

15 Mechanical Workshop

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The activities of the mechanical workshop are three-fold³:

- Fabrication of specialized equipment, which can not be purchased commercially, for the various research projects of the institute. Some major components are listed below.
- Training of apprentices, and first year students in experimental physics in short special workshop courses.
- Services for other institutes or firms.

In the following we list some examples of components produced during 1999 with reference to the sections in this annual report:

Measurement of the gravitational constant: the suspension system has been completely reconstructed (see Sec.1 and Figures 15.1 and 15.2).

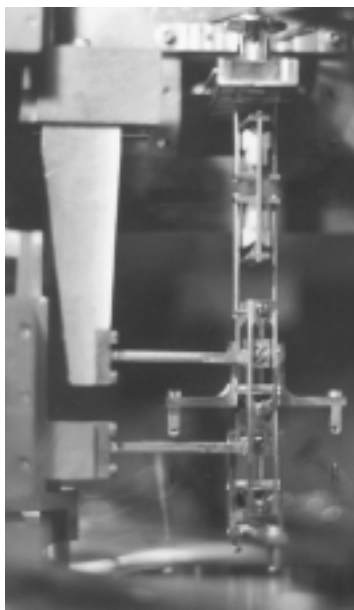


Figure 15.1: *Part of the setup of the measurement of the gravitational constant (Sec.1). The two horizontal bars in the lower half of the picture act as cantilevers. They can be moved up and down to exchange the test masses.*

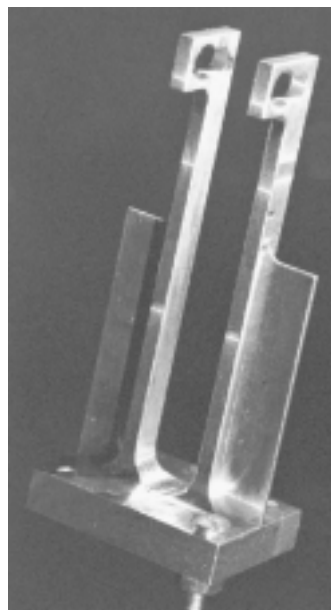


Figure 15.2: *Close-up of a cantilever (total length 58 mm) made of a single piece of aluminum.*

Surface physics: manufacture of ultrahigh vacuum components, such as sample manipulators with five degrees of freedom, major components for the COPHEE spectrometer (Sec. 12.9), such as support frame, mu-metal shieldings, gas system for sample preparation,

³See <http://www.physik.unizh.ch/groups/werkstatt> for additional information.

and high-precision sample holders made of various materials (see Sec. 12).

HERA-B: fabrication of support structures for the MSGC detectors made of various materials (CFK, GFK, Hexel, aluminum) allowing for precise and easy adjustments of the detector positions (see Sec. 8).

H1: preparations for the construction of a set of five concentric proportional chambers like e.g. four high-precision steel cylinders (300 to 400 mm diameter and 2700 mm length) serving as mandrels, special milling tools for the cutting of grooves into the Rohacell layer for the cathode readout cables, ovens for the heat-treatment of surfaces and glued components, high-precision gauges, modifications to wire transfer frames and tooling, construction of a prototype chamber, and start of construction of final chambers (see Sec. 7 for further details).

Athena: fabrication of the support structure for the silicon microstrip modules and the CsI crystals of the annihilation detector which is operated at very low temperature, and is machined from a single block of aluminum (see fig. 6.4 and Sec. 6).