

Mechanical Group at Department of Physics and Astronomy

The Mechanical Group support the scientific groups at the department with design, development, manufacturing, assembly and commissioning of mechanical systems.

UHV vacuum systems in particular are our expertise. However, we also cover other mechanical aspects. Spectrographs for telescopes. Micro mechanism and bigger constructions. Water, pneumatic and gas systems.

We use Inventor CAD system for 3D design.

We have CNC milling and turning machines for manufacturing of parts.

Our workshop also cover many other machining and forming techniques. Cutting, drilling, bending, rolling, welding and soldering.

We have He leak detectors and a UHV ultrasonic cleaning facility. In addition, we have a laser theodolite for precise alignment.

Below is a kaleidoscope of a variety of mechanical systems we have made in the past.



Electronics support team at the Department of Physics and Astronomy

The electronics group, together with the staff at the ASTRID synchrotron radiation facility design, develop, build, and also operate smaller and larger systems of electronics equipment and accelerator systems. Altium designer CAD programs are used.

Commercial systems are generally preferred but for many systems, state-of-the-art is required with requirements exceeding systems available on the market. This may for example involve high stability, low-noise, system integration, pulse stability, bandwidth or rise- or fall-time.

Examples of systems built have included detector systems, atomic and molecular neutral atoms and ion traps, dc and rf accelerators, ion sources, radio-frequency systems, electron guns, laser systems, scanning-tunnel microscopes, vacuum interlock systems, timing sequence systems and much more.

Systems are built from commercial electronics modules and units, but often also designed in house when special requirements are important. These may involve ultra-high precision analog design, fast and accurate high-voltage switching, high-voltage RF generators for accelerators and laser systems, precision high-current and high-voltage power supplies, SOC (System On Chip), DDS (Direct Digital Synthesizers), high-frequency filters and conditioning, and high-resolution ADC/DACs.

In house assembly of circuit boards is made, but when more units are required, electronic production is outsourced to subcontractors in Europe and China.

The group designs and build and operate and control a large number of computer systems from microprocessors, FPGA's, Bechoff PLC systems, to large control systems with networks of many connected PC's like for the ASTRID accelerator systems. Software includes CAD work with simulations and also LabView programming.

Some photos of systems built at the department are shown below.

