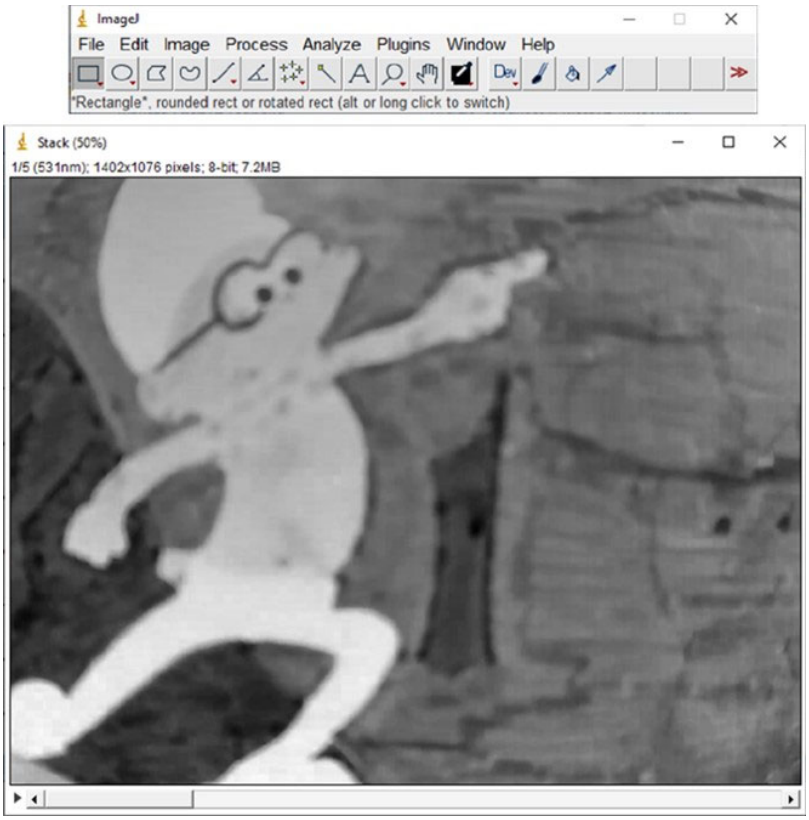


Step 2

To combine all these images into one 'stack' go to Image→Stacks→Images to Stack. A small window will pop up. Choose a name and click OK.

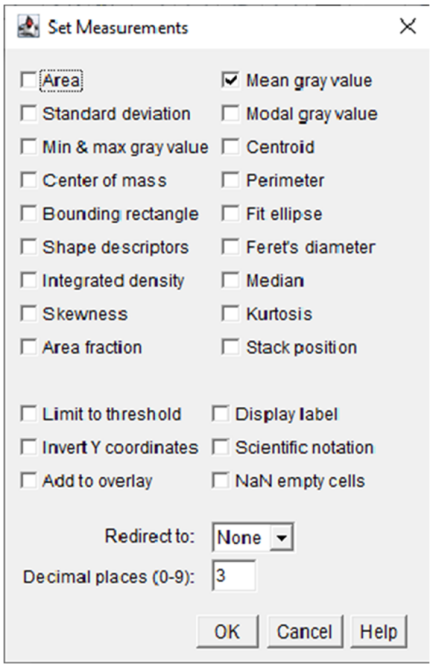


You will get something like that. All images are now in one window. You can see all images by moving the horizontal bar at the bottom of the window.



Step 3

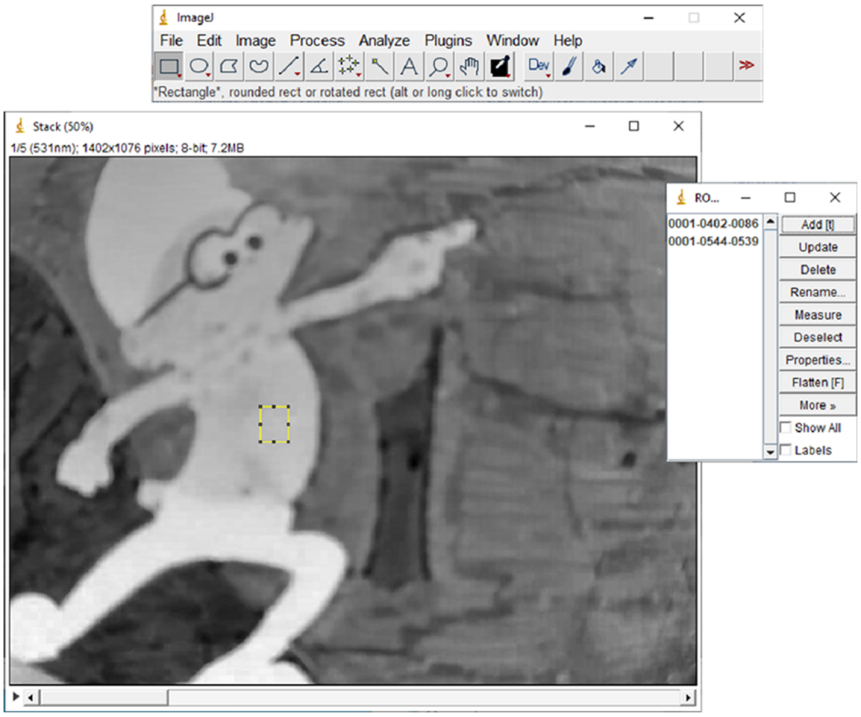
Now we choose the type of calculations that we want to get. Go to Analyze→Set Measurements. A new window will pop up. Choose "Mean gray value" as only the option and click OK.

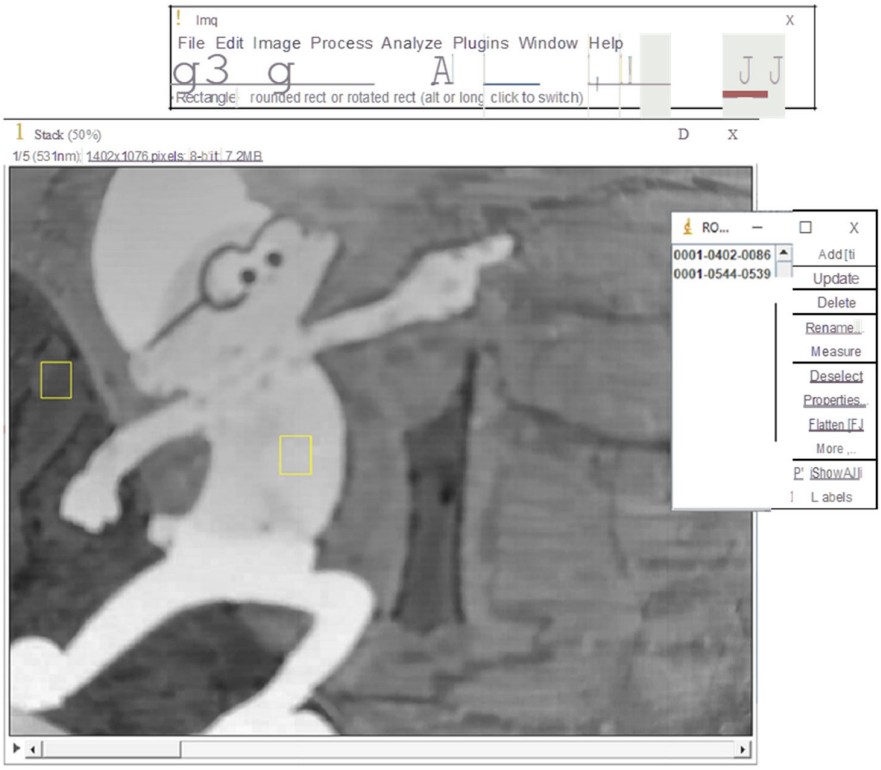


Step 4

Now we choose the areas that we want to analyze.

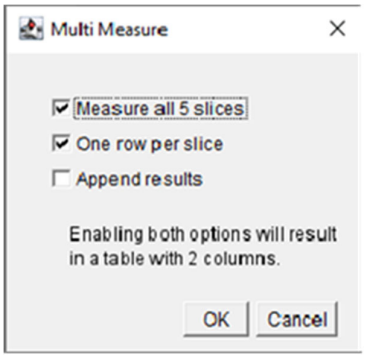
Select again Analyze→Tools→ROI Manager. A small window will pop up. Select an area on the image (with the rectangle) and click "Add". You can add as many areas as you want. You can see all areas together by selecting the "Show All" option in that window. You can delete an area by selecting it and clicking the "Delete" button.


ImageJ
File Edit Image Process Analyze Plugins Window Help
"Rectangle", rounded rect or rotated rect (alt or long click to switch)
Stack (50%)
1/5 (531nm); 1402x1076 pixels; 8-bit; 7.2MB
RO...
0001-0402-0086
0001-0544-0539
Add [t]
Update
Delete
Rename...
Measure
Deselect
Properties...
Flatten [F]
More »
Show All
Labels

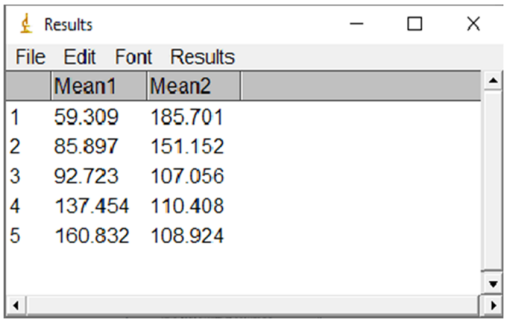

Img
File Edit Image Process Analyze Plugins Window Help
Rectangle rounded rect or rotated rect (alt or long click to switch)
Stack (50%)
1/5 (531nm); 1402x1076 pixels; 8-bit; 7.2MB
RO...
0001-0402-0086
0001-0544-0539
Add [t
Update
Delete
Rename...
Measure
Deselect
Properties...
Flatten [F
More »
Show All
Labels

Step 5

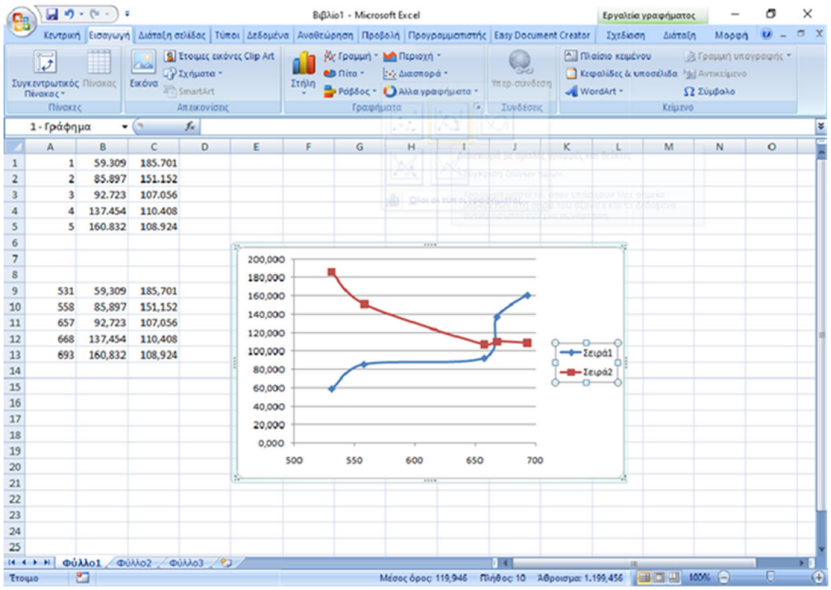
Select Measure→Multimeasure. In the new window, select "Measure all x slices" and click OK.



A new window with the results will pop up. The first column is the number of the image, while the other columns are for the areas that you selected.



	Mean1	Mean2
1	59.309	185.701
2	85.897	151.152
3	92.723	107.056
4	137.454	110.408
5	160.832	108.924

Step 6

You can use the data to draw a graph. Here, we paste the data into Excel. We change the numbers 1 to 5 to the wavelength, and then we draw the graph for the data. You might have to change the dots to commas.