

DRAGONS and NIFS processing at the CADC



CANFAR Canadian Advanced Network For Astronomy Research

- Developed by the NRC's Canadian Astronomy Data Centre (CADDC)
- Operated on Digital Research Alliance of Canada hardware by the CADDC
- Built to support Canadian astronomers at Canadian universities and at NRC
- Provides significant digital resources (compute cores and storage)
- Based on Docker containers
- Offerings:
 - Remote desktop environment
 - Notebook sessions
 - CARTA image viewer
 - User storage
 - Access control to data and software
 - Keep private
 - Share with team
 - Make public
- Uptake has been rapid

CANFAR Science Portal

Launch different session containers with specified resources

- Desktops (for launching and displaying non-browser apps)
- Notebook servers
- CARTA Visualization servers

The screenshot displays the CANFAR Science Portal interface. At the top, there is a navigation bar with the CANFAR logo and links for Documentation, Services, About, Open Source, Support, and a user profile for Brian Major. Below this is a section titled "Active Sessions" which shows three active sessions: "carta1", "desktop1", and "notebook1". Each session is represented by a card with its respective icon and name. Below the active sessions is a "Launch" section with a "Session Type" dropdown menu. The dropdown menu is open, showing a list of supported session types: "notebook", "carta", and "desktop". The "type" field is currently set to "notebook". Other fields in the launch form include "container image" (images.canfar.net/highz-alma/notebook-astrophy:0.1), "memory" (16), and "# cores" (2). There are "Launch" and "Reset" buttons at the bottom of the form.

Notebook Session

The JupyterLab environment

The screenshot displays a JupyterLab interface in a web browser. The browser tabs include CANFAR, Science Por, 1 - JupyterL, CARTA, and ARCADE. The address bar shows the URL `ws-uv.canfar.net/notebook/zieh596p/lab/tree/headless`. The JupyterLab interface has a top menu bar with options: File, Edit, View, Run, Kernel, Git, Diagram, Tabs, Settings, Help, and Share. The memory usage is indicated as Mem:137 MB.

On the left, a file browser shows the directory `/ headless /` with two files: `test-1a` and `test-1b`, both last modified 3 months ago. A search bar is present with the text "Filter files by name".

The main area contains a terminal window titled "Terminal 1" with the following output:

```
majorb ~ $
majorb ~ $
majorb ~ $ id
uid=20001(majorb) gid=20001(majorb) groups=20001(majorb),100(use
rs),30091(AdminTest),30093(ABC),30127(CANFAR-Staff),30272(Alinga
Test),30276(Adrian-TEST),30497(caom2TestGroupWrite),34127(CFHT-1
5AP10),34210(CFHT-15AP09),34241(CADC),34337(CAOM2),34347(CFHT-15
BP10),34381(CFHT-15BP09),34635(CFHT-16AP10),34637(CFHT-16AP09),3
4964(CFHT-16BP09),35030(W-CADC),35039(W-ALL),35091(CFHT-16BP10),
35124(cadcstats),35126(CFHT-17AP30),35130(cadc-dev),35131(CFHT-1
7AP99),35141(cfis-read),35207(CFHT-17AP98),35219(INAF-Group),353
50(CFHT-17AT10),35375(CFHT-17BP99),35383(CFHT-17BP97),35440(MAST
-RW),35544(CFHT-17BS02),35550(CFHT-17BT01),36002(arbutus-cloud-u
sers),36003(CADC-DEVELOPMENT),36227(jao-cadc),1025424273(skaha-u
sers),1240980498(rc-harbor),1477619040(ARCADE-Users),1623998838(
skaha-admins)
majorb ~ $
majorb ~ $ cd
majorb ~ $ pwd
/arc/home/majorb
majorb ~ $
majorb ~ $
majorb ~ $ cd /arc/projects
majorb projects $ ls
ALMA_Outflows      cfis                LSST                unions
antennae           chime_frb          mlao                uvickbos
beta               CIRADA             new-earth          vertico
canucs             dali_alma_data     NewHorizons
casa-data-repository jwst-crds         ots
cfhtai            k-pop              signals
majorb projects $
```

CARTA Session

Astronomical image and data
cube visualization tool

The screenshot displays the CARTA web interface with the following components:

- Browser Tabs:** Science Portal, ARCADE, CARTA v1.4, JupyterLab.
- Address Bar:** ws-uv.canfar.net/carta/http/bjc3ggtg/?socketUrl=wss://ws-...
- Main Image:** BHR71_cont_p1.image. WCS: (12:01:27.16, -65:08:14.8); Image: (501, 426); Value: 1.49326e-1 Jy/beam*. The image shows a dark field with several bright spots.
- X Profile:** X Profile: Cursor. WCS: 12:01:27.16, Image: 501 px, 1.49326e-1. The plot shows Value (Jy/beam) vs X coordinate.
- Y Profile:** Y Profile: Cursor. WCS: -65:08:14.8, Image: 426 px, 1.49326e-1. The plot shows Value (Jy/beam) vs Y coordinate.
- Render Configuration:** Clip Percentile: 99.9%. Scaling: Linear. Color map: [Color bar]. Invert color map: [Off]. Clip Min: -0.0089254. Clip Max: 0.07539306. A histogram shows the distribution of values with Min and Max markers.
- Image List:** Image List x Animator x. Table with columns Image, Layers, and Matchin.

Image	Layers	Matchin
0 BHR71_cont_p1.image	R	XY

User Storage Portal

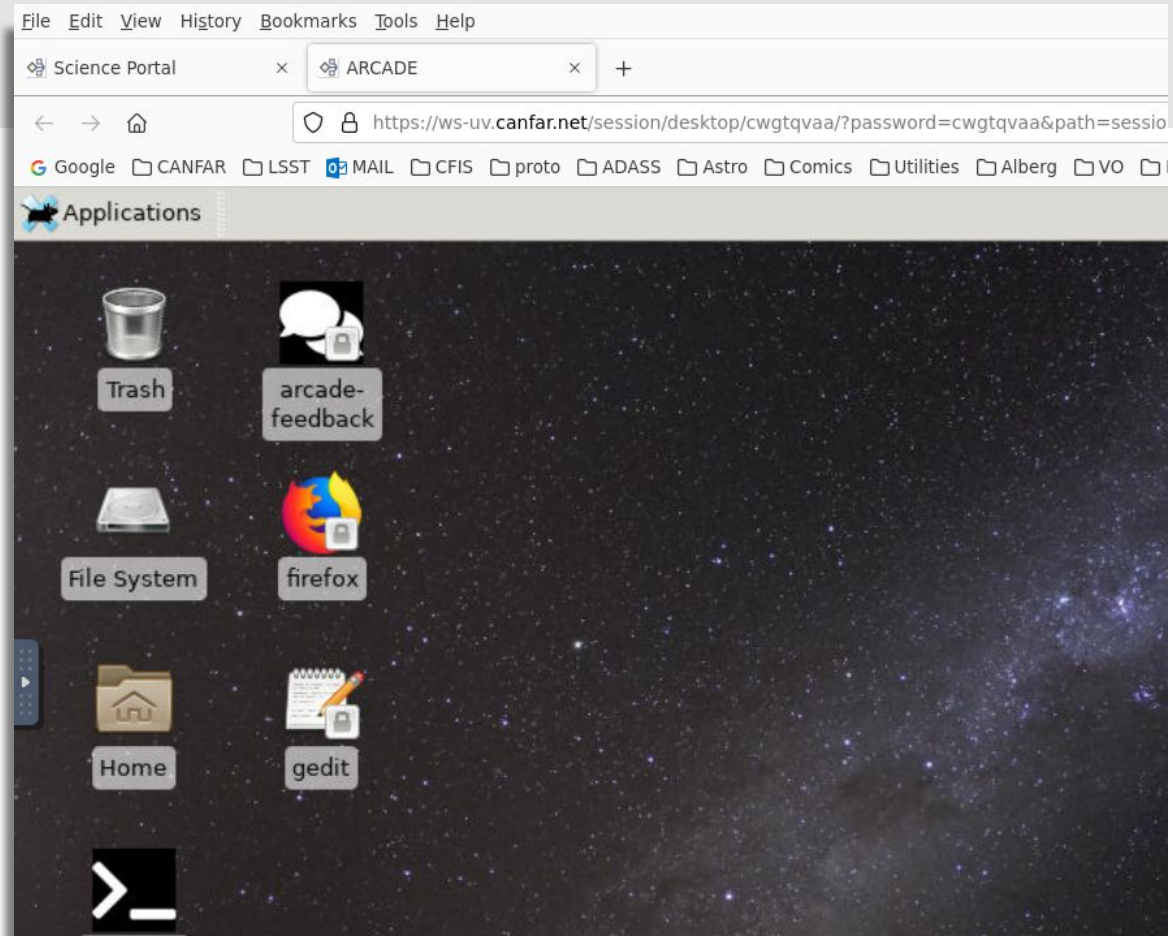
- Two storage systems:
 - Vault (archival storage)
 - Cavern: (large file system)
- Users get 1Tb or 10Tb or (rarely) 100Tb allocations
- Access via:
 - browser
 - python client
 - container mounts
 - remote (laptop) mounts

The screenshot shows a web browser window with the URL `canfar.net/storage/arc/list/projects`. The page features the CANFAR logo and navigation links for Documentation, Services, About, Open Source, Support, and a user profile for Brian Major. The main content area is titled `/projects` and includes a search bar and a toolbar with actions like Home, Up, Root, Add, Download, Move, and Delete. A dropdown menu is open under the 'arc' storage system, showing options for 'vault' and 'arc'. Below the toolbar, a table displays a list of project entries with columns for Name, Size, Last Modified (UTC), Read/Write permissions, Read permissions, and Owner.

Name	Size	Last Modified (UTC)	Read/Write	Read	Owner
<input type="checkbox"/> ALMA_Outflows	--	2020-11-09 - 20:20:08		Public	RuheeJan
<input type="checkbox"/> antennae	--	2021-06-02 - 00:31:50		Public	heh15
<input type="checkbox"/> beta	--	2021-09-17 - 19:38:40		Public	casteels
<input type="checkbox"/> canucs	--	2021-11-19 - 17:41:31	canucs		cjw
<input type="checkbox"/> casa-data-repository	--	2017-03-24 - 14:24:05		Public	gaudet
<input type="checkbox"/> cfhtai	--	2021-11-11 - 18:08:13	cfhtai		sfabbro
<input type="checkbox"/> cfis	--	2021-10-02 - 00:05:22		Public	sgwyn
<input type="checkbox"/> chime_frb	--	2021-11-04 - 08:37:58	chime-frb-rw	Public	shinybrar
<input type="checkbox"/> CIRADA	--	2021-11-10 - 14:15:07	POSSUM_Members		parthvenkat

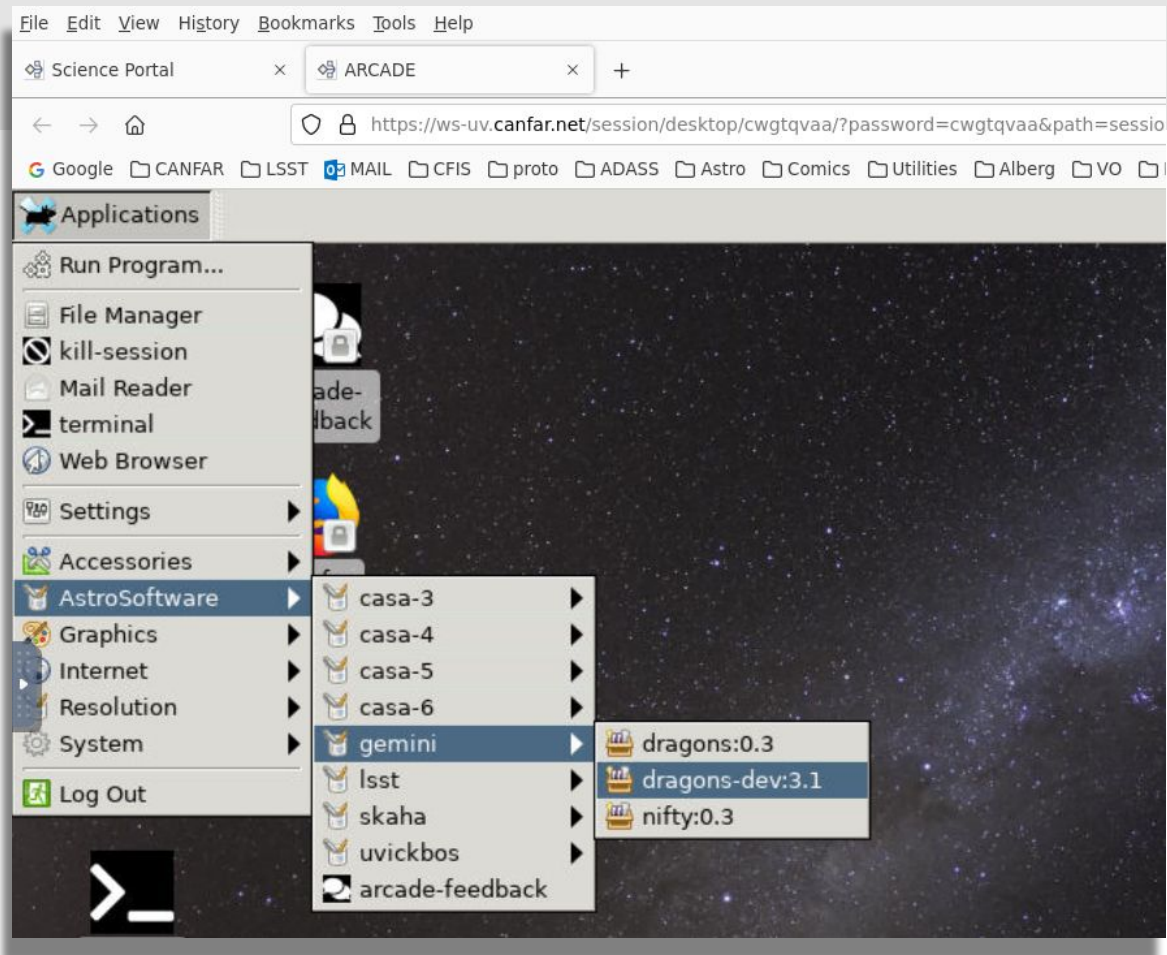
Remote Desktop Session

- Browser based
- Looks like an Linux desktop
- Runs in a container
- App launcher:
 - Standard astronomical software
 - User contributed software
 - **Now includes DRAGONS**
- When launched, software runs
 - in new container
 - new resources
 - potentially, significantly more resources



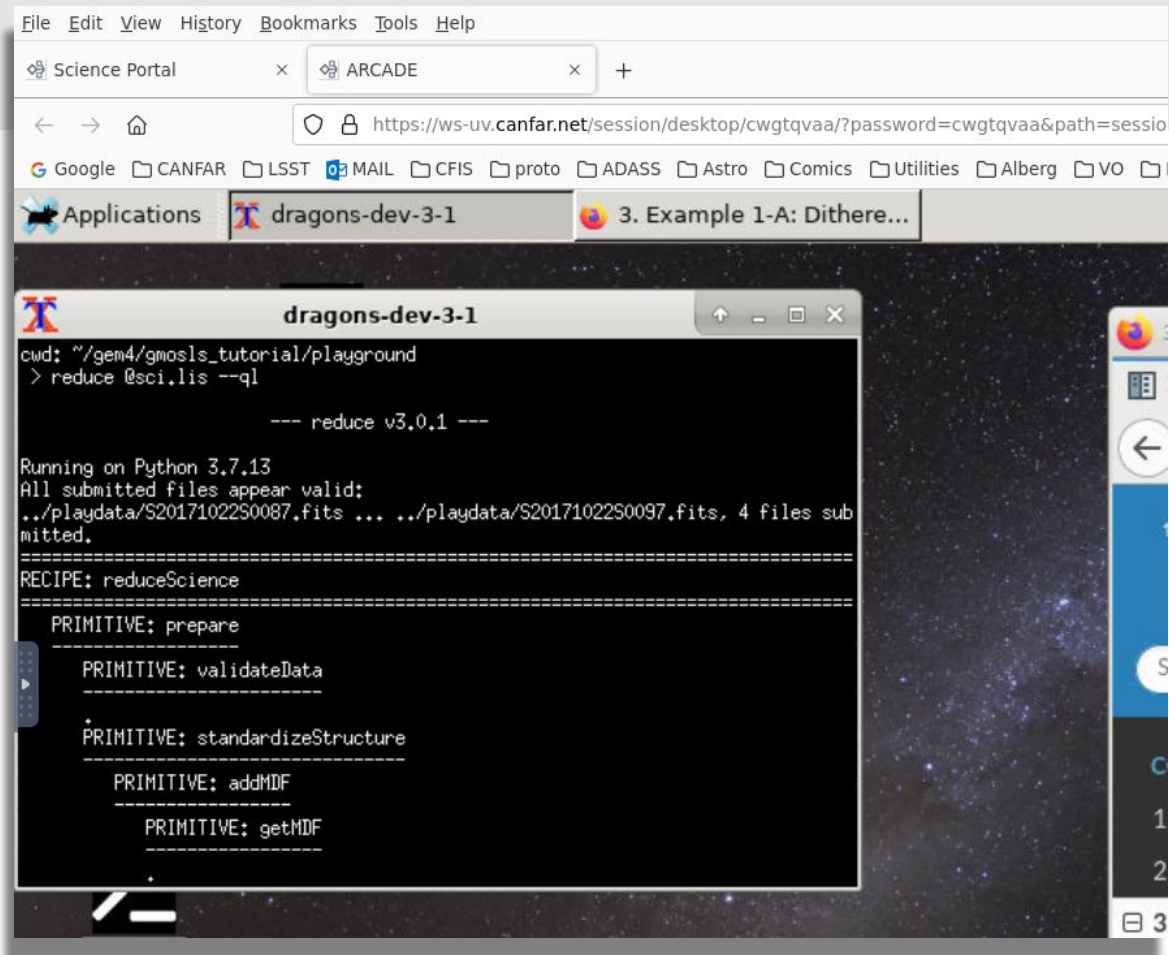
Remote Desktop Session

- Browser based
- Looks like an Linux desktop
- Runs in a container
- App launcher:
 - Standard astronomical software
 - User contributed software
 - **Now includes DRAGONS**
- When launched, software runs
 - in new container
 - new resources
 - potentially, significantly more resources



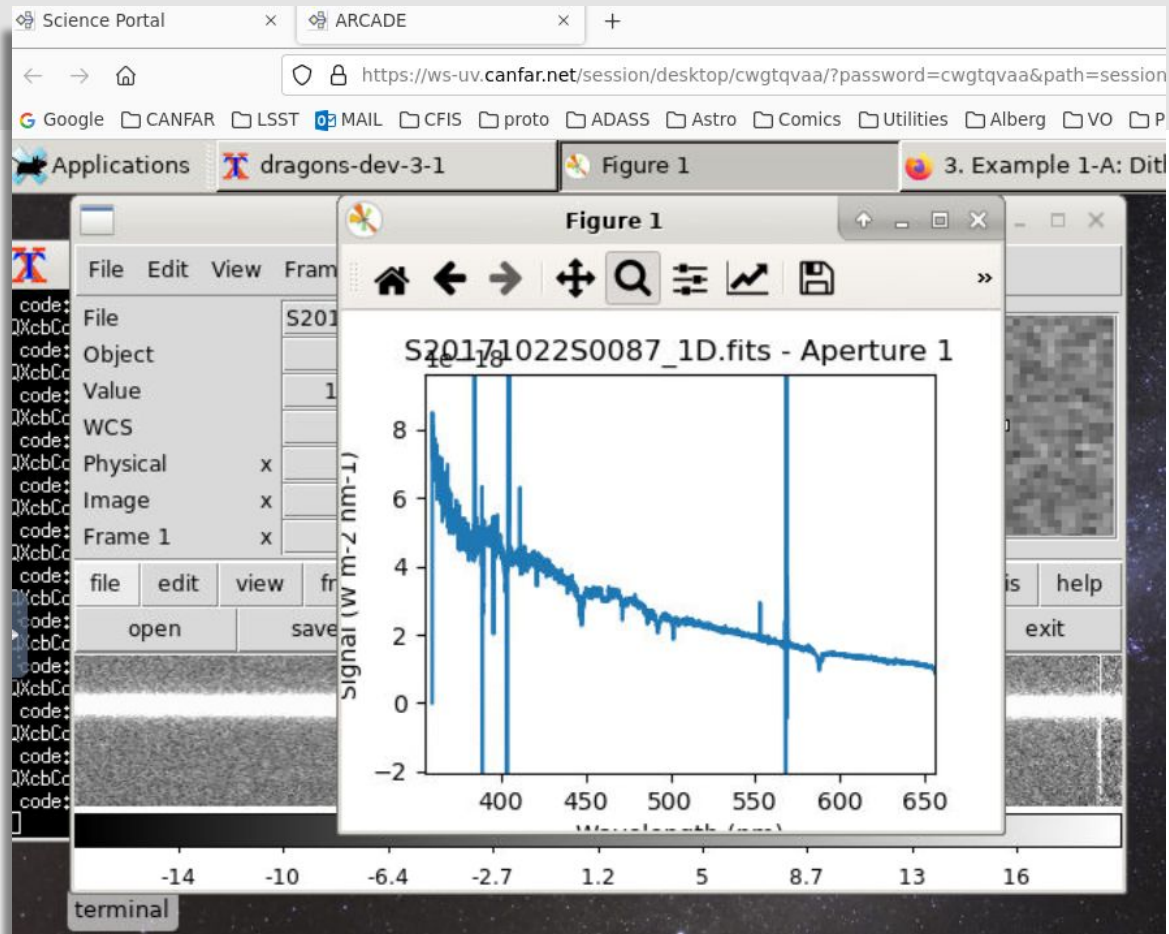
Remote Desktop Session

- Browser based
- Looks like an Linux desktop
- Runs in a container
- App launcher:
 - Standard astronomical software
 - User contributed software
 - **Now includes DRAGONS**
- When launched, software runs
 - in new container
 - new resources
 - potentially, significantly more resources



Remote Desktop Session

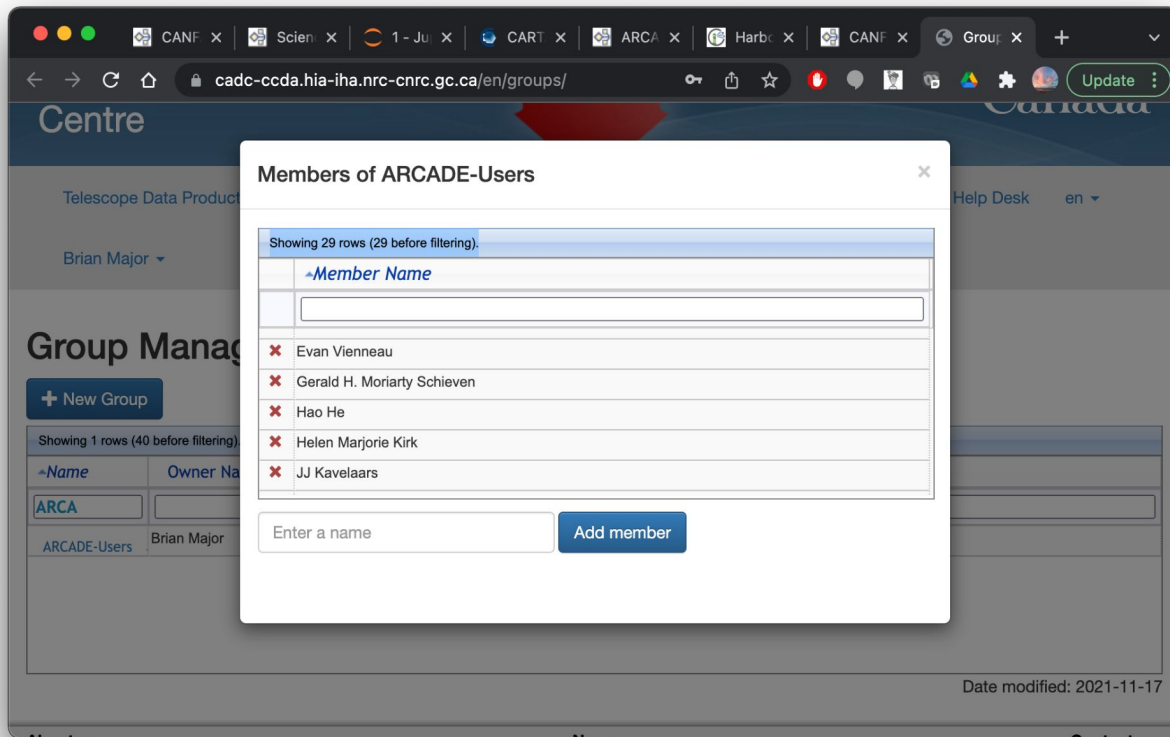
- Browser based
- Looks like an Linux desktop
- Runs in a container
- App launcher:
 - Standard astronomical software
 - User contributed software
 - **Now includes DRAGONS**
- When launched, software runs
 - in new container
 - new resources
 - potentially, significantly more resources



Group Management

Groups consulted in:

- Object storage (vault)
- Container storage (arc)
- Archive storage (caom2)
- Image registry
- Service APIs
- Catalogs



The screenshot shows a web browser window with the URL `cadcccca.hia-ih.nrc-cnrc.gc.ca/en/groups/`. The page title is "Centre" and the main heading is "Group Management". A modal window titled "Members of ARCADE-Users" is open, displaying a list of members. The modal includes a search bar, a table of members, and an "Add member" button.

Member Name
✖ Evan Vienneau
✖ Gerald H. Moriarty Schieven
✖ Hao He
✖ Helen Marjorie Kirk
✖ JJ Kavelaars

Enter a name

Date modified: 2021-11-17

Gemini Software on CANFAR

- DRAGONS
 - version 3.0.1 currently installed
 - upgrade to 3.0.2 imminent
 - upgrade to 3.1 will be slightly trickier, but doable
- NIFTY
 - version 0.3
 - Was run on the NIFS archive, science ready data available at the CADC
- What should we do next?

Why you should (or should not) use CANFAR

Should:

- Easy access to significant resources
 - Multiple instances with up to 32 cores and large memory
 - Storage: 1-10 Tb allocations (or more).
- Software already installed
- Co-located with Gemini public archive at CADC
- Cloud-based: can access from any device with a browser
- Easy to share results

Should not:

- You already have a good computer
- You can easily install software
- You don't have a lot of data

Summary

- CANFAR provides
 - compute
 - storage
- CANFAR has Gemini software pre-installed:
 - DRAGONS
 - NIFTY
 - Science ready data products available
- If you would like access to the CANFAR Science Platform send an e-mail to support@canfar.net with a brief description of your project