



MXCuBE at Sirius

Laís Pessine do Carmo

Beamline Software Group (SOL)

Brazilian Synchrotron Light Source (Sirius/LNLS)

Online MXCuBE & ISPyB Meeting @ Elettra-Sincrotrone Trieste

26 - 27 October, 2021

Sirius Beamlines

Now in scientific commissioning:

- **MANACÁ** – Macromolecule crystallography
- **CATERETÊ** – X-ray coherent diffracting imaging
- **CARNAÚBA** – X-ray spectro-nanoscscopy and nano-diffraction
- **EMA** – Samples under extreme conditions
- **IMBÚIA** – Nano and micro Fourier-Transform Infrared spectroscopy
- **IPÊ** – Soft X-ray Inelastic scattering and Photoemission

Support laboratories

- **LCTE** – samples under Extreme Thermodynamic Conditions
- **LCIS** – in situ growth of thin films and heterostructures
- **TEPUI** – computing center, for data storage and analysis

lnls.cnpem.br/beamlines



IPÊ



EMA

Sirius Beamlines



Now in scientific commissioning:

- **MANACÁ** – Macromolecule crystallography
- **CATERETÊ** – X-ray coherent diffracting imaging
- **CARNAÚBA** – X-ray spectro-nanoscscopy and nano-diffraction
- **EMA** – Samples under extreme conditions
- **IMBÚIA** – Nano and micro Fourier-Transform Infrared spectroscopy
- **IPÊ** – Soft X-ray Inelastic scattering and Photoemission

Support laboratories

- **LCTE** – samples under Extreme Thermodynamic Conditions
- **LCIS** – in situ growth of thin films and heterostructures
- **TEPUI** – computing center, for data storage and analysis

- **CARCARÁ** – Diagnosis
- **CEDRO** – Circular DichROism
- **PAINEIRA** – Powder X-ray Diffraction (PXRd)
- **SABIÁ** - Soft x-ray ABSorption spectroscopy and ImAging

lnls.cnpem.br/beamlines



IPÊ



EMA

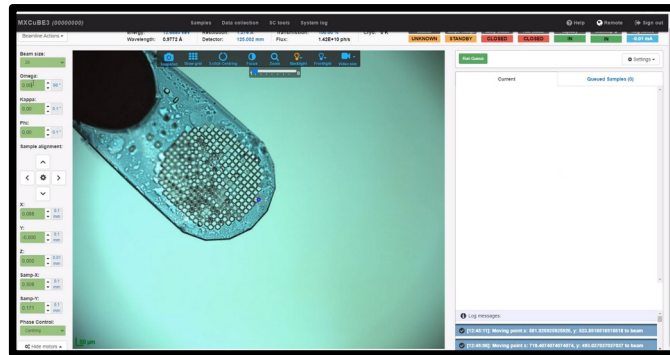
MANACÁ Beamline (MX)

Done

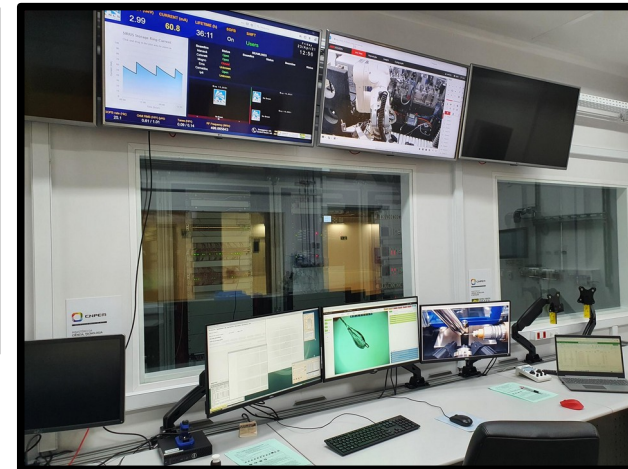
- 1st users publications *
- Experimental hutch cameras (at gonio and robot tool)
- Grid scan, a 1st version
- Cryojet EPICS IOC

WIP

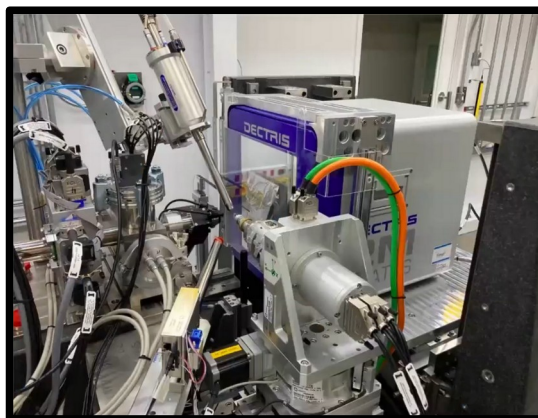
- Updating Pilatus EPICS IOC
- Energy control and scan



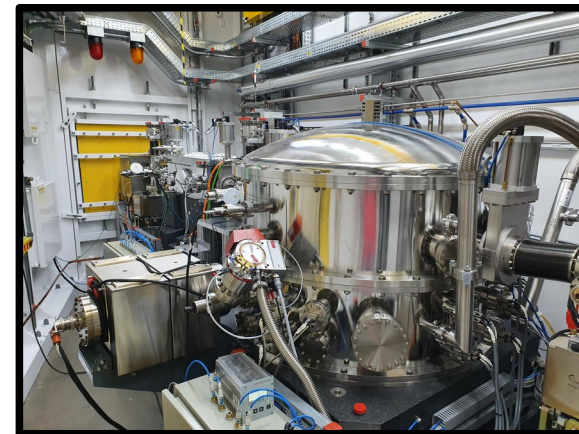
Grid scan, 25nm mesh calibration.



Operation room



Experimental hutch



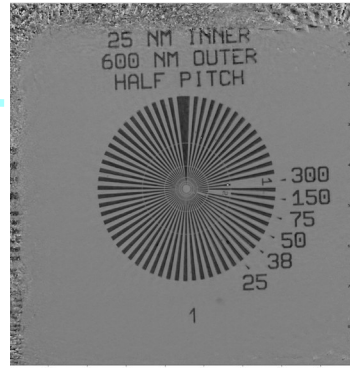
DCM

* G.D. Noske, A.M. Nakamura, V.O. Gawriljuk, R.S. Fernandes, G.M.A. Lima, H.V.D. Rosa, H.D. Pereira, A.C.M. Zeri, A.F.Z. Nascimento, M.C.L.C. Freire, D. Fearon, A. Douangamath, F. von Delft, G. Oliva, A.S. Godoy, *A Crystallographic Snapshot of SARS-CoV-2 Main Protease Maturation Process*, *Journal of Molecular Biology*, Volume 433, Issue 18, 2021, 167118, ISSN 0022-2836, <https://doi.org/10.1016/j.jmb.2021.167118>.

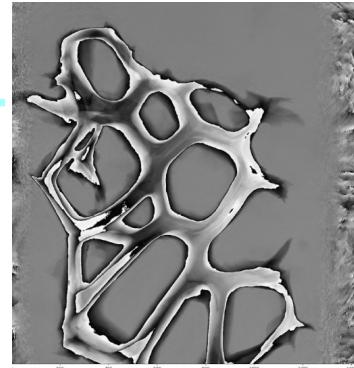
CATERETÊ Beamline (Coherent X-Ray Scattering)

Done

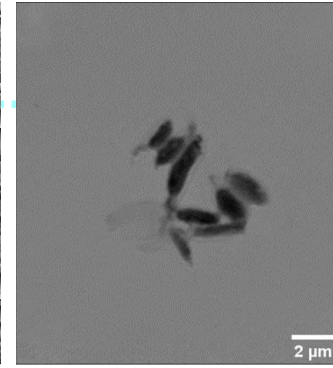
- 1st ptychography results
 - Pink beam at 3.8 keV
 - PiMega detector
 - Step scan



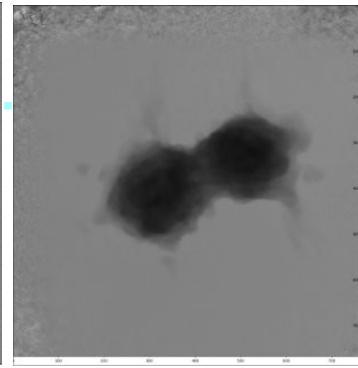
Siemens star



Sugarcane



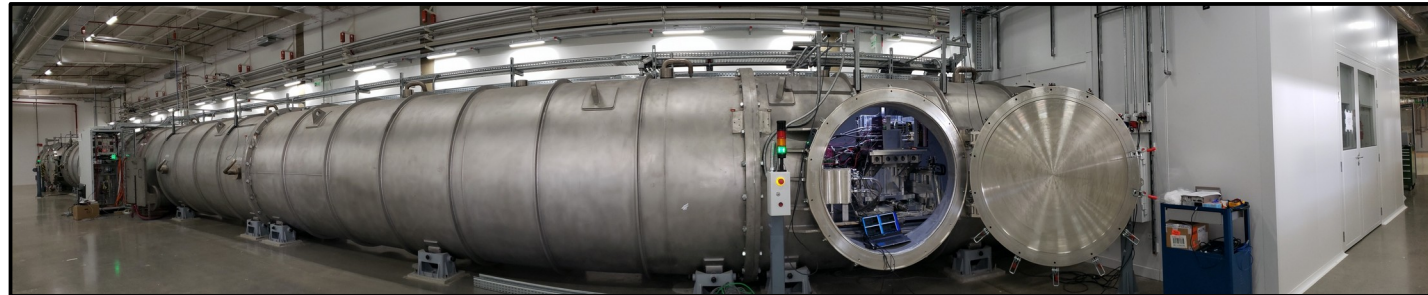
Algae



Culture cells

WIP

- Adding more axes to the scan



Tunnel (left and center) and experimental hutch (right).

MXCuBE 3

Done

- ✓ Fixes in EPICS classes
 - ✓ EPICSMotor, EPICSActuator



WIP

- ✓ Reviewing more EPICS classes (EPICSCamera)
- ✓ Remote access (MANACÁ)
- ✓ Initial version for CATERETÊ





Acknowledgement

- MANACÁ group
- CATERETÊ group
- All Beamline Support groups
- MXCuBE & ISPyB community

Thank you!

Questions? :)