

# SpinW Installation

Must have MATLAB already installed on your computer

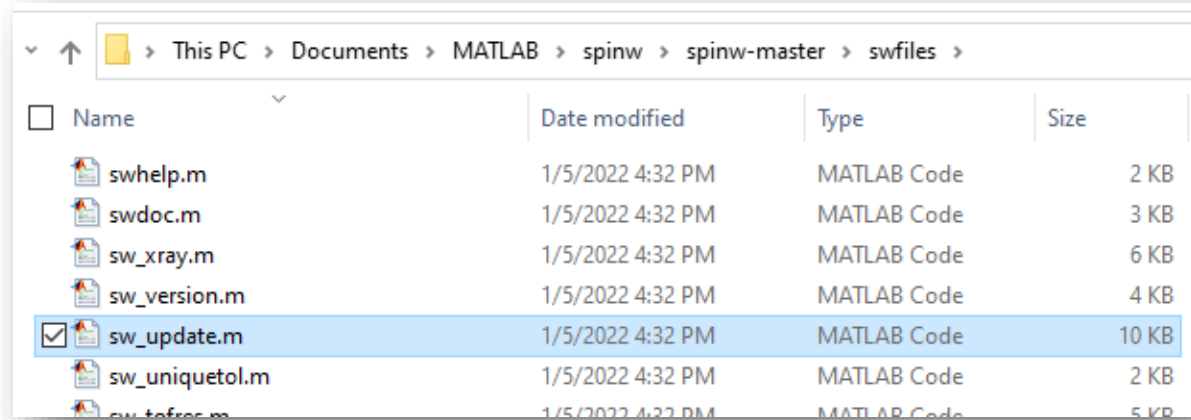
We are using the latest dev version found here: <https://github.com/SpinW/spinw>

Installation instructions can be found here: <https://spinw.org/installation/> or follow this tutorial

Questions/problems: [rebecca.dally@nist.gov](mailto:rebecca.dally@nist.gov)

# If you already have SpinW...

- If you already have SpinW installed and working correctly, you can run the “sw\_update.m” function to make sure you have the latest release.
  - Navigate to your spinw folder → swfiles



- Open “sw\_update.m” and run. There are no function inputs needed if you want the default options. The default will put the newest release in the same folder alongside the old version.
- Choose ‘y’ for all prompts.
- Note: the old path doesn’t seem to be removed in the “startup.m” file, so you may need to do that manually by typing in the console `edit startup` and removing lines with the old version number

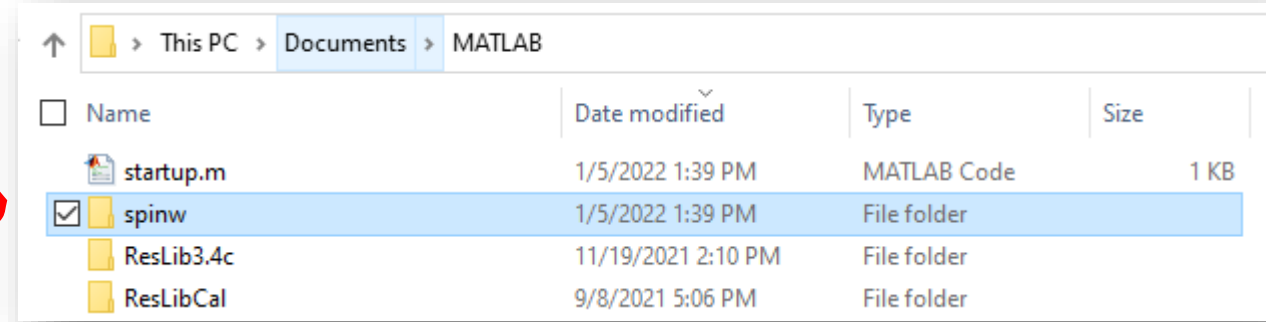
# If you already have SpinW...

- **IMPORTANT NOTE:** during our experiment, we will be using the SpinW function, 'sw\_readspec.m'. This function in v3.1 (the latest release) has a bug in it and will NOT work with our analysis code. There are two things you can do if you currently have v3.1:
  1. Follow this tutorial for getting the latest dev version (make sure to delete all old SpinW files)
  2. Replace the 'sw\_readspec.m' code in v3.1 (found in the 'swfiles' folder) with that found here: <https://github.com/SpinW/spinw/tree/master/swfiles>

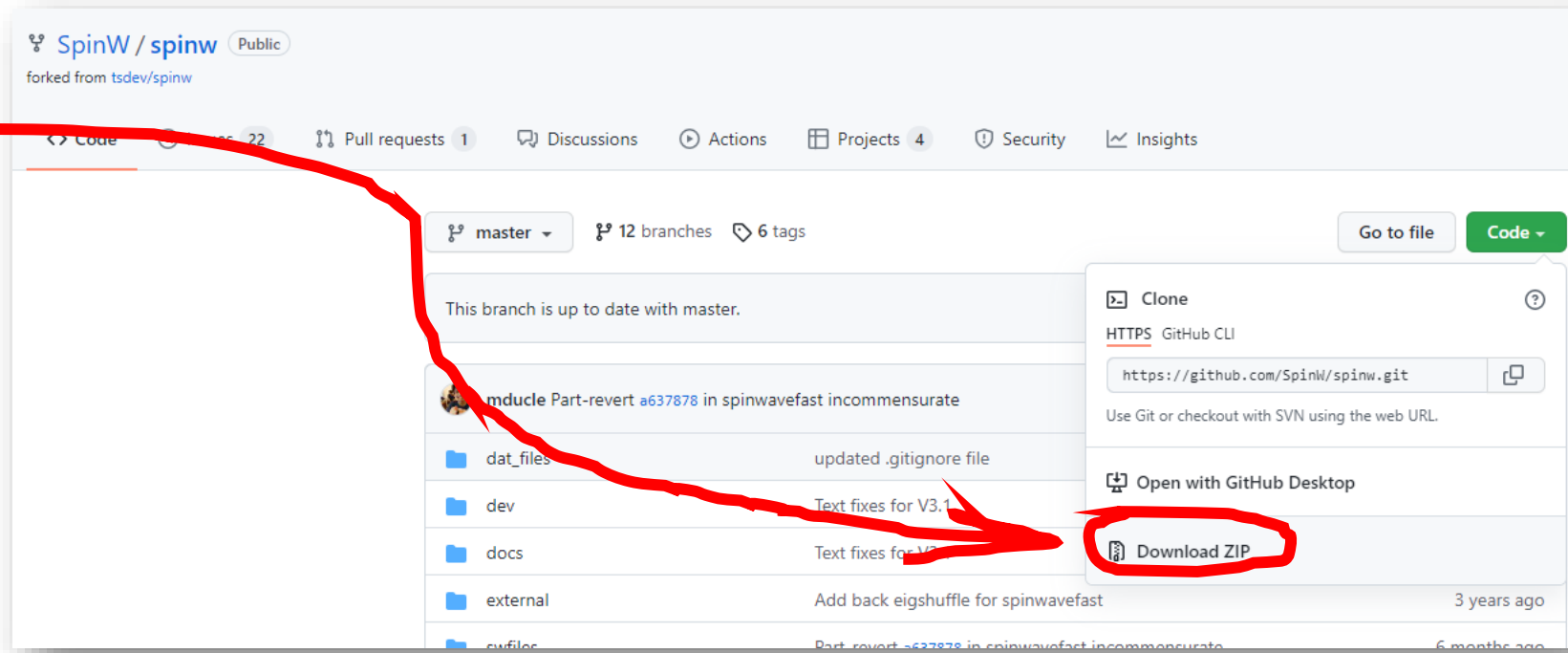
# Installing SpinW from scratch...

- Make a folder called “spinw” in a convenient location *e.g.* the userpath folder, usually in:

- Windows: %USERPROFILE%/Documents/MATLAB
- Mac: \$home/Documents/MATLAB
- Linux: \$home/Documents/MATLAB if \$home/Documents exists

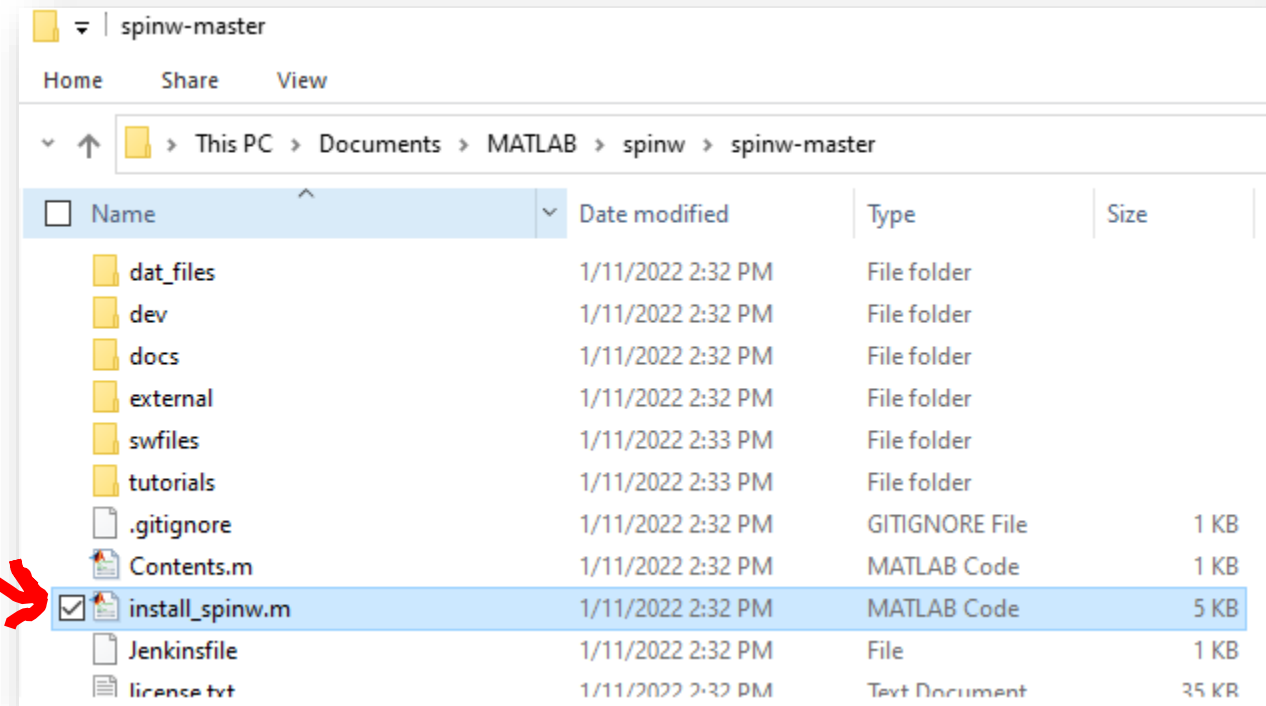


- Download the zip folder with the SpinW files here: <https://github.com/SpinW/spinw>
- Extract files into “spinw” folder you created



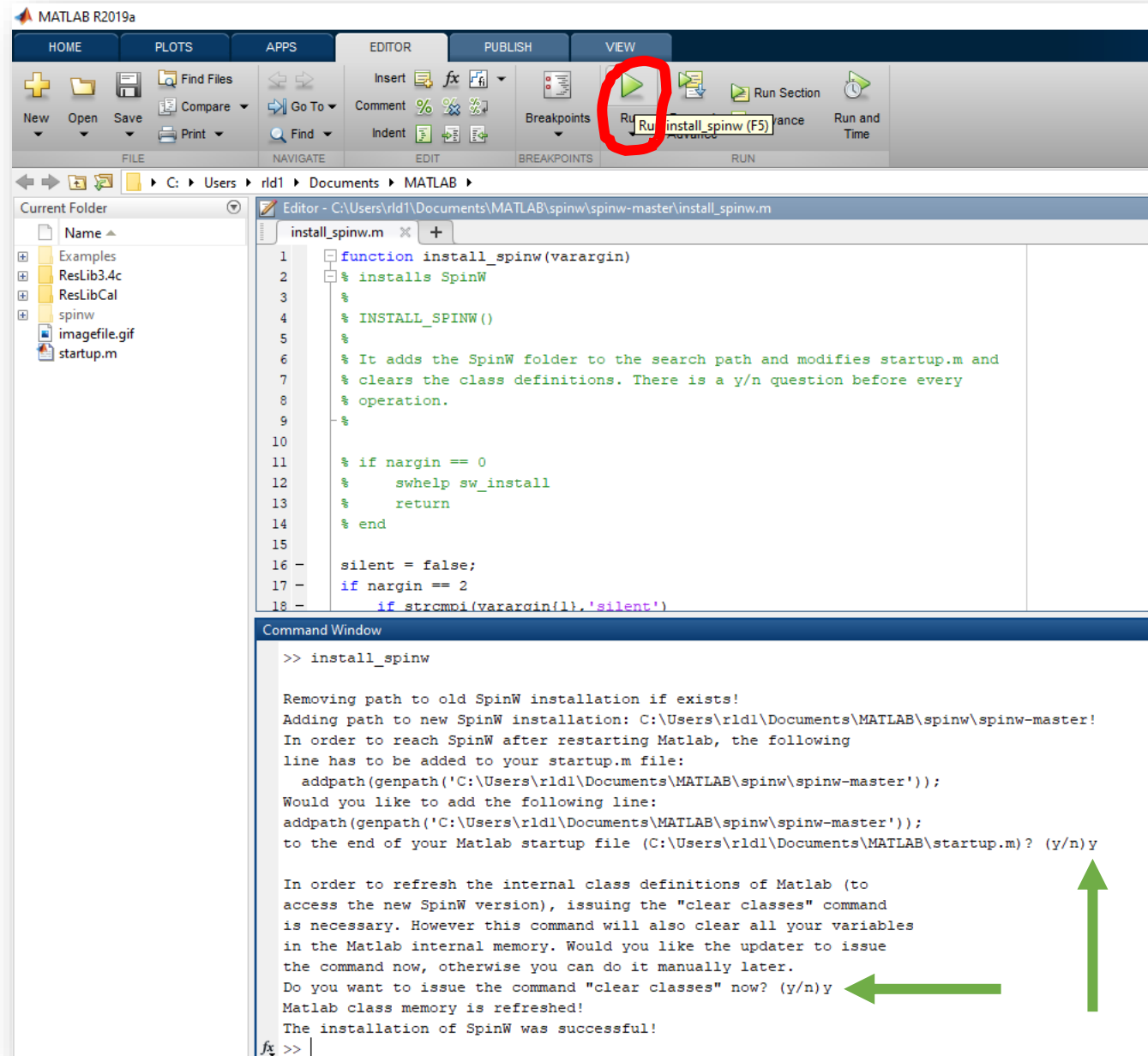
# Installing SpinW from scratch...

- Open “install\_spinw.m” in MATLAB and run the script. Type ‘y’ for all prompts. This will add the folder with the SpinW files to the startup path so your scripts using SpinW functions can always access the needed files.



# Installing SpinW from scratch...

- Open “install\_spinw.m” in MATLAB and **run** the script. Type **‘y’** for all prompts. This will add the folder with the SpinW files to the startup path so your scripts using SpinW functions can always access the needed files.
  - If the install is not successful, make sure you have a “startup.m” file in the right place. It should be in your userpath folder. Type `userpath` in the MATLAB command window to see where yours is. See <https://www.mathworks.com/help/matlab/ref/startup.html> for more information
- You should be good to go now!



MATLAB R2019a

HOME PLOTS APPS EDITOR PUBLISH VIEW

New Open Save Find Files Compare Go To Find Comment % % % Indent Breakpoints Run install\_spinw (F5) Run Section Run and Time

C:\Users\rld1\Documents\MATLAB

Current Folder

Editor - C:\Users\rld1\Documents\MATLAB\spinw\spinw-master\install\_spinw.m

```
1 function install_spinw(varargin)
2 % installs SpinW
3 %
4 % INSTALL_SPINW()
5 %
6 % It adds the SpinW folder to the search path and modifies startup.m and
7 % clears the class definitions. There is a y/n question before every
8 % operation.
9 %
10
11 % if nargin == 0
12 %     swhelp sw_install
13 %     return
14 % end
15
16 silent = false;
17 if nargin == 2
18     if strcmpi(varargin{1}, 'silent')
```

Command Window

```
>> install_spinw

Removing path to old SpinW installation if exists!
Adding path to new SpinW installation: C:\Users\rld1\Documents\MATLAB\spinw\spinw-master!
In order to reach SpinW after restarting Matlab, the following
line has to be added to your startup.m file:
    addpath(genpath('C:\Users\rld1\Documents\MATLAB\spinw\spinw-master'));
Would you like to add the following line:
addpath(genpath('C:\Users\rld1\Documents\MATLAB\spinw\spinw-master'));
to the end of your Matlab startup file (C:\Users\rld1\Documents\MATLAB\startup.m)? (y/n)y

In order to refresh the internal class definitions of Matlab (to
access the new SpinW version), issuing the "clear classes" command
is necessary. However this command will also clear all your variables
in the Matlab internal memory. Would you like the updater to issue
the command now, otherwise you can do it manually later.
Do you want to issue the command "clear classes" now? (y/n)y
Matlab class memory is refreshed!
The installation of SpinW was successful!
fx >> |
```

# Test if SpinW is working correctly

- Many tutorials can be found here in the folder:  
    ...\`spinw`\spinw-master\tutorials\publish
- Try opening 'tutorial1.m' and running it

# Test if SpinW is working correctly

- For Tutorial 1, three figure windows should appear, and the command window should contain the following information

- Try some other tutorials!

The figure displays several MATLAB windows illustrating the SpinW tutorial workflow:

- Script Editor:** Shows MATLAB code for defining a spin chain and calculating its dispersion. The code includes comments and function calls like `FMchain = spinw;`, `FMchain.genlattice('lat_const', [3 8 8], 'angled', [90 90 90]);`, and `FMchain.addatom('x', [0 0 0], 'S', 1, 'label', 'MCu1');`.
- Figure 1: SpinW plot:** Shows a 3D visualization of the spin chain lattice with magnetic atoms (MCu1) and their spin orientations (Ja).
- Figure 2:** Shows the spin wave dispersion plot:  $\omega(\mathbf{Q}, T = 0.0 \text{ K})$ . The y-axis is Energy transfer (meV) and the x-axis is  $(\xi, 0, 0)$  in  $2.0944 \text{ \AA}^{-1}$ . The plot shows a single peak at approximately 4.0 meV.
- Figure 3:** Shows the convoluted powder spectra:  $\text{Re } S^{-1}(\omega, \mathbf{Q}, T = 0.0 \text{ K})$ . The y-axis is Energy transfer (meV) and the x-axis is Momentum transfer ( $\text{\AA}^{-1}$ ). The plot shows a broad peak centered around 1.0  $\text{\AA}^{-1}$ .
- Command Window:** Shows the output of the MATLAB script, including the magnetic structure table and the results of the calculations.

num	matom	idx	S	realPhat	pos
1	'MCu1'	1	1	0	1