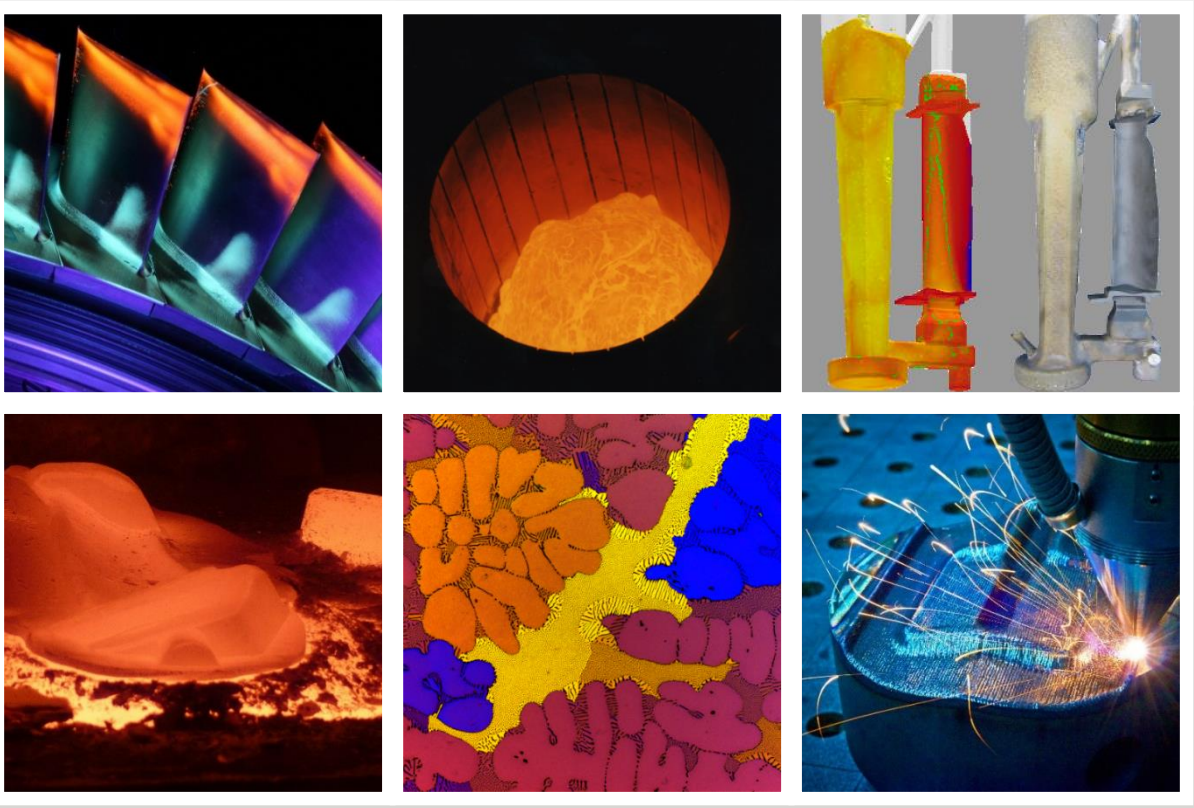


Challenge
Create an Initial Microstructure

Required software tools:

Dream3D (freeware):
http://dream3d.bluequartz.net/

Paraview (freeware): www.paraview.org

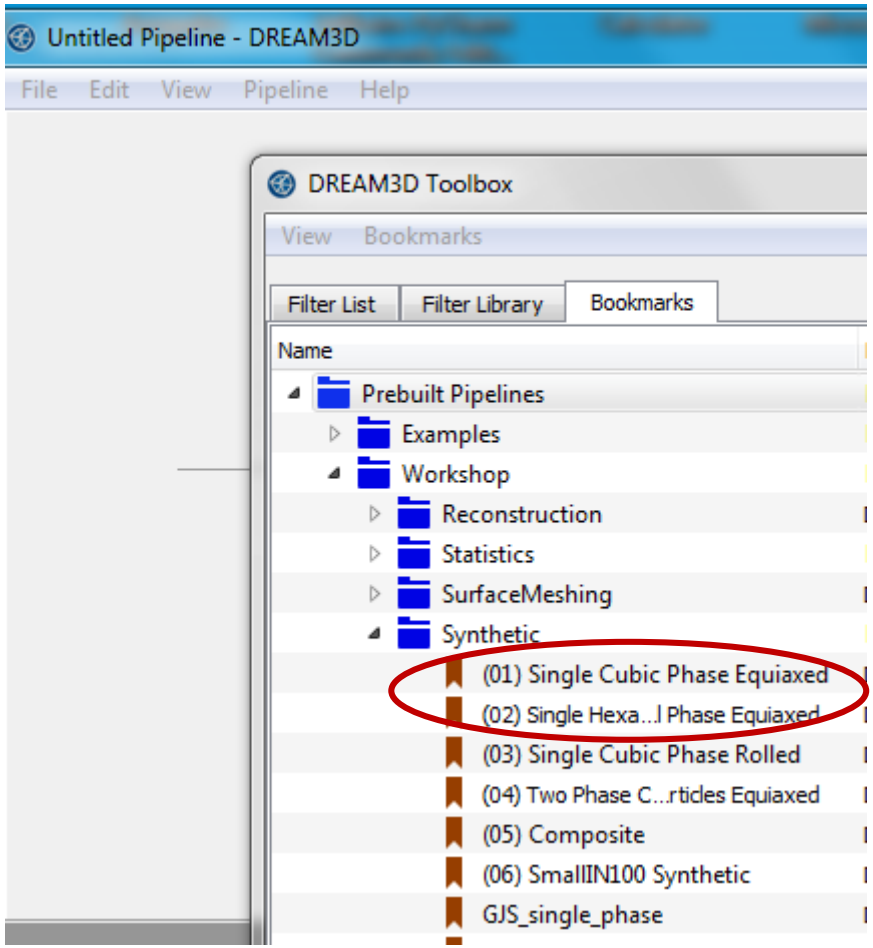
Further optional: HDF5 viewer (free) for dream3d and other HDF5 files

- *generate 3D grain structure by running the prebuilt pipeline in Dream.3D: „single phase equiaxed cubic”*

- *Inspect simulation domain geometry*
- *generate “.Dream3D” and “xdmf” output files*
- *visualize result (xdmf) in paraview*
- *inspect “.dream3D” output in HDF5 view*

- *modify pipeline for a 2D grain structure in a domain of 200x1x200 pixels/voxels with a scaling of 1.5 micron/voxel*
- *generate 2D microstructure files (.dream3d, .xdmf, VTK)*
- *optionally : extract 2D microstructure from a 3D dataset (see below)*

Open Dream 3 D



Many options …can be exploited on your own..

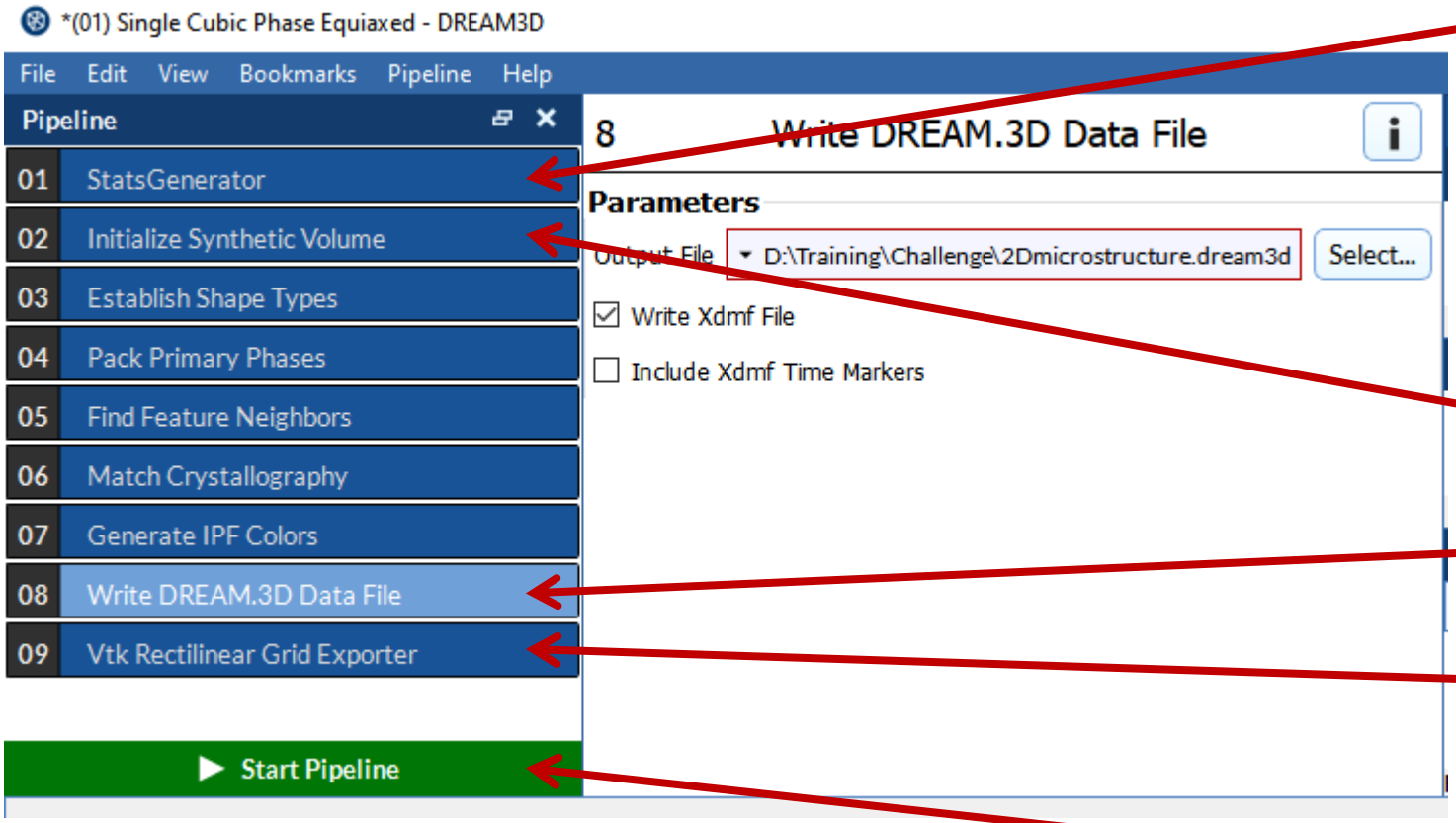
for synthesizing a microstructure:

Select pre-configured pipeline

(e.g single phase equiaxed cubic, double click)

(once having performed this you will easily see how to adapt a pipeline to your needs)

Following window will show up:



Statistics data

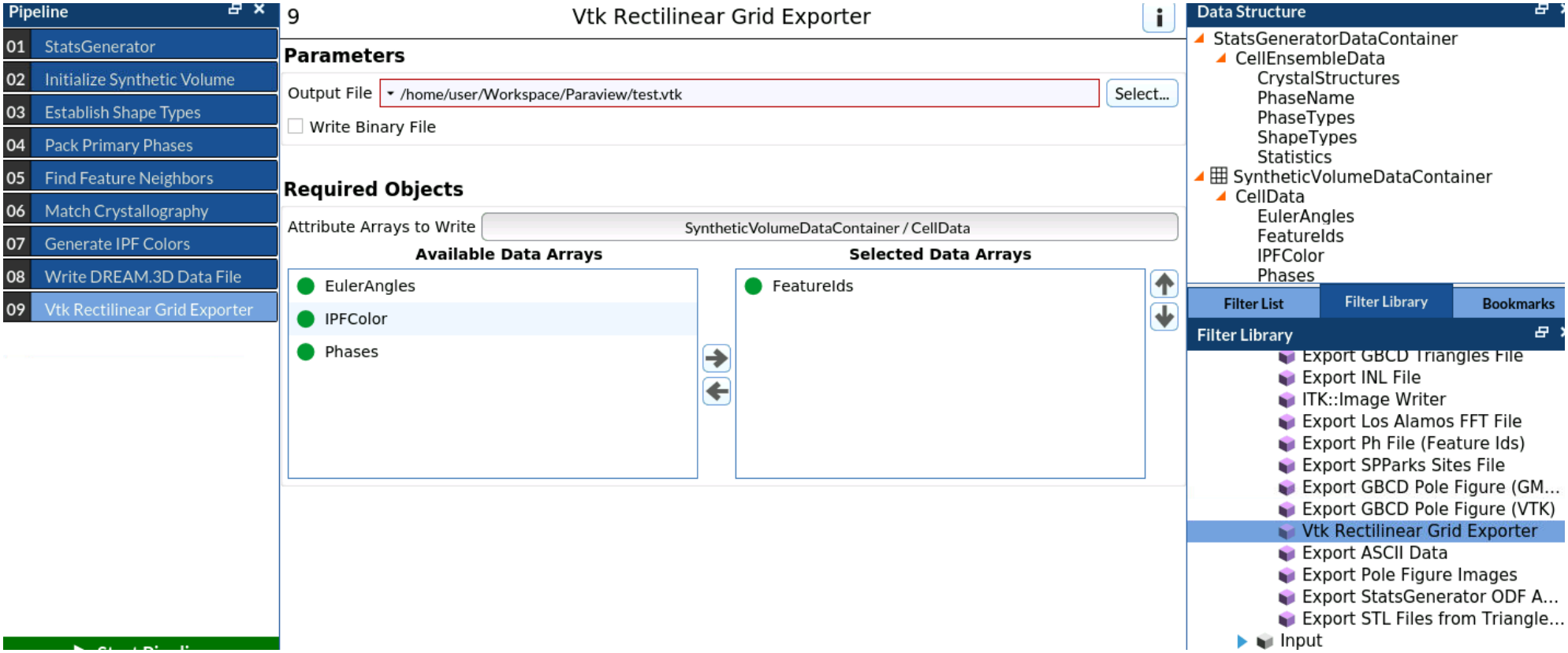
Size of simulation domain
Make spacings identical for cubic grid

specify output-file

add a VTK exporter (see next slide)

start pipeline !!!

Add a rectilinear grid export filter

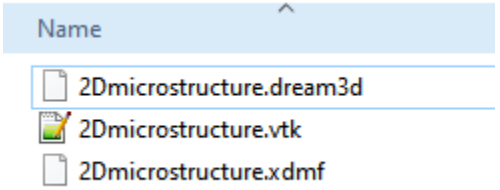


Hint: Right click on the empty field next to 'Attribute Array to Write' to add available data arrays

View and handle resulting microstructure with paraview

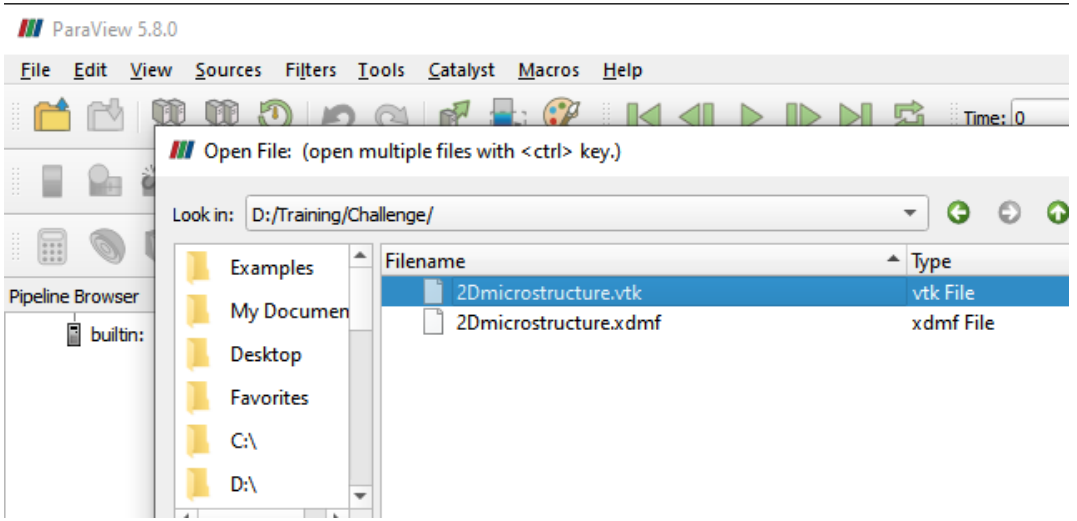
Three files are created:

- *dream3d (an HDF file)*
- *Xdmf*
- *VTK (from rectilinear grid export*

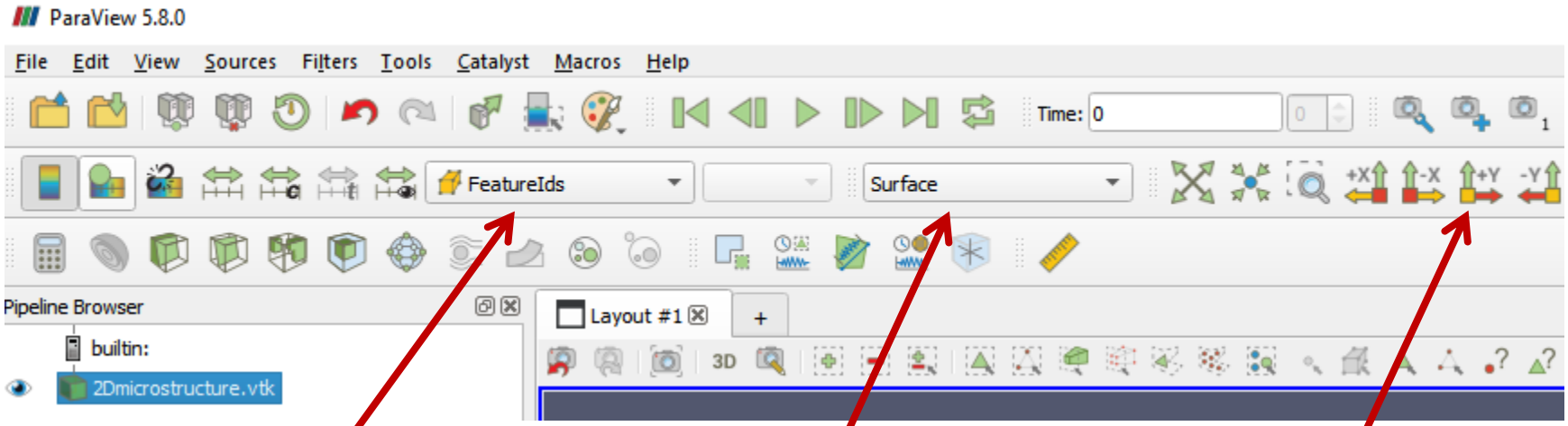


Xdmf or VTK can be used for first visualisation in Paraview

Use VTK for later export/save data to avoid export errors in newer Paraview versions (5.8 or higher)



Paraview: set up the view



Select data field ‚Feature Ids‘

Select ‚Surface‘ representation

Select axis orientation +Y

Optional: Extract 2D subset from 3D synthetic microstructure

Use a 3D geometry!

...select filter „extract subset“....

...define desired plane....

...apply the filter...

...save data (legacy VTK - ASCII)