

# SpinW Installation

Must have MATLAB already installed on your computer

Latest version and all releases can be 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)

# spinw.org



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# Spin

*SpinW* is a MATLAB library that can plot and numerically simulate magnetic structures and excitations of given spin Hamiltonian using classical Monte Carlo simulation and linear spin wave theory.

Link will take you to github page with latest SpinW version

## The Projects



**SpinW**

Original SpinW written in MATLAB.



**pySpinW**

Python implementation of SpinW

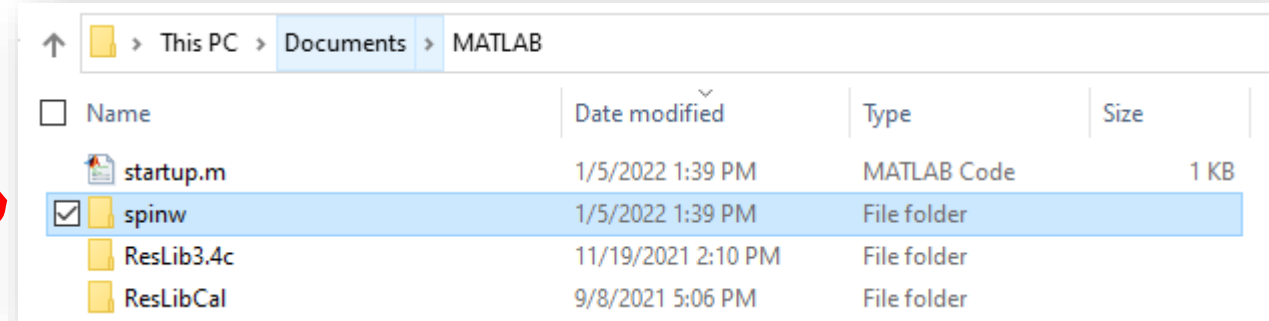


**SpinWcore**

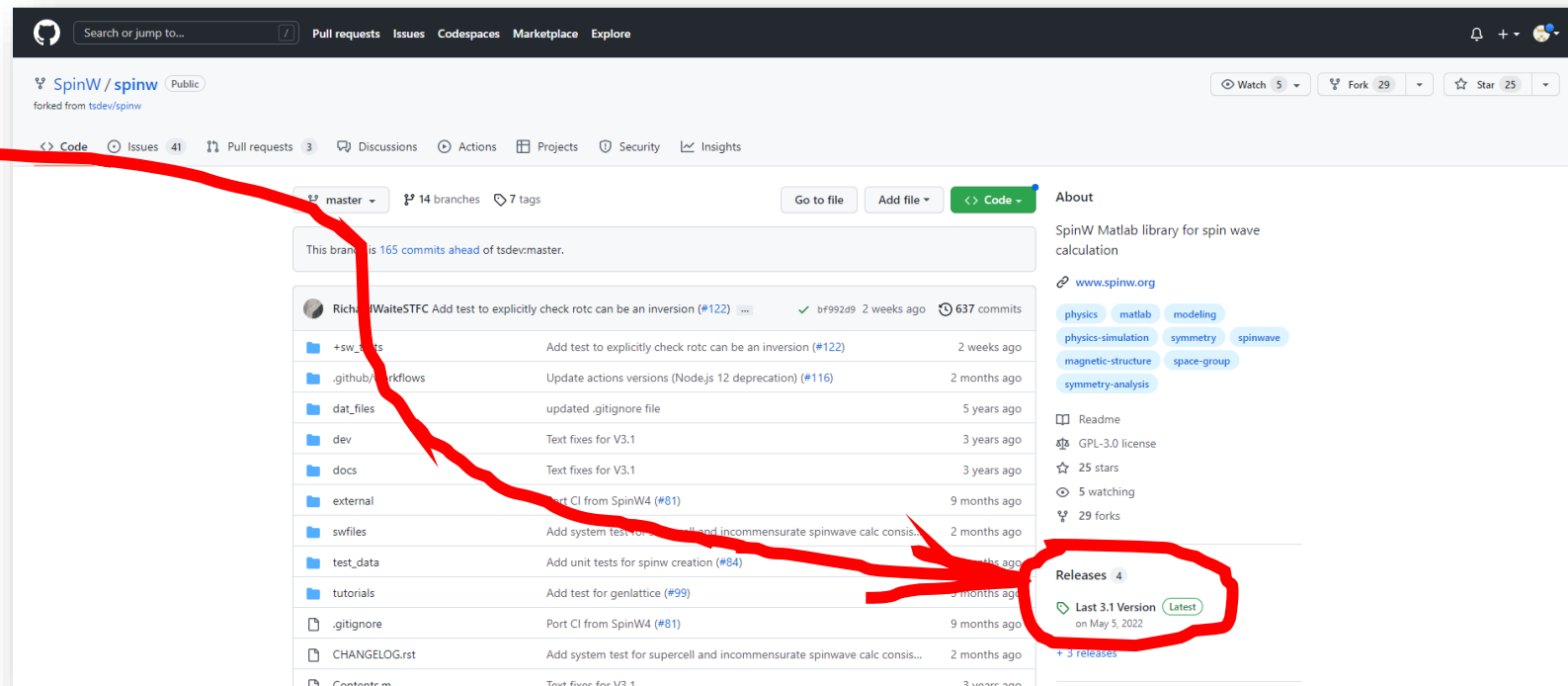
SpinW core functions written in C++ for speed

# 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

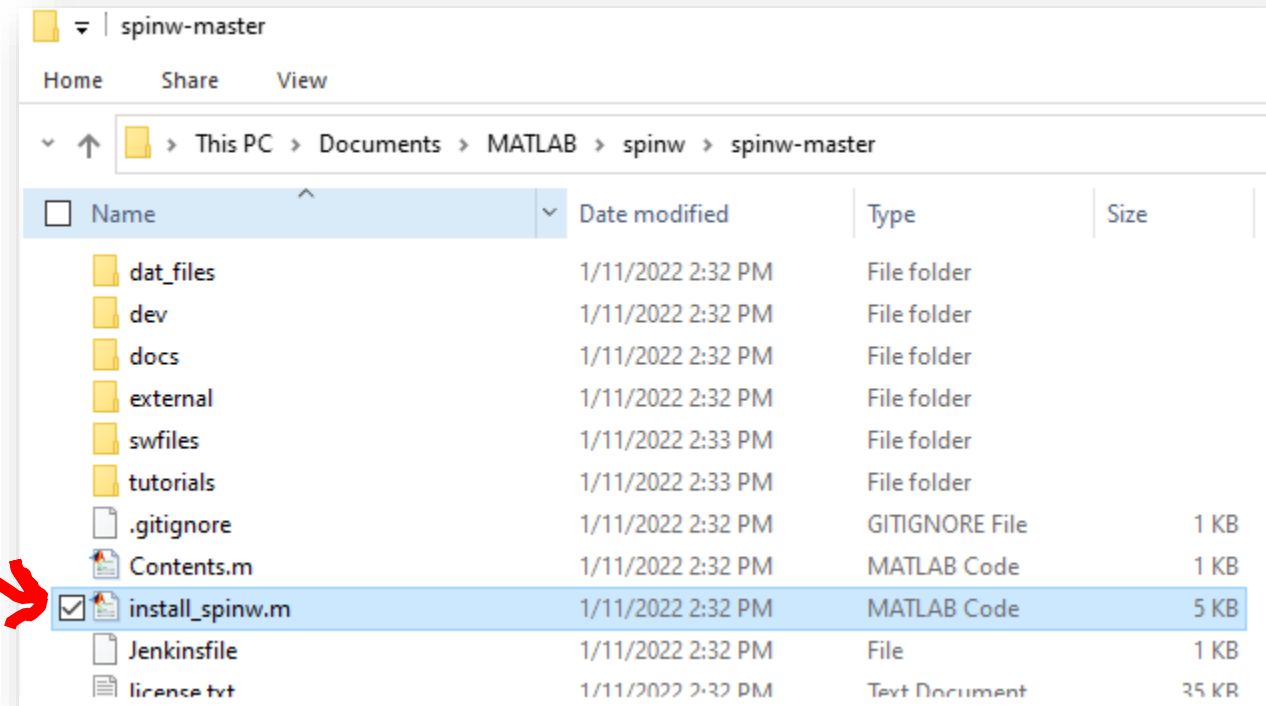


- On github page (<https://github.com/spinw/SpinW>), navigate to the latest version
- Download the source code (zip) and extract files into the spinw folder you created



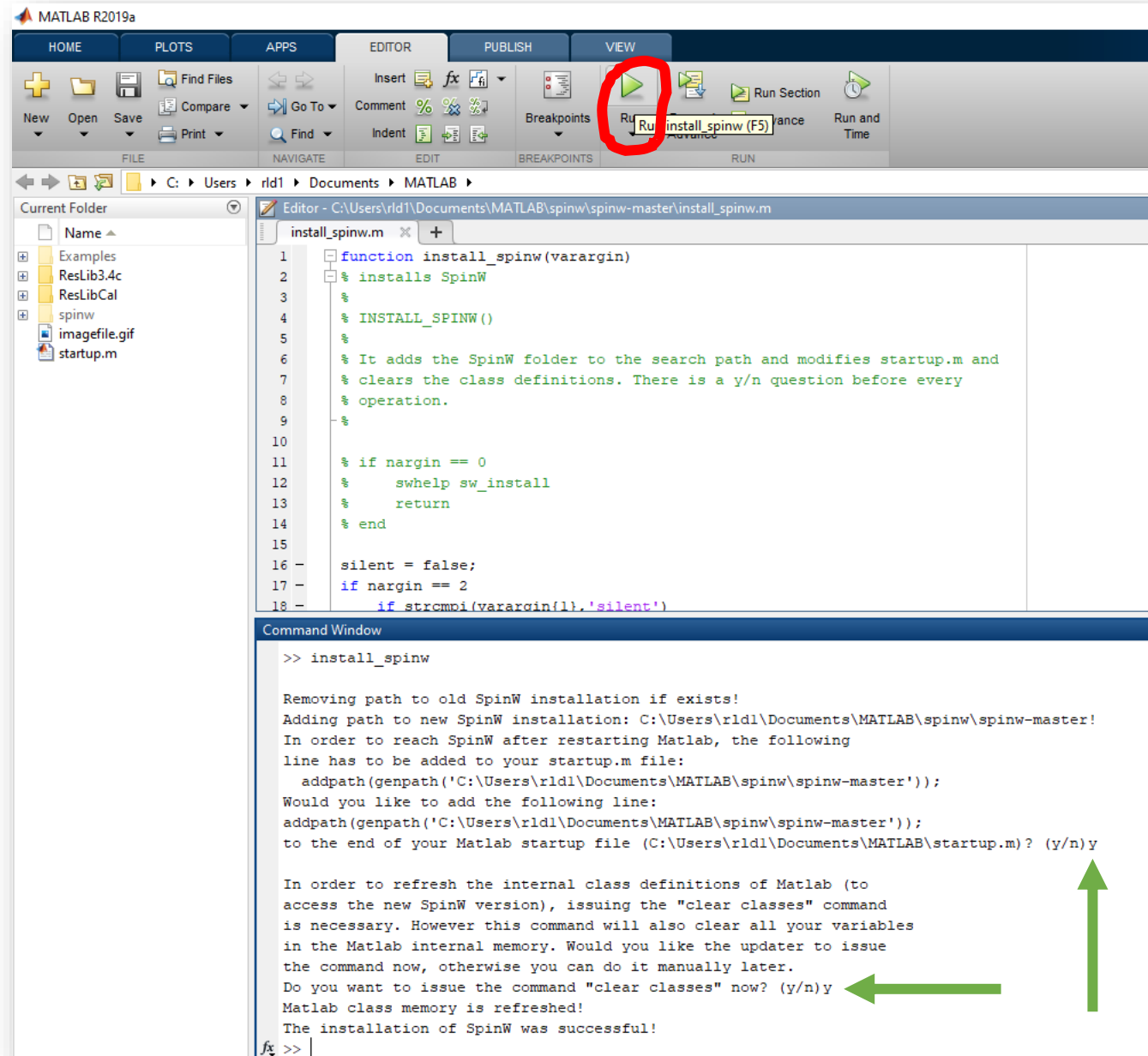
# Installing SpinW from scratch...

- 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 Section Run and Time

FILE NAVIGATE EDIT BREAKPOINTS RUN

C:\Users\rld1\Documents\MATLAB

Current Folder

- Examples
- ResLib3.4c
- ResLibCal
- spinw
- imagefile.gif
- startup.m

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!

>>
```

# Test if SpinW is working correctly

- Many tutorials can be found here in the folder:  
    ...\`spinw`\spinw-3.1.2\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 screenshot displays the MATLAB environment with the following components:

- Code Editor:** Contains MATLAB code for defining a spin chain and calculating its properties. The code includes comments and function calls like `FMchain = spinw;`, `FMchain.genlattice(...)`, and `FMchain.addatom(...)`.
- Command Window:** Shows the execution output, including the magnetic structure table and status messages like "Calculating COMMENSURATE spin wave spectra" and "Calculating powder spectra".
- Figure 1: SpinW plot:** A diagram showing a 1D spin chain with four magnetic atoms (blue arrows) and their interactions (green line).
- Figure 2: Spin wave dispersion:** A plot of Energy transfer (meV) versus momentum transfer  $(\xi, 0, 0)$  in  $2.0944 \text{ \AA}^{-1}$ . The plot shows a single peak at approximately 4.0 meV.
- Figure 3: Convoluted powder spectra:** A 2D heatmap showing Intensity (arb. u.) versus Energy transfer (meV) and Momentum transfer ( $\text{\AA}^{-1}$ ). The plot shows a broad peak centered around 1.0  $\text{\AA}^{-1}$ .