

# Overview of Oscar

Long-term visitors to ICERM who receive a Brown ID are provided with an exploratory account on the Oscar high performance computing cluster maintained by Brown's [Center for Computation and Visualization](#). Oscar access may also be provided to short-term visitors on request-basis with *advance notice*.

*If you are coming for a short-term visit and would like to request Oscar access, please contact ICERM IT staff no later than three weeks before your planned visit to ensure enough time to process a sponsored ID and enable Oscar access.*

Oscar can be used via SSH terminal or via the Oscar VNC client. The Oscar VNC client is preinstalled and available on the thin clients in all ICERM 10th floor offices and the graduate student workspace in the 10th floor lobby.

## Using Oscar

Oscar provides both [command line \(SSH\)](#) access and [virtual desktop \(VNC\)](#) access to the computing cluster. All Oscar accounts are capable of using both interfaces, so you should choose the method that will work best for what you are trying to accomplish.

Oscar accounts are tied to Brown Shibboleth accounts, so you must have an ICERM Sponsored Brown ID to use Oscar. Once Oscar access is enabled for your Brown account, you can log in to SSH and VNC using your Brown Shibboleth username and password.

## SSH Usage

Oscar's SSH interface provides a standard command line shell for interacting with the cluster. This is the best option for using simple command line scripts and submitting scripts for batch job processing. See the [SSH Login Instructions](#) for information on how to connect and basic usage. It's important to note that you should never run complex scripts or computations within the SSH login nodes. Computations should either be submitted as batch jobs or run in an interactive compute session using the `interact` command.

## Open OnDemand

Oscar's OOD is a web portal to the Oscar computing cluster. This is the easiest way to access Oscar and navigate around. Once logged in you effortlessly be able to access active jobs, use MATLAB or Mathematica, and even use the Oscar Shell CLI. See the [OOD Login Instructions](#) for information on how to get started with the web portal.

## VNC Usage

Oscar's VNC client provides a standard Linux graphical desktop using virtual network computing. If you'd like to use applications with a GUI, such as MATLAB or Mathematica, this is the best way to do so. Oscar's VNC sessions run within the scheduling system directly on a compute node, similar to the `interact` command, so you can run computations directly in the VNC session. See the [VNC Login Instructions](#) for information on how to get started with the VNC client.

## Available Software

Oscar maintains a [large library of software packages](#) for use on the HPC cluster. Some of the most commonly used mathematical applications and languages available include:

- MATLAB
- Mathematica
- Sage
- Julia
- R
- Python
- Maple
- Magma

To see the most up to date list of available software, log in to your Oscar account and run the terminal command `module avail`.

## Loading Software Modules

Oscar has a large library of software available on the cluster, but only a few apps are pre-loaded in to your sessions. The commands below will allow you to list all available modules, search the list of modules, and load/unload software packages. When using Oscar over VNC, you must open the Terminal Emulator to run these commands.

- To view all available software packages, type `module avail`.

- To search the list of available packages, type `module avail <package>`.
- For example, to search for all available versions of mathematica: `module avail mathematica`. Many packages, like Mathematica, have multiple versions available. This command lets you see all available versions of the package you searched for.
- To load a package into your session, type `module load <package/version>`.
- For example, `module load mathematica/11.0`. This will load the Mathematica 11.0 into your session and make it available for use.
- To unload a package you are no longer using, type `module unload <packagename>`

## Module-specific Guides

- [Oscar: Mathematica](#)
- [Oscar: MATLAB](#)
- [Oscar: Sage](#)

## Running Jobs

Oscar supports two main methods of running jobs: **batch jobs** and **interactive sessions**.

- Batch jobs are pre-scripted and can be submitted to the cluster's scheduler via the `sbatch` command.
- Interactive jobs are command-line sessions run directly on a compute node via the `interact` command that can be used in real time.

The [Running Jobs](#) page of the [Oscar User Manual](#) provides the most detailed and up-to-date instructions on scripting and submitting jobs.

## Important Notes About the Oscar Cluster

- **Please do not run any computations or simulations on the login nodes, as they are shared with other users. Use SLURM to submit a batch job to the queue for computations or start an interactive session on one of the compute nodes with the command `interact`.**

- The full [Oscar User Manual](#) is available on the CCV website.
- Oscar uses SLURM for managing batch jobs and interactive sessions on the cluster. Detailed instructions on submitting jobs is available on the [Running Jobs](#) page of the [Oscar User Manual](#).
- CCV has a [large library of software](#) already installed on the cluster. For a full list of available software, run the command `module avail`. More information about Oscar's software packages are available in the [Oscar User Manual](#). If you require a software package that is not currently available on the Oscar cluster, please contact ICERM's IT staff and we will work with CCV to get the software installed.
- Users can install sub-packages for some modules (like Sage and Python) to their home folders on their own by using the `-user` as an option in the install command. For example, with Sage, the command would be something like `sage -i <package name> -user`.
- The [Oscar VNC Client](#) is a Java application that can be installed on most laptops with Java installed. If you wish to install the client on your own laptop, please make sure to download the latest version of CCV VNC Client 2.0+ to ensure proper support and compatibility.

*If you have questions about these instructions or require further assistance, please contact the ICERM IT staff by dropping by the administrative offices or emailing [support@icerm.brown.edu](mailto:support@icerm.brown.edu).*

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