1 INSTALLATION

You should place the **temDM Stereo.gtk** and **temDM extFrames.gtk** plugins into a Plugins folder of DigitalMicrograph. There are typically several such folders, for instance `C:ProgramData/Gatan/Plugins`. The script **find plugins folders.s** included in the distribution package will help you to localize the desired folders. Open **find plugins folders.s** in DigitalMicrograph and run it by pressing execute or by pressing ENTER while holding the CNTR key. Read the list of the available plugins folders. The first folder in the list is most appropriated for placing the temDM plugins.

Some folders can be hidden in Windows. If you do not see all folders, make them visible in the file explorer of Windows 10:View tab - click hidden items checkbox. In some network-based systems, **find plugins folders.s** could fail to localize the user-specific DigitalMicrograph plugins folder. You might try to find them manually checking for the paths like
`.../users/user/AppData/Local`
`/VirtualStore/Program Files (x86)`
`/Gatan/DigitalMicrograph/Plugins.`

After you localize the appropriate plugins folder you should

- drop **temDM Stereo.gtk** and **temDM extFrames.gtk** into the chosen Plugins folder.

- restart DigitalMicrograph and find Stereo item in the Menu temDM.

Alternatively, you can install the script manually in DigitalMicrograph.

Having "extended frames classes.s" frontmost click:
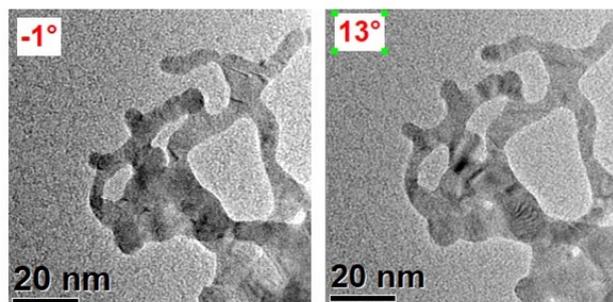File - Install script - Library-OK

Having "StereoPair functions.s" frontmost click

File - Install script - Library-OK

Having "Stereo.s" frontmost click:

File - Install script - Menu command - OK

In this way, you can modify the text of the script.
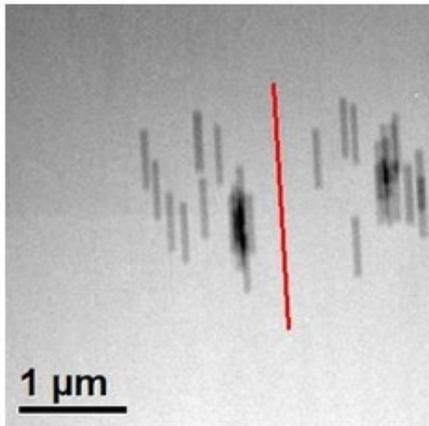

2 TAKE TWO IMAGES FOR STEREO VIEW

This is pretty easy. Just shoot a TEM or STEM image of your particle in the microscope, then tilt α something like 15 degree away from the original value and shoot the same particle again. You should place the particle *approximately* in the center of both images. More precise alignment will be performed later by the software.

3 CALIBRATE α-DIRECTION

In order to prepare a stereo pair, the plugin should know where is an α-direction in your microscope. Typically in modern TEM instruments, the lens rotation is tuned such as the α-direction is approximately at 90 degree from the horizontal axis at each magnification. It is however better to measure that more precisely.

- Displace the z-position of your sample something like 20 microns away from the eucentric height.

- Start live-view of the sample in DigitalMicrograph.

- Start mechanical α-wobbling of the sample.

- Mark the direction of apparent to and fro movements of the features in the sample. Use the standard DigitalMicrograph line or arrow annotation as a marker .

- Open the Stereo tool by choosing Stereo in temDM Menu.

- Press get axis when having the live-image in front.

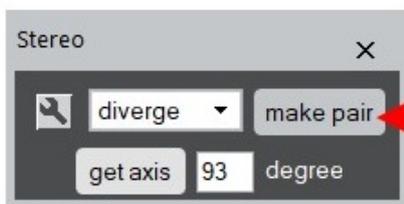The actual angle between the α-direction and the horizontal axis will appear in the corresponding tool field.
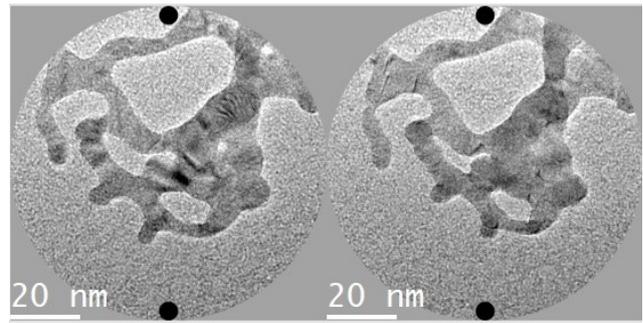
ing to the left, another to the right.

- Tune the appearance of two splitting images such as they form a kind of "trio" images as shown. The marker points at the upper and lower edges of the central image must coincide precisely. Tilt the head a bit if necessary. Suddenly, your brain will start to perceive the central image in the trio as a 3D object.
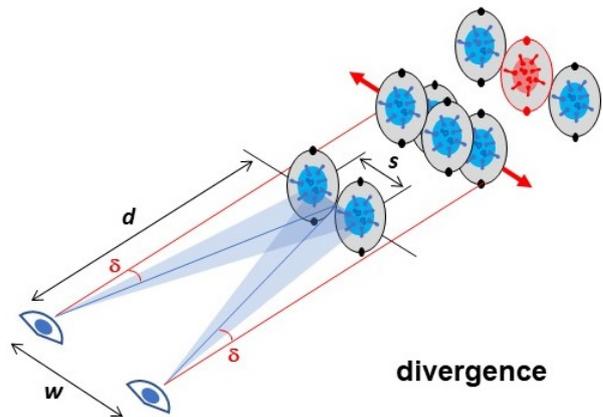
The divergence of eyes is rather easy but such a technique has a certain limitations. The width of a stereo pair should not be more than twice of your inter-eyes distance, which means that must not exceed appr. 120 mm.

4 MAKE DIVERGENT STEREO PAIR

Now, everything is prepared to make a stereo pair.

- Press make pair in the stereo tool.

- Choose two images of the same object under different angles. Press OK


The stereo pair consisting of images for your left and right eyes appears. How to view such a pair in order to get a stereo perception ?

- Look normally at the stereo pair. Choose the distance between eyes and the paper (monitor) most comfortable for viewing.

- Try to glance "behind" the monitor. If this sounds not easy, place the stereo pair near the monitor edge such as you can easily move your view at some distant objects. The images perceived by the left and right eyes start to split. One is mov-

5 MAKE CROSSING STEREO PAIR

This viewing way has no size limitation and might be practised even with stereo pairs at large screens in auditoriums.

- Choose cross in the drop down menu of the stereo tool.

- Press make pair.

- Choose two images of the same object under different angles. Press OK
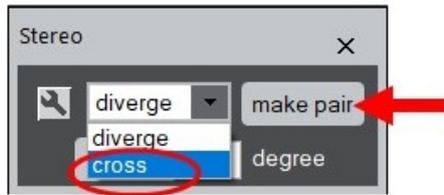
However, a viewing a pair by the crossing method requires in general more training in comparison to a divergence view. We recommend the following step sequence:

- Look normally at the stereo pair. Place a sharp tip of a pen or a pencil on the way of your view. The pencil should be located relatively close to your eyes. As as you are focused at the distant images, you will see two pencil tips at that moment.

- Tune the position of the pencil such as the left tip points to the left image in the stereo pair and the right tip points respectively to the right one. Tilt the head a bit if necessary.

- Focus your view at the pencil. Two tips merge in one. Note that the images at the back view form a "trio". Try to tune the central image in the trio such as the marker points coincide.

- Move you attention from the pencil tip to the central image *without* loosing the angle between both lines of sight. Remove the pencil.

In fact, you can view a stereo pair prepared for the divergence view with the crossing method and vice versa, however the resulted 3D object will be mirrored in the depth dimension.
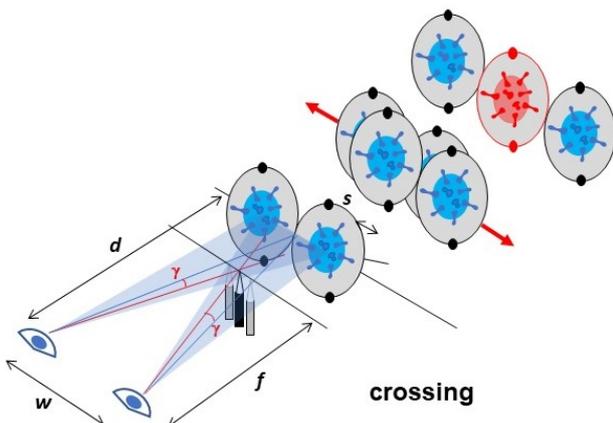
6 SETTINGS

Click a spanner icon to assess the settings.

zoom A stereo pair prepared for the divergent view must be displayed as a relatively small picture in the monitor. Otherwise you cannot diverge your eyes sufficiently. This option defines the default (de)magnification of the display and must be much less than 1. This zoom is applied to a divergence pair only, not to a crossing pair that can be of large size.

point defines the size of alignment points displayed at the top and bottom of images.

background allows to control the value of background appeared behind circular images in a stereo pair. You can make it black, white or equal to the middle intensity of images (recommended).