

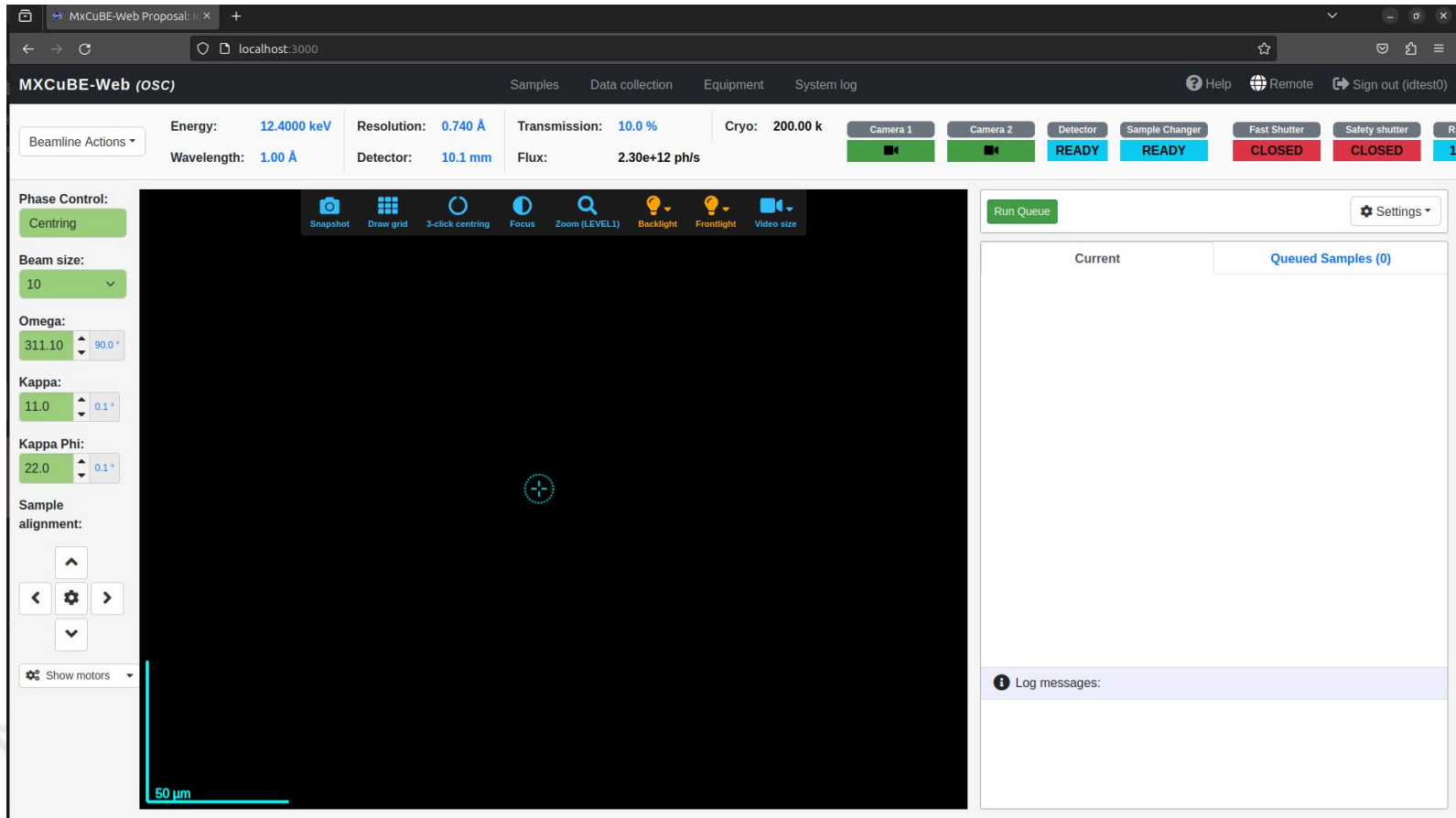
**SOLEIL : MXCUBE meeting 2023-11-29**

**Dan Tiberiu Costin**

- MXCUBE QT4 in production – old and but robust codebase
- MXCUBE WEB in developement
- 18 months full time contract started October 9 2023
- Under the guidance of Pierre Legrand

- 2012 – PhD in materials chemistry (nuclear fuel cycle)
- 
- 2017 – carrier switch to programming
- 2019 – Masters in applied Mathematics and Informatics
  - 18 months internship as Data Scientist at Goupama
- 2020 – back-end developer at Million Roads Avignon
- 2021 – Freelance Web Developer & Data Scientist
  - mainly with Python and Javascript React

- Successful detector distance tests
- Currently working on the Beamline Energy



The screenshot displays the MXCuBE-Web interface for the MXCuBE-Web Proposal. The browser address bar shows localhost:3000. The interface includes a top navigation bar with links for Samples, Data collection, Equipment, and System log. A status bar at the top right contains Help, Remote, and Sign out (idtest0) options.

Key parameters and status indicators are shown in the top section:

- Energy:** 12.4000 keV
- Resolution:** 0.740 Å
- Transmission:** 10.0 %
- Cryo:** 200.00 k
- Wavelength:** 1.00 Å
- Detector:** 10.1 mm
- Flux:** 2.30e+12 ph/s

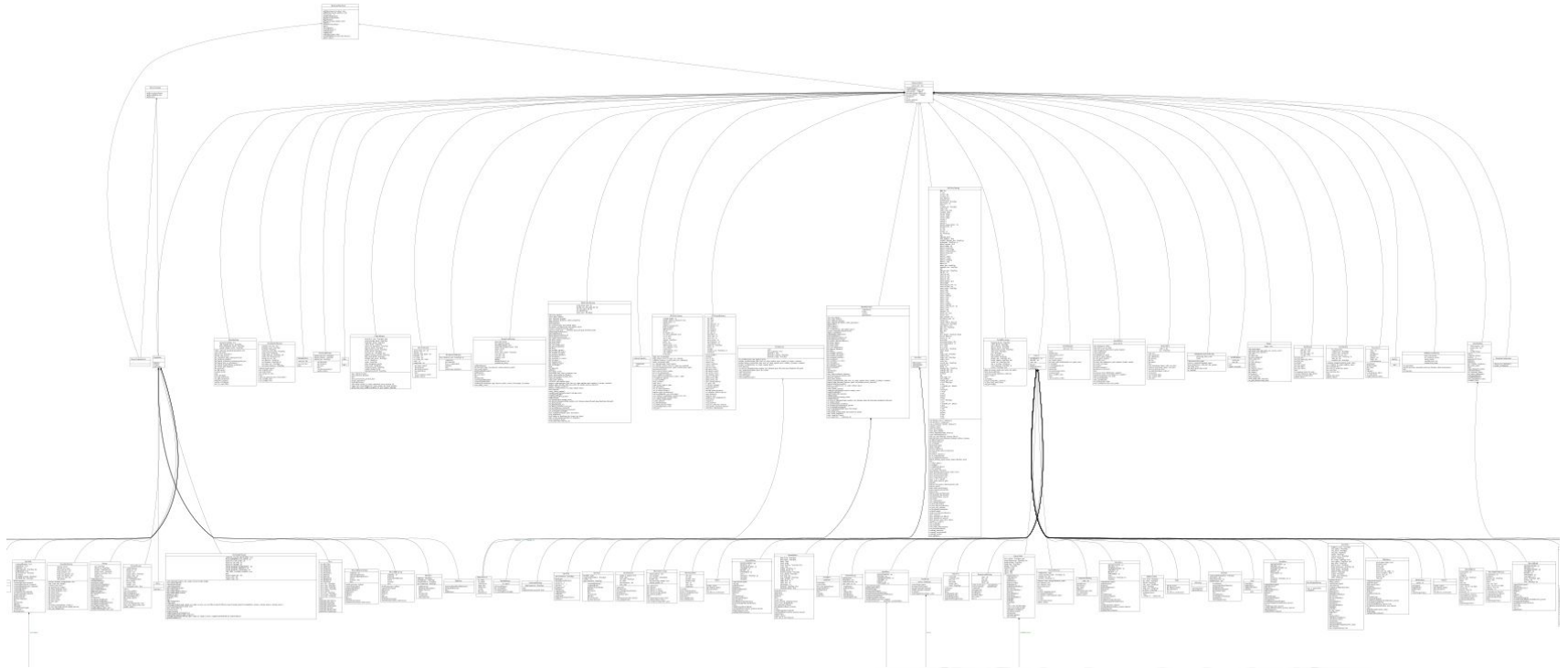
Control buttons for various components are visible:

- Camera 1: ON
- Camera 2: ON
- Detector: READY
- Sample Changer: READY
- Fast Shutter: CLOSED
- Safety shutter: CLOSED

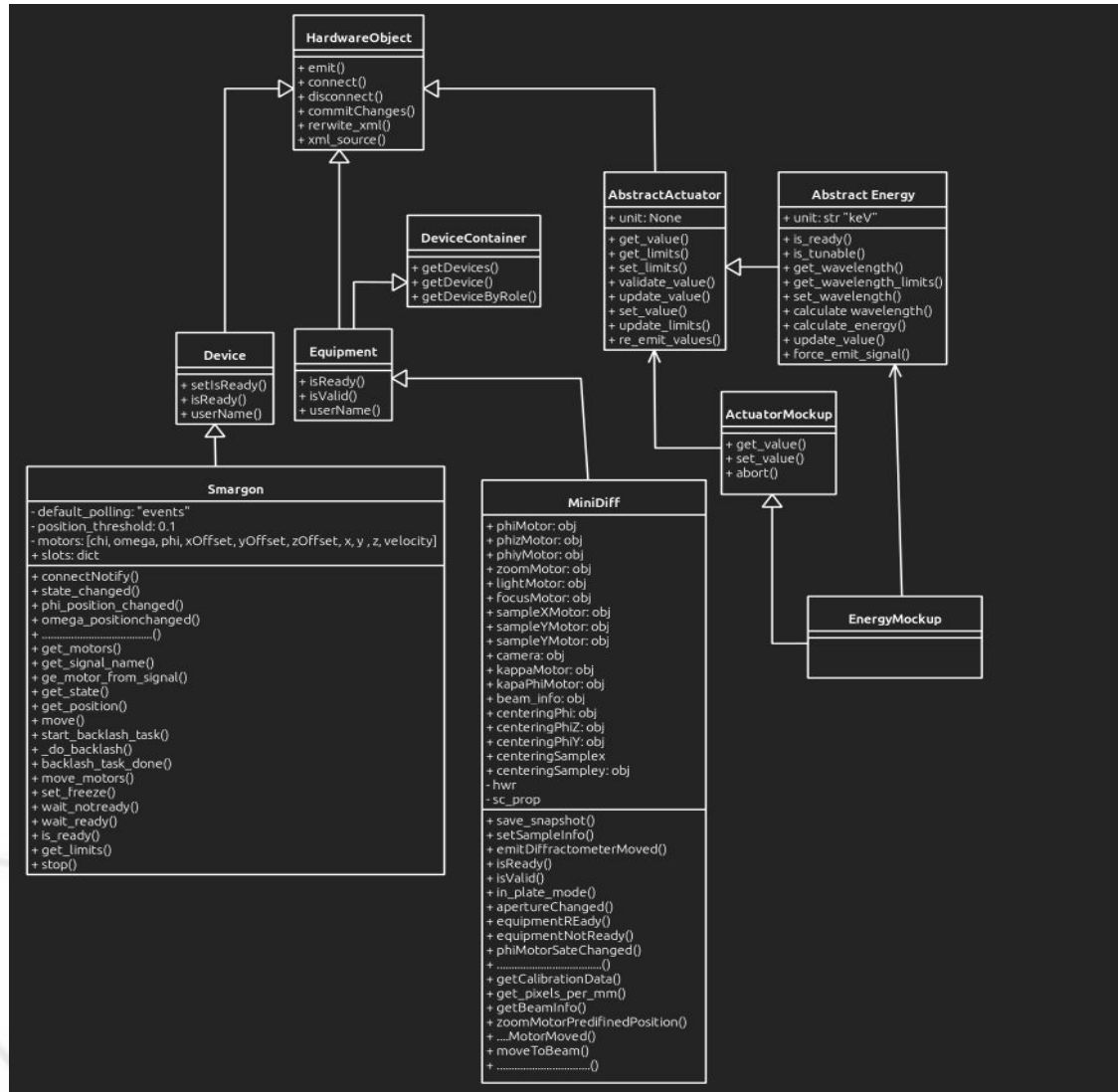
The main control area features a Phase Control section with a Centring button and a toolbar with icons for Snapshot, Draw grid, 3-click centring, Focus, Zoom (LEVEL), Backlight, Frontlight, and Video size. The Beam size is set to 10. The Omega angle is 311.10° and the Kappa angle is 11.0°. The Kappa Phi angle is 22.0°. The Sample alignment section includes directional arrows and a Show motors toggle.

On the right side, there is a Run Queue button, a Settings dropdown, and tabs for Current and Queued Samples (0). A Log messages section is located at the bottom right.

- Hardware Object Class Diagram of the production code



Building the class diagram for the new MXCUBE web codebase along the way



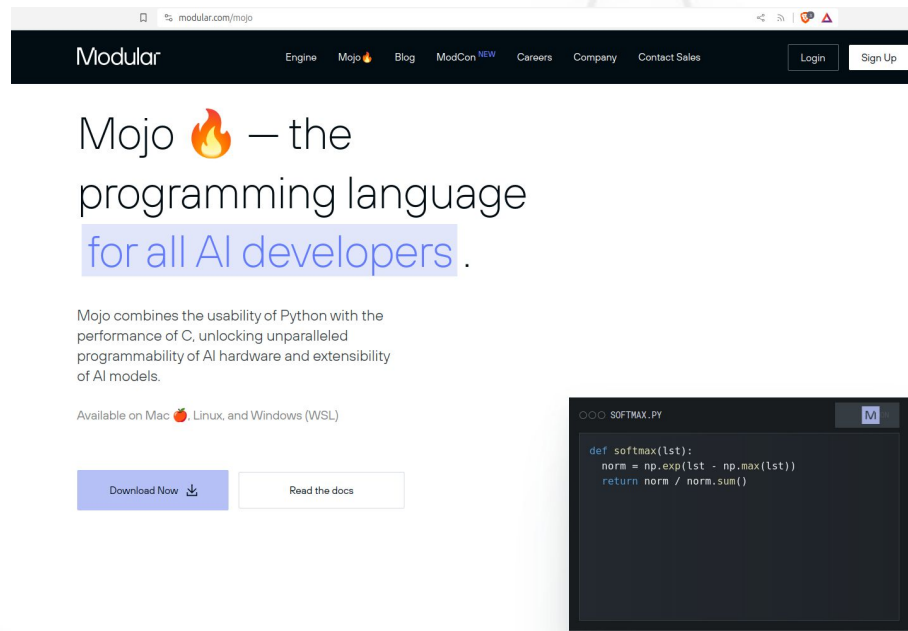
- Project accompanied by an Obsidian Vault
  - Markdown note file coletion that can also be queried similar to a database
  - Notes can be interlinked and visualised as a graph




# Thank you for your attention !

## Anyone curious about Modular for a future version of MXCUBE ?

<https://modular.com/>



The screenshot shows the Modular website homepage. At the top, there is a navigation bar with the Modular logo and links for Engine, Mojo (with a fire icon), Blog, ModCon<sup>NEW</sup>, Careers, Company, and Contact Sales. There are also Login and Sign Up buttons. The main content area features the headline "Mojo  – the programming language for all AI developers". Below this, a paragraph states: "Mojo combines the usability of Python with the performance of C, unlocking unparalleled programmability of AI hardware and extensibility of AI models." It also mentions availability on Mac, Linux, and Windows (WSL). At the bottom, there are two buttons: "Download Now" and "Read the docs". On the right side, there is a code editor window titled "SOFTMAX.PY" containing the following Python code:

```
def softmax(lst):  
    norm = np.exp(lst - np.max(lst))  
    return norm / norm.sum()
```



