

15 Mechanical Workshop

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During the past year the mechanical shops were mostly occupied with work for the different research projects described in this report. As a consequence orders from other institutes of the University of Zürich and from the outside made up for only a small part of the shop activity. More than 30 institutes make, however, use of the metal and other technical material supply stores maintained by the shop³.

Major projects which deserve mentioning are the following:

- H1-collaboration at DESY upgrade project (groups Straumann and Truöl, see Sect. 7): After the successful construction of a prototype for the new cylindrical proportional chamber (CIP) in 1999, the full five-layer detector was completed in January 2001. This project required more than 7800 man-hours, and the temporary employment of two DESY technicians during several months. The complexity and novelty of many techniques used in the construction forced us to make many dedicated tests. The successful completion was only possible with a considerable amount of patience and overtime of all persons involved. Figures 15.1 to 15.3 illustrate some of the construction steps. The items listed in Table 15.1 should provide a feeling for the size of the project.

Table 15.1: *Materials used in the CIP construction.*

Rohacell	25 m ² × 1.5 mm
Al-foil	32 m ² × 25 μm
Cathode foil (Cu pads)	12 m ² × 25 μm
Special high voltage connectors produced	240
Coaxial cables from cathode pad to signal connector	9000
Soldering connections	16680
Signal connectors soldering points	80 × 120
Anode wires	2400, 5.28 km, φ 25 μm
Araldit glue	10 kg
Total weight of chamber	35 kg

- Surface physics group (Group Osterwalder, see Section 12): Two bi-axial and one tri-axial goniometer, to be used in ultra-high vacuum for photoelectron diffraction were manufactured. A second project concerned a photocathode electron gun for time resolved electron diffraction (see Figures 15.6 to 15.8).

³For a catalogue see <http://www.physik.unizh.ch/groups/werkstatt/dienstleistung.html>



Figure 15.1: A Rohacell cylinder on its mandril is being prepared for polishing.



Figure 15.2: The grooves for the cables transmitting the cathode signals to the end flanges are filled with glue.



Figure 15.3: A completed detector cylinder is prepared for removal from the mandril.

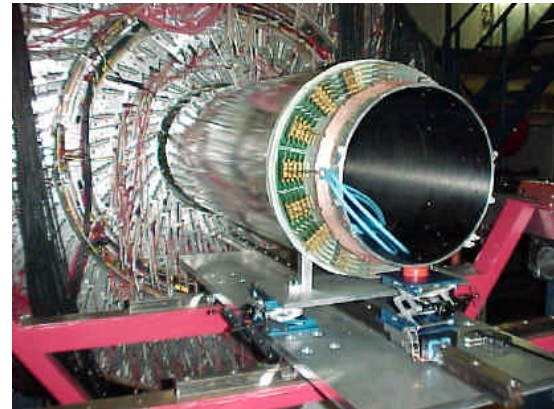


Figure 15.4: The new CIP is being mounted into the H1 central tracker.

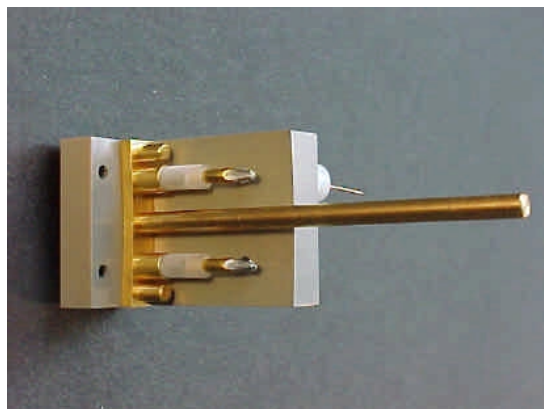


Figure 15.5: Special high-voltage connector.

Pictures from the
H1-collaboration
upgrade project.

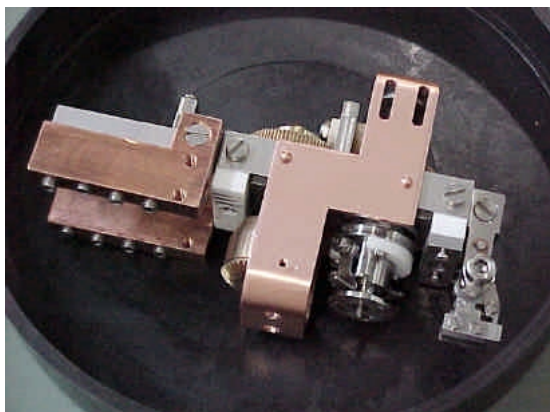


Figure 15.6: *Sample goniometer with five degrees of freedom for photoelectron diffraction - after construction.*

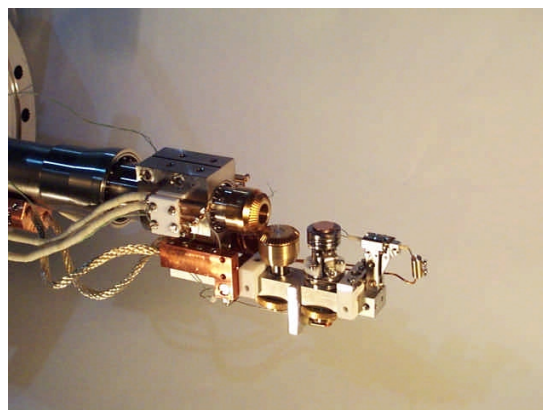


Figure 15.7: *Completed sample goniometer with five degrees of freedom for photoelectron diffraction - in position on the vacuum flange with supplies.*

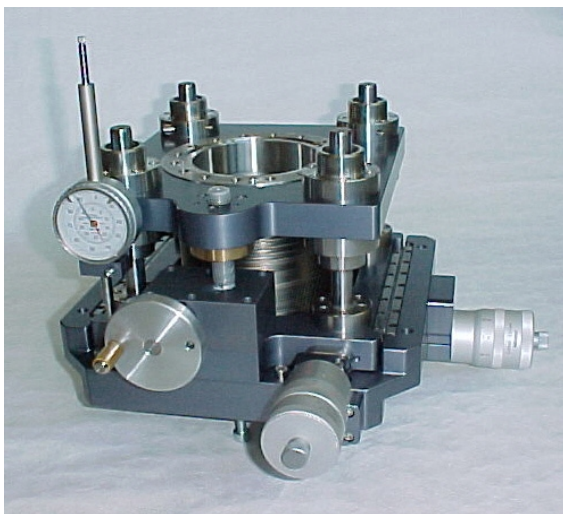


Figure 15.8: *Three axis positioning stage used in ultrahigh vacuum for the surface physics group.*

Pictures from projects
for the surface physics
group.