Tutorial

How to create the SPHIRE tutorial

1. Create a word docx document out of the latest .gfm version stored in the versions folder:
   make latest__to__docx
   This will create a new **tutorial__${time__stemp}.docx**.

2. Edit the file following the rules listed below.

3. Rename the edited file to **tutorial.docx**.

4. Check if you did not do any mistakes in the syntax:
   make check__docx
   This will create a new file **tutorial__check.gfm**, that can be used to check the occuring errors.
   It also can also be used to create a diff with the .gfm file used in step 1.

5. Fix occuring errors and repeat step 4.
   The errors:
   ('|||URLEND|||>', 'not found')
   ('|||URL|||<', 'not found')
   ('>|||URLEND|||', 'not found')
   Can be ignored.

6. Build the PDF
   make clean
   make
   This will create the **build** folder and after the program finished, please check the **build/tutorial.log** file for more advanced errors.

7. Fix the last errors and after no errors occure (*Latexmk: All targets (../build/tutorial.pdf) are up-to-date* in log.txt), distribute the PDF

How to create this tutorial

1. Edit README.md in **git flavoured markdown** syntax:

- **Bold** - **Bold**
- *italic* - *italic*
- ***Bolditalic*** - ***italic***
- _ need to be replaced by _

2. Build the pdf
   make readme

Installation

1. Download and install pandoc:
   https://pandoc.org/
   or via conda

2. Download and install TeX:
   Linux: **https://www.tug.org/texlive/**
   Mac: **https://www.tug.org/mactex/**

3. Run a python 2.7 environment while compiling the tutorial

How to edit the tutorial

Format

- There are 4 format options available:
  - Tags
  - ***Bolditalic***
  - **Bold**
  - *italic*
- Tags - For postprocessing |||TAG|||; some tags require |||TAG||| text |||TAGEND|||.
- ***Bolditalic*** - Used for button names and inline terminal commands.
- **Bold** - Used for file names, directory names, GUI labels and to highlight other texts.
- *italic* - Used for file extensions.
- All other formattings should be avoided.

Tags

Listed are just the ones for editing existing chapters/sections.
In case you want to see all possibilities checkout **scripts/gfm__to__latex__tags.txt**.

Inline

- |||NEWLINE|||
  Put this one between paragraphs.

- |||SI|||number unit unit|||SIEND|||
  Put this around numbers that have a unit, e.g. |||SI||1.14 1 per pixel per angstromˆ2|||SIEND|||.

- |||UNIT|||unit unit|||UNITEND|||
  Put this around a unit , e.g. |||UNIT||1 per pixel per angstromˆ2|||UNITEND|||.

- |||URL|||url||URLEND|||
  Put this around numbers that have a unit, e.g. |||URL||https://. . . .|||URLEND|||.

- |||WIKI|||
  Put this to insert a link to the SPHIRE wiki

- |||REDNUM||| text |||REDNUMEND|||
  Color text red

- |||PURPLENUM||| text |||PURPLENUMEND|||
  Color text purple

Environments

- |||ISSUE|||{Issue header} text |||ISSUEEND|||
  Start an issue section

- |||ADVANCED|||{Advanced header} text |||ADVANCEDEND|||
  Start an Advanced section

- |||EQUATION|||Equation in TeX syntax|||EQUATIONEND|||
  Put this for nice formatted equations.

- |||TIP||| text |||TIPEND|||
  Tip section

- |||NOTE||| text |||NOTEEND|||
  Note section

- |||IMPORTANT||| text |||IMPORTANTEND|||
  Important section

- |||TERMINAL||| text |||TERMINALEND|||
  Terminal input section

- |||STDOUT||| text |||STDOUTEND|||
  Standard output/log file content section

- |||CENTER||| text |||CENTEREND|||
  Centered text

Itemization

- |||ITEMIZEDASH||| text |||ITEMIZEDASHEND|||
  List with dashes as labelitem

- |||ITEMIZEARROW||| text |||ITEMIZEARROWEND|||
  List with arrows as labelitem

- |||ITEMIZEGUI||| text |||ITEMIZEGUIEND|||
  List with dots as labelitem

- |||ENUMERATE||| text ||ENUMERATEEND|||
  List with numbers as labelitem

Inside Itemization

- |||ITEM|||
  Put this before items in an |||ITEMIZEXXX||| |||ITEM||| text |||ITEMIZEXXXEND||| and |||ENUMERATE||| |||ITEM||| text |||ENUMERATEEND||| environment.

- |||ITEMTIP||| text |||ITEMTIPEND|||
  Tip section in an |||ITEMIZEXXX||| |||ITEM||| text |||ITEMIZEXXXEND||| and |||ENUMERATE||| |||ITEM||| text |||ENUMERATEEND||| environment.

- |||ITEMNOTE||| text |||ITEMNOTEEND|||
  Note section in an |||ITEMIZEXXX||| |||ITEM||| text |||ITEMIZEXXXEND||| and |||ENUMERATE||| |||ITEM||| text |||ENUMERATEEND||| environment.

- |||ITEMIMPORTANT||| text |||ITEMIMPORTANTEND|||
  Important section in an |||ITEMIZEXXX||| |||ITEM||| text |||ITEMIZEXXXEND||| and |||ENUMERATE||| |||ITEM||| text |||ENUMERATEEND||| environment.

Figures

- |||FIGUREGUI|||figure_name|||FIGUREGUIEND|||
  Large figure with a width of the page.

- |||FIGUREMEDIUM|||figure_name|||FIGUREMEDIUMEND|||
  Medium figure with a width of 70% of the page.

- |||FIGURESMALL|||figure_name|||FIGURESMALLEND|||
  Small figure with a width of 40% of the page.

- |||FIGUREADV|||figure_name|||FIGUREADVEND|||
  Figure used in a advanced or issue environment.

- |||FIGURESUB|||figure_name_1|||FIGURESUBMIDDLE|||figure_name_2|||FIGURESUBEND|||
  Two figures next to each other.

- |||FIGUREMINI|||figure_name_1|||FIGUREMINIMIDDLE||| text |||FIGUREMINIEND|||
  Figure and text on the same level.

- |||FIGURECAP||| Caption
  Start for an figure caption, e.g.
  |||FIGURESUB|||figure_name_1|||FIGURECAP||| CAP1 |||FIGURESUBMIDDLE|||figure_name_2|||FIGURECAP|||CAP2|||FIGURESUBEND|||

Acronyms

- |||ANOVA|||
  analysis of variance

- |||BDB|||
  Berkley Data Bank

- |||CRYO-EM|||
  cryo-electron microscopy

- |||CS|||
  Spherical Aberration

- |||CTF|||
  Contrast Transfer Function

- |||ELM|||
  Electron Microscopy

- |||FSC|||
  Fourier shell correlation

- |||GUI|||
  graphical user interface

- |||HDF|||
  Hierarchical Data Format

- |||ISAC|||

iterative stable alignment and clustering

- |||ML|||
  Maximum Likelihood

- |||MPI|||
  Message Passing Interface

- |||MTF|||
  modulation transfer function

- |||PDB|||
  protein data bank

- |||SD|||
  standard deviation

- |||SNR|||
  Signal to noise ratio

- |||SPANA|||
  single particle analysis

- |||SPARX|||
  single particle analysis for resolution extension

- |||SPHIRE|||
  SParx for HIgh-REsolution electron microscopy

- |||XFEG|||
  X-Field Emission Gun

- |||SGE|||
  Sun Grid Engine

Basic Latex

Inside equation

- \frac{numerator}{denominator}
- \text{Plain text}
- \times
- \approx

Outside equation

- \parencite{citationname}
  Name of the citation located in latex/Tex_global/lit.bib.
- \\
  Force line break at this point.