

Environmental labs

Faculty of Engineering and the Environment



www.facebook.com/environmental.lab.university.of.southampton

Analytical facilities

The group has the support of dedicated analytical laboratories housing a wide range of equipment used to characterise our feedstocks and the energy products we produce. A selection is shown in the following pages





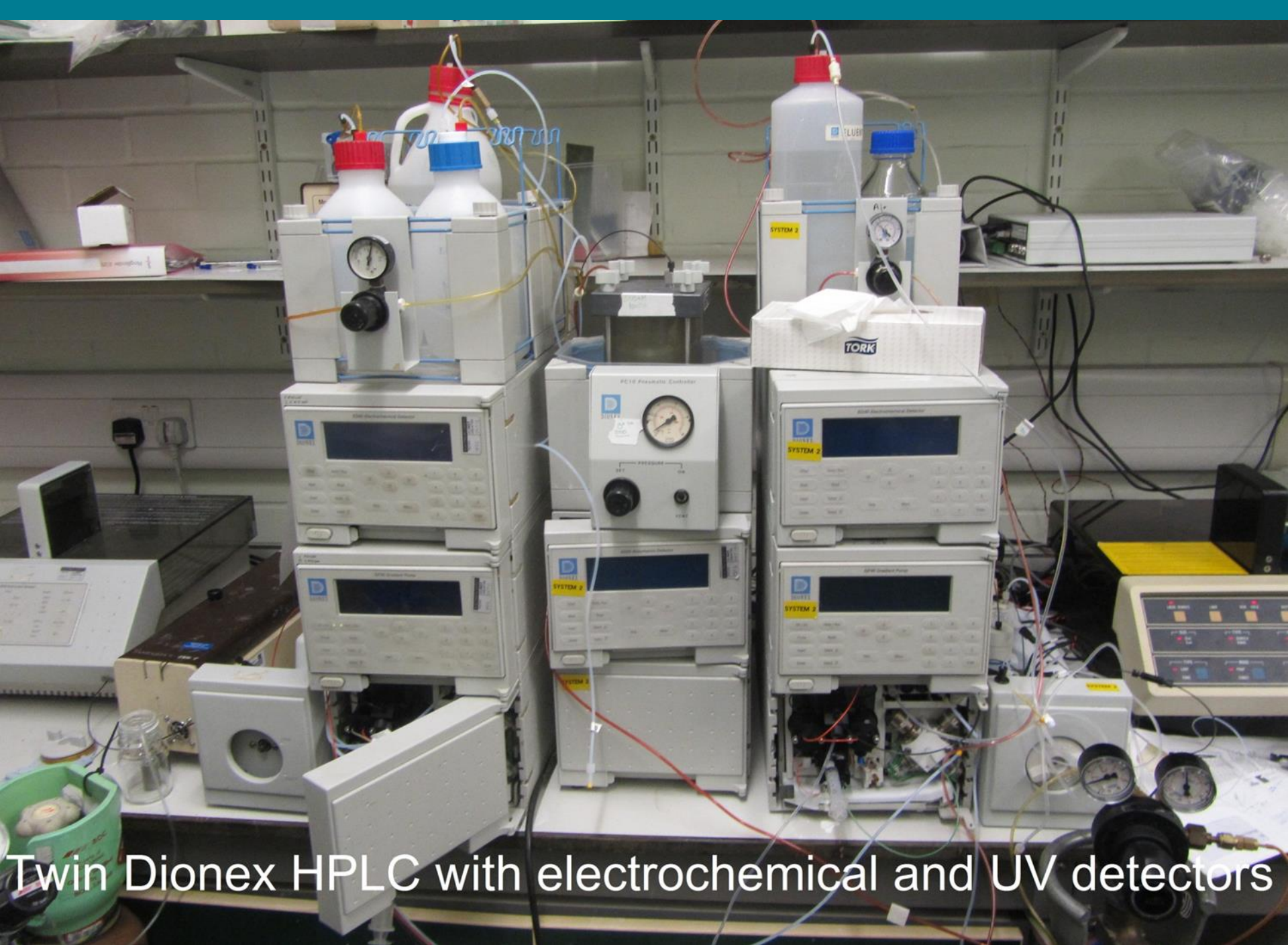
Environmental laboratory



GC analytical lab



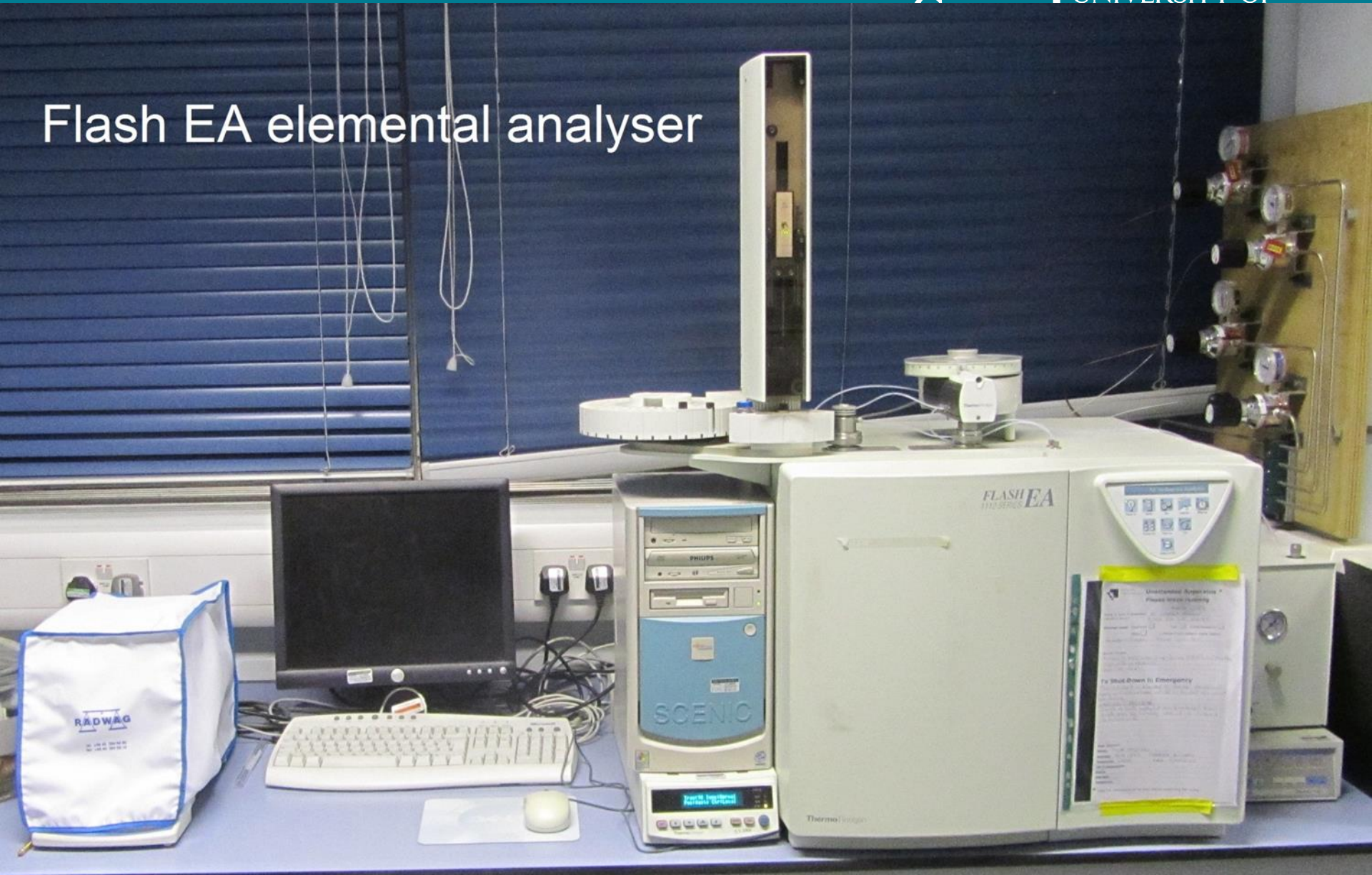
Metrohm ion chromatograph

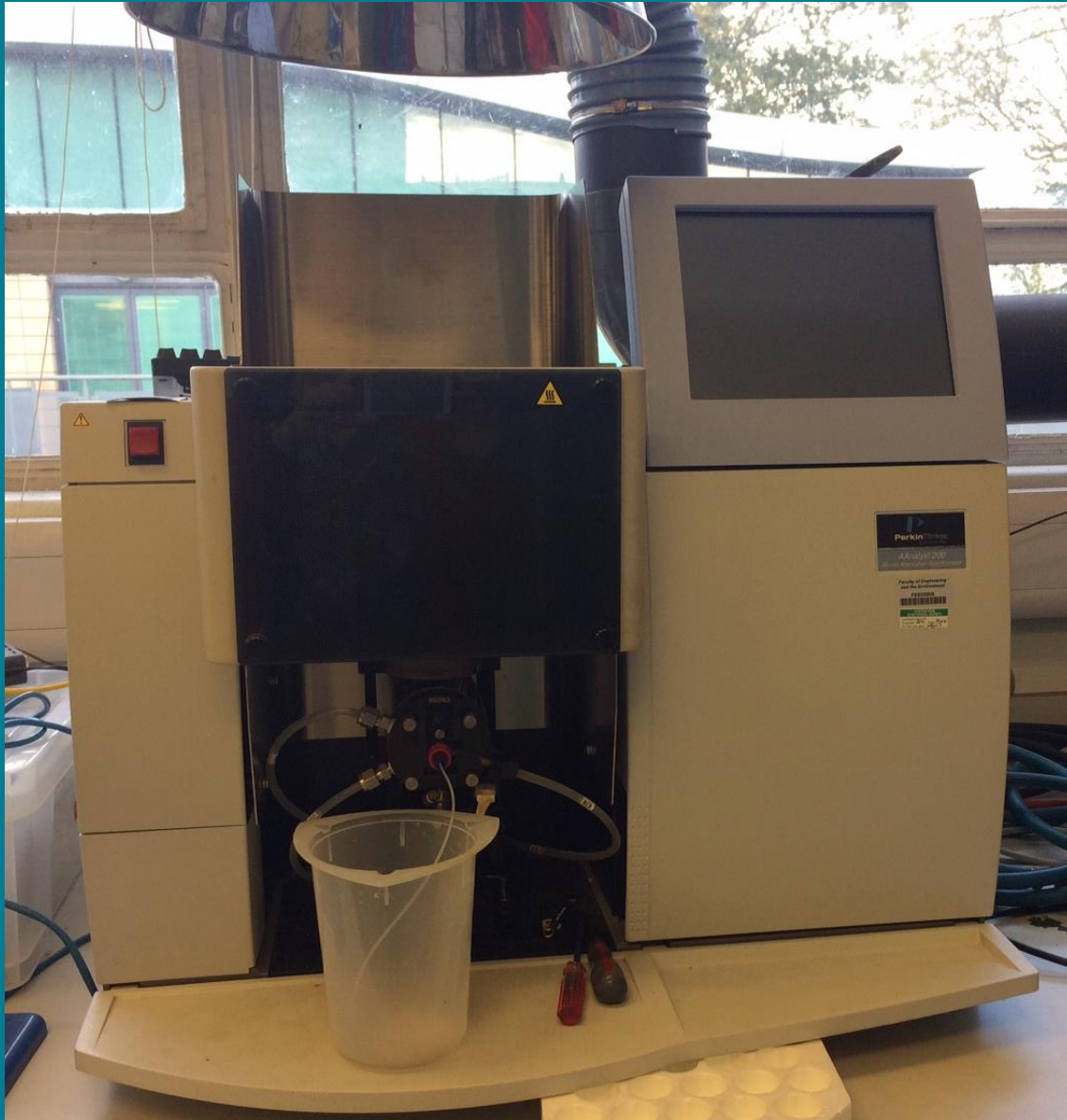


Twin Dionex HPLC with electrochemical and UV detectors

A photograph of a Finnigan TraceGC ultra gas chromatograph-mass spectrometer (GC-MS) in a laboratory setting. The instrument is a large, off-white machine with blue vertical accents. On the left side, the label "FINNIGAN Polaris Q" is visible. On the right side, the label "FINNIGAN TraceGC ultra" is visible. The machine has a control panel on the right with a small digital display and a keypad. A sample tray is visible on top of the instrument. In the background, other laboratory equipment and a window with blinds are visible.

GC mass spectrometer





Atomic absorption
spectrophotometer



Shimadzu and Varian GCs



Atomic fluorescence spectrophotometer

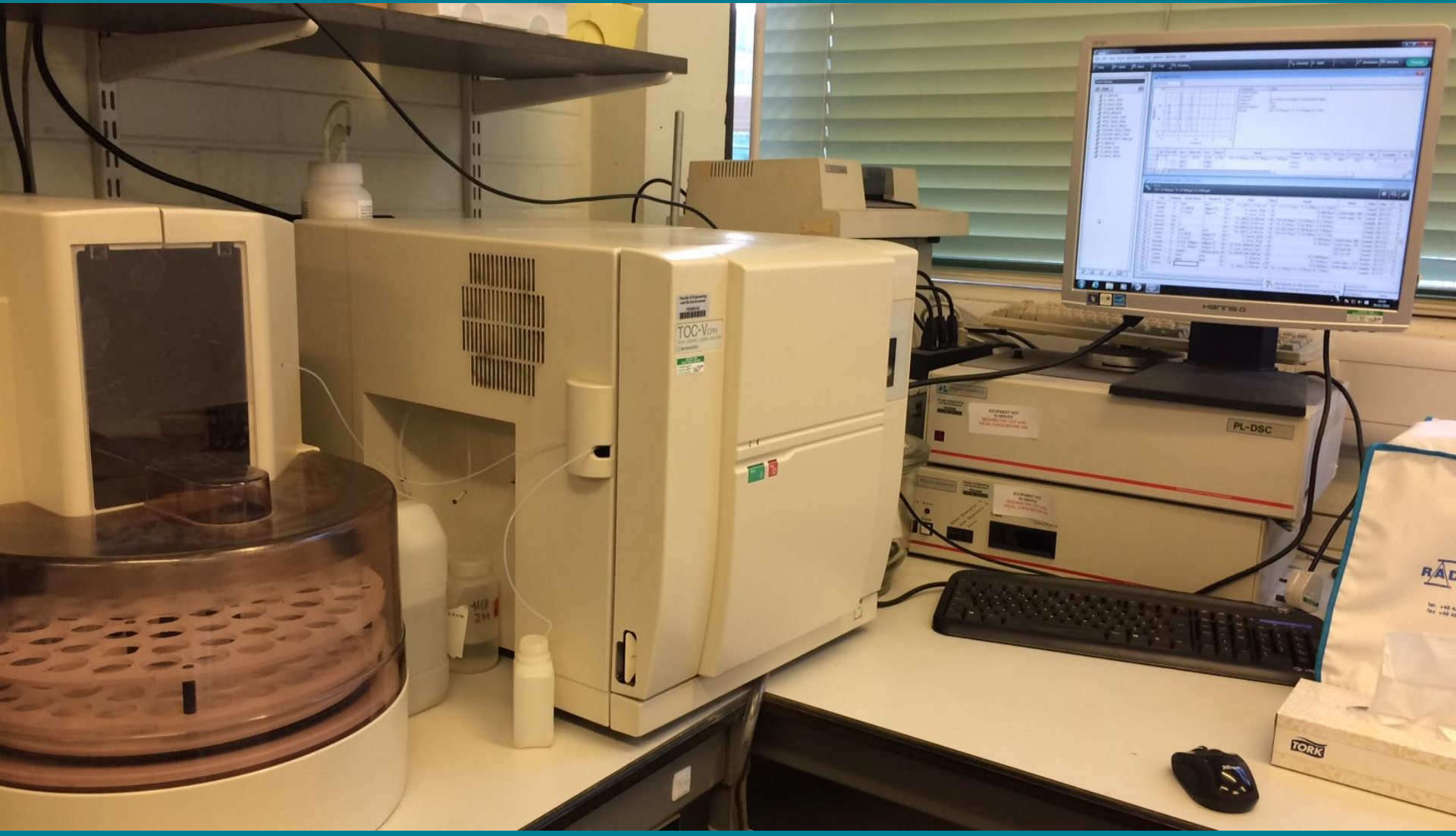


Near infrared (NIR) spectrophotometer

Fluorometer

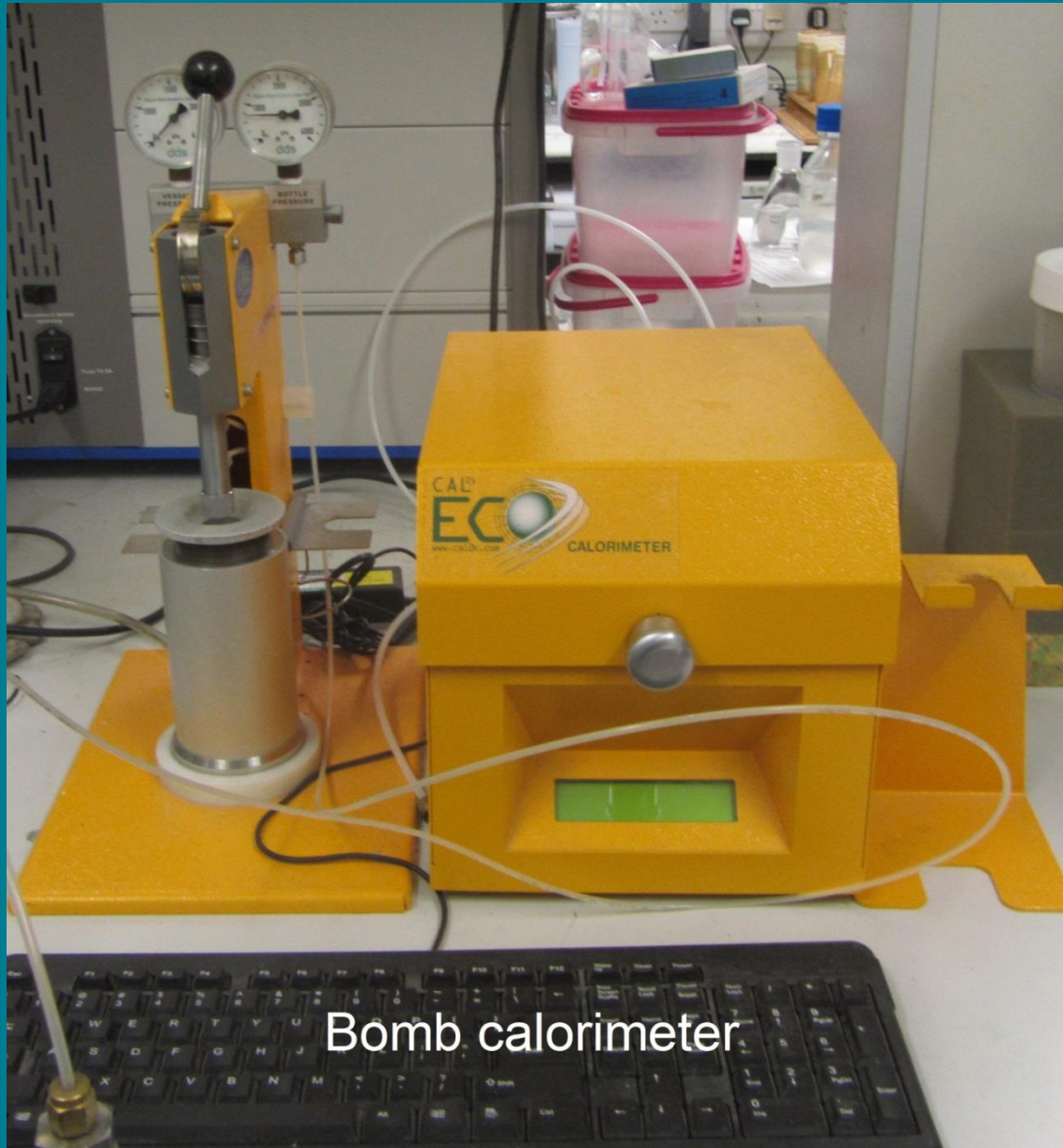


TOC Analyzer

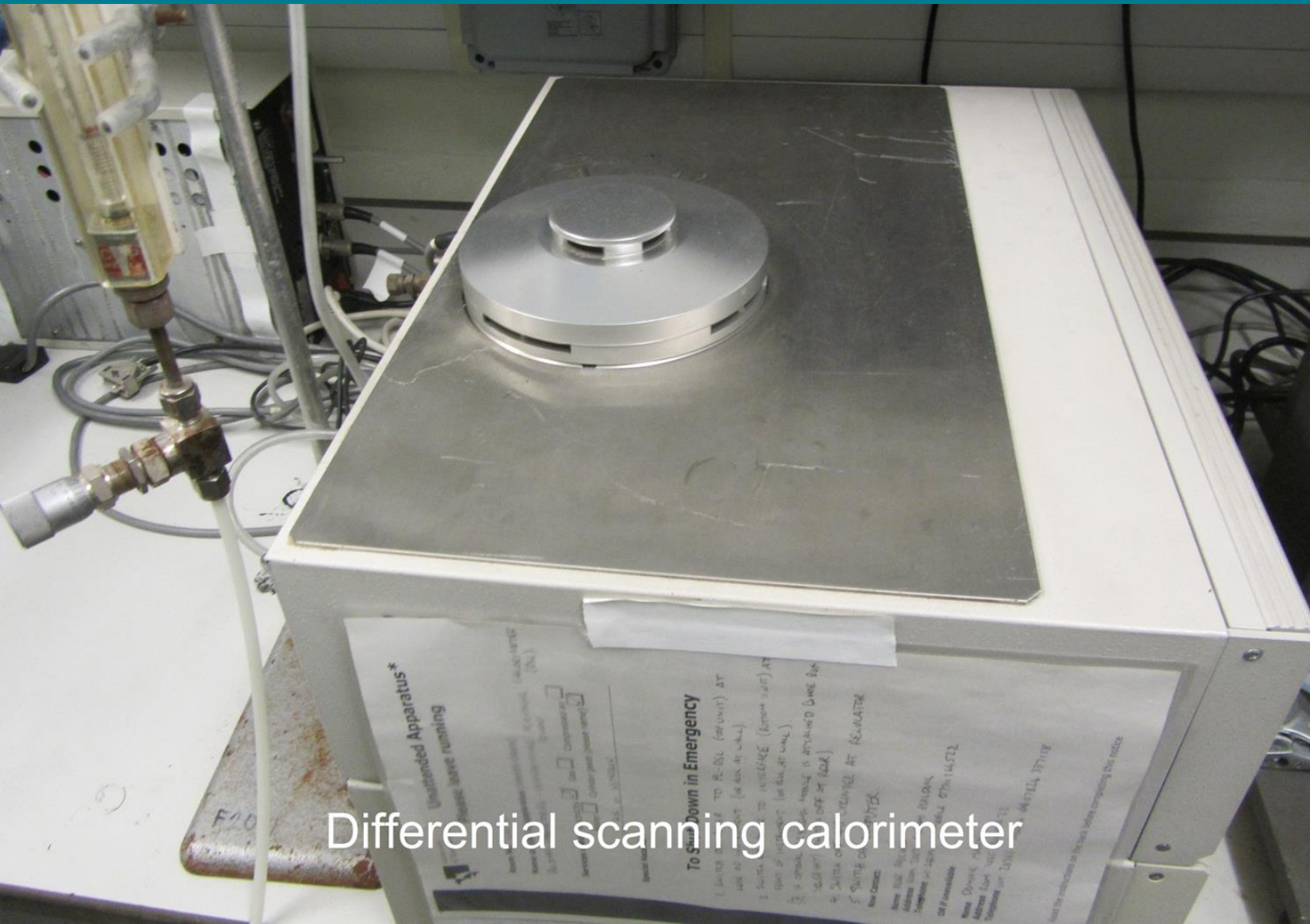


Bran-Luebbe Autoanalyzer





Bomb calorimeter



Differential scanning calorimeter

AKTA cross flow membrane filtration test rig



YSI Biochemical Analyzer

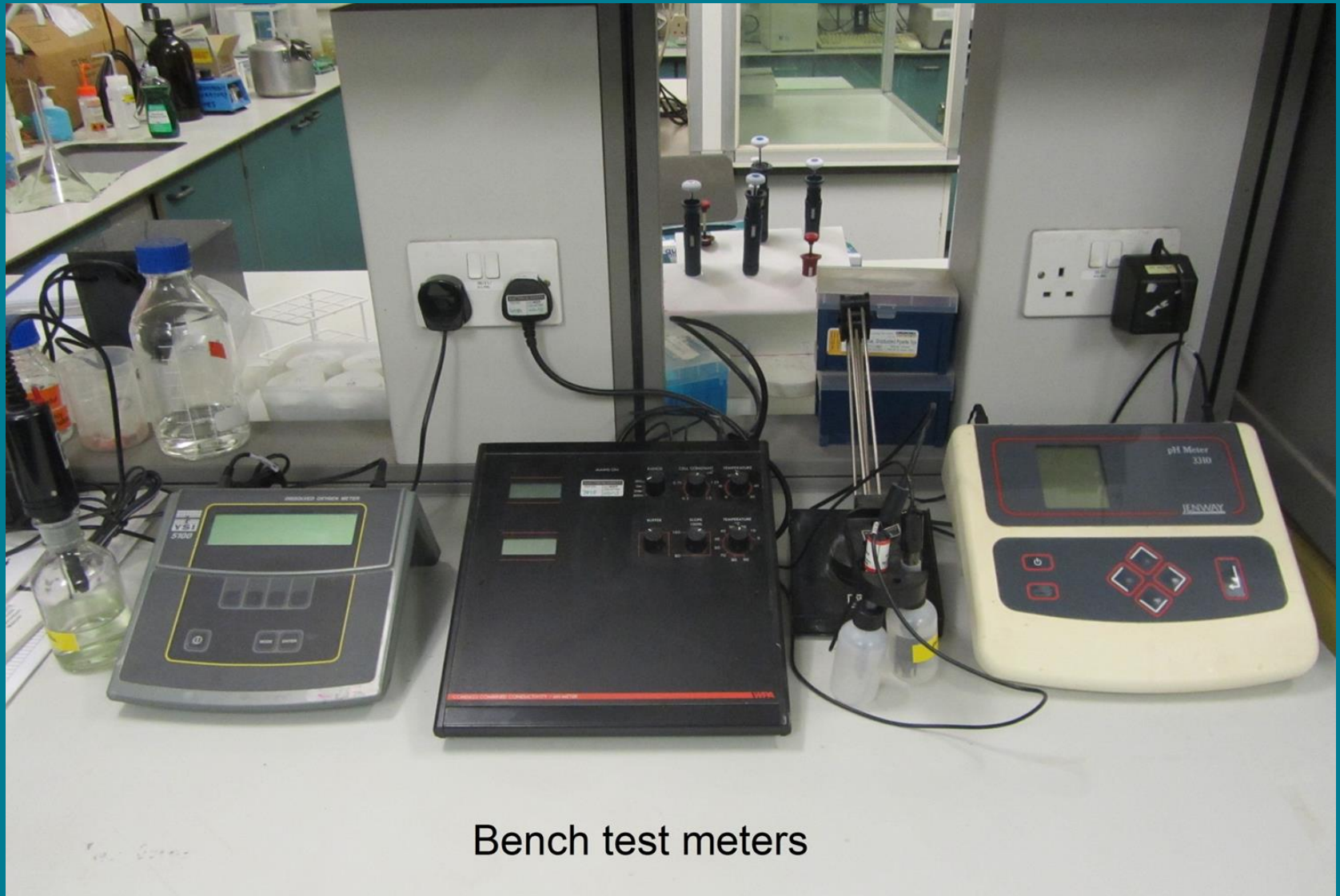




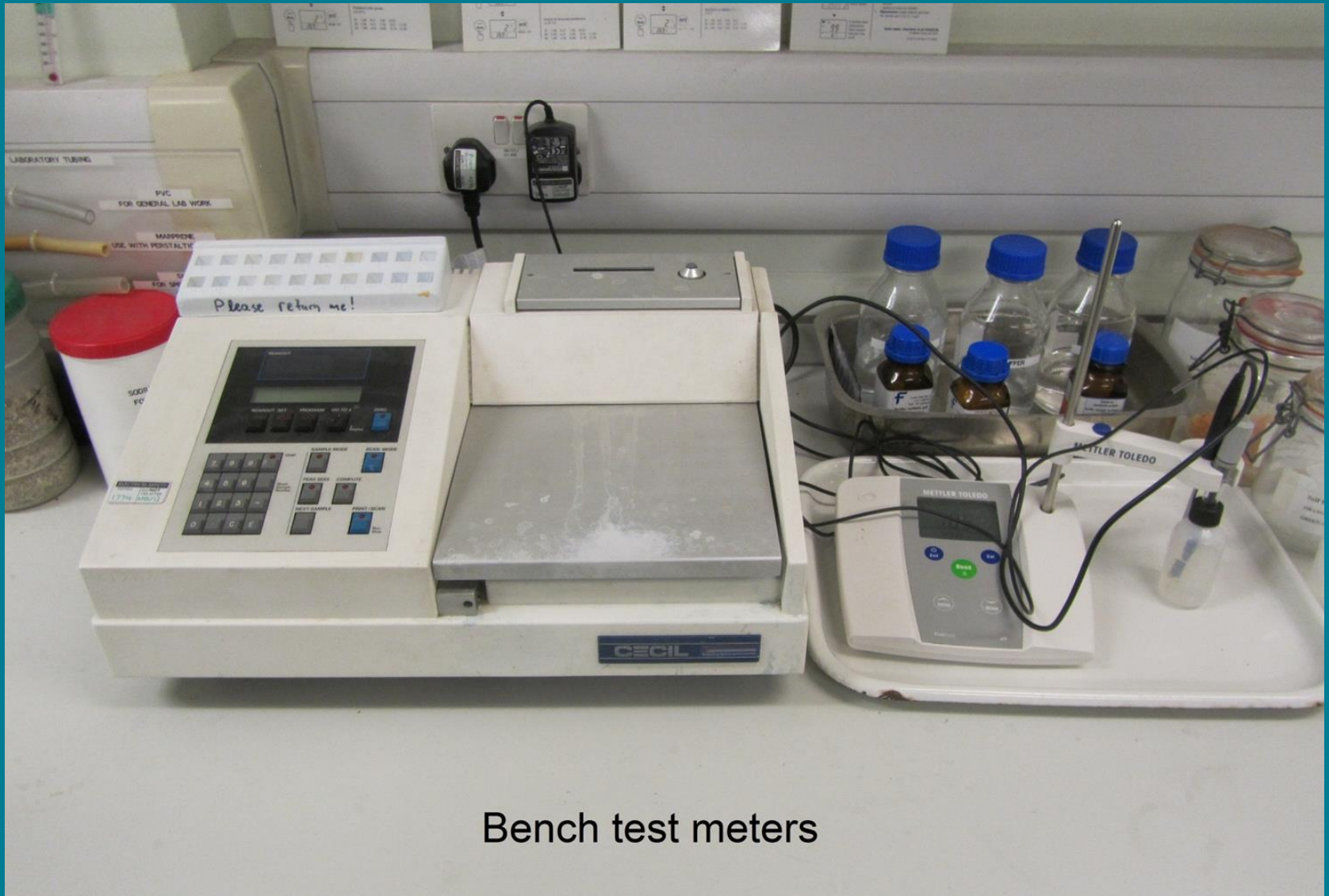
Freeze drier



ammonia distillation



Bench test meters



Bench test meters



autotitrators



Homogeniser



Mortar and Pestle



Autoclave



Autoclave

Powerfuge pilot continuous centrifuge

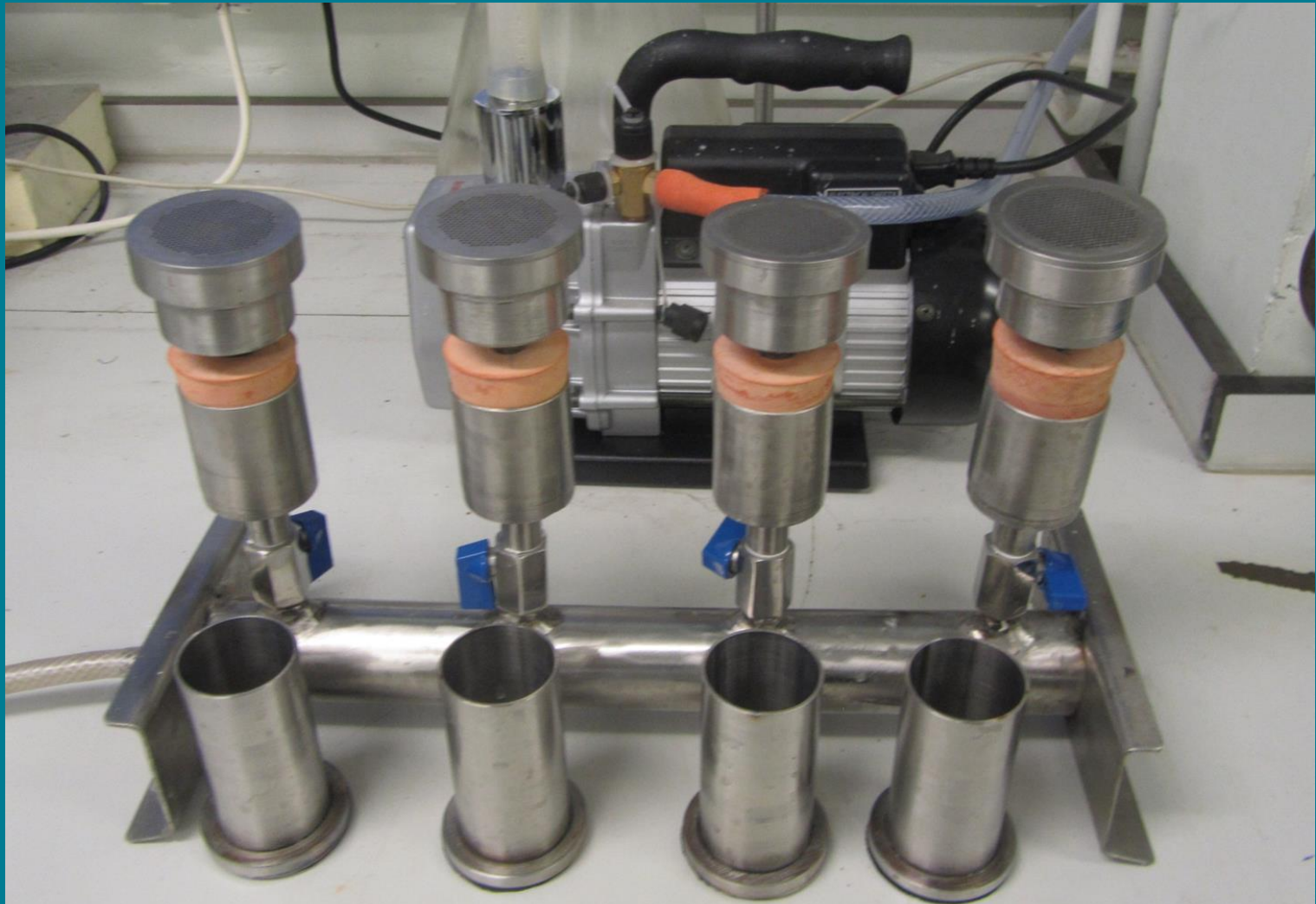




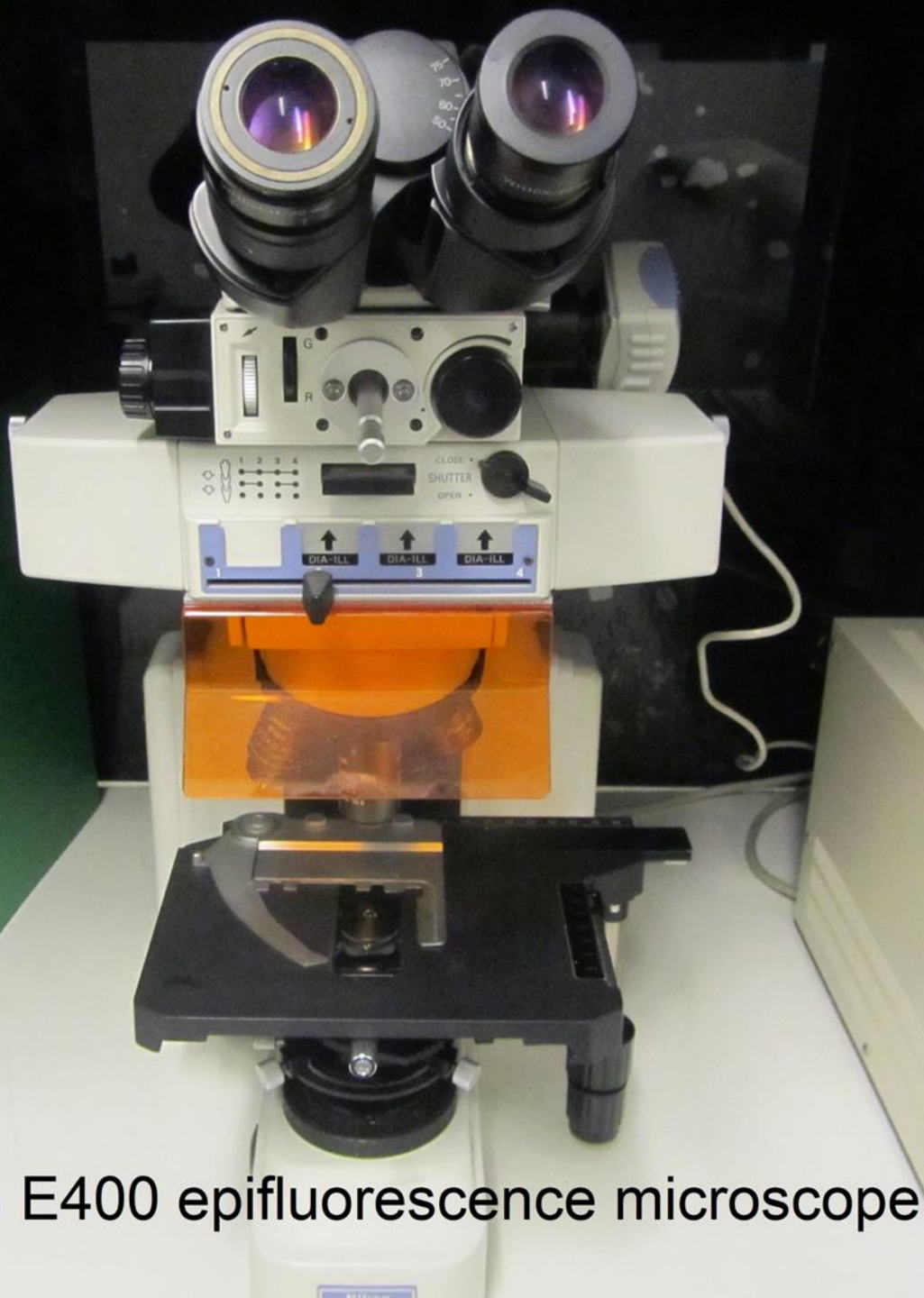
Bench centrifuge



High speed refrigerated bench centrifuge



filtration equipment



Nikon E400 epifluorescence microscope

Experimental facilities

We undertake work at all scales of operation from laboratory studies to the monitoring of commercially operating plant.

Our facilities house over 250 anaerobic digesters of different types and sizes from 0.5 to 100 litres.

These are used in simple batch tests to determine biochemical methane potential (BMP) and for continuous feed kinetic studies to derive design and operational data.

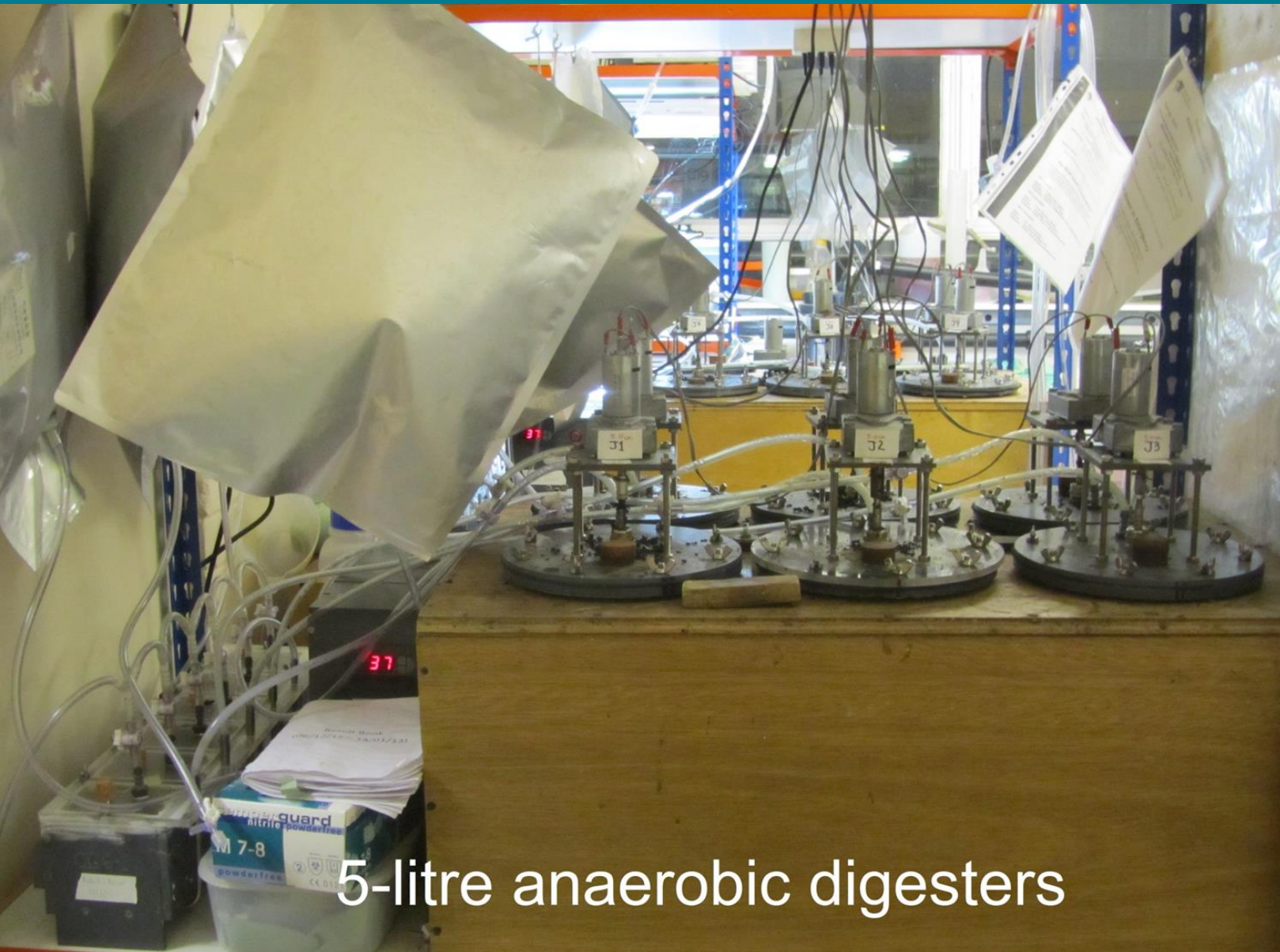
Digester types include: continuously stirred tank reactors (CSTR), Upflow anaerobic sludge blanket (UASB) reactors, anaerobic filters, and anaerobic membrane bioreactors (AnMBR).

These operate over a range of temperatures from ambient to thermophilic using substrates from energy crops to solid wastes and process wastewaters.





2-litre anaerobic digesters



5-litre anaerobic digesters



A bank of anaerobic digesters in the environmental biotechnology laboratory



2-litre stirred batch anaerobic digesters
for biochemical methane potential testing



35-litre anaerobic digesters with
ammonia stripping columns



100 litre anaerobic digesters



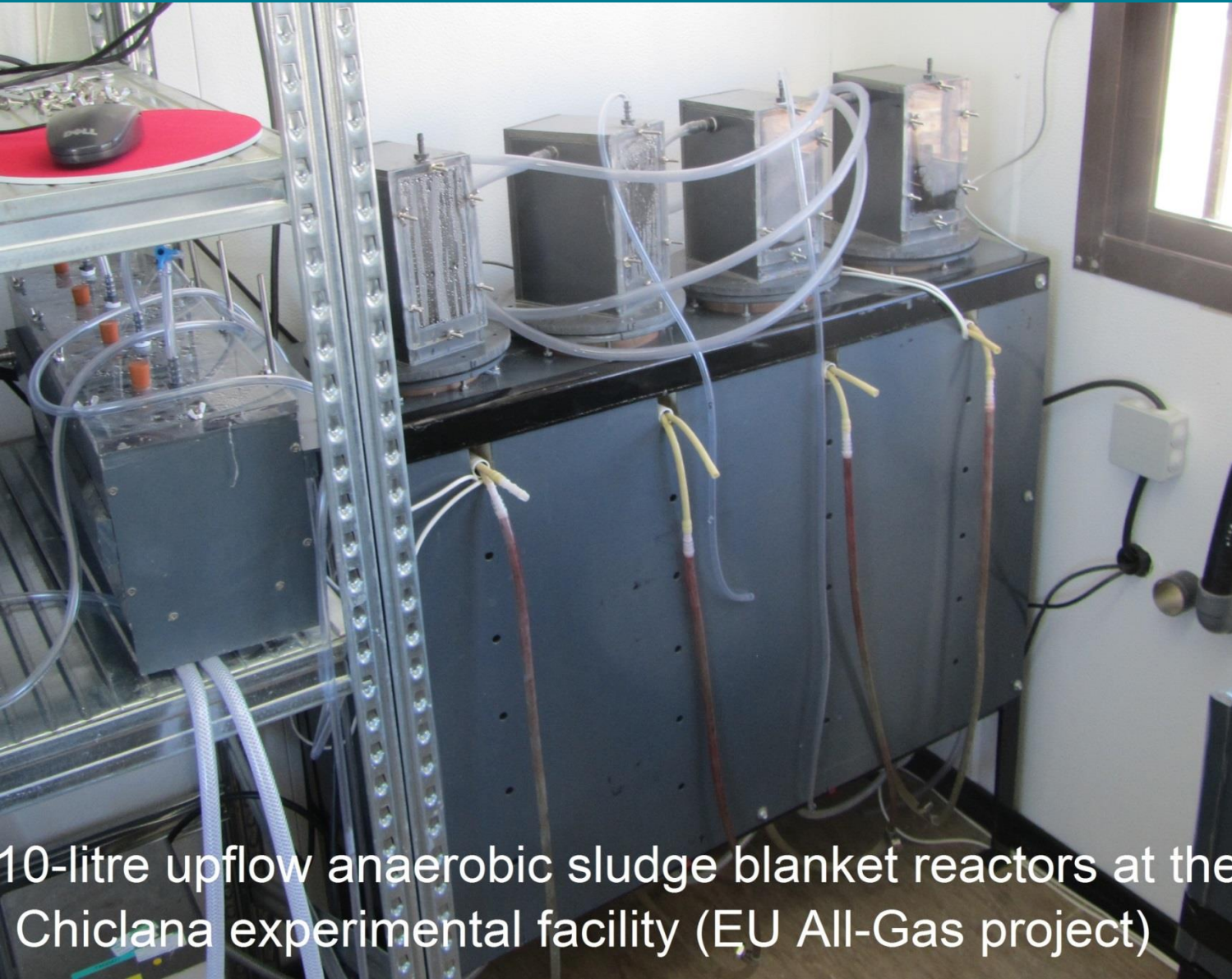
Anaerobic MBR



Gas-sparged AnMBR with
and without particle addition



Low temperature controlled upflow anaerobic sludge blanket reactors



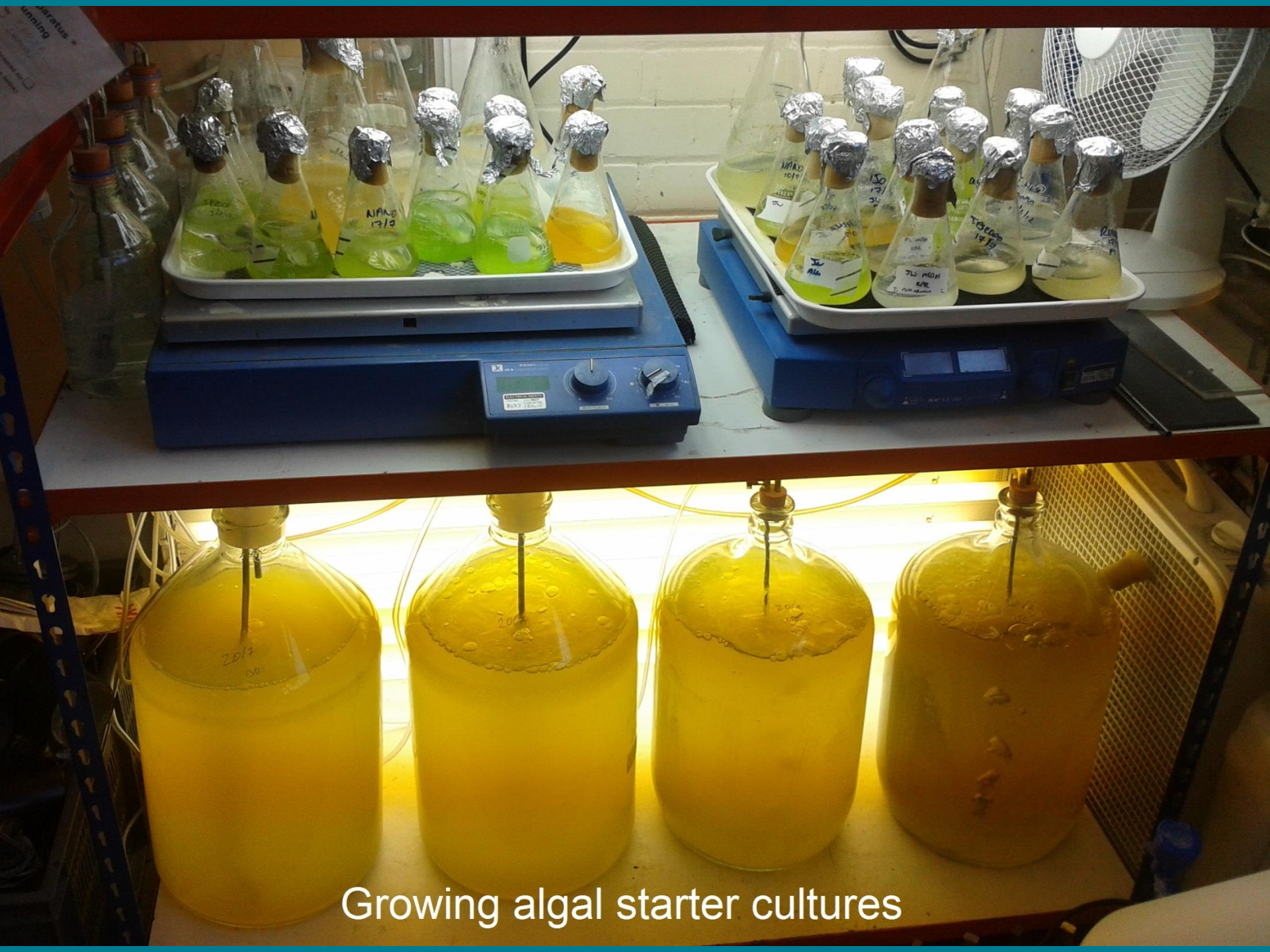
10-litre upflow anaerobic sludge blanket reactors at the Chiclana experimental facility (EU All-Gas project)

lab scale fermentation equipment





Measuring the growth rate of algae



Growing algal starter cultures



Lab-scale instrumented photobioreactors



300-litre photobioreactor
in the greenhouse facility

More information

See also our webpages:

www.bioenergy.soton.ac.uk



www.facebook.com/environmental.lab.university.of.southampton

www.southampton.ac.uk/engineering/research/themes/water_and_environment.page