

Huygens Professional and Core on HPC Bunya Guide

A. Thompson and R. Amor
QBI Advanced Microscopy Facility
Queensland Brain Institute, The University of Queensland
Research Lane, St Lucia, 4072 QLD, AUSTRALIA
<r.amor@uq.edu.au>

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Abstract

A brief guide on how to use Huygens Professional and Core on HPC Bunya, including running Huygens Core by submitting a job to the Simple Linux Utility for Resource Management (SLURM) scheduler.

Preamble

This is HPC Bunya:

<https://rcc.uq.edu.au/systems/high-performance-computing/bunya>.

If you haven't done so already, request for access to Bunya here:

<https://forms.office.com/r/87rfgvxDnz>.

Bunya training is available here:

<https://rcc.uq.edu.au/training-support/training-courses>.

Register via email to rcc-support@uq.edu.au to attend UQ-only training sessions.

Read the Bunya user guide here:

<https://github.com/UQ-RCC/hpc-docs/blob/main/guides/Bunya-User-Guide.md>

and the Bunya OnDemand guide here:

<https://github.com/UQ-RCC/hpc-docs/blob/main/guides/OnDemand-Guide.md>.

You can then request access to Huygens Professional and Core on HPC Bunya using this link:

<https://services.qriscloud.org.au/access/6211d1e3482544b2b73fc85156446e2c/member>.

Running Huygens Professional and Core via OnDemand

1. Go to the OnDemand site:
<https://bunya-ondemand.rcc.uq.edu.au/>
2. Navigate to Interactive Apps > GPU-Accelerated Desktop. Give the job a name, choose your Bunya account group, and specify the number of GPUs, CPU cores per task, number of tasks, and maximum running time. Click "Launch."
3. OnDemand will prompt: "Please be patient as your job currently sits in queue. The wait time depends on the number of cores as well as time requested."
Click "Launch GPU-Accelerated Desktop" when the desktop is running (Fig. 1).

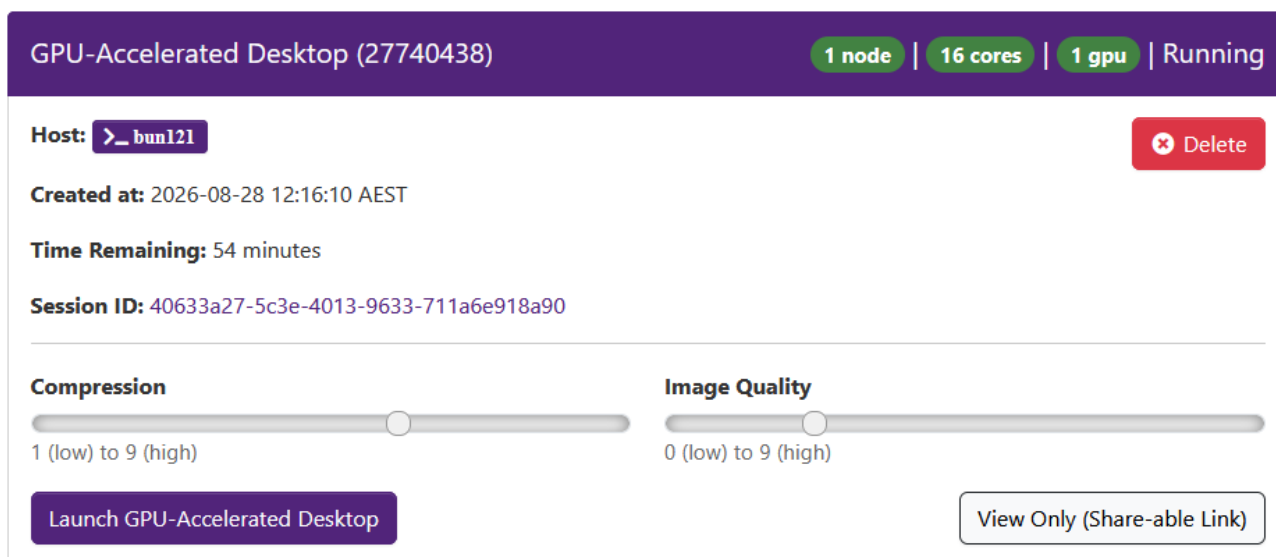


Figure 1: HPC Bunya OnDemand GPU-accelerated desktop running.

- On the visualisation desktop, open a MATE terminal by navigating to Applications > System Tools > MATE Terminal and type:
`module load huygens/26.04.0-p2`
`huygenspro`
(Fig. 2).

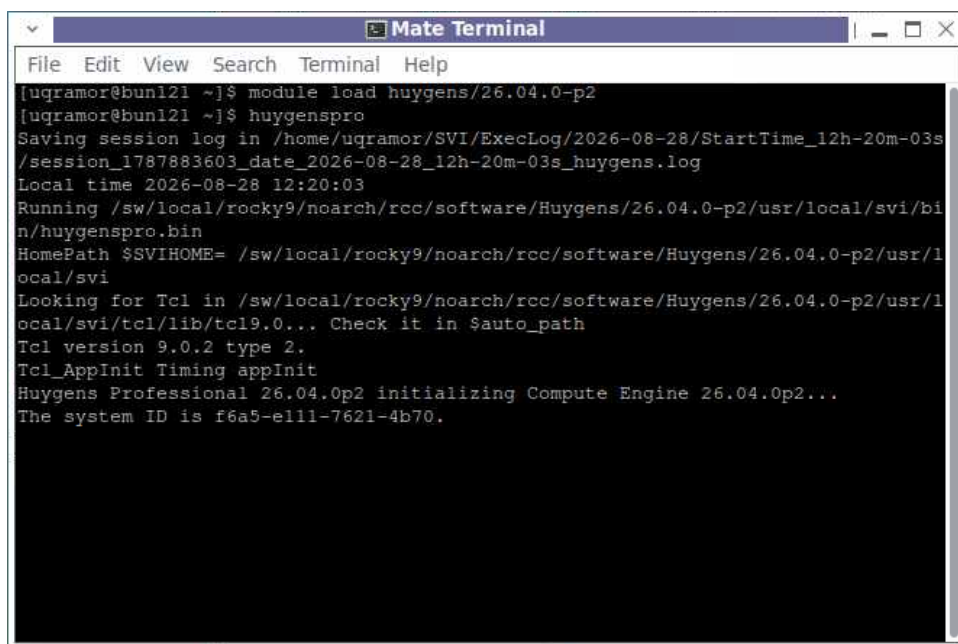


Figure 2: Running Huygens Professional via the MATE terminal.

5. This launches the Huygens Professional graphical user interface (GUI, Fig. 3).

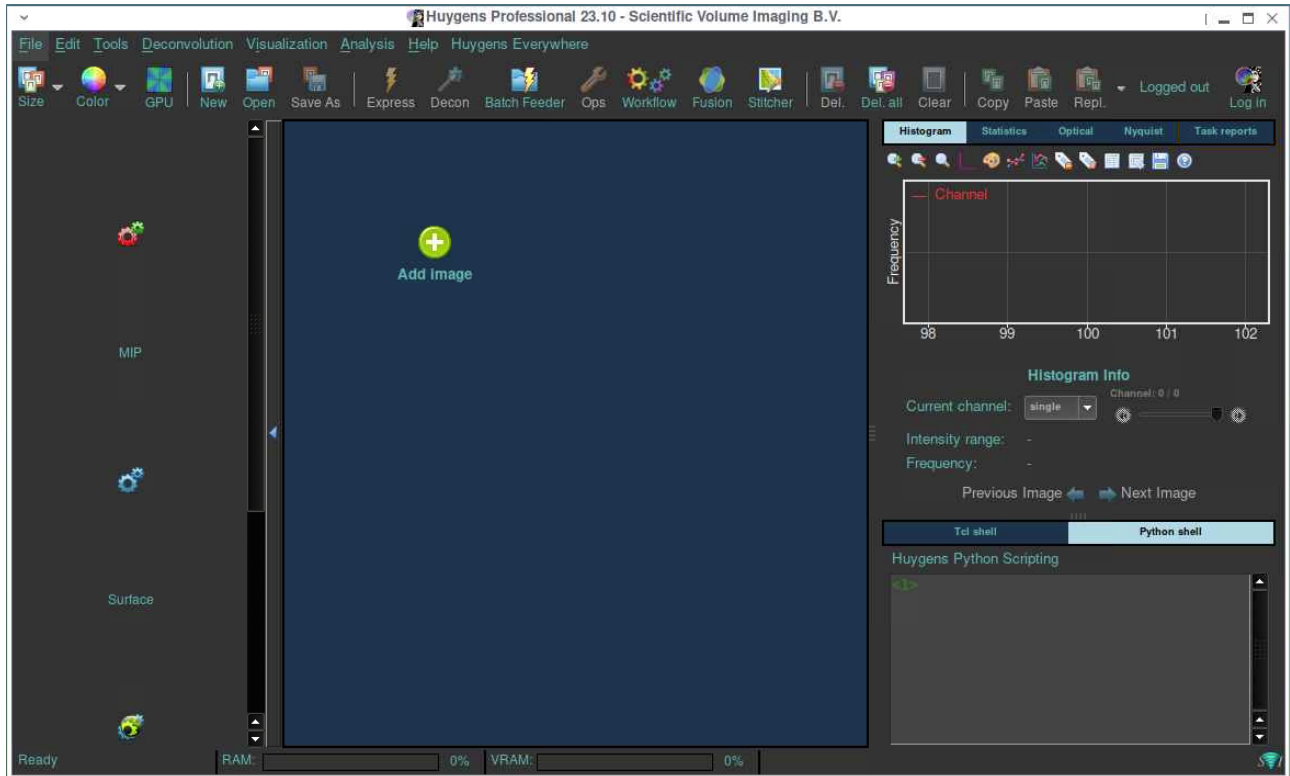


Figure 3: The Huygens Professional GUI.

6. Open an image and create a microscope template as normal (Fig. 4).

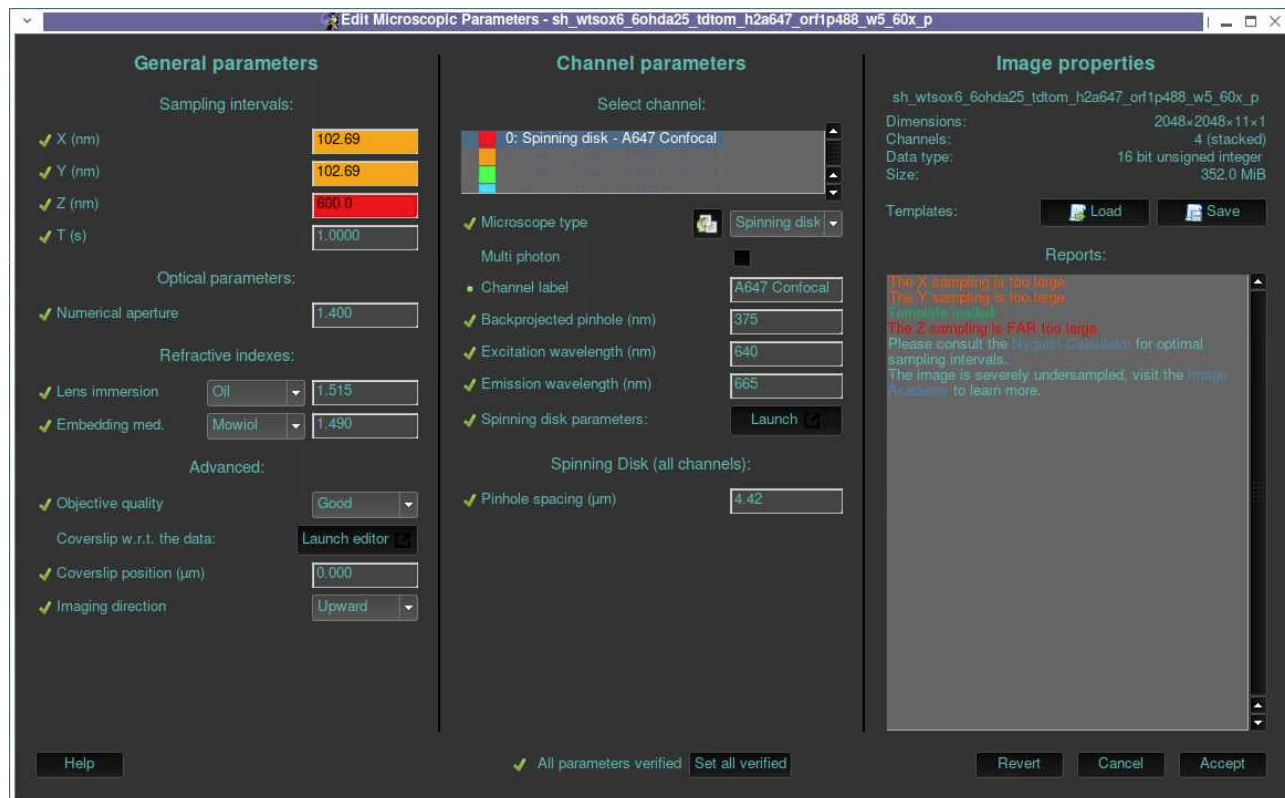


Figure 4: Creating a microscope template.

7. Do a deconvolution run using the wizard and save the deconvolution template as normal (Fig. 5).



Figure 5: Saving a deconvolution template.

8. Open the Workflow Processor and create a batch job, specifying the input images or folder, the microscope template, deconvolution template, and output file format and directory (Fig. 6).

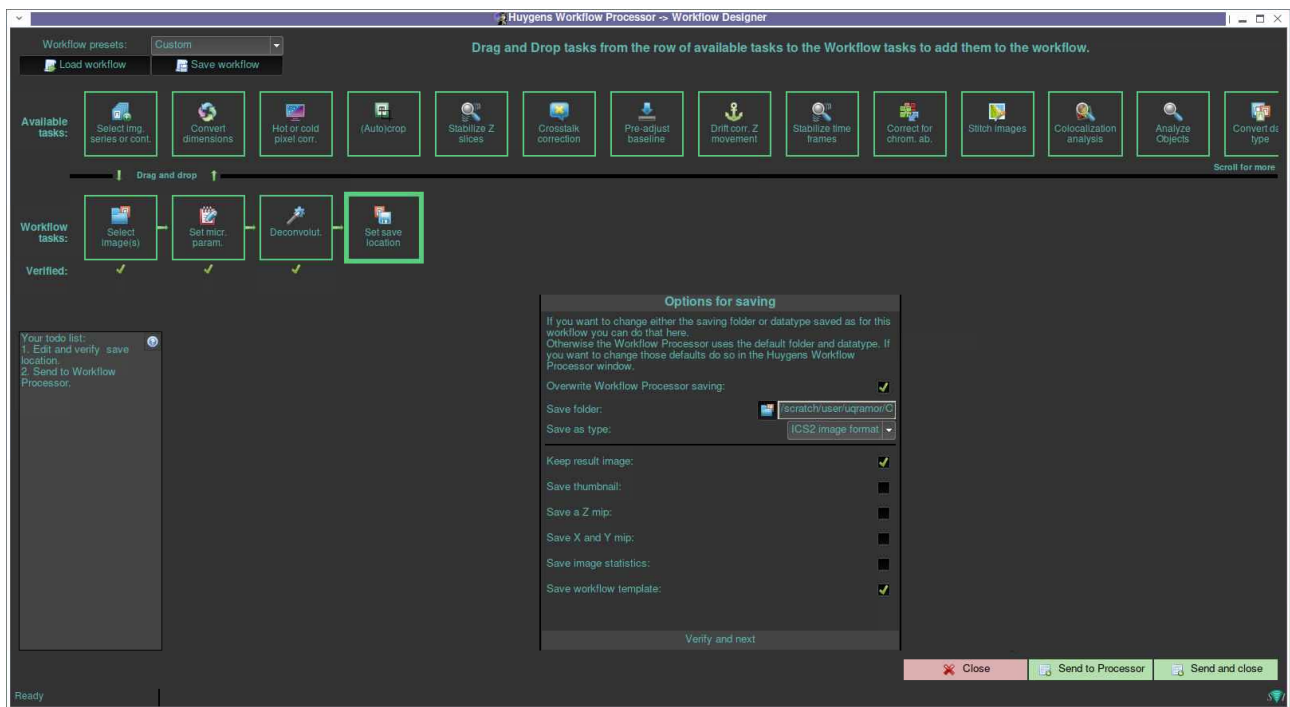


Figure 6: Creating a batch job on the Workflow Processor.

9. Save the batch template (.hgsb file, Fig. 7). You will use this template file to run batch jobs with Huygens Core, on the visualisation desktop and on SLURM.

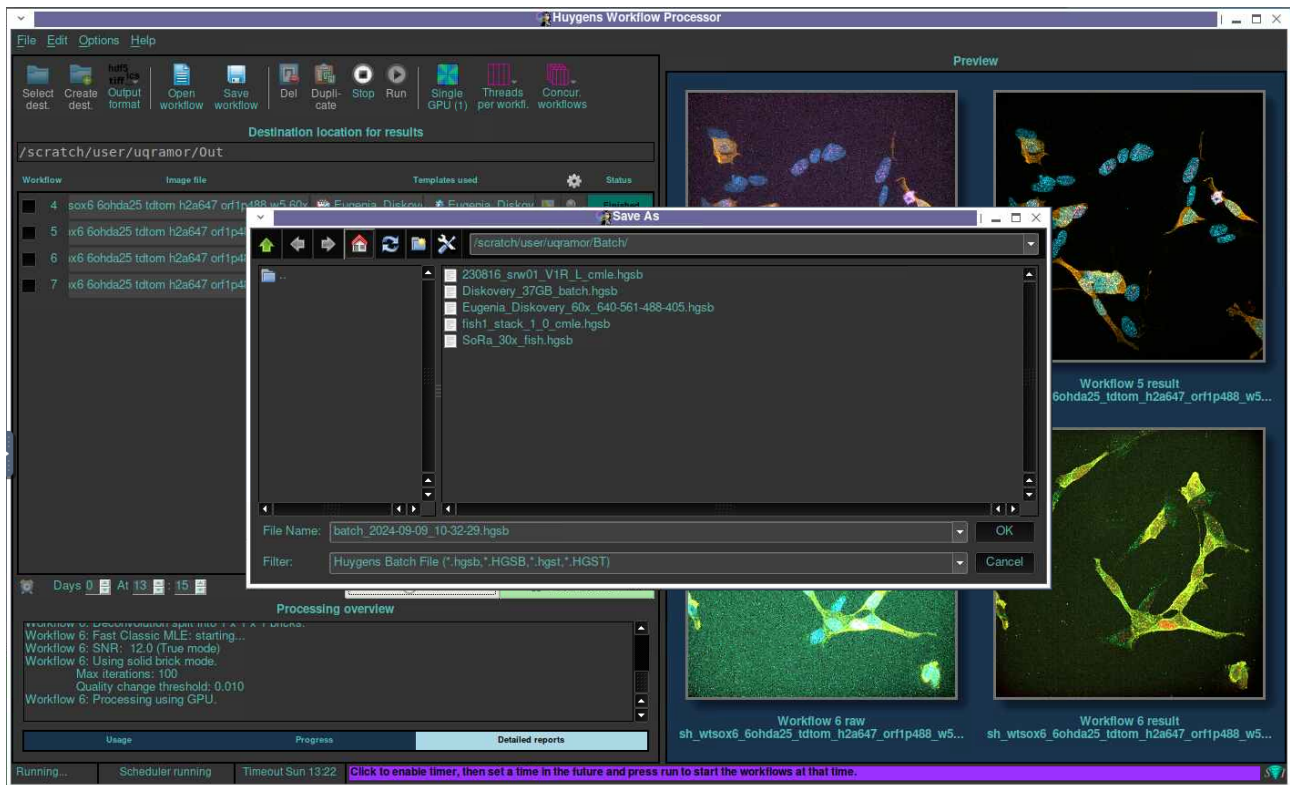


Figure 7: Saving a batch template.

10. Run Huygens Core by opening a new terminal and typing:

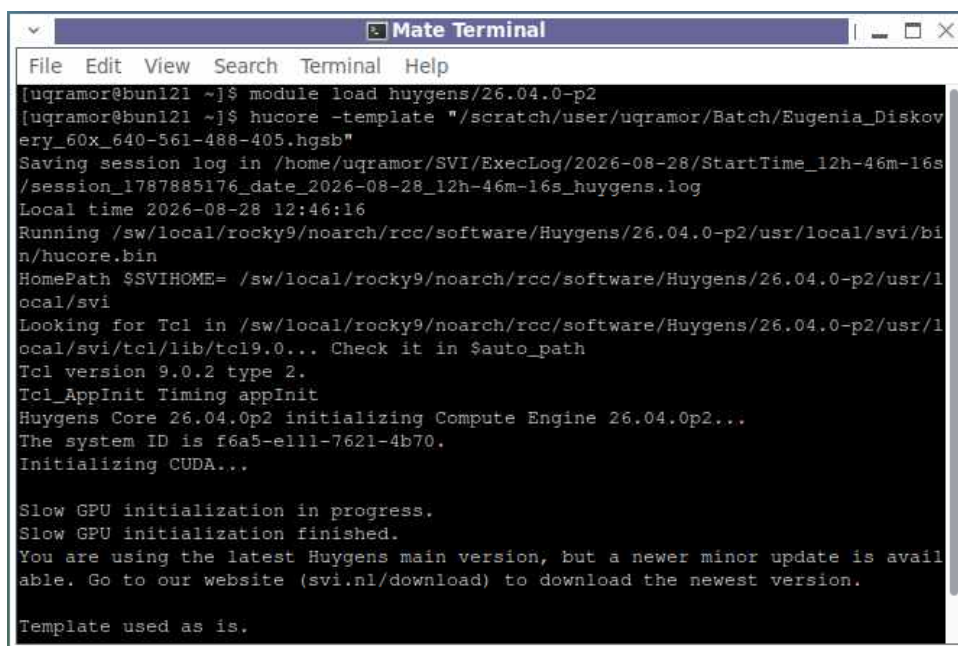
```
module load huygens/26.04.0-p2
hucore -template 'batch.template.location'
```

for example,

```
hucore -template '/scratch/user/uqramor/Batch/Eugenia_Diskcovery_60x_640-561-488-405.hgsb'
```

(Fig. 8).

Huygens Core will then run the batch job and save the outputs in the directory specified on the batch template.

A screenshot of a terminal window titled "Mate Terminal". The terminal shows the execution of the 'hucore' command with a specific template. The output includes information about saving session logs, local time, running the hucore binary, setting environment variables like \$SVIHOME, checking for Tcl, and initializing the Compute Engine and CUDA. It also displays a message about GPU initialization and a notice about a newer minor update being available.

```
Mate Terminal
File Edit View Search Terminal Help
[uqramor@bun121 ~]$ module load huygens/26.04.0-p2
[uqramor@bun121 ~]$ hucore -template "/scratch/user/uqramor/Batch/Eugenia_Diskcovery_60x_640-561-488-405.hgsb"
Saving session log in /home/uqramor/SVI/ExecLog/2026-08-28/StartTime_12h-46m-16s/session_1787885176_date_2026-08-28_12h-46m-16s_huygens.log
Local time 2026-08-28 12:46:16
Running /sw/local/rocky9/noarch/rcc/software/Huygens/26.04.0-p2/usr/local/svi/bin/hucore.bin
HomePath $SVIHOME= /sw/local/rocky9/noarch/rcc/software/Huygens/26.04.0-p2/usr/local/svi
Looking for Tcl in /sw/local/rocky9/noarch/rcc/software/Huygens/26.04.0-p2/usr/local/svi/tcl/lib/tcl9.0... Check it in $auto_path
Tcl version 9.0.2 type 2.
Tcl_AppInit Timing appInit
Huygens Core 26.04.0p2 initializing Compute Engine 26.04.0p2...
The system ID is f6a5-e111-7621-4b70.
Initializing CUDA...

Slow GPU initialization in progress.
Slow GPU initialization finished.
You are using the latest Huygens main version, but a newer minor update is available. Go to our website (svi.nl/download) to download the newest version.

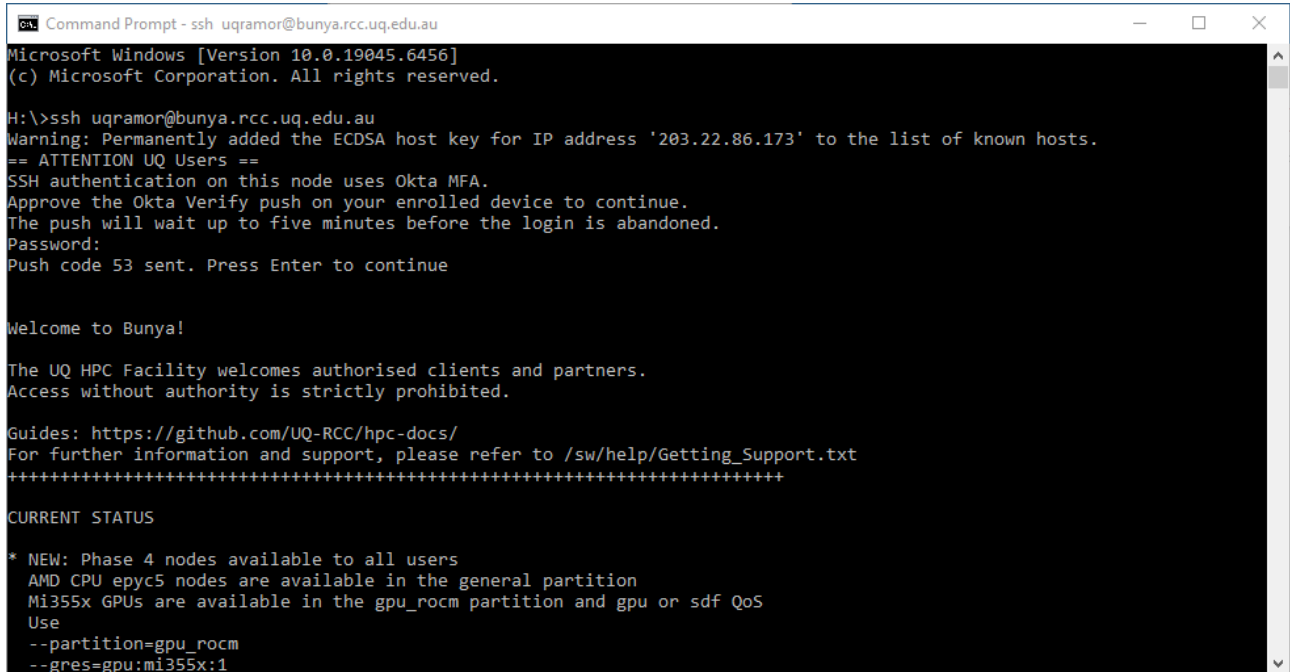
Template used as is.
```

Figure 8: Running Huygens Core via OnDemand.

Huygens SLURM on Bunya

1. On your machine, open a terminal window. Log on to Bunya by typing:
`ssh USERID@bunya.rcc.uq.edu.au`

Enter your UQ password. Go through the Duo authentication prompts. You will then be logged on to Bunya (Fig. 9).



```
Command Prompt - ssh uqramor@bunya.rcc.uq.edu.au
Microsoft Windows [Version 10.0.19045.6456]
(c) Microsoft Corporation. All rights reserved.

H:\>ssh uqramor@bunya.rcc.uq.edu.au
Warning: Permanently added the ECDSA host key for IP address '203.22.86.173' to the list of known hosts.
== ATTENTION UQ Users ==
SSH authentication on this node uses Okta MFA.
Approve the Okta Verify push on your enrolled device to continue.
The push will wait up to five minutes before the login is abandoned.
Password:
Push code 53 sent. Press Enter to continue

Welcome to Bunya!

The UQ HPC Facility welcomes authorised clients and partners.
Access without authority is strictly prohibited.

Guides: https://github.com/UQ-RCC/hpc-docs/
For further information and support, please refer to /sw/help/Getting_Support.txt
+++++

CURRENT STATUS

* NEW: Phase 4 nodes available to all users
  AMD CPU epyc5 nodes are available in the general partition
  Mi355x GPUs are available in the gpu_rocm partition and gpu or sdf QoS
  Use
  --partition=gpu_rocm
  --gres=gpu:mi355x:1
```

Figure 9: Connecting to Bunya via ssh on a terminal window.

- By default, you will be on the /home directory. Print the current working directory:

```
$ pwd
```

(Note: “\$” indicates a command line and is not part of the command.)

UQ RCC requires that all jobs are called from the /scratch directory. Change to your /scratch directory:

```
$ cd /scratch/user/USERID
```

(Fig. 10).

```

Command Prompt - ssh uqramor@bunya.rcc.uq.edu.au
--gres=gpu:mi355x:1

* NEW: Bunya has changed from DUO to Okta for UQ users
* L40 GPUs no longer available in gpu_cuda

* Next maintenance 7pm Monday 9th November until 9pm Tuesday 10th Tuesday

* Jobs leaving GPU resources idle will be automatically deleted.
* IDE processes on login nodes will be terminated.
* 90 days file expiry on /scratch/user and /scratch/projects

* If you are using MPI codes and have not built it in 2026,
  then you need to add this option --mpi=pmix_v4 to your srun command.
  That is, srun --mpi=pmix_v4 [then the rest of your srun command line]

*****

Last failed login: Fri Aug 28 13:13:19 AEST 2026 from 10.49.122.159 on ssh:notty
There were 2 failed login attempts since the last successful login.
[uqramor@bunya5 ~]$ pwd
/home/uqramor
[uqramor@bunya5 ~]$ ls
Desktop  Downloads      HuygensGpu.txt  ondemand  Public  Templates
Documents HuygensError.txt Music           Pictures  SVI     Videos
[uqramor@bunya5 ~]$ cd /scratch/user/uqramor
[uqramor@bunya5 uqramor]$ ls
710  Amira  Batch2  Collaborate  Diskovery  Installer  Out      SoRa  tmp
980  Batch  Blue    'Demo Images'  hucore2.sh  Leica     slurm-27746569.out  STEDYCON  Yokogawa
[uqramor@bunya5 uqramor]$

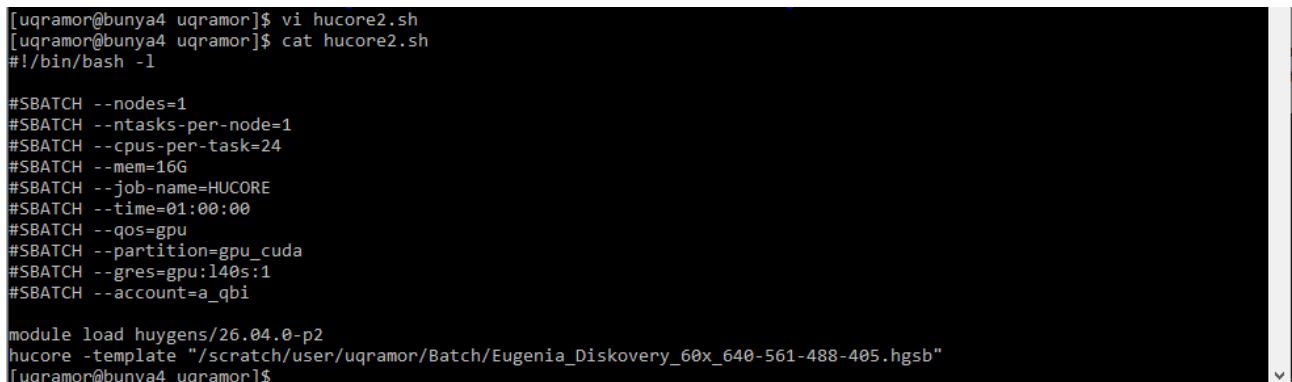
```

Figure 10: Printing the current working directory and changing to the scratch directory.

3. Create a script to submit your job to the SLURM scheduler. Use vi, or a similar editor. Give the script a name, and use .sh as the extension (Fig. 11).

Watch QCIF's quick overview of vi here:

https://www.youtube.com/watch?v=TuR9d9Z_Fis



```
[uqramor@bunya4 uqramor]$ vi hucore2.sh
[uqramor@bunya4 uqramor]$ cat hucore2.sh
#!/bin/bash -l

#SBATCH --nodes=1
#SBATCH --ntasks-per-node=1
#SBATCH --cpus-per-task=24
#SBATCH --mem=16G
#SBATCH --job-name=HUCORE
#SBATCH --time=01:00:00
#SBATCH --qos=gpu
#SBATCH --partition=gpu_cuda
#SBATCH --gres=gpu:l40s:1
#SBATCH --account=a_qbi

module load huygens/26.04.0-p2
hucore -template "/scratch/user/uqramor/Batch/Eugenia_Discovery_60x_640-561-488-405.hgsb"
[uqramor@bunya4 uqramor]$
```

Figure 11: An example script to submit a Huygens Core job to SLURM.

A short description of the lines on the script follows. The Bunya User Guide has more information.

`#!/bin/bash -l`

→ We are using BASH (the Bourne Again SHell), a shell program and command language for Linux. The `-l` command makes the shell a login shell.

The `SBATCH` commands are for allocating resources:

`#SBATCH --nodes=1` → number of nodes

`#SBATCH --ntasks-per-node=1` → 1 for single- and multi-thread jobs

`#SBATCH --cpus-per-task=24` → number of threads

`#SBATCH --mem=16G` → RAM per job in MB, GB, TB; see the Bunya guide

`#SBATCH --job-name=HUCORE` → the name you give your job

`#SBATCH --time=01:00:00` → time the job needs to complete; max=168 hrs for `gpu_cuda`, =24hrs for `gpu_viz`

`#SBATCH --qos=gpu` → the Quality of Service name; see the QoS guide

`#SBATCH --partition=gpu_cuda` → you are using the GPU partition;

`#SBATCH --gres=gpu:l40s:1` → GPU type and number; in this example, using one L40s GPU; can also use “`gres=gpu:nvidia_a100_80gb_pcie_1g.10gb:1`” or “`gres=gpu:h100:1`”

`#SBATCH --account=a_qbi` → your accounting group

The next two lines launch Huygens Core for batch runs:

`module load huygens/26.04.0-p2` → launches the Huygens module

`hucore -template ‘.hgsb batch file’` → launches Huygens Core and runs the batch job as specified in the template

4. Submit the job to SLURM:
`$ sbatch SCRIPT.FILENAME`

```
[uqramor@bunya4 uqramor]$ sbatch hucore2.sh
Submitted batch job 27746569
```

Figure 12: Submitting the job to SLURM.

5. Check the status in the job queue:
`$ squeue --me`

```
[uqramor@bunya4 uqramor]$ squeue --me
      JOBID PARTITION   NAME     USER ST       TIME  NODES MODELIST(REASON)
      27746569   gpu_cuda   HUCORE   uqramor PD       0:00      1 (Priority)
      27740439   gpu_viz   Viz_Desk uqramor PD       0:00      1 (Resources)
```

Figure 13: Checking the status in the queue.

6. Monitor the job by using the `tail` command.
`$ tail -f slurm-JOBID.out`

To exit the `tail` command, press Ctrl + C.

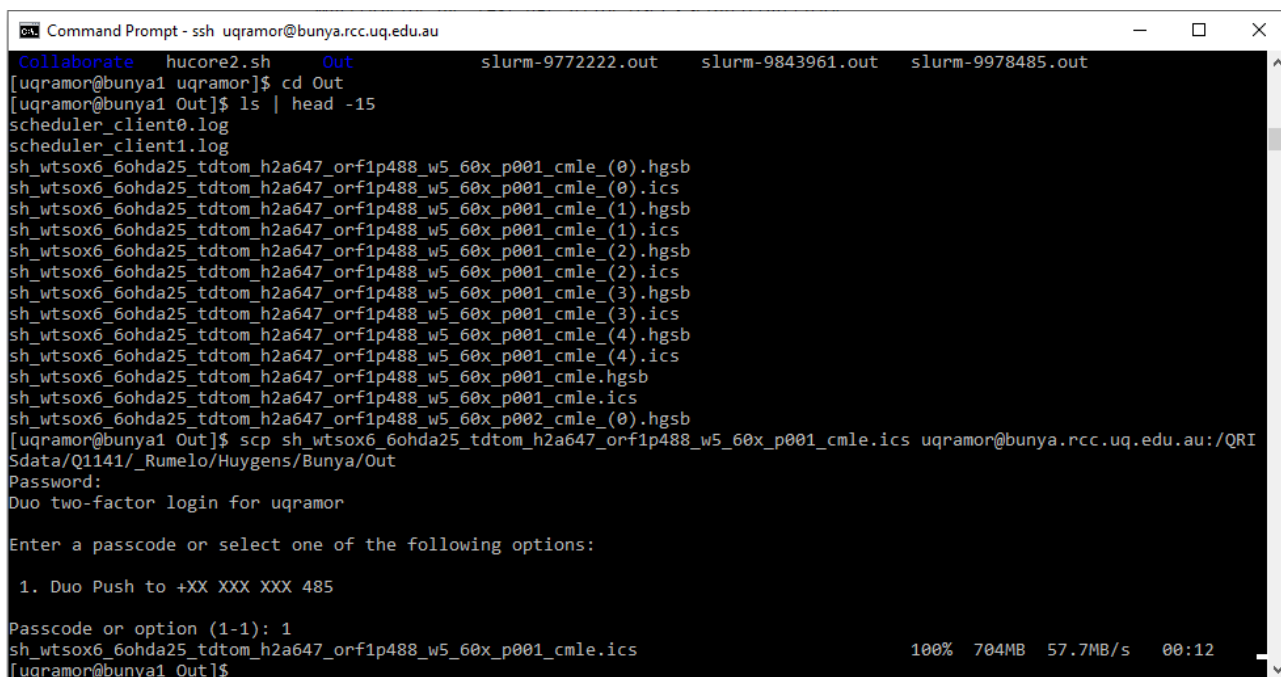
```
[uqramor@bunya4 uqramor]$ tail -f slurm-27746569.out
t dim: 1.000
Doing task imgSave...
Scaling mode while saving: -cmode scale
Scaling mode while saving: -cmode scale
Saving image using command: sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p_cmle__2_ save {/scratch/user/uqramor/Out/sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p_cmle_(2).ics} -type ics2 -cmode scale
Skipped saving template as requested.
Successfully saved results to: {/scratch/user/uqramor/Out/sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p_cmle_(2).ics}

Template /scratch/user/uqramor/Batch/Eugenia_Diskovery_60x_640-561-488-405.hgsb successfully processed
Tcl_AppInit App init time 76.67
Local time 2026-08-28 14:12:55
^C
[uqramor@bunya4 uqramor]$
```

Figure 14: Monitoring the job.

7. When the job is done, use scp (secure copy) to transfer individual files to your RDM collection:

```
$ scp FILENAME USERID@bunya.rcc.uq.edu.au:/RDM_FILE_PATH
```



```

Command Prompt - ssh uqramor@bunya.rcc.uq.edu.au
Collaborate hucore2.sh Out slurm-9772222.out slurm-9843961.out slurm-9978485.out
[uqramor@bunya1 uqramor]$ cd Out
[uqramor@bunya1 Out]$ ls | head -15
scheduler_client0.log
scheduler_client1.log
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p001_cmle_(0).hgsb
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p001_cmle_(0).ics
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p001_cmle_(1).hgsb
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p001_cmle_(1).ics
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p001_cmle_(2).hgsb
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p001_cmle_(2).ics
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p001_cmle_(3).hgsb
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p001_cmle_(3).ics
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p001_cmle_(4).hgsb
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p001_cmle_(4).ics
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p001_cmle.hgsb
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p001_cmle.ics
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p002_cmle_(0).hgsb
[uqramor@bunya1 Out]$ scp sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p001_cmle.ics uqramor@bunya.rcc.uq.edu.au:/QRI
Sdata/Q1141/_Rumelo/Huygens/Bunya/Out
Password:
Duo two-factor login for uqramor

Enter a passcode or select one of the following options:

1. Duo Push to +XX XXX XXX 485

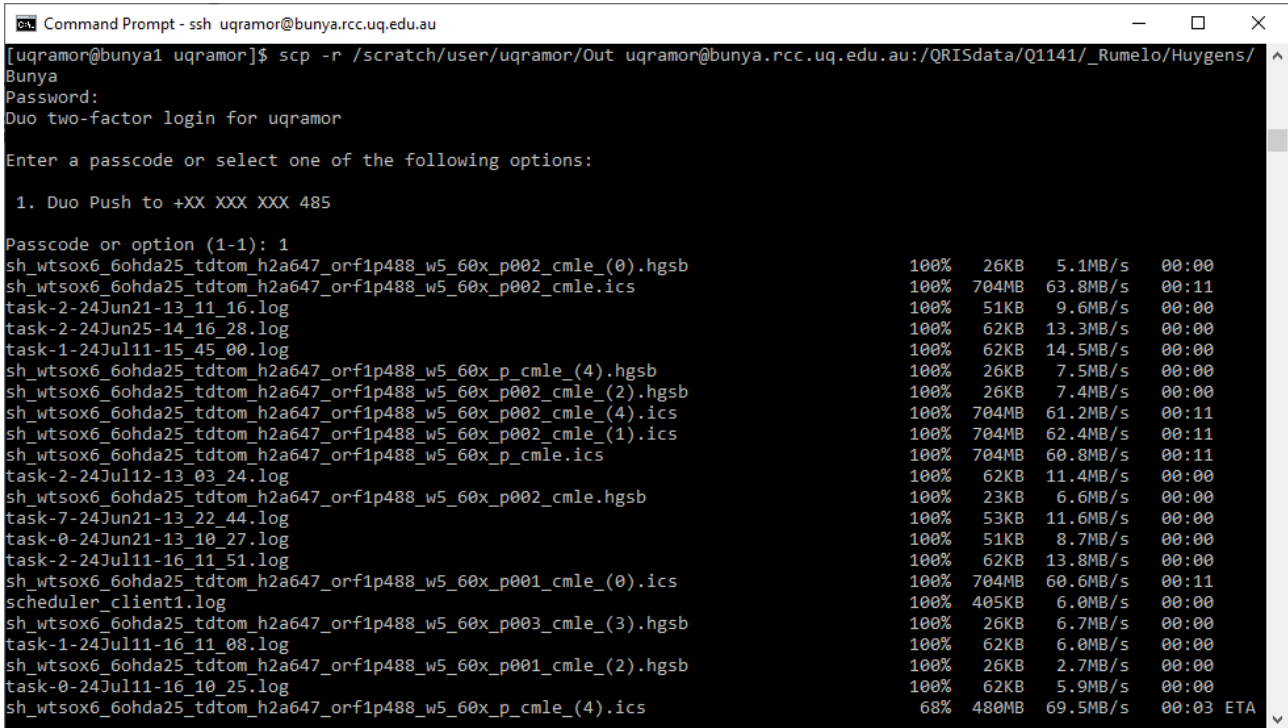
Passcode or option (1-1): 1
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p001_cmle.ics 100% 704MB 57.7MB/s 00:12
[uqramor@bunya1 Out]$

```

Figure 15: Transferring a file using scp.

or copy the whole output directory:

```
$ scp -r OUTPUT_DIRECTORY USERID@bunya.rcc.uq.edu.au:/RDM_FILE_PATH
```



```
Command Prompt - ssh uqramor@bunya.rcc.uq.edu.au
[uqramor@bunya1 uqramor]$ scp -r /scratch/user/uqramor/Out uqramor@bunya.rcc.uq.edu.au:/QRISdata/Q1141/_Rumelo/Huygens/
Bunya
Password:
Duo two-factor login for uqramor
Enter a passcode or select one of the following options:
1. Duo Push to +XX XXX XXX 485
Passcode or option (1-1): 1
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p002_cmle_(0).hgsb      100% 26KB 5.1MB/s 00:00
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p002_cmle_(2).hgsb      100% 704MB 63.8MB/s 00:11
task-2-24Jun21-13_11_16.log      100% 51KB 9.6MB/s 00:00
task-2-24Jun25-14_16_28.log      100% 62KB 13.3MB/s 00:00
task-1-24Jul11-15_45_00.log      100% 62KB 14.5MB/s 00:00
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p_cmle_(4).hgsb      100% 26KB 7.5MB/s 00:00
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p002_cmle_(2).hgsb      100% 26KB 7.4MB/s 00:00
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p002_cmle_(4).ics      100% 704MB 61.2MB/s 00:11
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p002_cmle_(1).ics      100% 704MB 62.4MB/s 00:11
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p_cmle_(1).ics      100% 704MB 60.8MB/s 00:11
task-2-24Jul12-13_03_24.log      100% 62KB 11.4MB/s 00:00
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p002_cmle.hgsb      100% 23KB 6.6MB/s 00:00
task-7-24Jun21-13_22_44.log      100% 53KB 11.6MB/s 00:00
task-0-24Jun21-13_10_27.log      100% 51KB 8.7MB/s 00:00
task-2-24Jul11-16_11_51.log      100% 62KB 13.8MB/s 00:00
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p001_cmle_(0).ics      100% 704MB 60.6MB/s 00:11
scheduler_client1.log      100% 405KB 6.0MB/s 00:00
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p003_cmle_(3).hgsb      100% 26KB 6.7MB/s 00:00
task-1-24Jul11-16_11_08.log      100% 62KB 6.0MB/s 00:00
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p001_cmle_(2).hgsb      100% 26KB 2.7MB/s 00:00
task-0-24Jul11-16_10_25.log      100% 62KB 5.9MB/s 00:00
sh_wtsox6_6ohda25_tdtom_h2a647_orf1p488_w5_60x_p_cmle_(4).ics      68% 480MB 69.5MB/s 00:03 ETA
```

Figure 16: Transferring the output directory using scp.

Acknowledgments

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