



# Computational light scattering (PAP315)

## Lecture 3b

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- Linux/Mac or Linux subsystem in Windows or MSys2 in Windows
  - If not available, we can give access for this course's time to virtual Linux machine
- GCC compiler suite. In CentOS:
  - `yum install gcc gcc-c++ gcc-gfortan`
  - `yum install fftw fftw-devel`
- ...although you can also find pre-compiled binaries for Windows for both the codes. Use those if you must



- Go to <https://github.com/adda-team/adda>
- Get adda package by downloading the zip...
  - `wget https://github.com/adda-team/adda/archive/master.zip`
  - `unzip master.zip`
  - `cd adda-master`
- ...or by git:
  - `mkdir adda; cd adda; git init`
  - `git clone https://github.com/adda-team/adda.git`
- `cd src`
- `make seq`
  - If error with FFTW3-library or header file, edit 'Makefile' by uncommenting line 99: 'override OPTIONS += FFT\_TEMPERTON'
- `mkdir ~/bin; cp seq/adda ~/bin`

## Test ADDA installation

- `cd ../tests`
- `adda -V`
- `adda`
- If command 'adda' is not found, then
  - `export PATH=${PATH}:~/bin`



All run parameters are given by command line options. There is a summary of these in the appendix of the ADDA user guide

```
cp ../input/avg_params.dat .  
cp ../input/all_dir_params.dat .
```

## Computing scattering from a sphere

- `adda -dir sphere -Csca -shape sphere -size 10.0 -m 1.5 0.001 -save_geom sphere.geo`

## Scattering from a cylinder

- `adda -dir cylinder -shape cylinder 0.2 -size 20.0 -m 1.5 0.001 -save_geom cylinder.geo`
- `-store_int_field`
- `-size 20.0 -beam barton5 12.5`
- `-orient avg avg_params.dat`



- Go to <http://ddscat.wikidot.com/>
- Download source (or, `wget` [http://ddscat.wikidot.com/local-files/downloads/ddscat7.3.3\\_220120.tgz](http://ddscat.wikidot.com/local-files/downloads/ddscat7.3.3_220120.tgz))
- `tar xzf ddscat7.3.3_220120.tgz`
- `cd src; make ddscat; cp ddscat ~/bin`



- See the UserGuide.pdf in the doc-folder
- In ddscat root folder, make directory 'tests', switch there and copy the default parameter file 'ddscat.par' from doc-folder
- Make parameter file for refractive index
- Edit 'ddscat.par' and run

- Sphere, compare to ADDA:

Lines...

```
11: 'ELLIPSOID'
```

```
12: 24 24 24
```

```
27: 6.28319 6.28319 1 'LIN'
```

```
31: 5.0 5.0 1 'LIN'
```

- Two spheres, make geometry file and...

```
11: 'SPHERES_N'
```

```
12: 64 0 'spheres.dat'
```

```
27: 6.28319 6.28319 1 'LIN'
```

```
31: 5.0 5.0 1 'LIN'
```