

18 Mechanical Workshop

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In addition to in-house projects and work for other institutes of the University we also manufactured parts for outside companies. Besides the regular maintenance and repair work we also supported various Bachelor- and Master-thesis projects.

Again over 30 institutes and local high schools were supplied with materials and technical support by the central metal and technical material store maintained by our staff. ⁶ That this service is appreciated by the users was demonstrated by the many visitors during the open day organized in November 2012.

Our machinery was brought up to date in various ways. For the welding shop a larger spot welding system was purchased (see Fig. 18.1). In the material shop the circular saw was replaced and for the central workshop two Schaublin 102 lathes were completely refurbished. In the student workshop two ancient Aciera milling machines have been replaced by the two completely refurbished Deckel FP1 shown in Fig. 18.2.

In September 2012 we started with the evaluation of the new milling machine for the main workshop which will replace the 21-year old Deckel FP5. Unfortunately, the new computer controlled machines have larger outer dimensions for a given work area and the available space is limited.

We conducted the basic mechanical workshop courses for the bachelor students in physics during four weeks. During this time, 9 courses were carried out which lasted 35 hours each. In October 2012 we again organized two welding courses for the physics laboratory assistant apprentices from the ETH. For people interested in a grade as a polytechnician we provided two one-week trial apprenticeships. One of the participants will start his apprenticeship in our workshop in 2013.

The workshop staff continues to get educated. Software courses in computer aided design (CAD) and computer aided manufacturing (CAM) were attended. We took welding training courses and went to the regular meetings in relation with the education of the apprentices. We visited machinery and tool manufacturers, as well as machine and tool exhibitions. In addition to the compulsory Swissmechanic courses our apprentices attended advanced training courses in turning and milling, CNC programming, pneumatics and electronics. Early 2013 we started the preparations for the intermediate and final examinations of the apprentices.

⁶For a catalogue see <http://www.physik.uzh.ch/groups/werkstatt/>

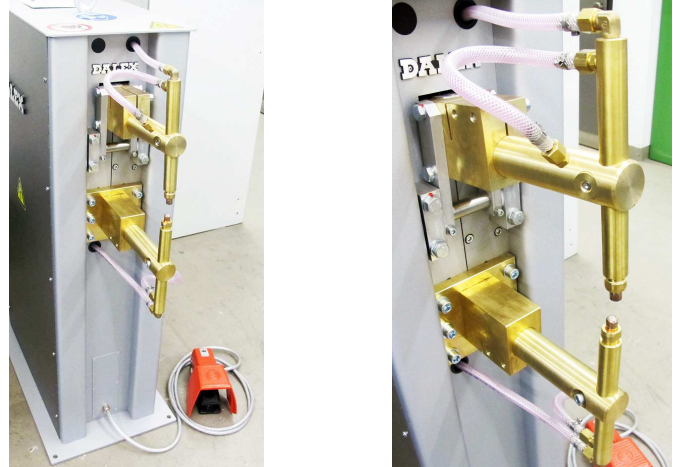


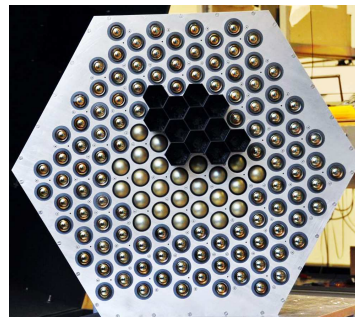
FIG. 18.1 – The new rocker arm spot welding machine.



FIG. 18.2 – New milling machines in the student workshop.

18.1 A selection of our production

- CTA Cherenkov Telescope Array (Sec. 7)
Test setups for the FlashCam project and installation tools were manufactured. We made soldering tools, junction boxes and parts for the detectors.



Prototype of the CTA FlashCam camera.

- Surface Physics (Sec. 15)

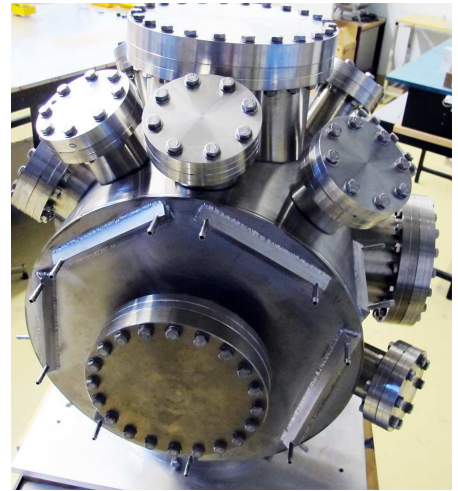
We produced replacement parts made of molybdenum and stainless steel. Various laboratory equipment was completed and repaired.



Ellipsoidal mirror focussing a halogen lamp filament into a glass rod.



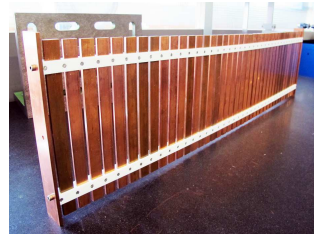
Molybdenum sample holder parts.



Preparation chamber of the Sinergia equipment.

- Astroparticle Physics (Secs. 3 and 4)

An additional fourth calibration system for the GERDA experiment was built. Teflon parts for PMT test setups and a copper field shaping structure for the prototype TPC of the XENON experiment were manufactured. We also performed special welding tests for the group.



Field shaping structure for the XENON test TPC of the XENON experiment.

- Superconductivity and Magnetism (Sec. 13)

Special high-pressure sample chambers made of high strength materials and all necessary replacement part were fabricated.



High-pressure chamber.



Various sealing rings for sample chamber.

- Physics on the nanometer scale (Sec. 16)

We modified and maintained the custom made vapour deposition device with six coating stations. Connectors made of plastic and ceramic materials for the use in vacuum and different evaporation mask were manufactured.



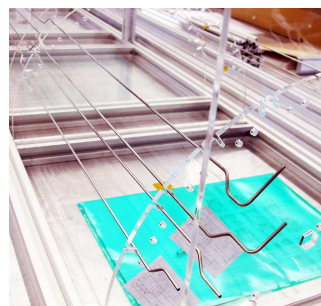
Extension chamber for the thermal desorption spectrometer.



Dedicated sample holders for the low energy electron point source (LEEPS)

- CMS Barrel Pixel detector upgrade

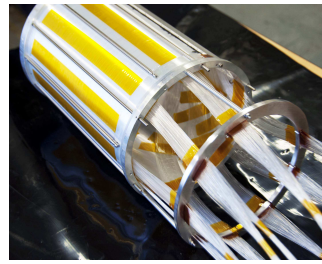
In September 2012 we started with the construction of the CO₂ cooling test setup for the CMS barrel pixel detector upgrade project. We performed bending tests on thin-walled stainless steel tubes with small diameters and manufactured a variety of parts and fittings made of stainless steel.



CO₂ cooling test setup - note the tubes bent with a computer controlled bending machine.

- AEGIS experiment at CERN (Sec. 2)

We manufactured a complex thin-walled aluminum cylinder with very small fibre channels for the AEGIS tracking detector.



The AEGIS fibre tracking detector.

- Zoological Museum

A set of modular table frames and a bird identification game were made for the *Galápagos* exhibition at the Museum which takes place between 11th December 2012 and 8th September 2013.



Modular table frames.



Parts for a bird identification game.

- Anthropological Institute

We built three test boxes used to collect urine specimens from Callitrichidae (a family of New World monkeys) which is used to study the evolution of primates.

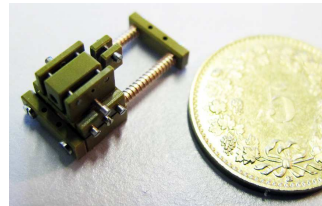


Test box for the anthropological institute.

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- Institute of Neuroinformatics

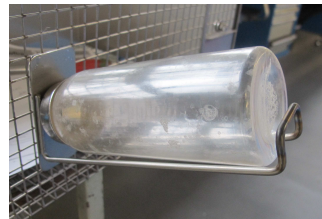
A new micro-drive generation was manufactured. These are implanted in the heads of singing birds where the activity of single neurons is recorded. The hope is to understand the mechanisms that generate complex vocal sequences and the learning process in general.



New version of a miniaturized piezodrive.

- Animal Hospital

A series of hundred novel water bottle holders



Drinking bottle holder for the animal hospital.

- Outside company

A series of six outdoor 16 W LED lamp stands made of stainless steel. The light direction can be adjusted over 90 degrees.



Outdoor lighting LED lamp made of stainless steel for an outside company.