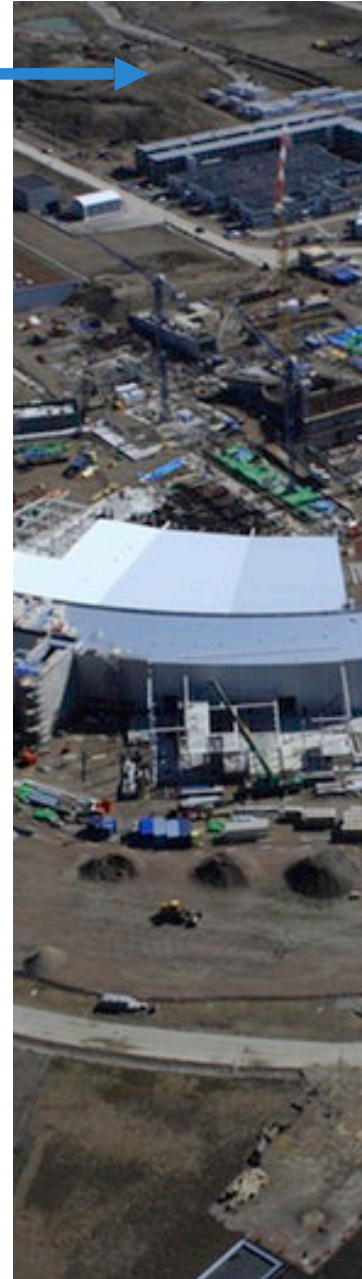
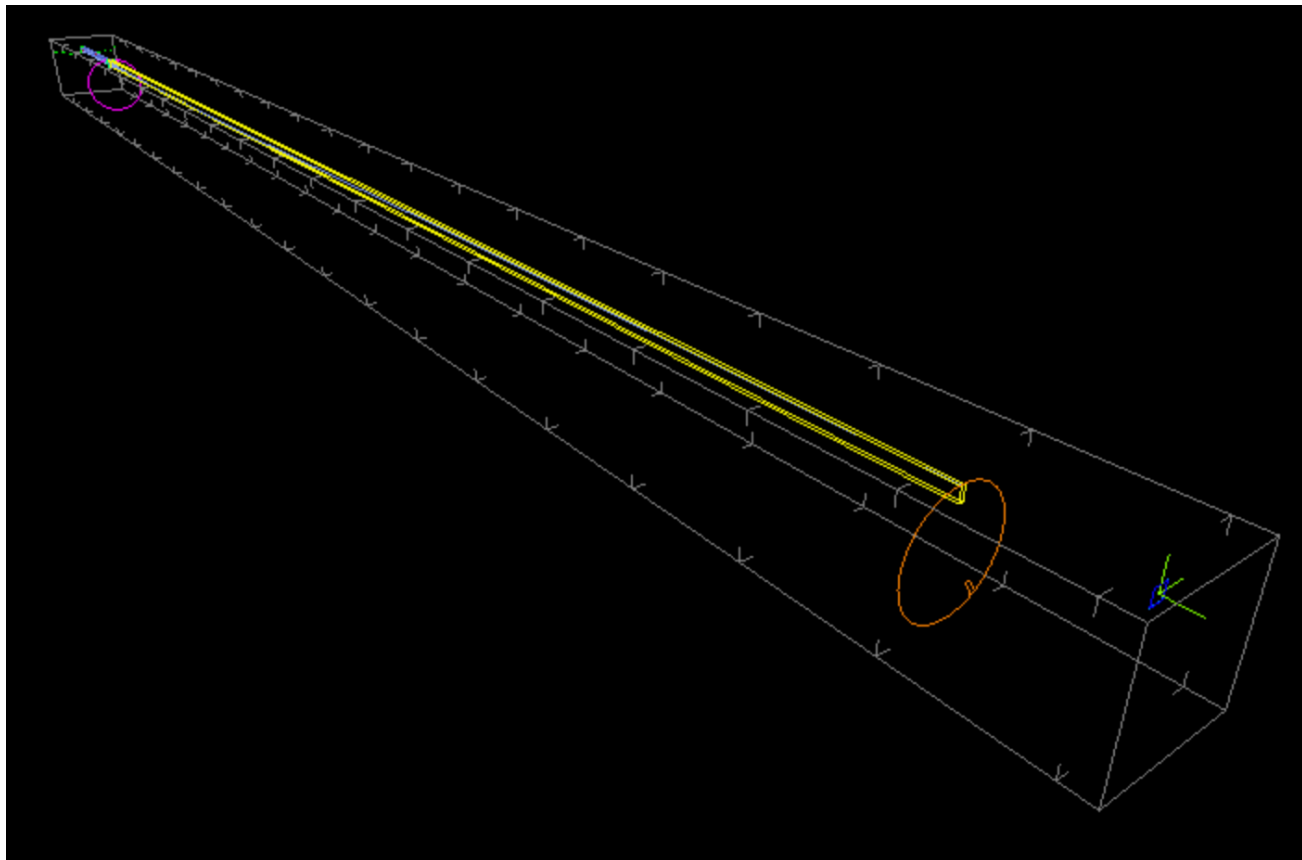


# Exercise:

1 *Build yourself a simple TOF instrument!*

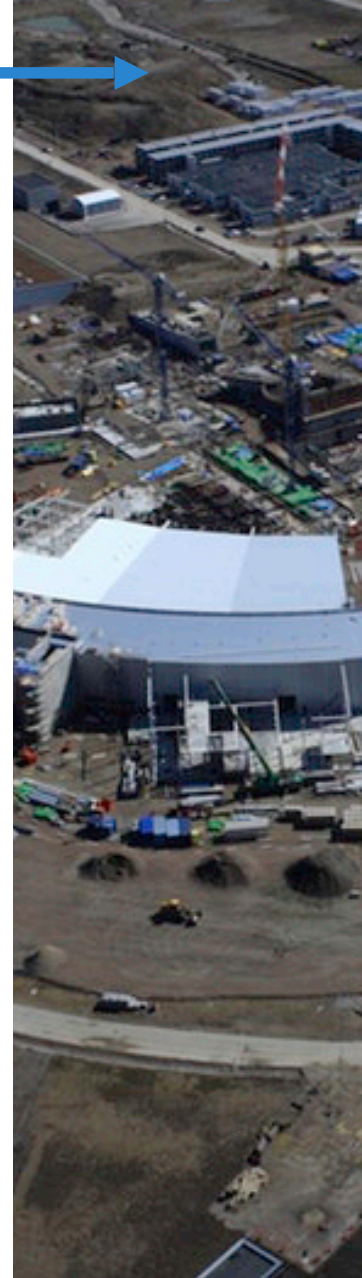
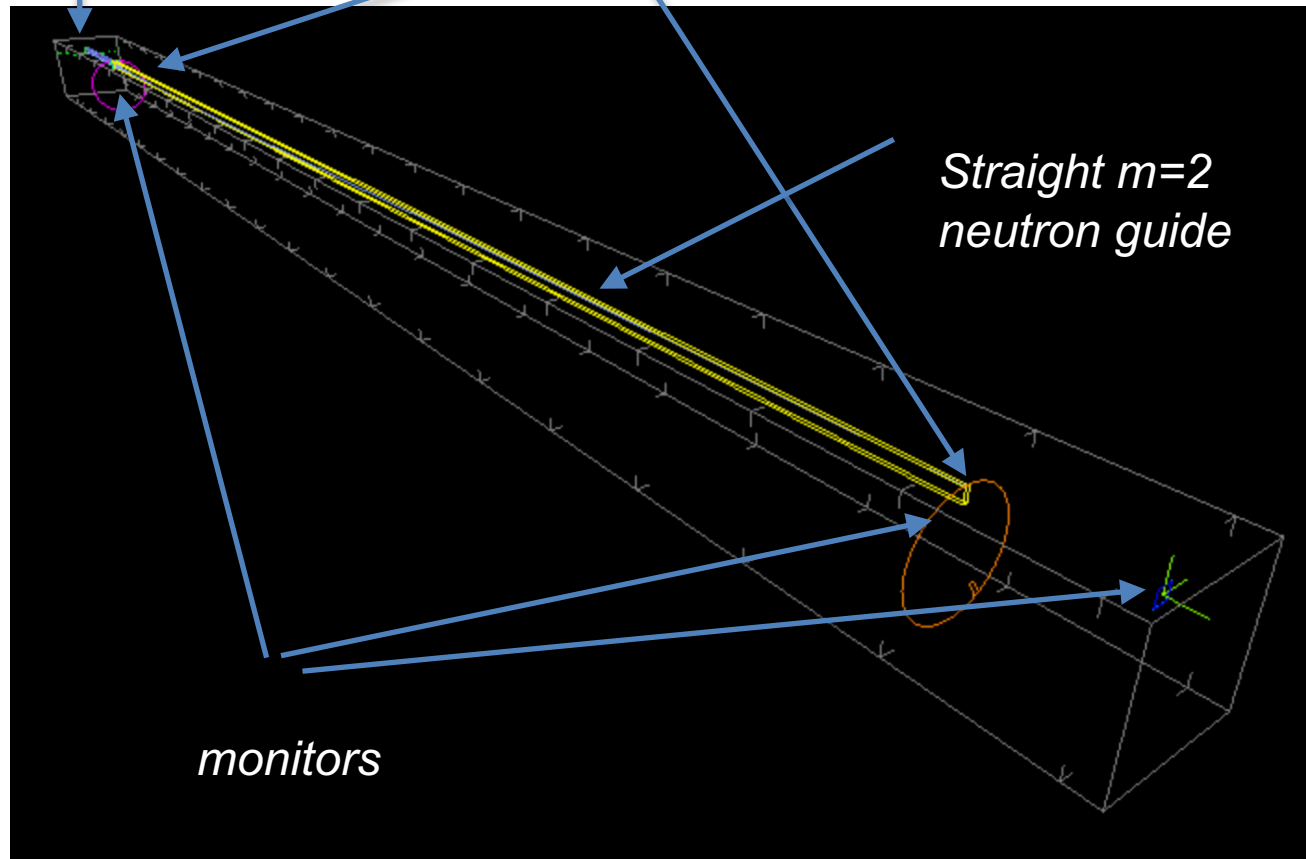


# Exercise:

1 *Build yourself a simple TOF instrument!*

ISIS\_moderator

2 Disk\_chopper's

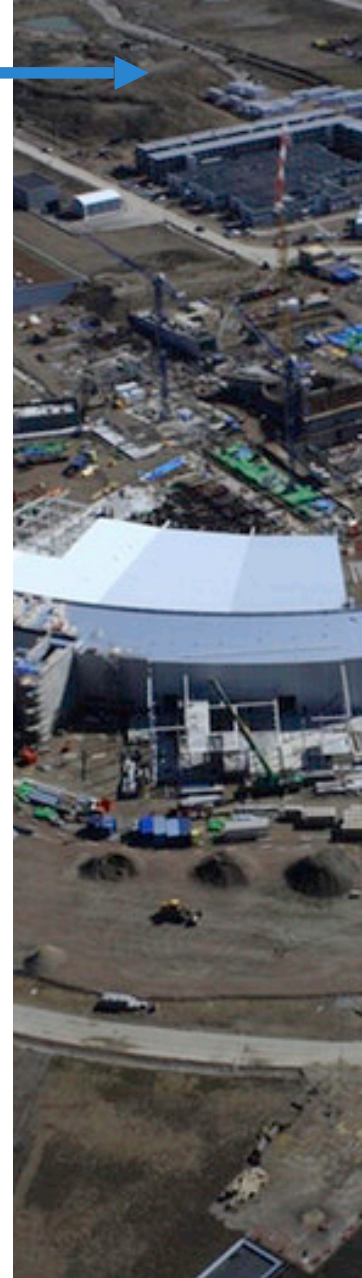


# Start by inserting a source

```
COMPONENT isis_moderator = ISIS_moderator(  
  Emin=0,  
  Emax=0,  
  dist=2.0,  
  Lmin=0.1,  
  Lmax=10,  
  target_index=0,  
  focus_xw=0.03,  
  focus_yh=0.1)
```

AT (0, 0, 0) RELATIVE PREVIOUS

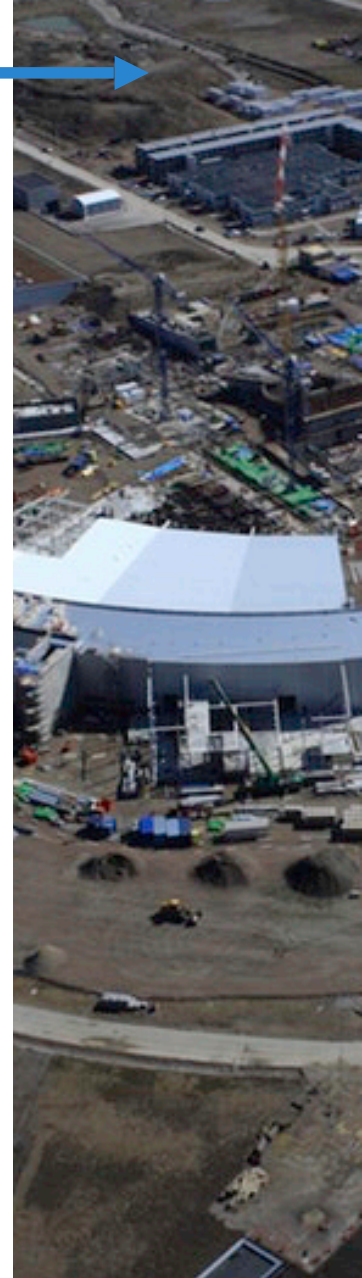
- ✦ Define wavelength band 0.1-10 Å
- ✦ Focus at rectangle 3 x 10 cm @ 2m



# Next, insert a set of monitors at the 2m beamport position

```
COMPONENT PSDsource = PSD_monitor(  
  filename="PSDsource")  
AT (0, 0, 2) RELATIVE isis_moderator
```

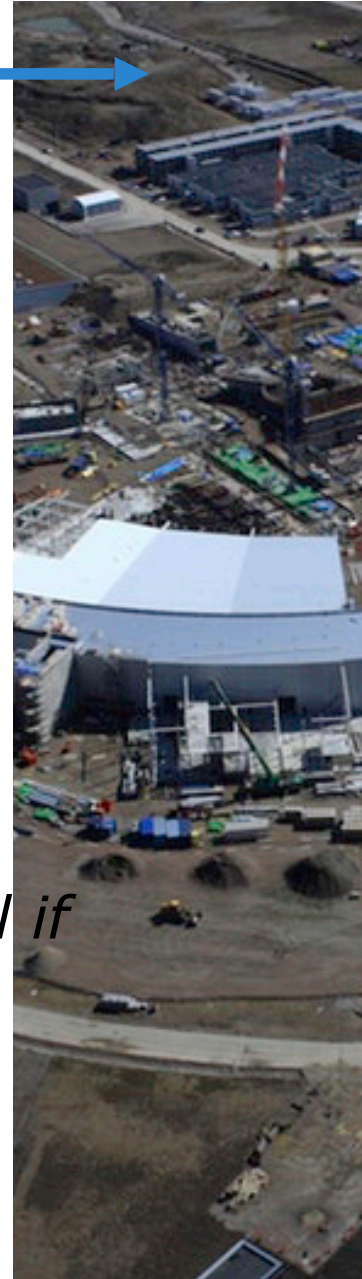
```
COMPONENT TOFLsource = TOFLambda_monitor(  
  nL=128,  
  tmin=0,  
  tmax=5000,  
  filename="TOFLsource",  
  Lmin=0.1,  
  Lmax=10)  
AT (0, 0, 0) RELATIVE PREVIOUS
```



# ... and a first chopper

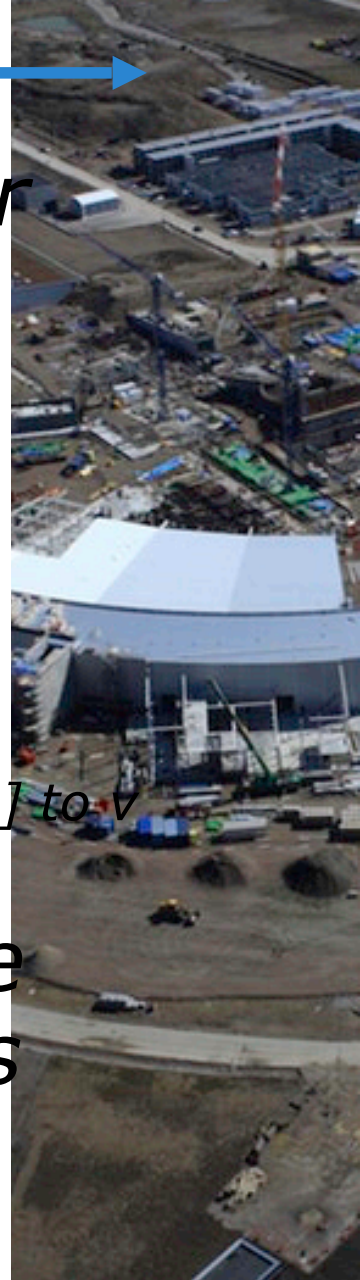
```
COMPONENT Disk1 = DiskChopper(radius=0.4, yheight=0.12,  
                               nu=nu, nslit=1, theta_0=5,  
                               delay=ttarget1)  
WHEN (choppers) AT (0,0,0.0001) RELATIVE PREVIOUS
```

- ✦ Notice the use of the flag
  - ✦ **WHEN(choppers)**
    - ✦ - so define an input parameter "**choppers**" to control if choppers are in or out
- ✦ Also define the input parameter **nu**
- ✦ See next page



# ... and a first chopper

- ✦ Calculate the needed **ttarget1** chopper phase for selecting 2 Å neutrons using either
  - ✦ Pocket calculator
  - ✦ the *DEFINE & INITIALIZE* sections
    - ✦ (hint: the constant AA2MS can be used to convert from  $k$  [Å<sup>-1</sup>] to  $v$  [m/s])
- ✦ Insert another set of monitors after the DiskChopper, remember new filenames for the output



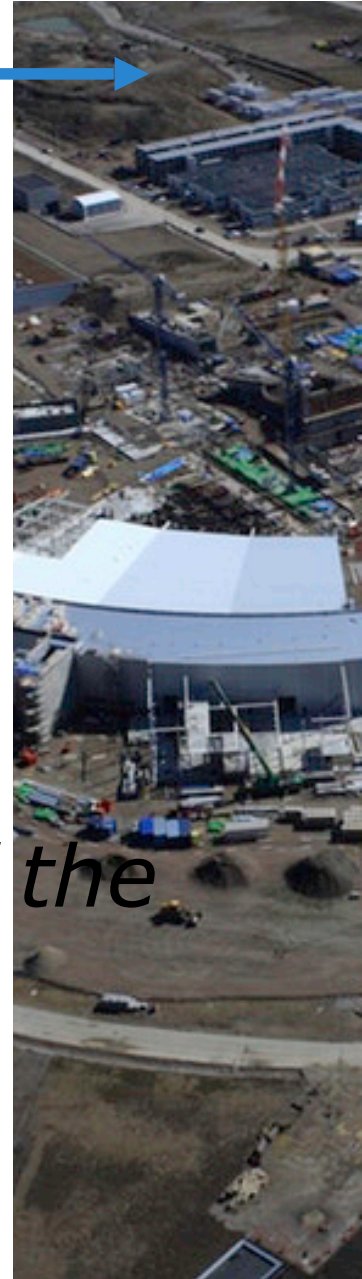
# Now a guide...

- ✦ *Insert a 17 m straight  $m=2$  guide*

```
COMPONENT guide = Guide(
  w1=0.03,
  h1=0.10,
  w2=0.03,
  h2=0.10,
  l=17)
```

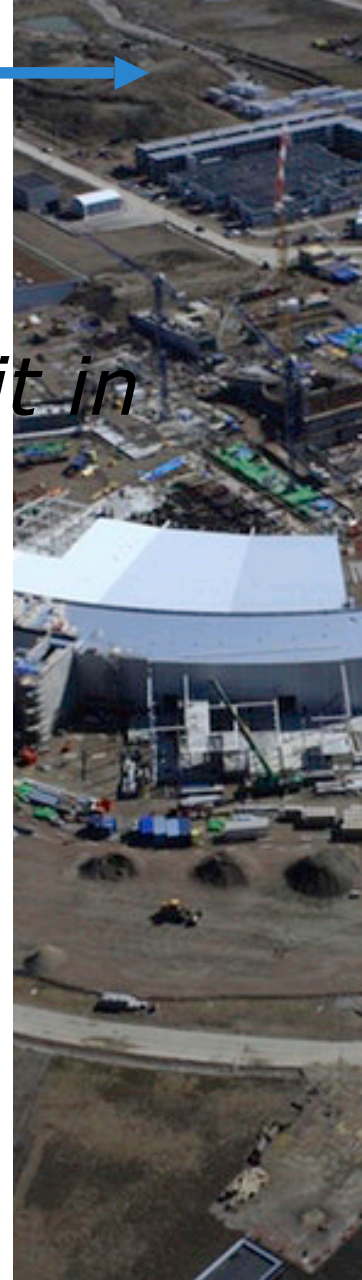
WHEN(**guide**) AT (0, 0, 0.0001) RELATIVE PREVIOUS

- ✦ *Define an input parameter to control if the guide is in or out*



# Another chopper...

---



- ✦ Define a **ttarget2** chopper phase for correctly selecting 2Å neutrons
- ✦ Put a second DiskChopper and sandwich it in sets of monitors like before.
  
- ✦ Visualise the instrument using
  - ✦ `mcdisplay-pyqtgraph`
  - ✦ `mcdisplay-webgl`
  - ✦ `mcdisplay-pyqtgraph --tof`
  - ✦ - and ensure all looks OK

# Run simulations to

- ♦ *See that you are in fact selecting 2Å neutrons*
- ♦ *Compare intensities with and without guide, with and without choppers*
- ♦ *Optionally insert a PowderN sample and a cylindrical TOF monitor - find the relevant parameters using the documentation tools.*

