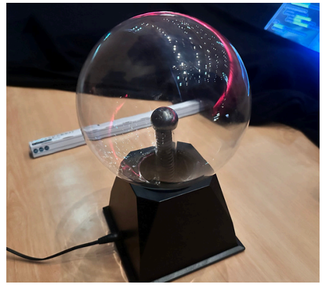
Equipment	Description & How to Use
Computer with presentation on stand	Runs the presentation slides and show timing. A stands helps keeping the computer out of reach of the liquid nitrogen.
Black table cloth	Covers the equipment before and after the show.
Cheat sheet	Quick reference guide for the presenter.
Clock	Keeps the 45-minute show on schedule.
Lighter	Used to light the candle for the Wimshurst machine + representing an easy way to create a simple form of plasma.
Candle on stand	Placed between the two balls of the Wimshurst machine to show separation of positive/negative particles in a plasma.
Wimshurst machine	Used with the candle to demonstrate how plasma reacts to electric charge, illustrating how protons could be separated from a plasma.
Plasma ball (Plan B)	Backup demo if the Wimshurst machine fails; creates plasma by applying high voltage to a gas.
Fluorescent tube (Plan B)	Used with the plasma ball to show electron movement if the Wimshurst machine fails.

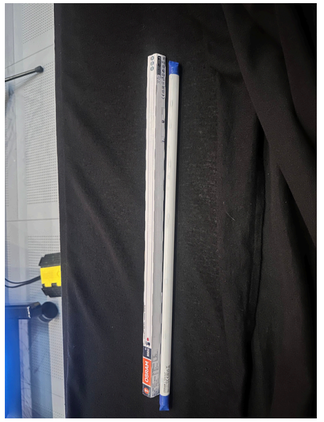
Proton Express



Wimshurst Machine

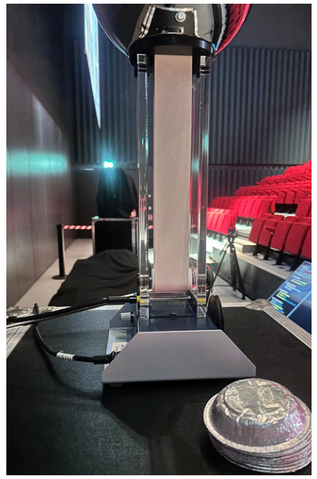


Plasma ball



Flourescent tube

Van de Graaff generator + discharge ball	Electrostatic generator that charges a metal ball; used to demonstrate how electric charge/force can accelerate charged particles.
Aluminium saucers	Placed on top of the charged Van de Graaff generator; they fly off due to like-charge repulsion, demonstrating acceleration by electric force.
CRT TV (cathode ray tube television)	Old-style television used as an analogy for a particle accelerator; electrons are accelerated from the back of the tube to the screen.
Box with CRT TV magnet (strong permanent magnet)	Held near (not touching) the TV screen to bend the electron beam and distort the image - shows how a magnetic field curves charged particles.
Electromagnet (connected with 2 cables to the power source)	Coil of copper wire connected to a power source; demonstrates how electric current creates a magnetic field (electromagnetism), can be switched on/off to pick up paperclips.
Paperclips	Small metal objects picked up by the electromagnet.
LHC superconducting cable prop	NbTi - Niobium Titanium prop showing the type of superconducting cable used at CERN.
Kettle	Liquid nitrogen is poured inside and the lid closed; boiling nitrogen expands rapidly and creates pressure, making the kettle whistle.
Ring and Ball apparatus	Demonstrates thermal contraction by cooling the ring until the ball no longer fits through it.



Van de Graaff generator + aluminium saucers



CRT TV



Magnet box CRT TV



LHC Superconducting cable

Electromagnet (connected with 2 cables to the power source)



Kettle



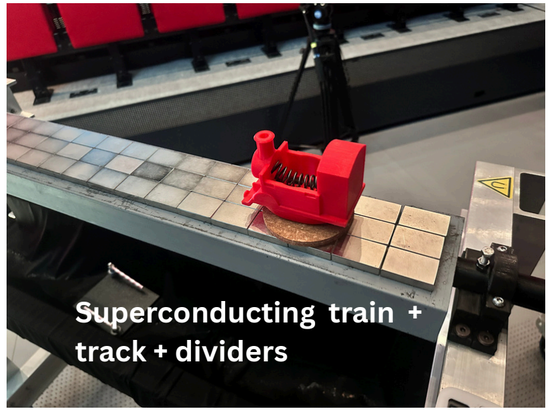
Ring and Ball

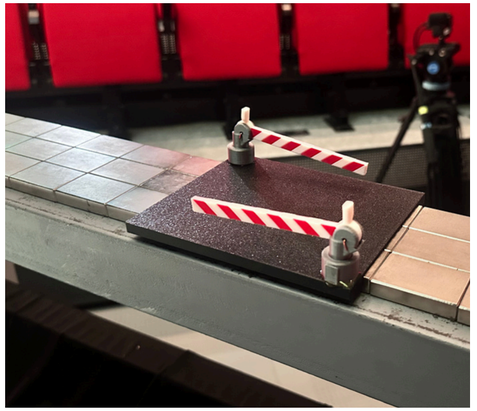


Rubber tube (with knot at one end)	Frozen in liquid nitrogen until brittle, then broken with a hammer. The knot prevents fountain effect.
Hammer	Breaks the frozen rubber tube.
Chopping board	Safe surface for striking frozen rubber.
levitating train	Demonstrates superconducting levitation over a magnetic track. 3D printed train containing YBCO superconductor.
train divider	Separates the rail from the train while cooling. Removed once superconducting state is reached.
Magnetic rail	Track made of magnets for the levitating train. When not in used, covered by a wooden cover for safety.
Liquid Nitrogen 11L Dewar	Main cryogenic storage vessel supplying all liquid nitrogen demonstrations. Stored under the table when not in use.
Small Dewar (2L)	Used to transfer liquid nitrogen from the main dewar to the demonstrations.
Safety goggles	Required whenever liquid nitrogen is handled.
Cryogenic safety gloves	Required when transferring or handling large amount of liquid nitrogen.

Rubber tube (with knot) and hammer + Chopping board

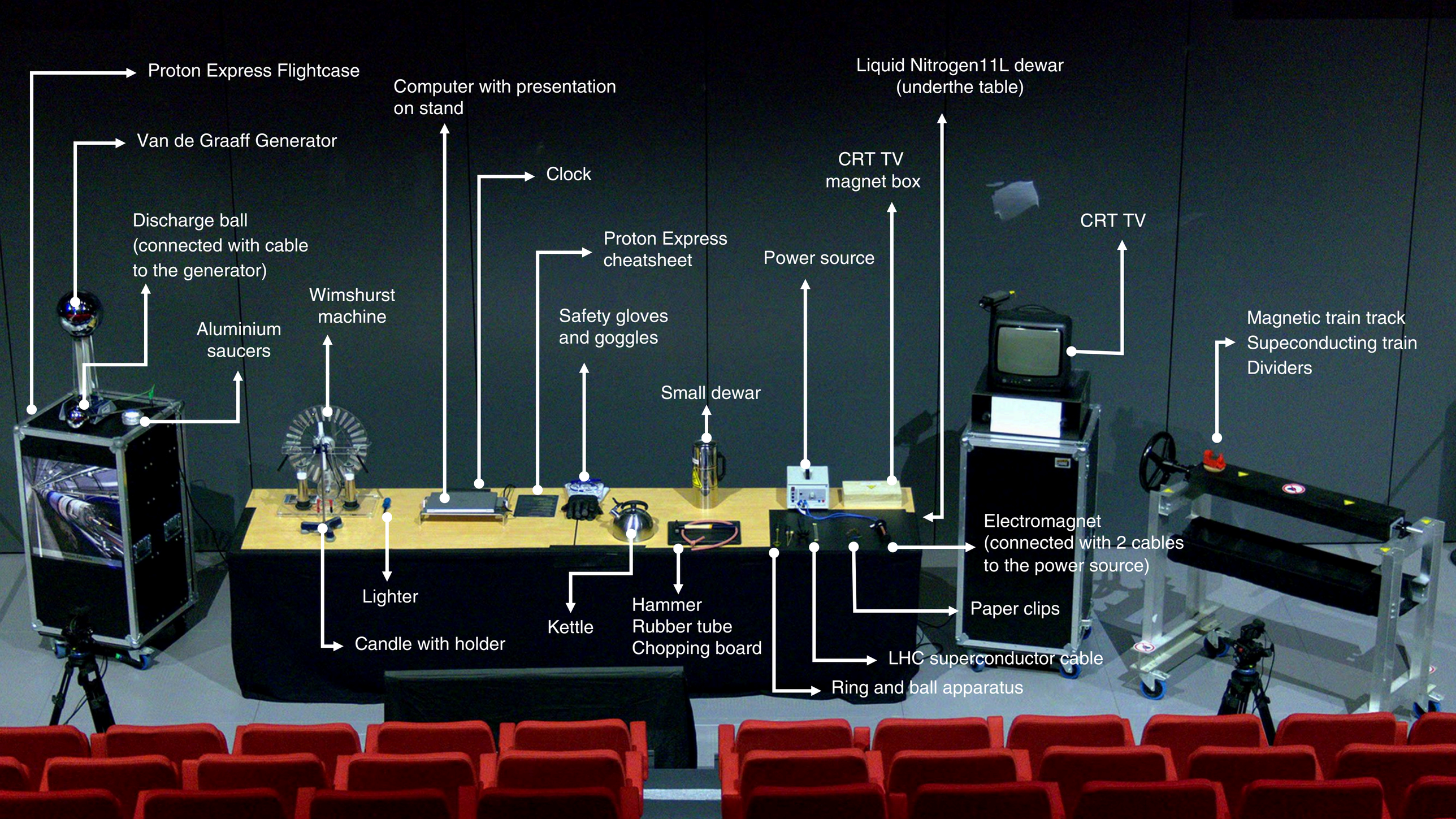






To show how it levitates (new addition).




Proton Express Flightcase
Van de Graaff Generator
Discharge ball
(connected with cable
to the generator)
Aluminium
saucers
Wimshurst
machine
Computer with presentation
on stand
Clock
Proton Express
cheatsheet
Safety gloves
and goggles
Small dewar
Lighter
Candle with holder
Kettle
Hammer
Rubber tube
Chopping board
Liquid Nitrogen11L dewar
(underthe table)
CRT TV
magnet box
Power source
CRT TV
Magnetic train track
Supeconducting train
Dividers
Electromagnet
(connected with 2 cables
to the power source)
Paper clips
LHC superconductor cable
Ring and ball apparatus