# SE Equipment Overview for NR

So, before we start, it would be good to have an overview over

- SE kit that we have available and the state it's in (e.g. NIMA troughs, S/L cells, magnets, cryostats, humidity cells etc etc.)

- any projects that you and your team are working on

- your views about future developments

## NR Equipment List

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| --- | --- |
| Nima Langmuir Troughs | |
| Current State | Pictures |
| As per the image to the right INTER, INTER 2, BAM, BAM 2 and SURF troughs have been sent to Terry Waite to get them in working order again and calibrated. They are currently bagged and stored in our annex. There is also a large trough and MARIO trough which are in our TS1 lab and haven’t been included in the above maintenance. | A picture containing several  Description automatically generated |

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| Solid Liquid Cells | |
| Current State | Pictures |
| In our storage we have the following complete cells:  7 ILL style (LH picture) & 3 STFC style.  Additionally 2 ILL bases are being used on other pieces of equipment and another ILL cell is with Max and the NT school. A fourth STFC cell has been modified slightly for Luke. |  |

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| OFFSPEC Sample Changer | |
| Current State | Pictures |
| Has been setup to be heated by an oil waterbath which allows for higher temperatures compared to a glycol filled one. | A picture containing floor, indoor  Description automatically generated |

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| Nima Langmuir Black Box | |
| Current State | Pictures |
| For use with the Nima Langmuir troughs, allows for a specific environment within the box. All connections for the troughs pass through the walls via feed throughs to maintain a seal. Two types of lid for use depending on the temperature of the experiment. | A picture containing wall, indoor  Description automatically generated |

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| Liquid Air Troughs | |
| Current State | Pictures |
| Two 5 position and one 7 position trough available. 7 new inserts machined to replace missing ones and allow for cleaning while another set is in use. |  |

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| GMW 3473-70 | |
| Current State | Pictures |
| We have three of these magnets which have a maximum current input of 70 amps. Used to hold a various pieces of equipment such as the flow cryostat, ISISstat, furnace and sample changer. | A picture containing indoor, miller  Description automatically generated |

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| Flow Cyrostat (Little Blue) | |
| Current State | Pictures |
| In good working order. Has the option of a two position sample changer and well as a standard centre stick. 1.7 - 300k temperature range. 50mm sample space. | A close-up of a machine  Description automatically generated with low confidence |

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| ISISstat 2 | |
| Current State | Pictures |
| It works however cooling time is very slow ~ 10k per hour which isn’t suitable for multi sample experiments. Investigating the problems and improving it is an ongoing project. 50mm sample space. |  |

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| Toploading CCR | |
| Current State | Pictures |
| Has been commissioned but not used on an experiment to date. Offers a similar temperature range and cooling rate to the flow cryostat however doesn’t have sapphire windows. 50mm sample space. | A picture containing indoor, floor  Description automatically generated |

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| User Cells (UFO Cells) | |
| Current State | Pictures |
| Three user cells, vacuum rated, a couple of different attachments to allow for multiple setups. Aluminium windows with window heaters. | A picture containing indoor, engine, dirty, several  Description automatically generated |

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| GMW Vacuum Furnace | |
| Current State | Pictures |
| Maximum 400 degrees C, quartz windows, must be used with a vacuum. Can fit in a GMW 3473 magnet. |  |

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| HPLC Pump | |
| Current State | Pictures |
| 5 Jasco pumps and 2 Knauer pumps. 1 Jasco permanently installed on SURF. The Knauer pumps are installed on INTER and OFFSPEC (March cycle). All pumps have switches. 1 of the Jasco pumps has reduced volume lines for low volume samples. |  |

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| Syringe Pumps | |
| Current State | Pictures |
| 5 Aladdin (bottom picture) and 4 WPI pumps. All in working order. |  |

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| GMW 5403 | |
| Current State | Pictures |
| In long term storage. Works as far as we know. |  |

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| Rheometers | |
| Current State | Pictures |
|  | A picture containing text, indoor, cluttered  Description automatically generated |

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| 4 Position Heater Stage | |
| Current State | Pictures |
| In working order however could do with a major overhaul if likely to be used going forward. Used for holding up to 100mm diameter silicon blocks. | A picture containing indoor, engine, miller  Description automatically generated |

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| SURF Langmuir Trough Box | |
| Current State | Pictures |
| Aluminium box for environmental control around the Langmuir trough. Works but have been approached by Mario for it to be updated. This version was designed and built by Royal Holloway. |  |

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| Electro-Chemical Cell | |
| Current State | Pictures |
| Available for experiments however they are still being tested to optimise the design. One decision that has been made is that the pin version is the one which will be taken forward as it is easier to assemble and has given more reliable readings during testing. |  |

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| HTS Magnet | |
| Current State | Pictures |
| New 80mm room temperature bore magnet. Has been load tested on POLREF and helium analysing carried out by the FLYNN lab. Currently there is no equipment which can fit the 80mm bore. An 80mm furnace is currently being worked on by Richie/Christy. 3T maximum field. | A picture containing indoor, dirty  Description automatically generated |

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| Environmental Control Chambers | |
| Current State | Pictures |
| 4 chambers which allow for a whole solid liquid cell or temperature controlled stage (pictured) to have a controlled environment around them; this could be a gas environment or humid environment using a salt solution. The pictured setup has been used on a couple of SURF experiments. | A picture containing indoor, counter, miller  Description automatically generated |

## Current Projects

New user cell (Tom/Luke)

Humidity generator (Tom/Keith)

Upgrading ILL solid Liquid cells to latest design (Matt/Apprentice)

Vacuum cell (Richie/Christy/Andrew)

Horizontal sample changer (Richie/Christy)

Pressure cell (Andy/Becky)

80mm furnace (Richie/Christy)

## Future Developments

Solid liquid cells

Langmuir troughs

SURF aluminium box for Langmuir troughs

ISISstat 1 – 100mm Tails