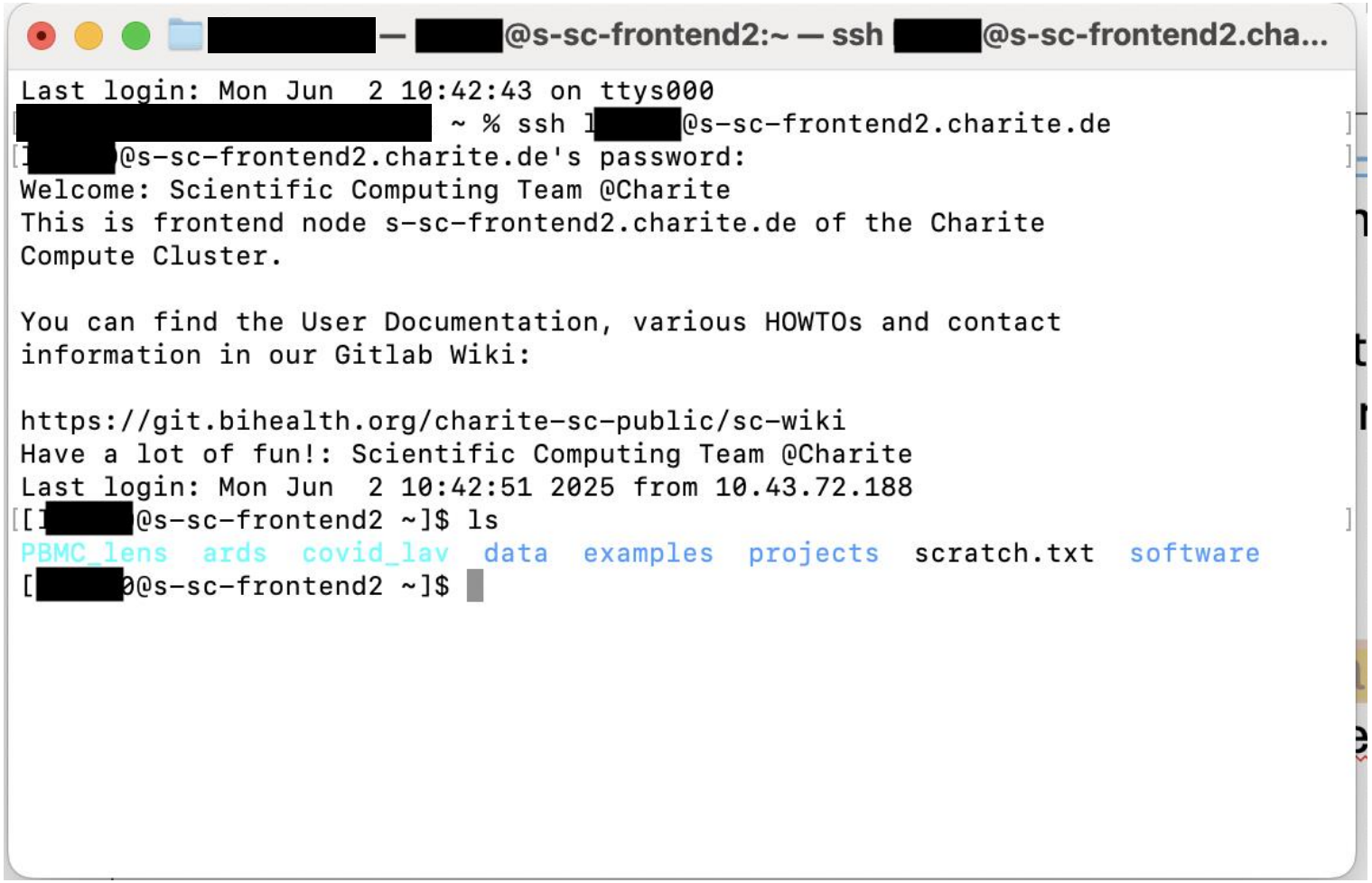
Working with the Charité high performance cluster (HPC)

1) Obtain access to the **cluster**: write an email to sc-hpc-helpdesk@charite.de requesting access to the cluster from your charité email mentioning your Charité username (typically 5-7 characters, alphanumerical)
2) Obtain access to the **cluster documentation**: visit https://git.bihealth.org/charite-sc-public/sc-wiki/ , when first trying to access this, you are prompted to apply for access, which you should do (one sentence description of what you want to do with the cluster is sufficient) and which will hopefully be granted quickly

- Access the cluster via command line at
  - `ssh <username>@s-sc-frontend1.charite.de`

Working with the Charité high performance cluster (HPC)



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- Access the cluster via command line at
  - `ssh <username>@s-sc-frontend1.charite.de`
- **Access the jupyter hub (recommended for beginners** and interactive analyses) at
  - https://s-sc-hub.charite.de/hub/

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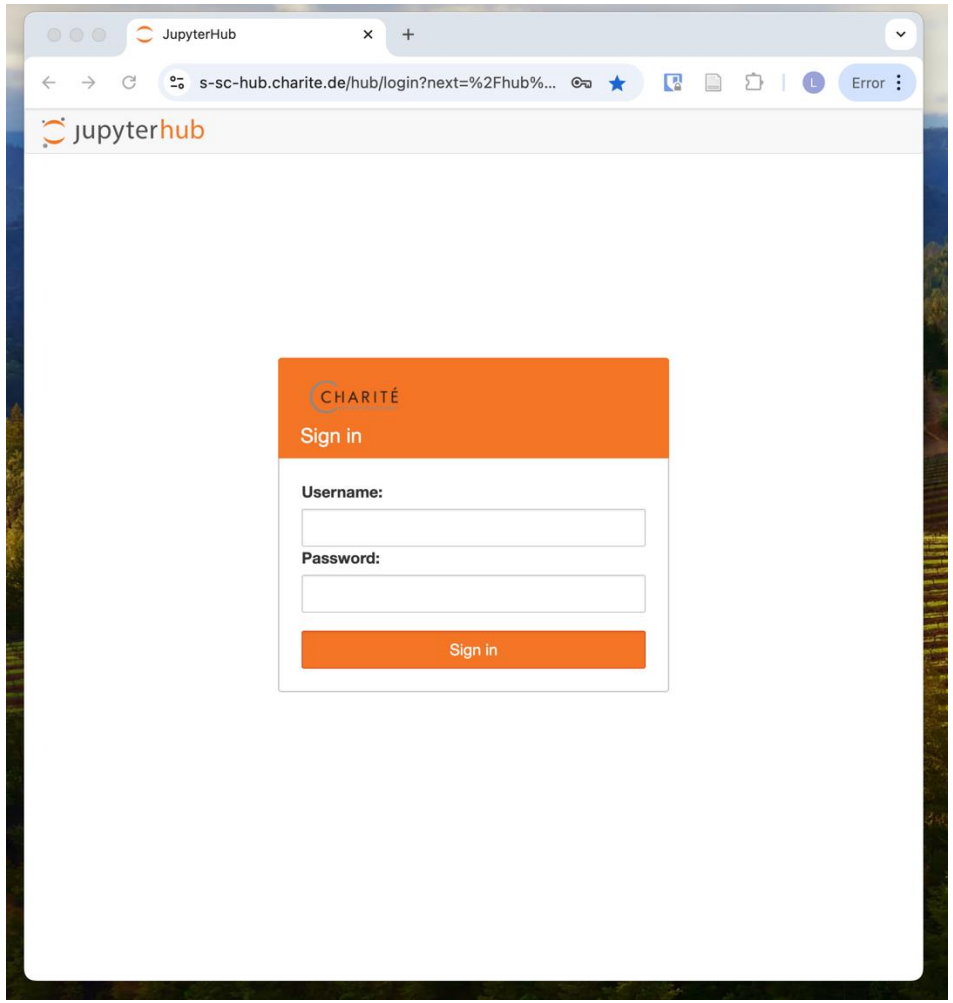

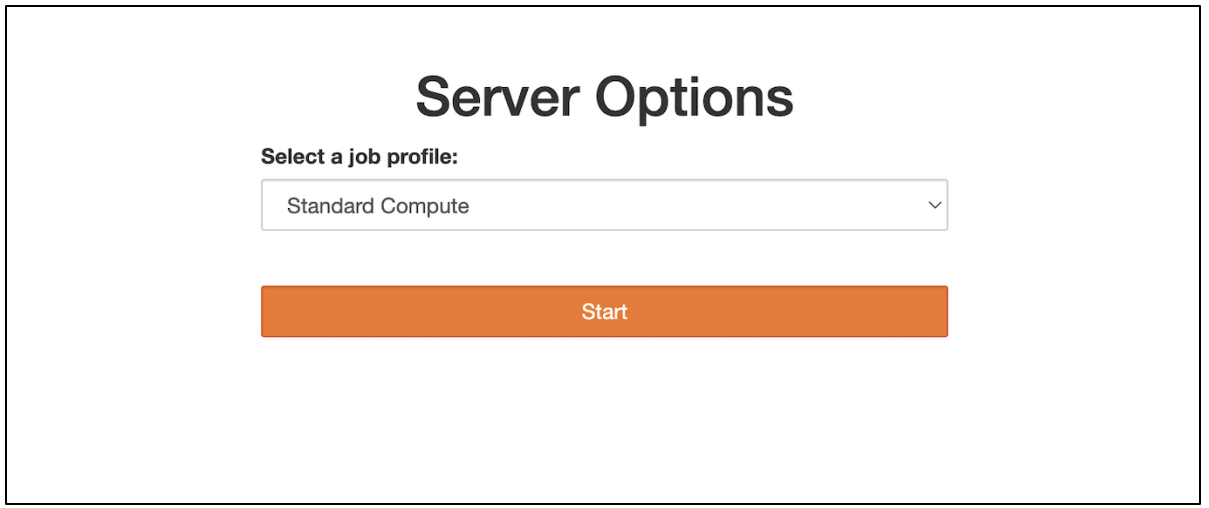

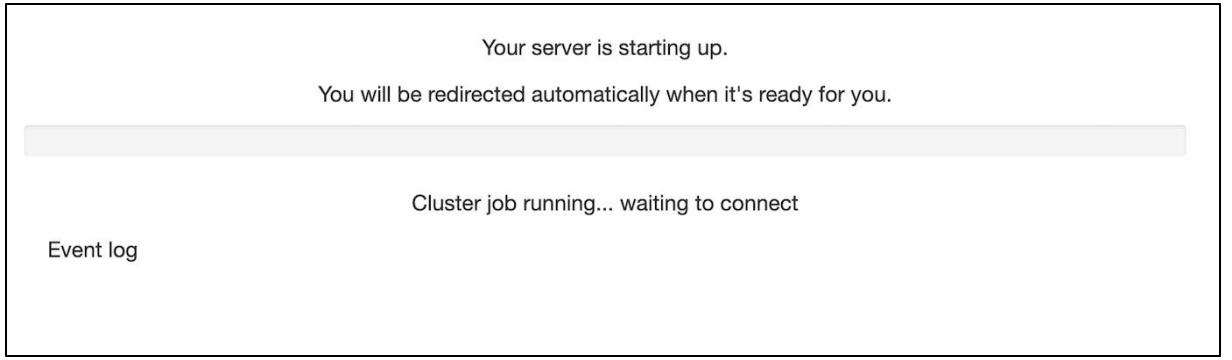

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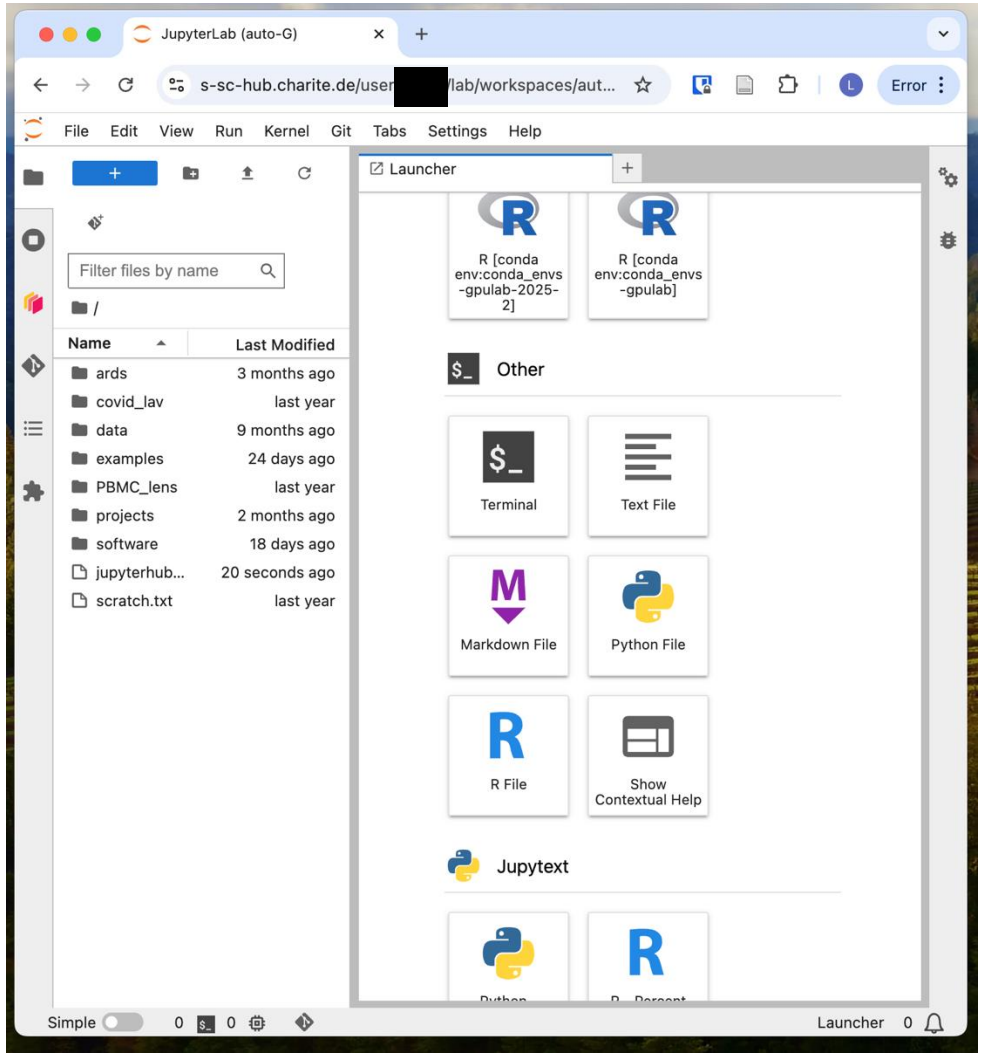

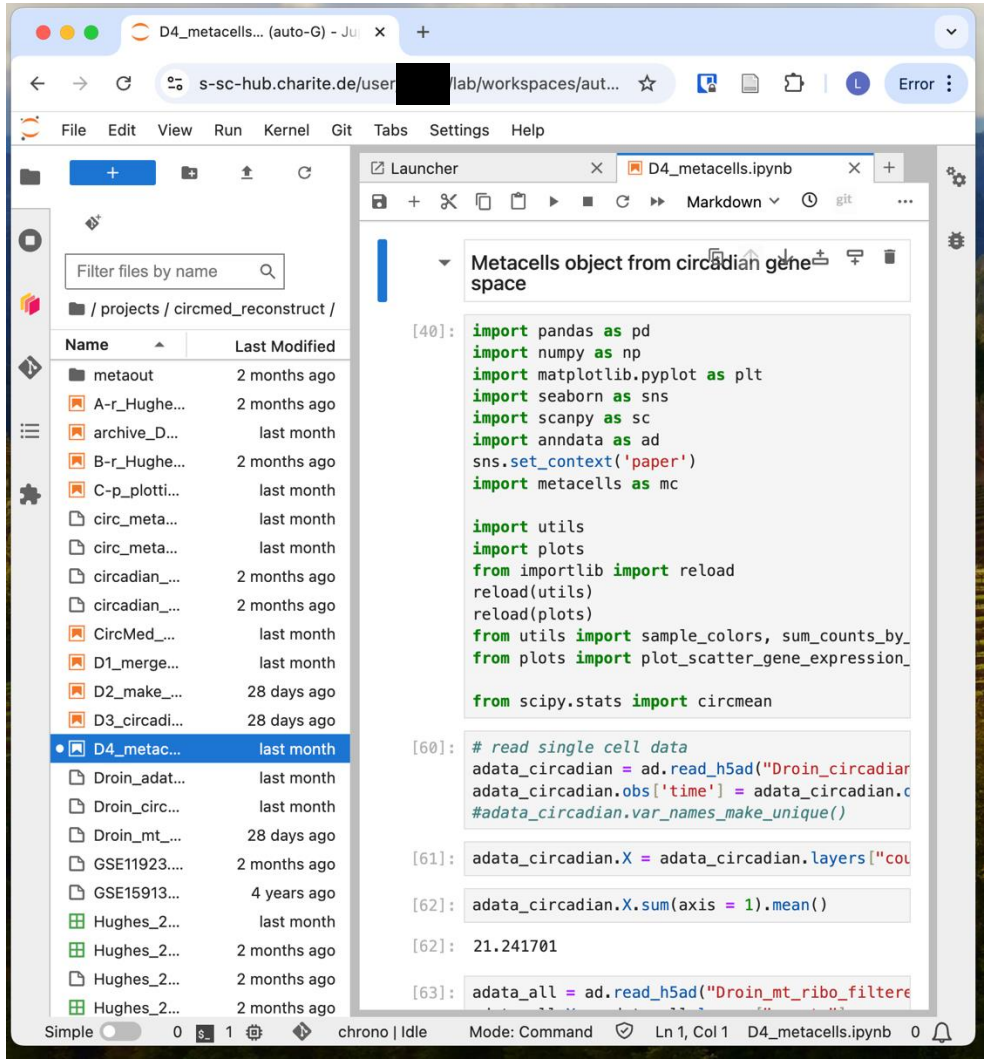

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2) Obtain access to the cluster documentation: visit https://git.bihealth.org/charite-sc-public/sc-wiki/ , when first trying to access this, you are prompted to apply for access, which you should do and which will hopefully be granted quickly

- Access the cluster via command line at
  - `ssh <username>@s-sc-frontend1.charite.de`
- Access the jupyter hub (recommended for beginners) at
  - https://s-sc-hub.charite.de/hub/

- **The cluster can be accessed only from within the Charité network**
- If you want to work remotely, you need VPN access with extra privileges ("Zusatzantrag O" filled according to the instructions here https://git.bihealth.org/charite-sc-public/sc-wiki/-/wikis/Resources/User%20Documentation/User%20Guide:%20HPC%20@Charite#connection-to-the-cluster-from-outside-the-charite-network-over-vpn and screenshot on the next slide)

Working with the Charité high performance cluster (HPC)

Connection to the cluster from outside the Charite network over VPN

If you need to connect to the cluster through VPN, you have to apply for VPN permissions (Antrag O). The current list of the relevant hosts and ports is here:

- s-sc-frontend1.charite.de, 22/ssh und 443/https
- s-sc-frontend2.charite.de, 22/ssh und 443/https
- s-sc-frontend3.charite.de, 22/ssh und 443/https
- s-sc-hub.charite.de, 443/https
- s-sc-metrics.charite.de, 443/https

To simplify the VPN application process, the VPN-Team of the Charite IT (vpn@charite.de) has defined the group rule `charite-hpc-user-access`. You can simply enter the name of this group in your VPN application (Erweiterte Berechtigung »Spezifische Dienste« -> Zielsystem: Gruppenregel charite-hpc-user-access)

Note on the VPN application VPN permissions are neither necessary nor sufficient for cluster access. A granted VPN application does not imply login access to the frontend nodes. To be granted access to the cluster, please send a request to the SC Helpdesk as explained above.

Working with the Charité HPC – live demo of jupyter hub, documentation and dashborad

- **Access to jupyter hub** https://s-sc-hub.charite.de/hub/
- **General user guide** (includes info on how to use prebuilt conda environments to notebook kernels): https://git.bihealth.org/charite-sc-public/sc-wiki/-/wikis/Resources/User-Documentation/User-Guide:-HPC-@Charite
- How to submit jobs to SLURM (large and/or repetitive jobs, like alignment jobs, that do not require interaction) https://git.bihealth.org/charite-sc-public/sc-wiki/-/wikis/Resources/User-Documentation/User-Guide:-HPC-@Charite
- **Dashboard** of the cluster, shows how busy it is currently https://s-sc-metrics.charite.de/
- Applying for larger data storage folders works via email, as outlined here (PI or data owner involvement required) https://git.bihealth.org/charite-sc-public/sc-wiki/-/wikis/Resources/User-Documentation/User-Guide:-HPC-@Charite#data-storage
- Connecting **Rstudio** to the cluster is possible, but requires some fiddling https://git.bihealth.org/charite-sc-public/sc-wiki/-/wikis/Resources/HOWTOs/Rstudio

Of note - Charité HPC is not the same as BIH HPC

- In addition to the system described above, BIH also provides a Compute Cluster which can be used by Charité and MDC users
- The BIH HPC is extremely well documented, see here https://hpc-docs.cubi.bihealth.org/
- Obtaining access works via the group leader who first needs to apply for a user group to be installed

- Similar to Charité HPC, it also includes an interactive protal, the OnDemand portal https://hpc-portal.cubi.bihealth.org/pun/sys/dashboard
- This allows interactive jupyter notebook sessions as well as Rstudio sessions