



Excursie de studii la Institutul de Optică Cuantică „Max Planck”

Gärching-München, luna mai 2017





Seniorenzentrum

Niels-Bohr-Str.

701

Ortszentrum Rathaus
Bürgerhaus Postamt

Einsteinstr.

Albert Einstein
dt. Physiker, geb. 1879, gest. 1955

Heisenbergstr.

Max-Planck-Straße

Max Planck,
dt. Physiker, geb. 1858, gest. 1947







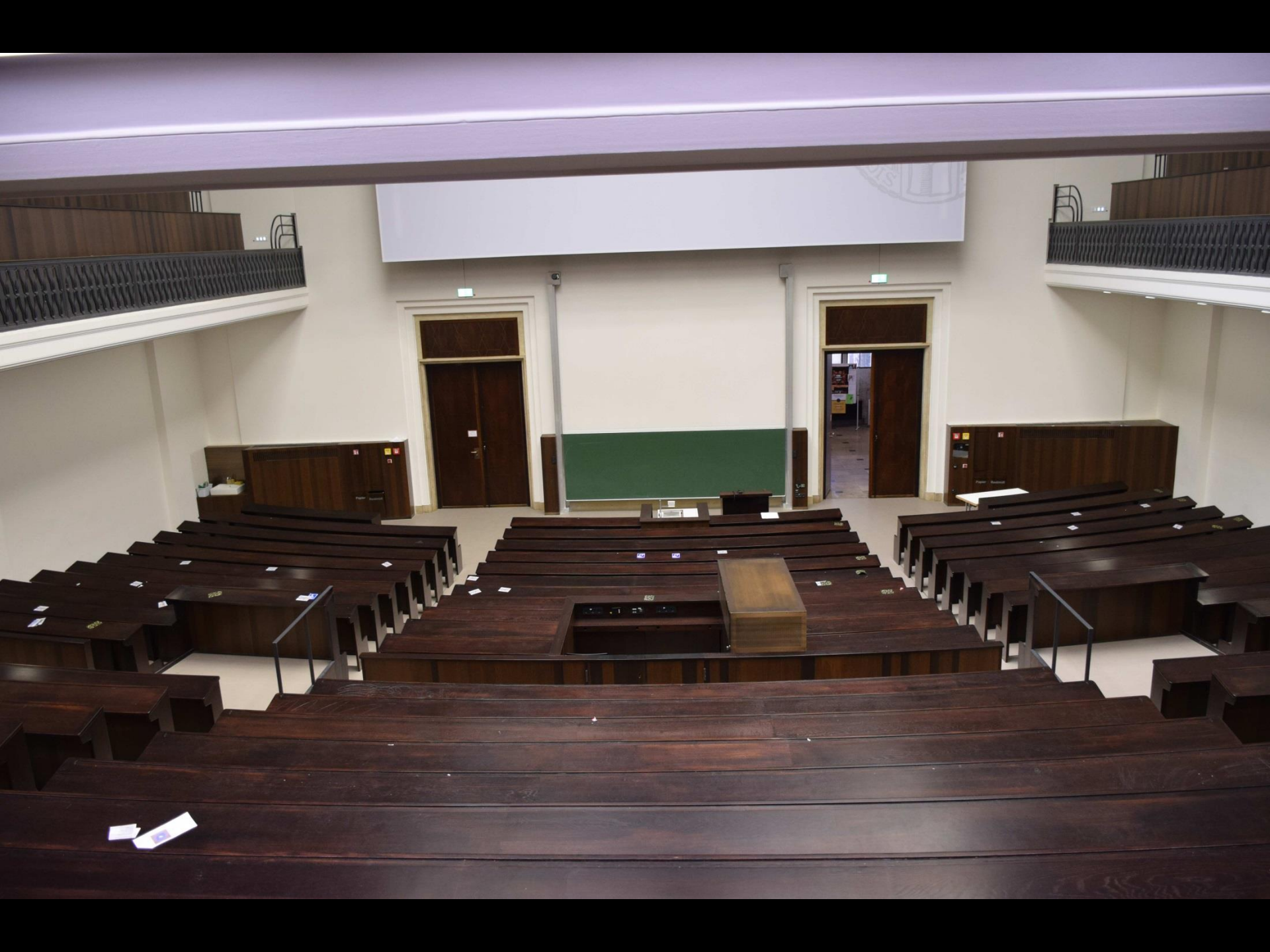
UNIVERSITAS -
LUDOVIC MAXIM -
MONACENSIS













SIRIUS

ORION

RIGEL

CASSIOPEIA

PLE-JADEN

SATURNUS

JUPITER

URANUS

NETTUNUS

URSA MINOR

URSA MAJOR

DELPHIN







Marienplatz

hUQ8





PROBAT
BAULEITUNG

Häcker-Pschorr

Häcker-Pschorr

Häcker-Pschorr

Häcker-Pschorr

Häcker-Pschorr

Häcker-Pschorr



Neu denken
E.ON

MÜNCHEN
ZIN
GER

Fräulein
HAARSCHMUCK

OPTIK
HÖRTKORN
Dixons

Hacker-Pschorr
Hacker-Pschorr
Hacker-Pschorr





ANNO 1589





PASTA & PIZZA

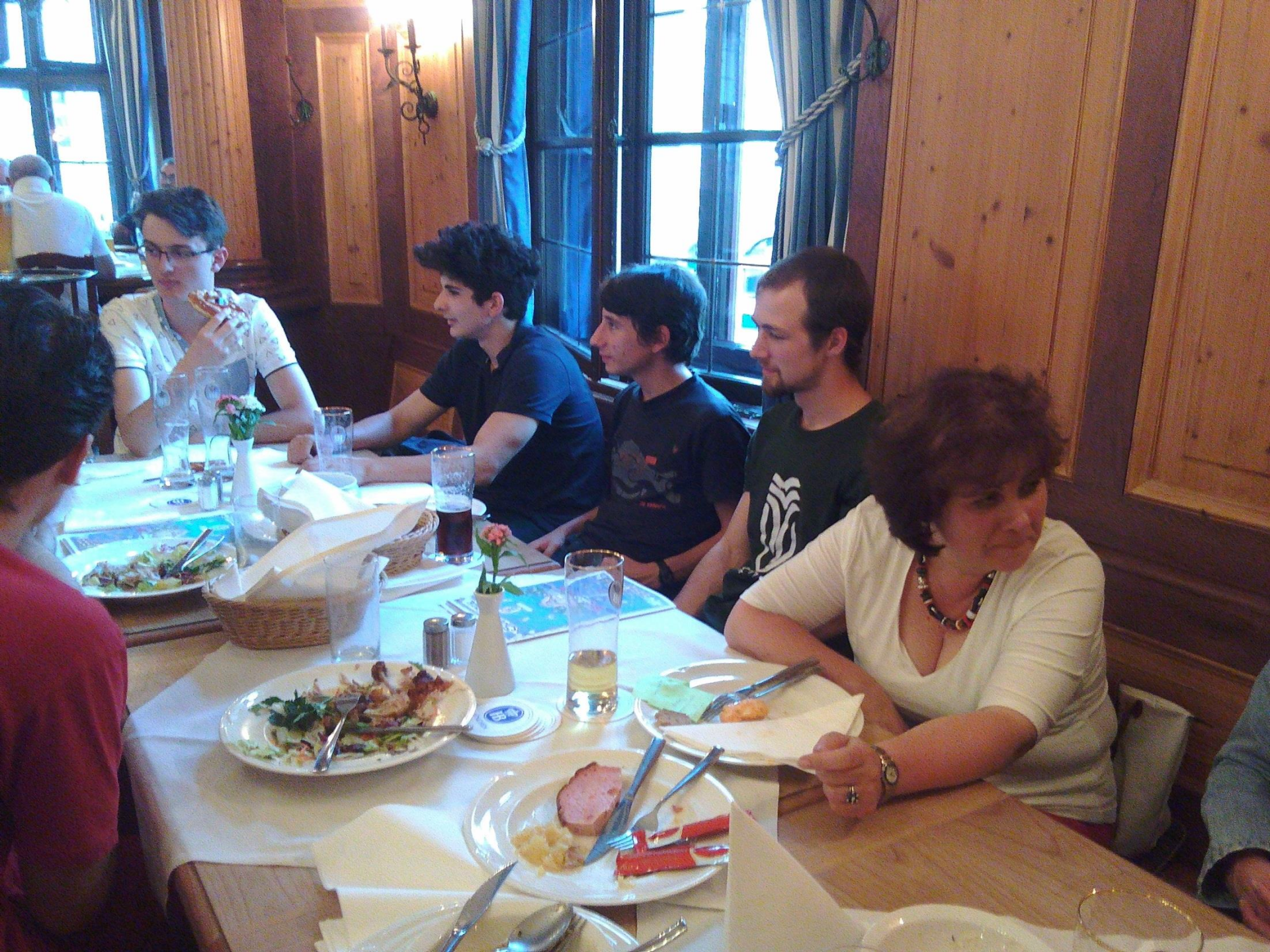
GALLETTES

6

PASTA & PIZZA

SCHOKOLA
TEE

www.schaback.de







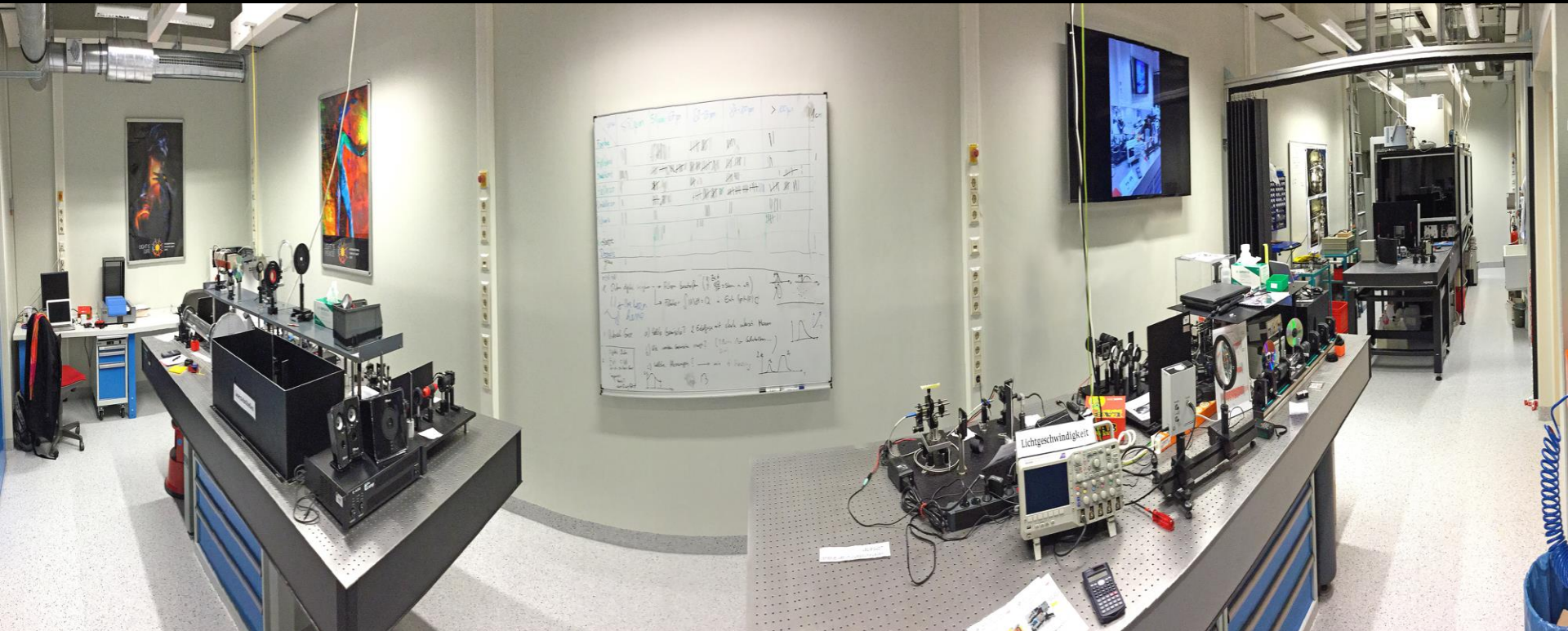


60
Jahre

HB
MÜNCHEN

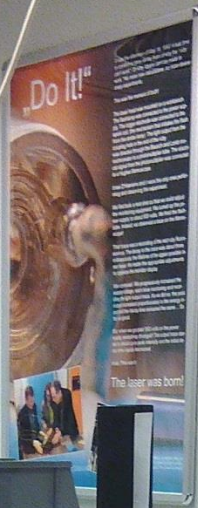




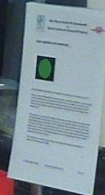


PhotonLab - laborator laser pentru elevi





Haardicke messen



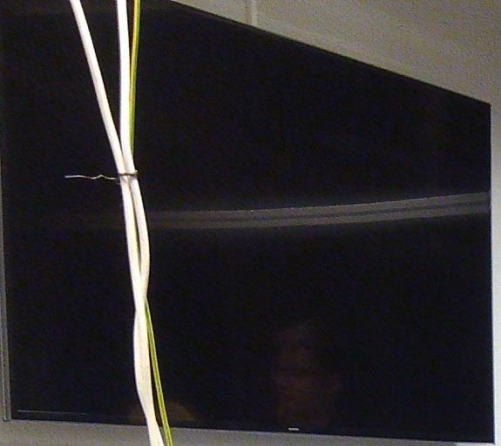


11
Quantenradierer

20
Holographie

21

Newport
Scientific Series
High Performance Sealed Hole Table Top



20

Holographic

Mini-Phasor-Inverter for Class
 Marik Centre for Research

Holography
 1. Place the slide on top of the hologram...
 2. Turn the slide 90 degrees...
 3. Place the slide on top of the hologram...
 4. Turn the slide 90 degrees...
 5. Place the slide on top of the hologram...
 6. Turn the slide 90 degrees...

What are the characteristics of a hologram?
 A hologram is a recording of light intensity and phase. The phase information is recorded by interference of the object and reference beams. The phase information is recorded by interference of the object and reference beams. The phase information is recorded by interference of the object and reference beams.



A woman with short blonde hair and glasses is gesturing with her hand while talking to a group of students. One student in a pink shirt is leaning over a piece of equipment, possibly a microscope or a camera, and looking at a notebook. Other students are standing around, some looking at the equipment and others talking.

Two students in white t-shirts and blue jeans are standing on the right side of the image, looking towards the left. One is looking at a piece of equipment, and the other is looking towards the camera.

8

Interferometer

**Max-Planck-Institut für Quantenoptik
Munich Centre for Advanced Photonics**

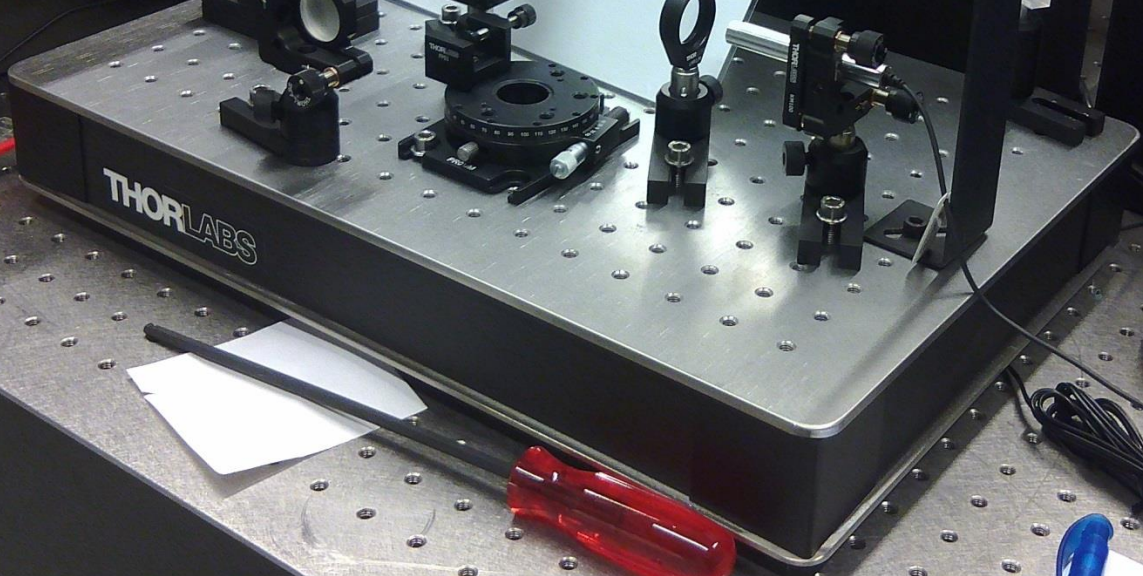
1. Light + Light = Darkness!
In order to measure the wavelength of laserlight
1. Interferential measurement



2. Adjusting the Interferometer:
Adjustment: The mirrors can be adjusted with the two screws lying
oppositely to each other at the mirror holder.

**What laser safety glasses and turn
the laser on!**
Adjust the two backscattered
reflected spots to the center of the
laser beam.

On the screen you will watch two laser reflexes
that should come to overlap.
If they overlap exactly, you will see only one
pattern of several stripes.
Adjust the interferometer in a way so that you can only see two to



increased the
ring and recor-
did so, the peak
to the energy in-
two same... So

on the power
output trace star-
y and the initial de-

as born!

200 KIMTECH



200 KIMTECH

200 KIMTECH

3

Haardicke

Haardicke messen

Max-Planck-Institut für Quantenoptik
Maxwell Center for Advanced Photonics
Interference Diffraction of Light
1. What is the thickness of my hair?
Experimental setup: Diffraction of light by a hair

Practical Note: The white paper below you (don't see hair yet)

Place one hair in front of the light source of the setup. The hair should be perpendicular to the light beam. Adjust the distance between the hair and the screen so that you can see the diffraction pattern.

Question: How thick is the hair? (The hair thickness is approximately 100 micrometers.)

Answer: The thickness of the hair is approximately 100 micrometers.



H₂O des

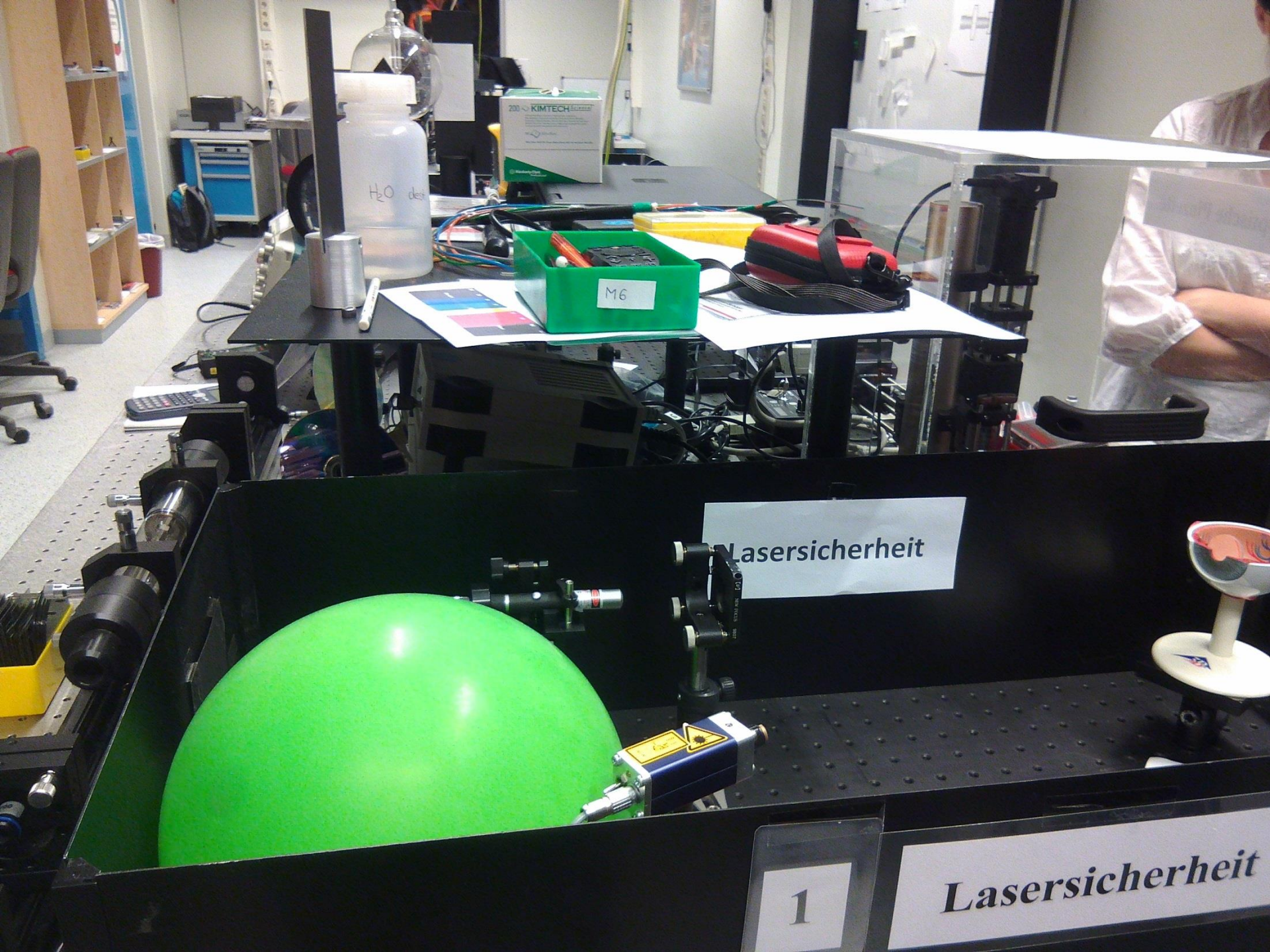
200 KIMTECH

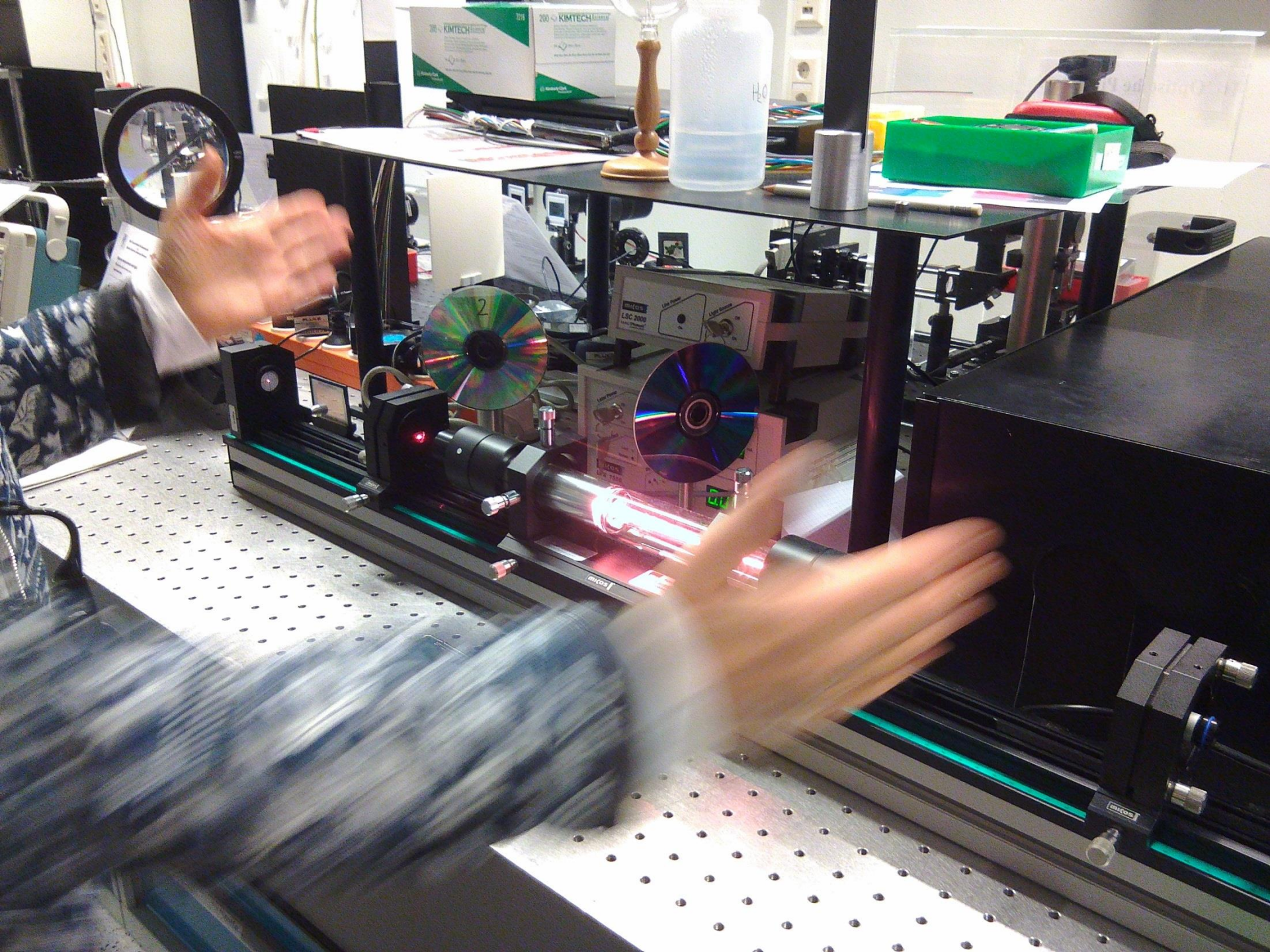
M6

Lasersicherheit

1

Lasersicherheit



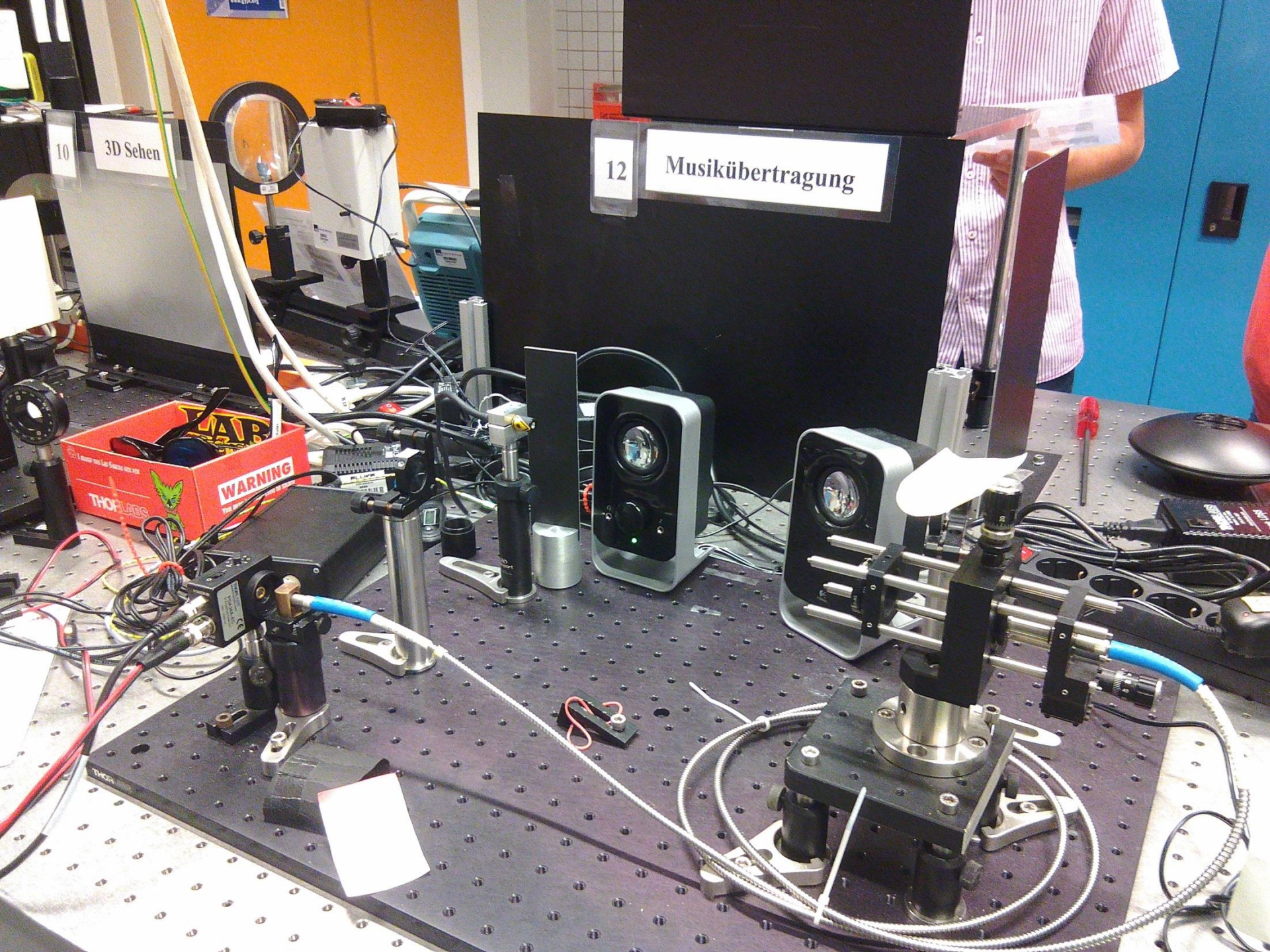


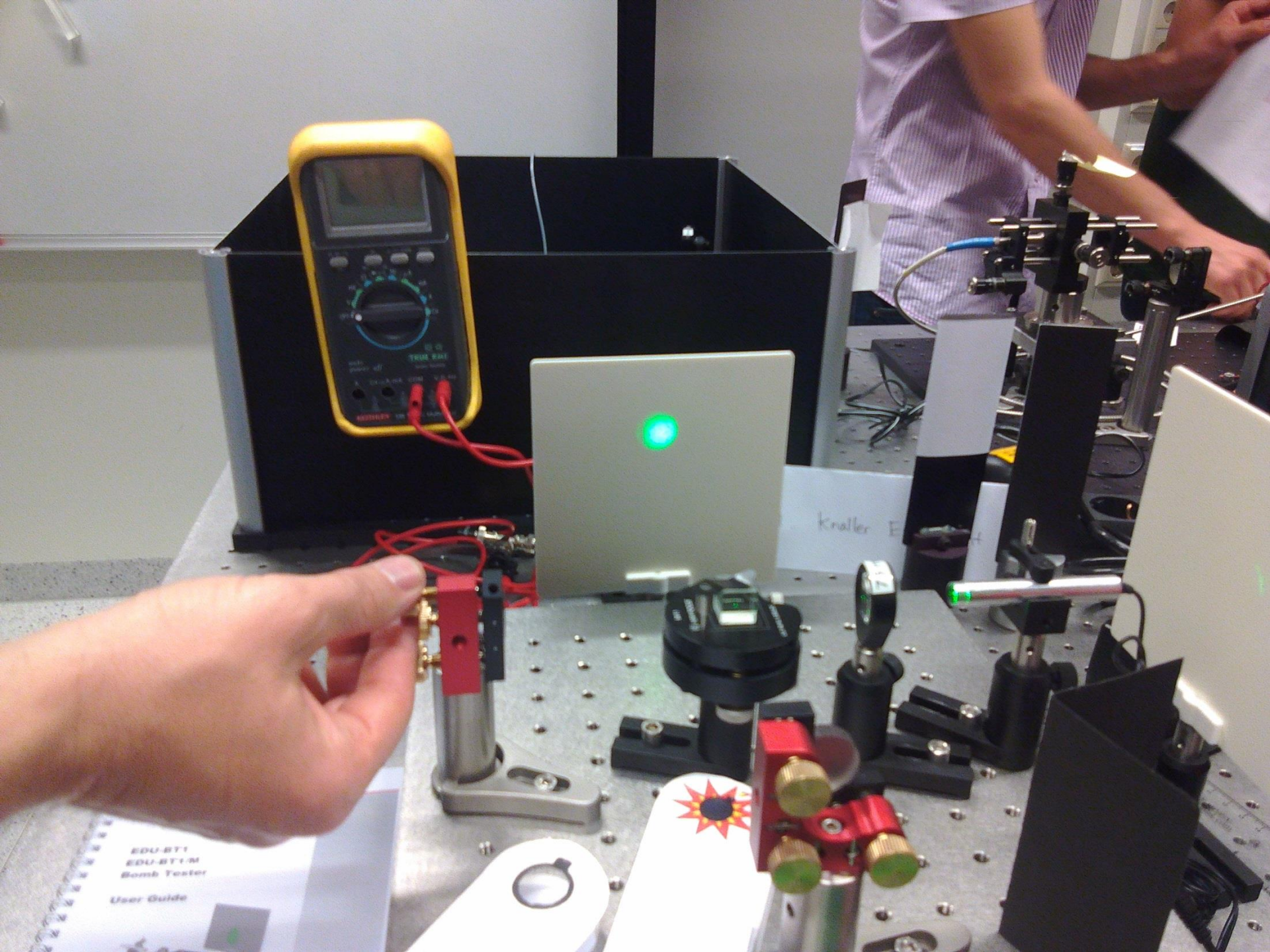
10

3D Sehen

12

Musikübertragung





Knaller E

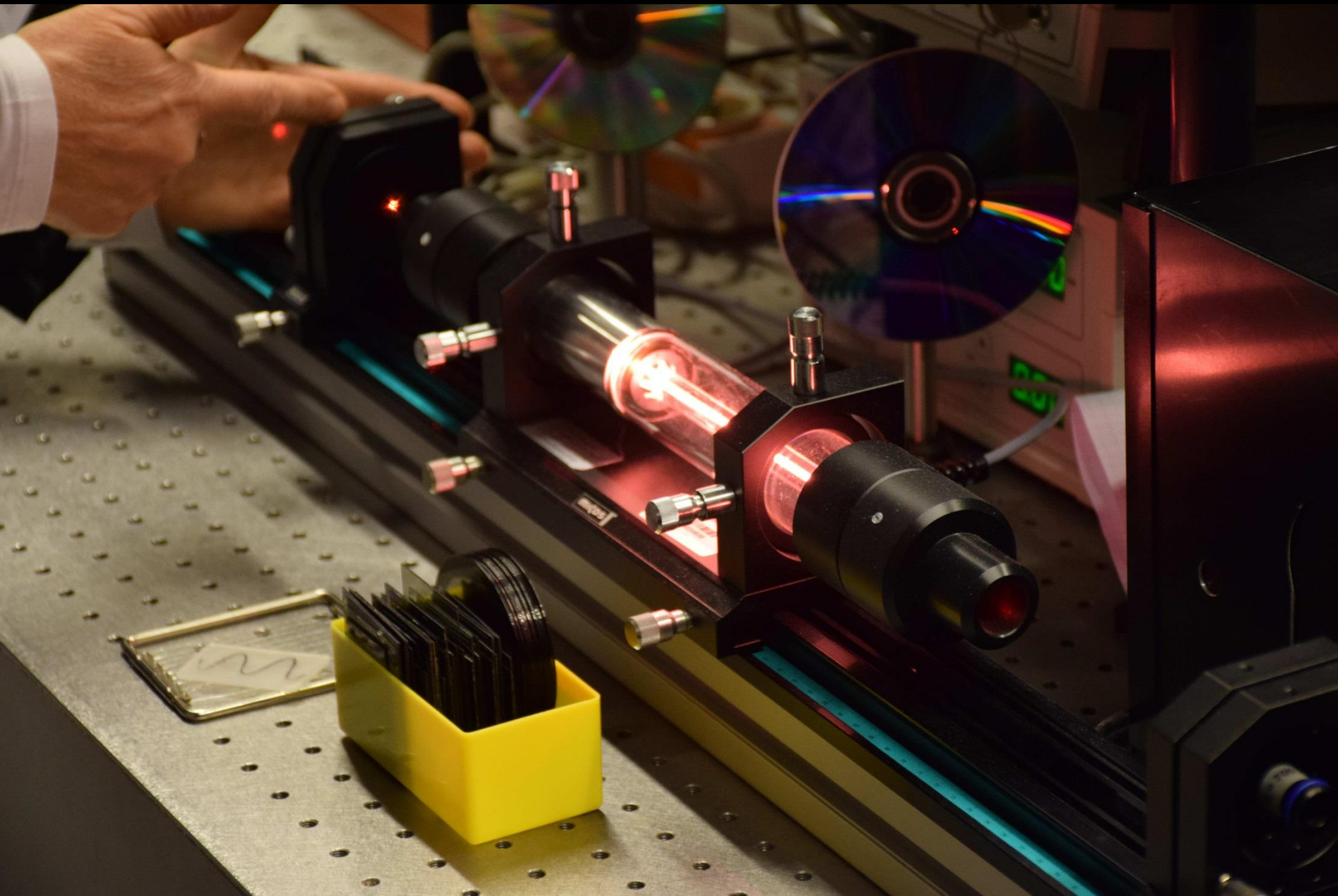


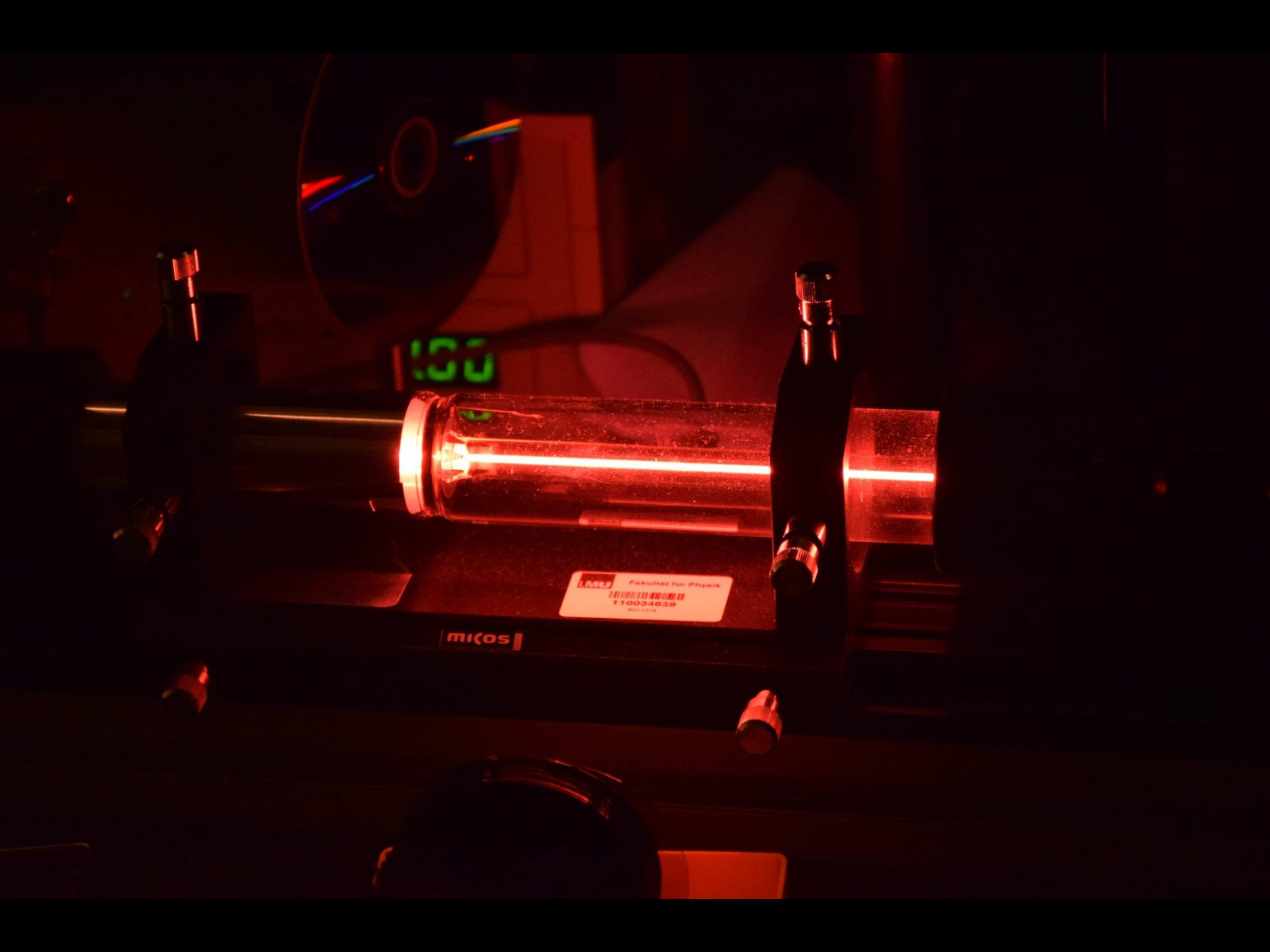
EDU-BT1
EDU-BT1-M
Bomb Tester
User Guide





Knaller Exp

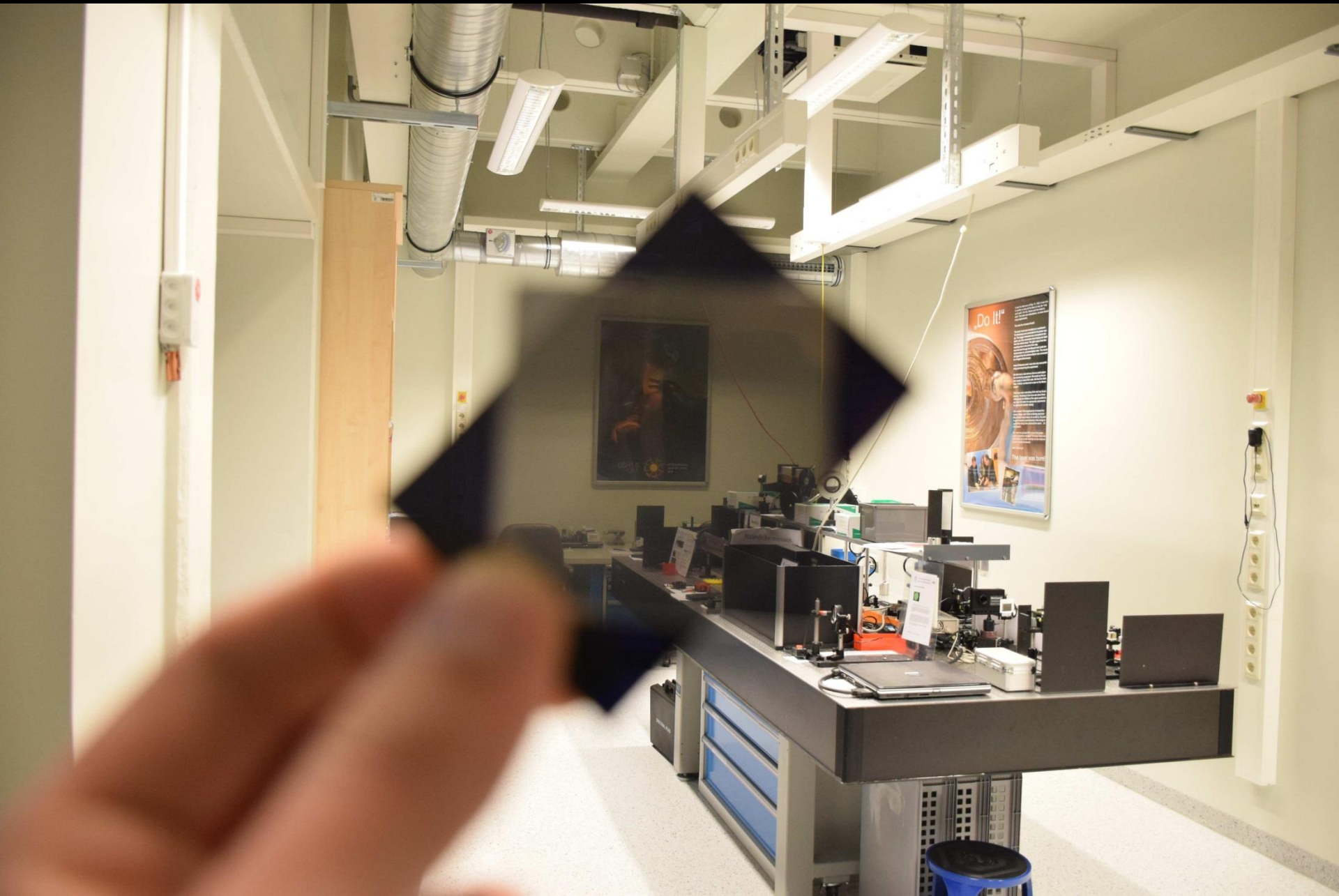




1.50

IME Fakultät für Physik
110034639

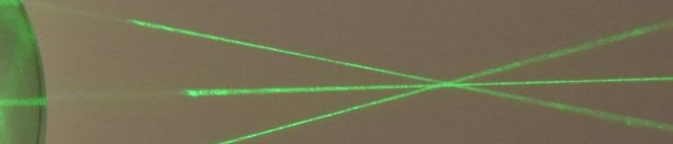
micos

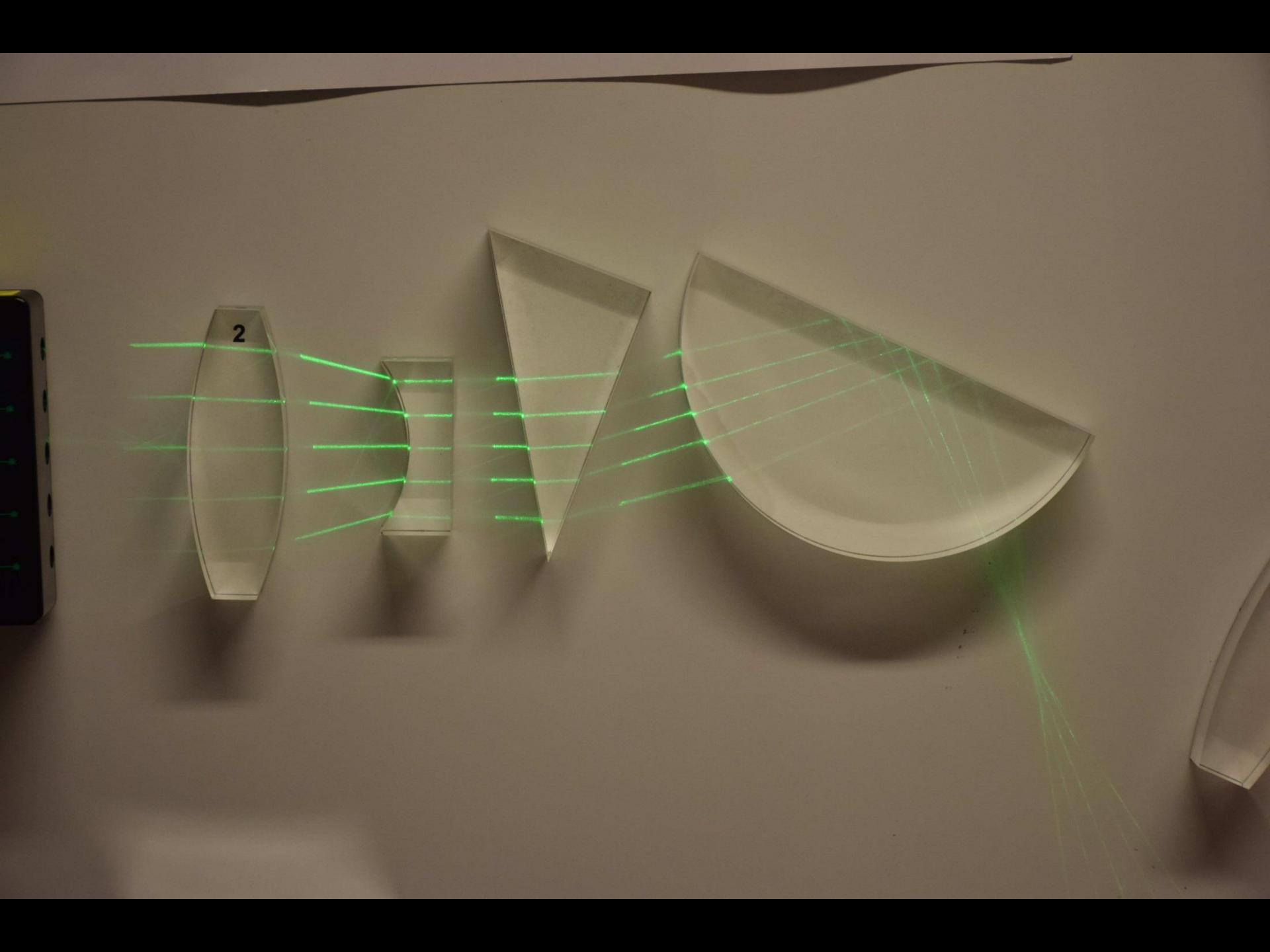


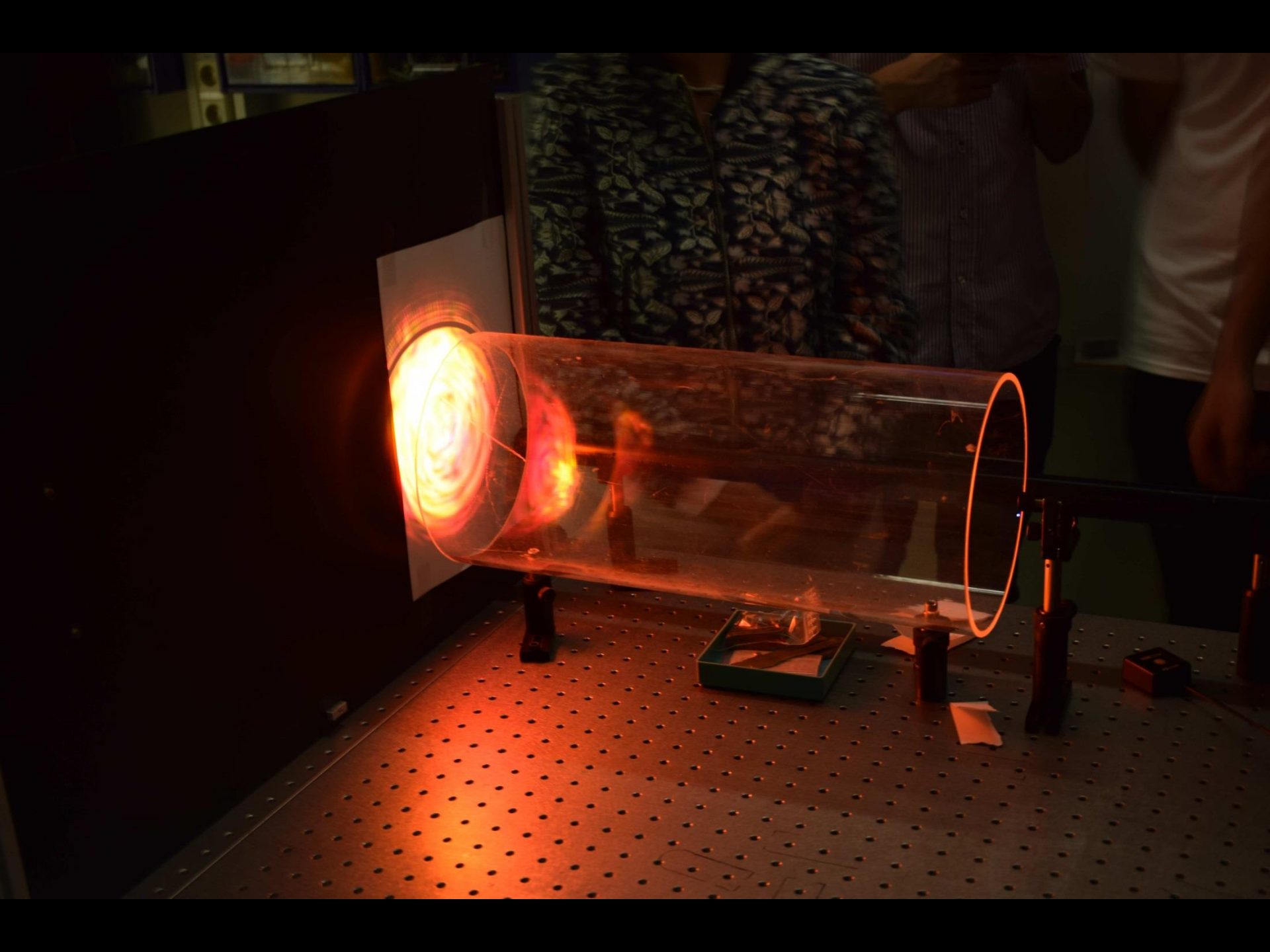




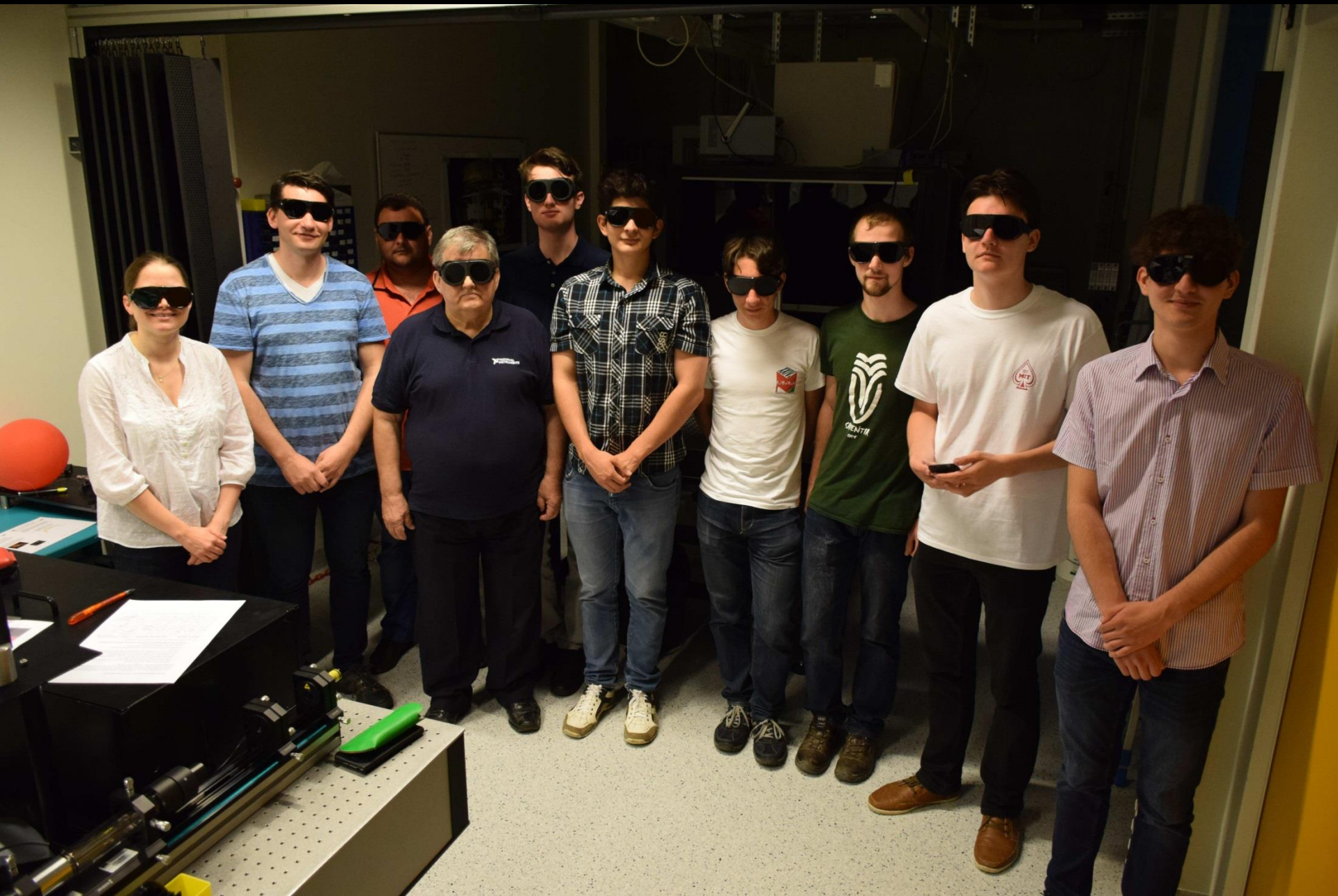


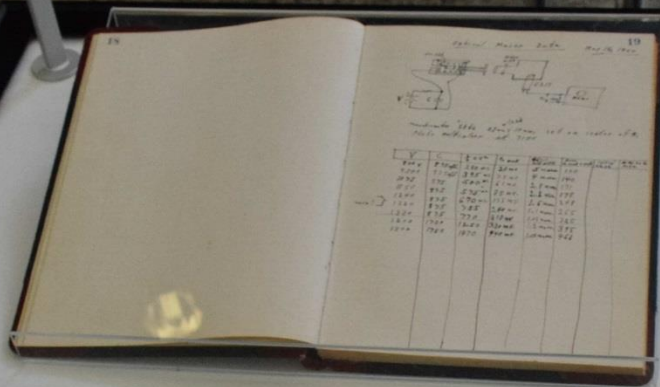










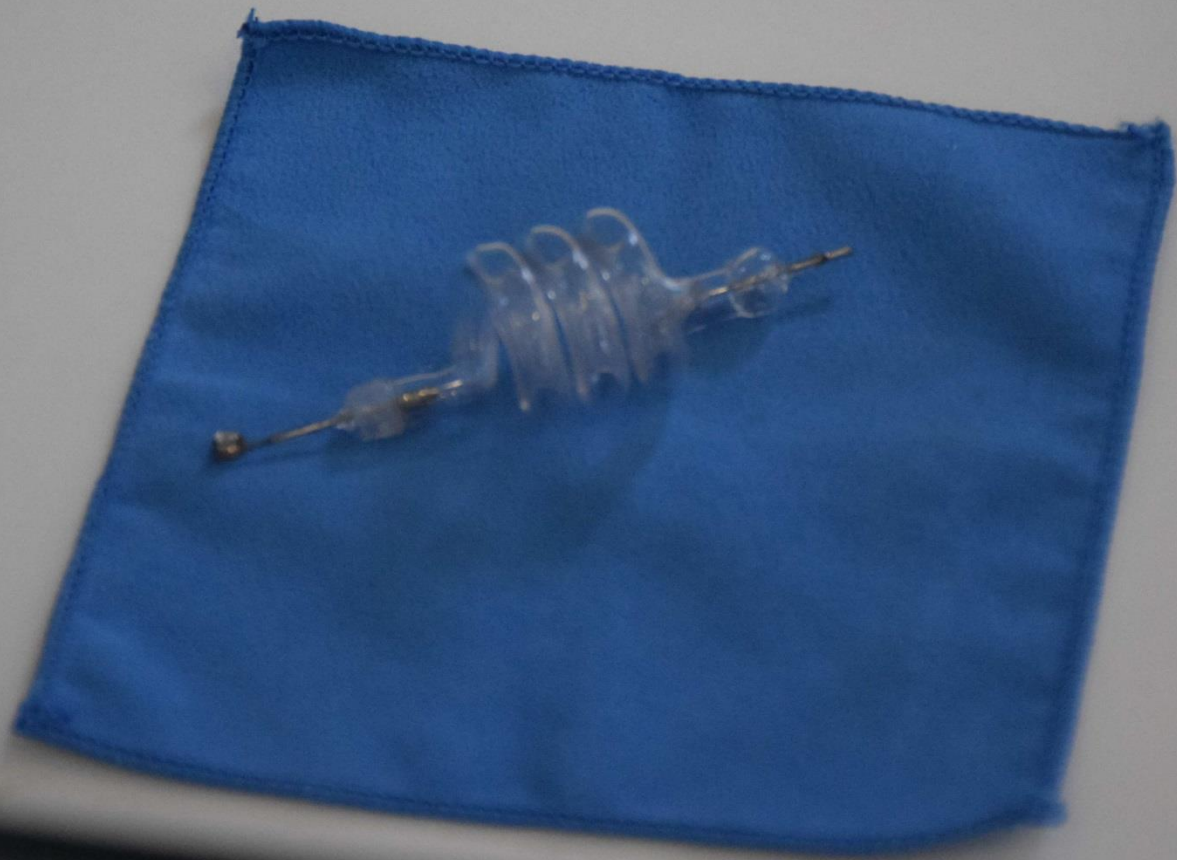


Laboratory notebook of Theodore Maiman
July 1960 - October 1960
The right page shows the laboratory notes
of Theodore Maiman on May 16th 1960.
The two-day Maiman trials had great successful
observations.

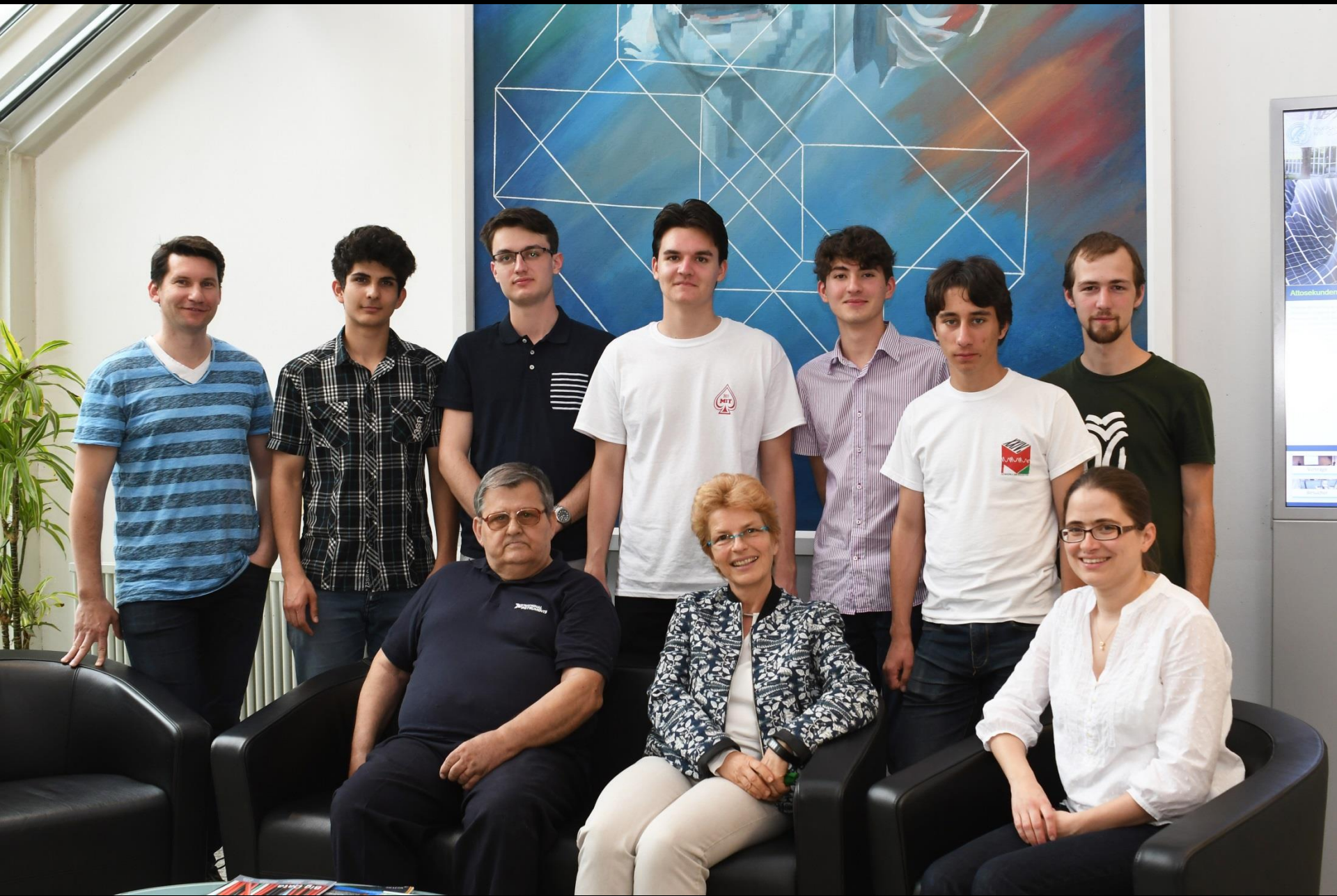


Theodore Maiman's original first laser early 1960. U.S. Patent # 3,353,115
An aluminum cylinder with flash light and ruby crystal mount.
A spiral flash light and a ruby crystal with evaporated-silver-mirrored
ends are enclosed in a hollow aluminum cylinder.











Masa de prânz am servit în grădina cantinei TUM









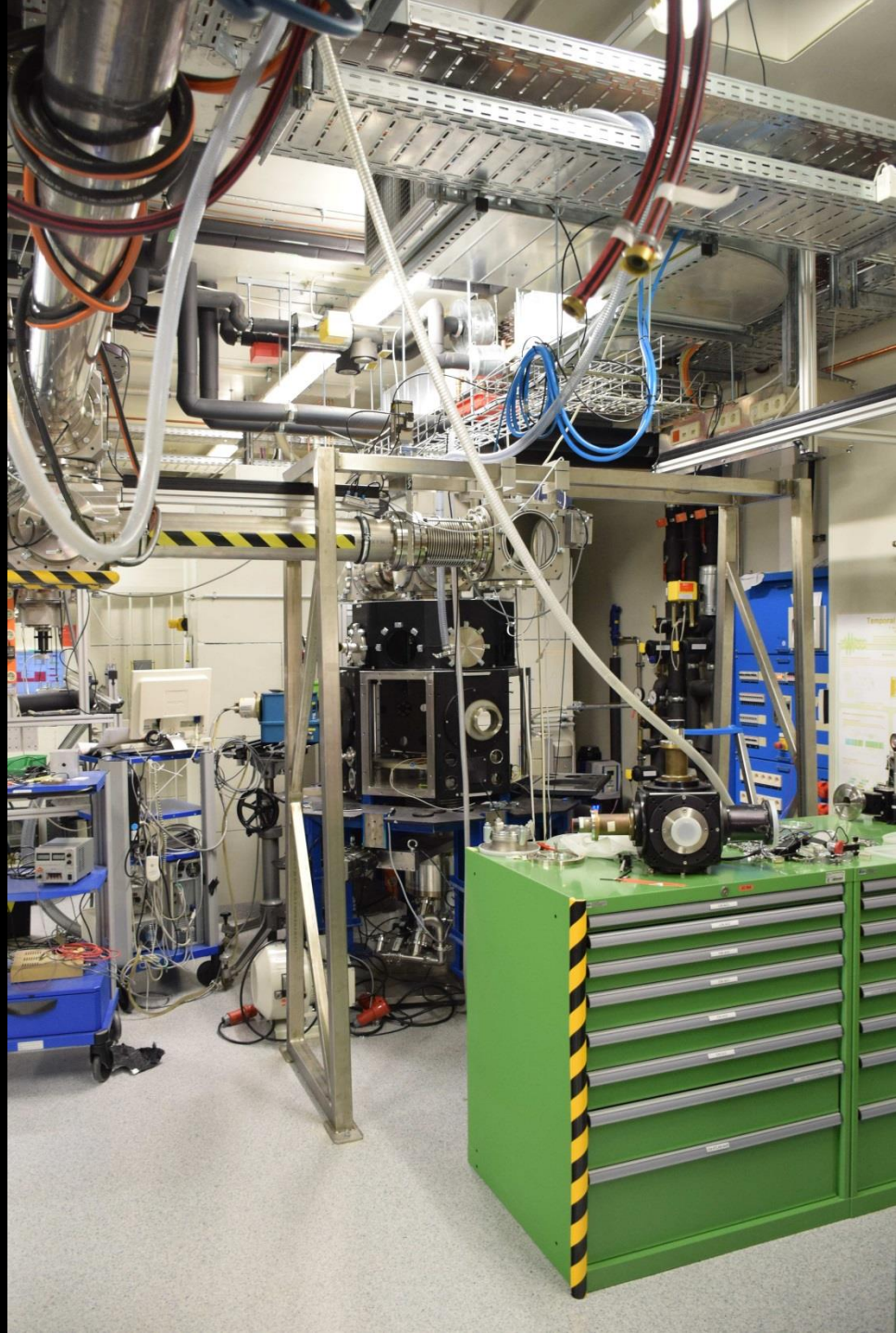


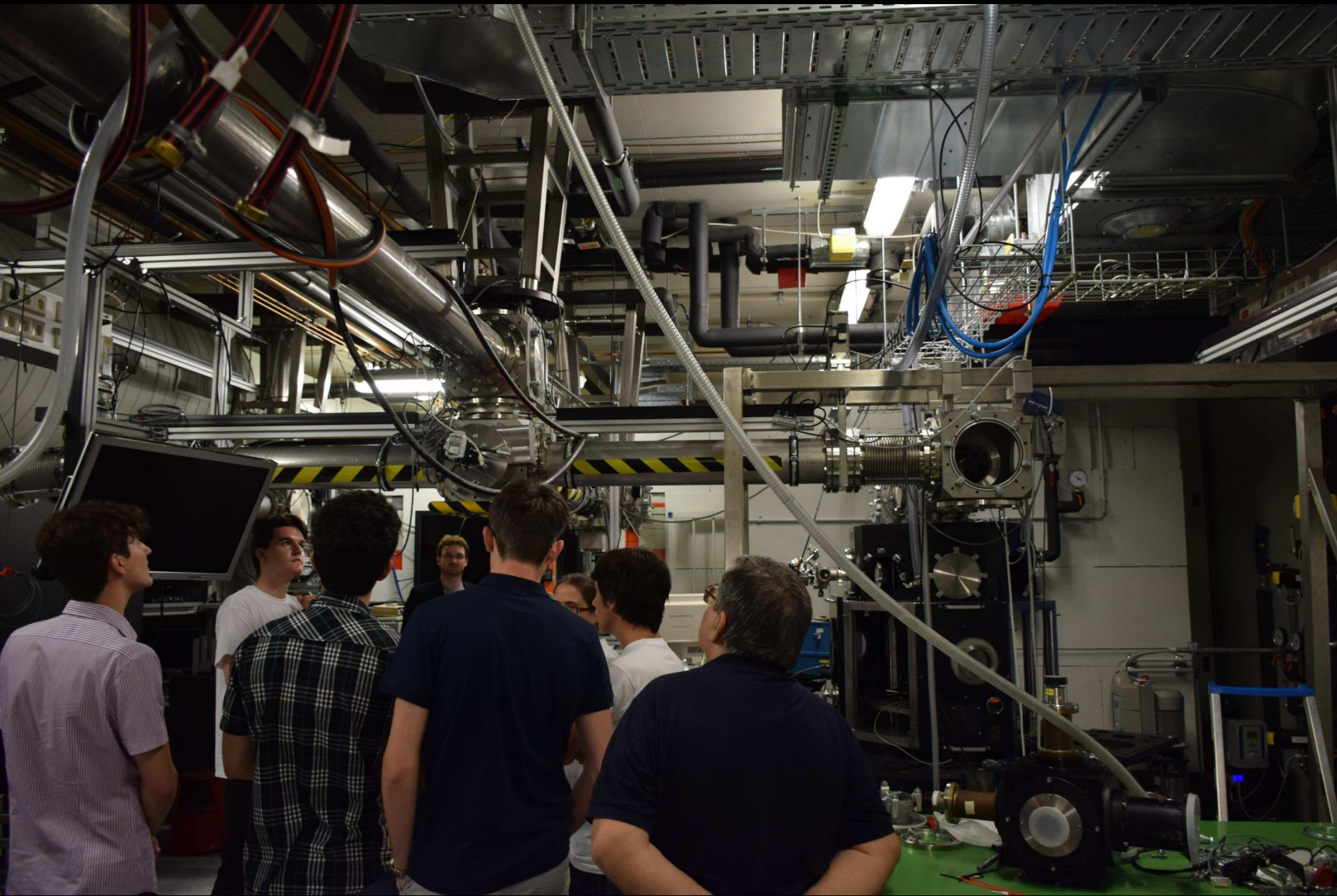


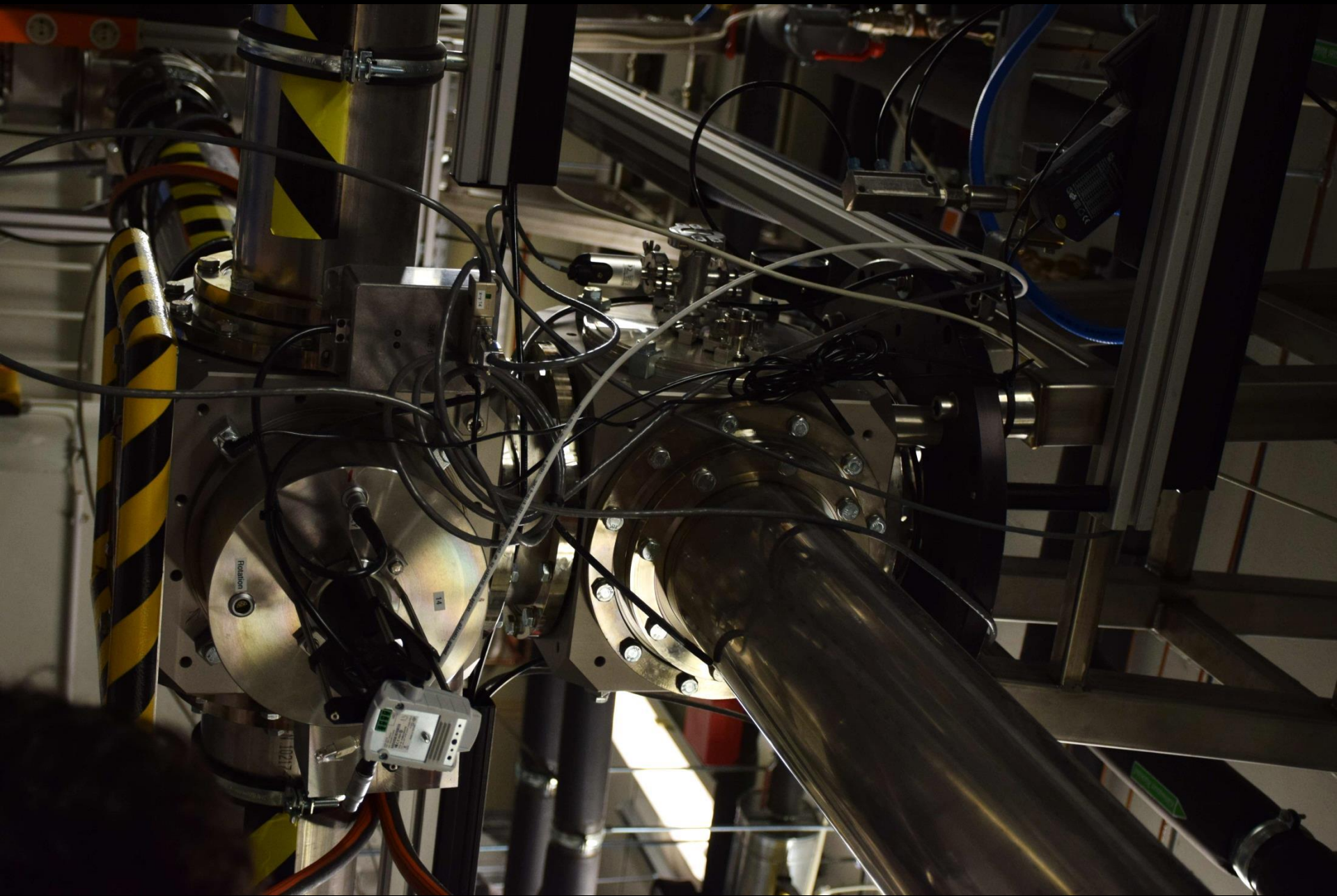


MAX PLANCK INSTITUTE
OF QUANTUM OPTICS

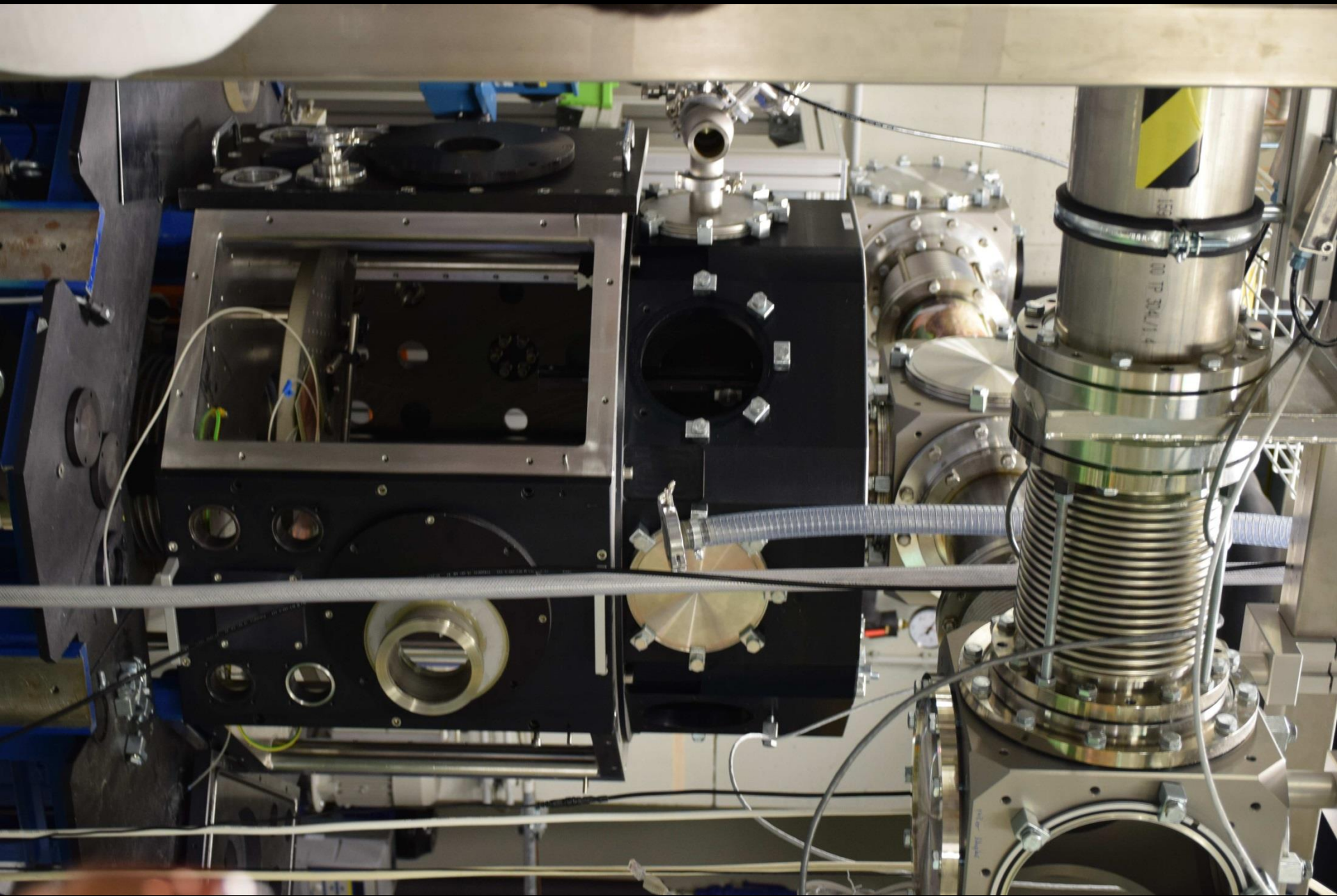


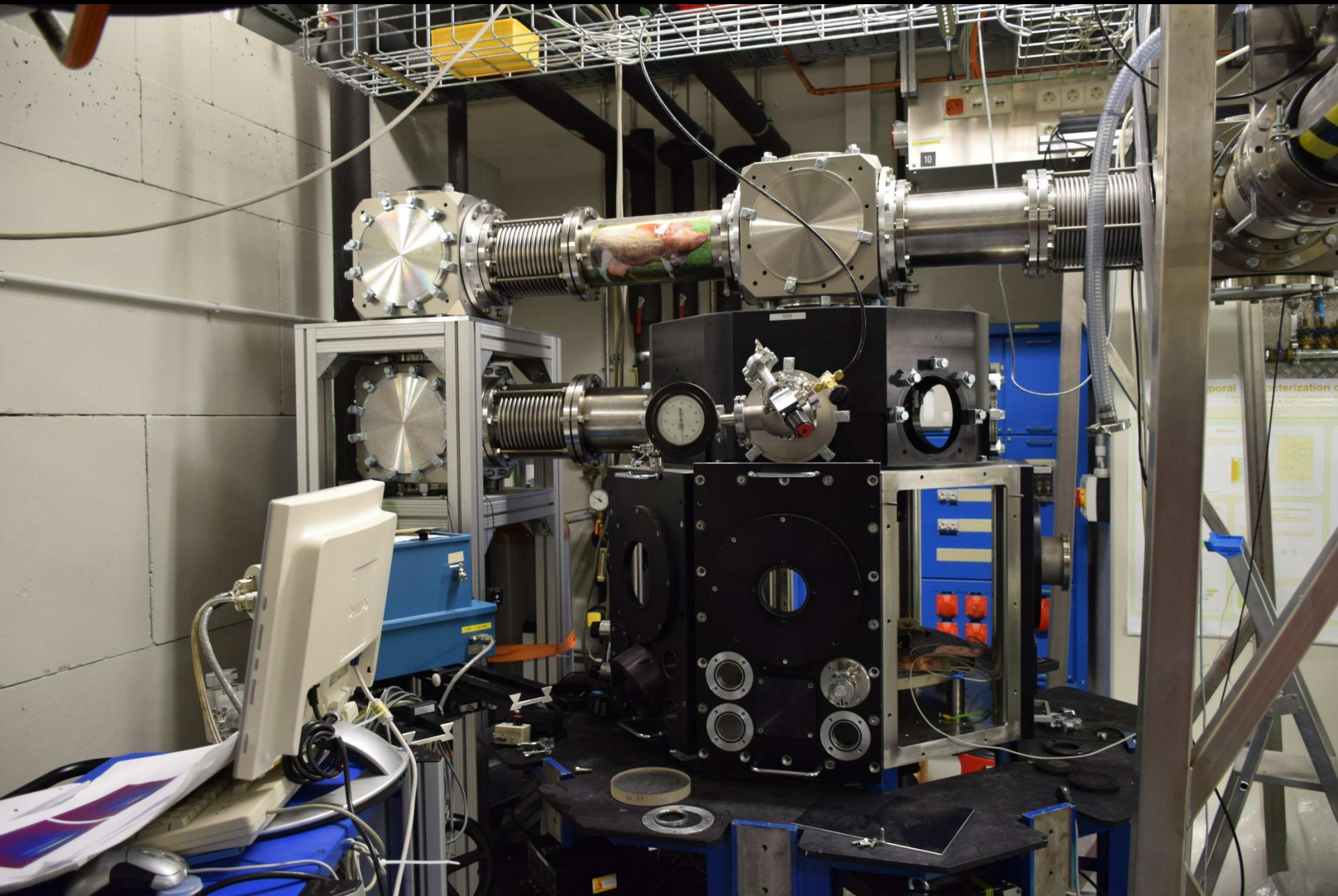




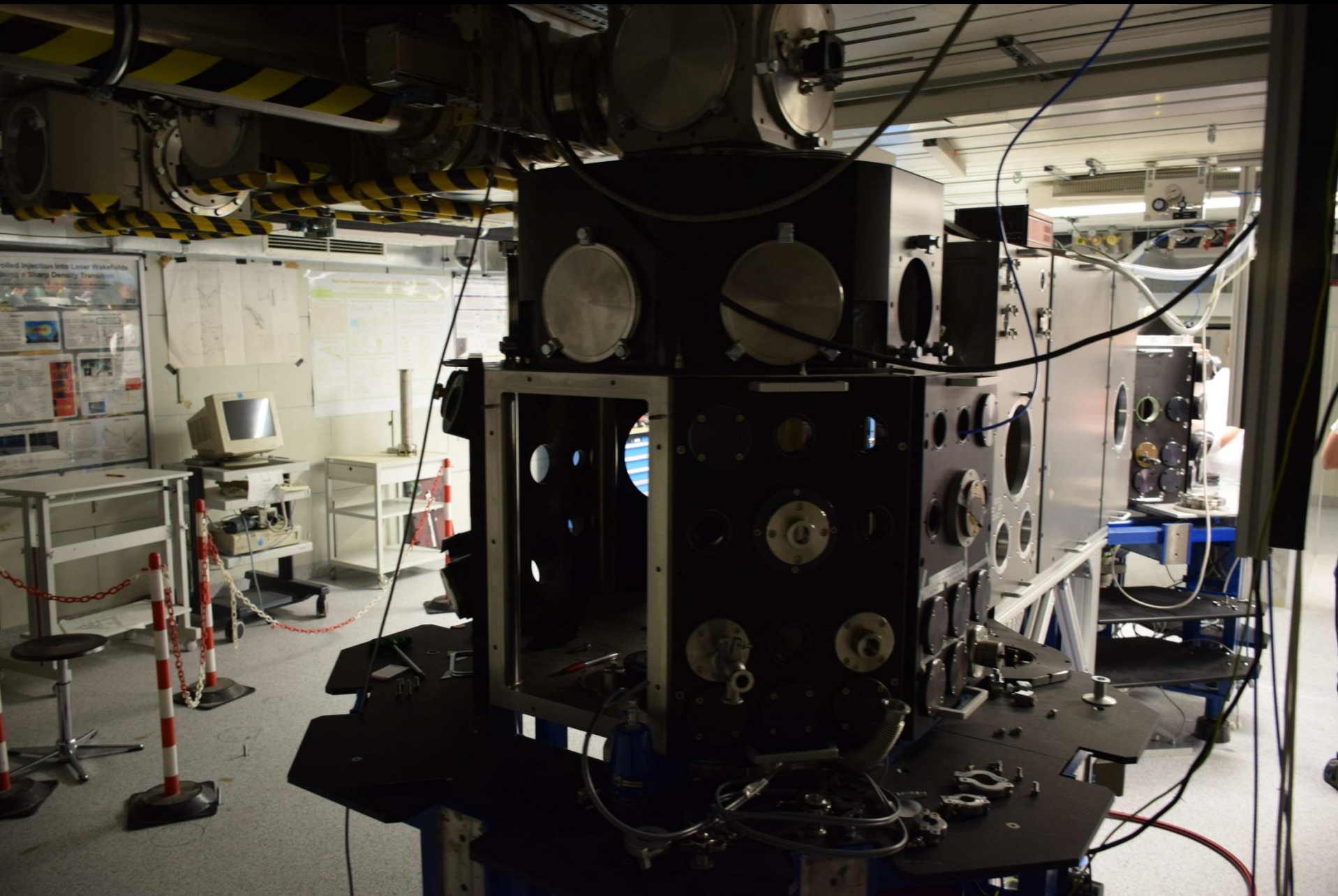


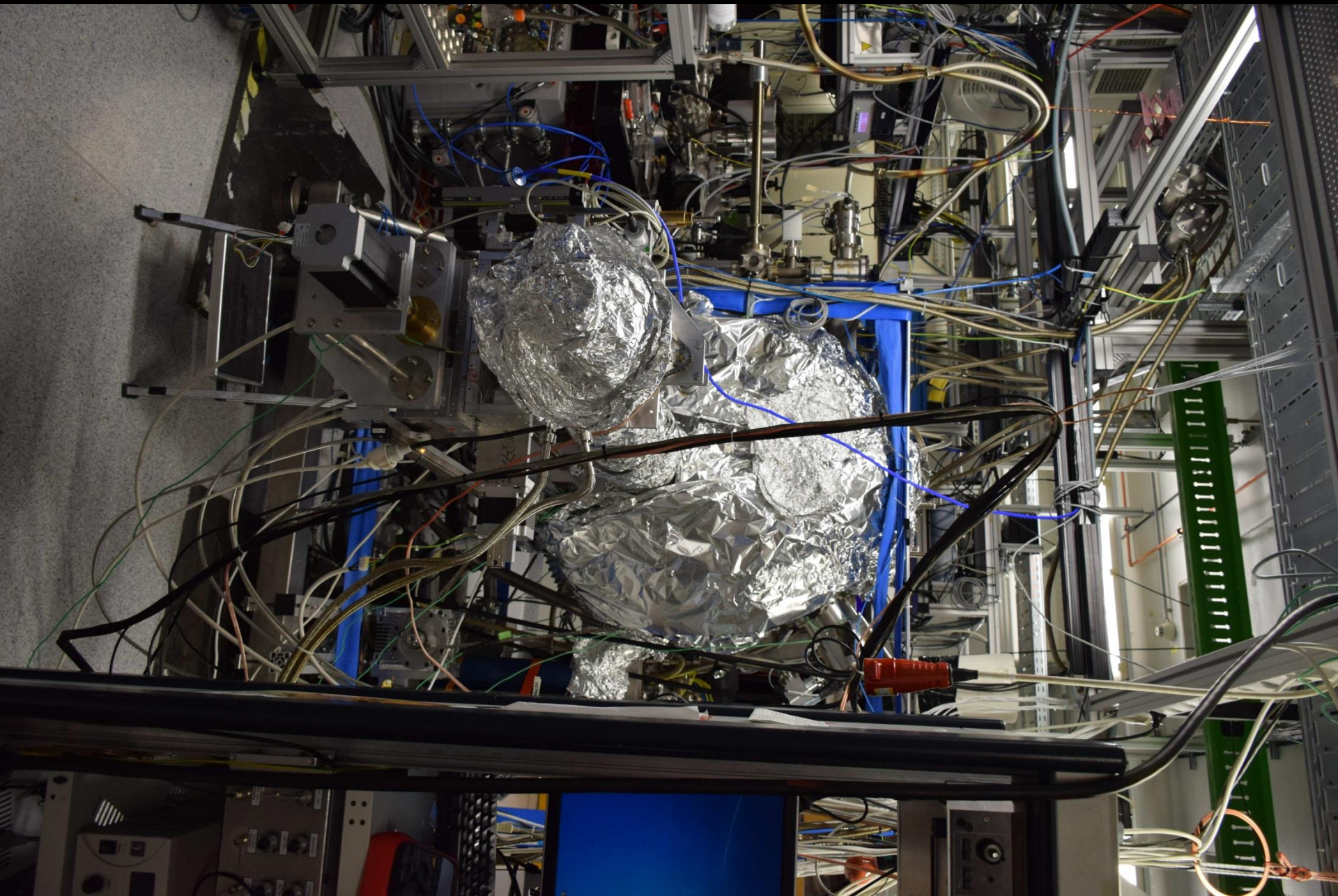


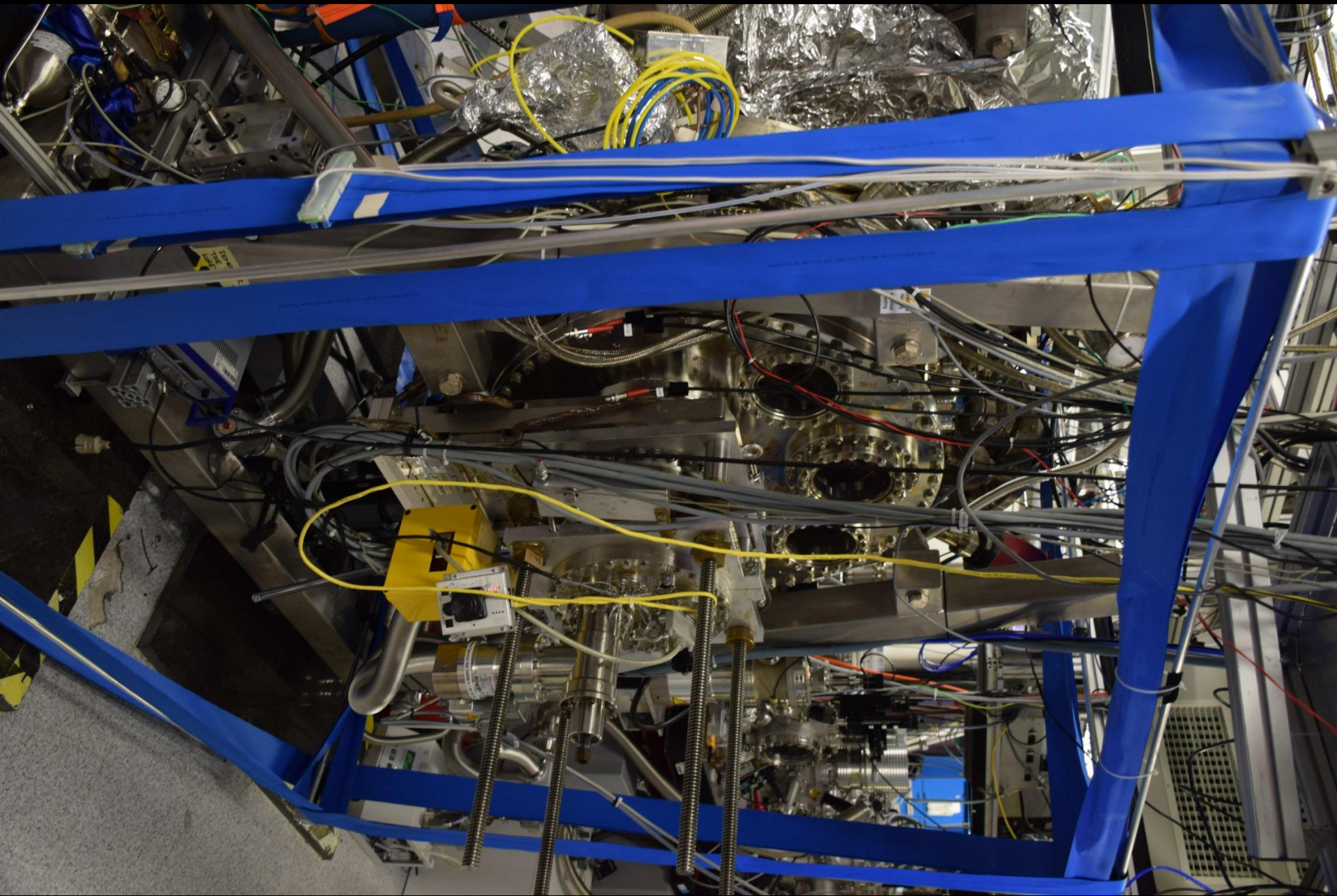


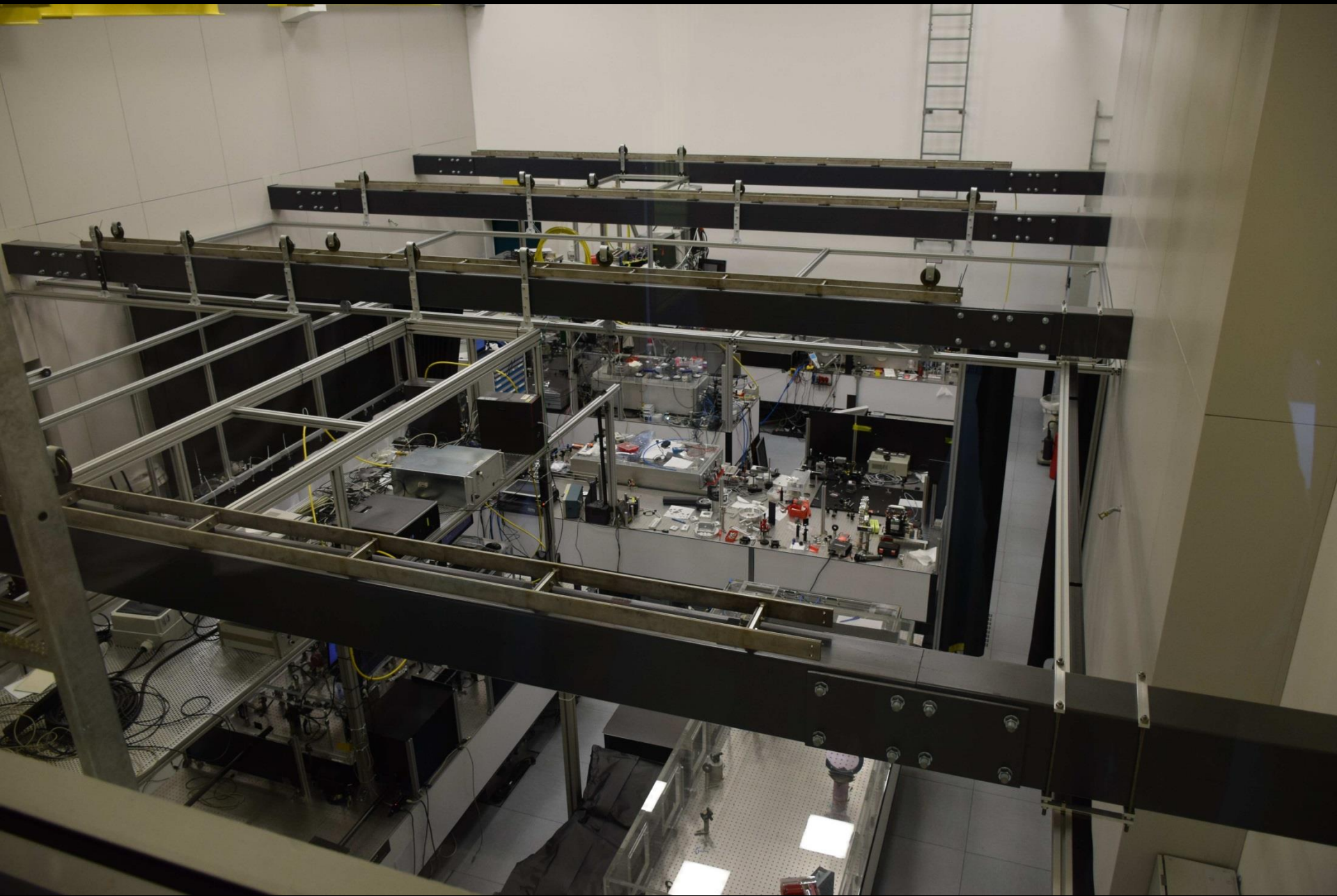












LASER  CO₂-ALARM



























DEM SIEG GEWEIHT VOM KRIEG ZERSTÖRT ZUM FRIEDEN MAHNEND

N CITY



5035

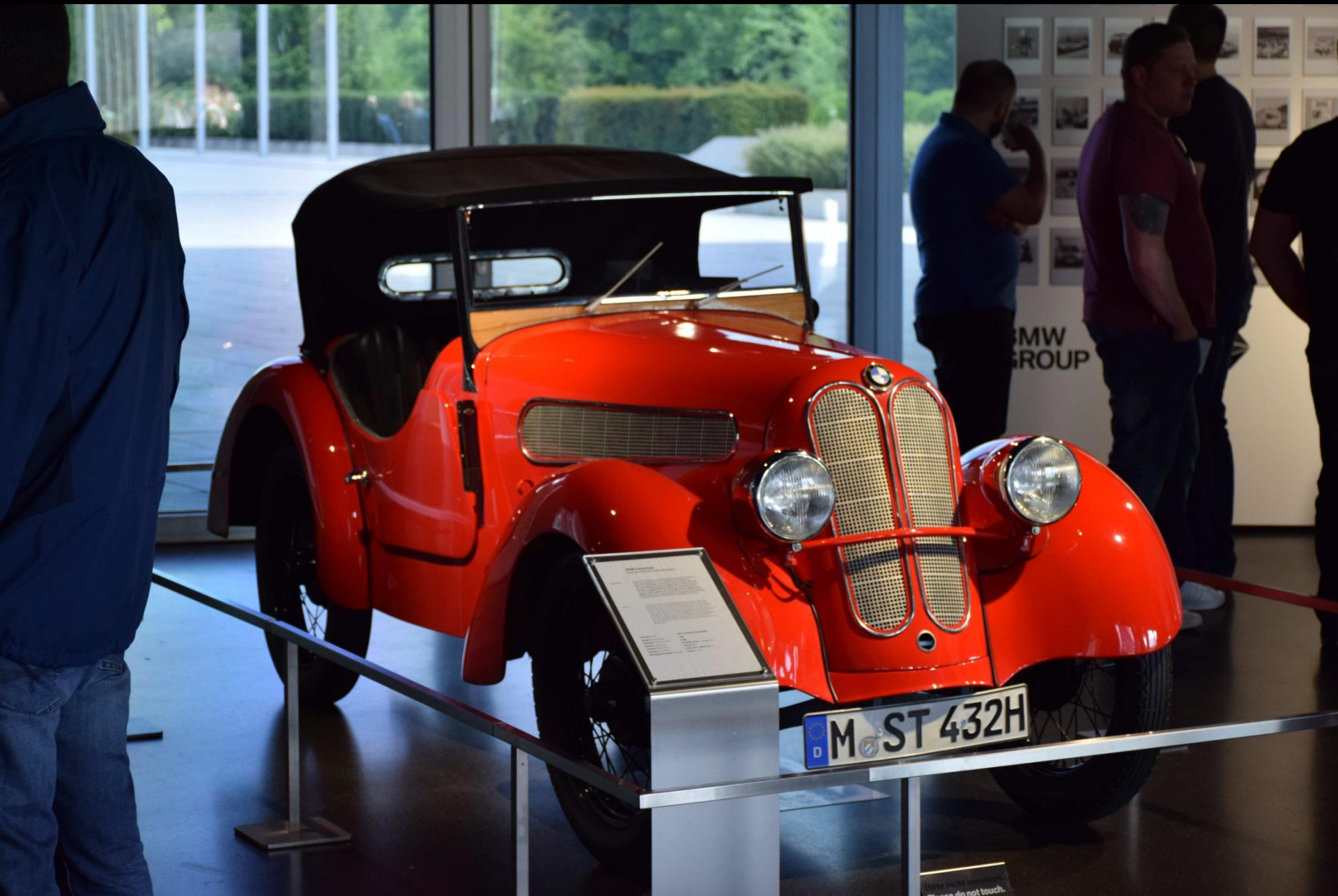
HKL
18000 - 44 800 44

HKL MIETPAR

LAND-ROVER
IDEENSPLATZ 2







Informational plaque detailing the car's specifications and history.

D M-ST 432H

BMW GROUP

Bitte nicht berühren
do not touch.



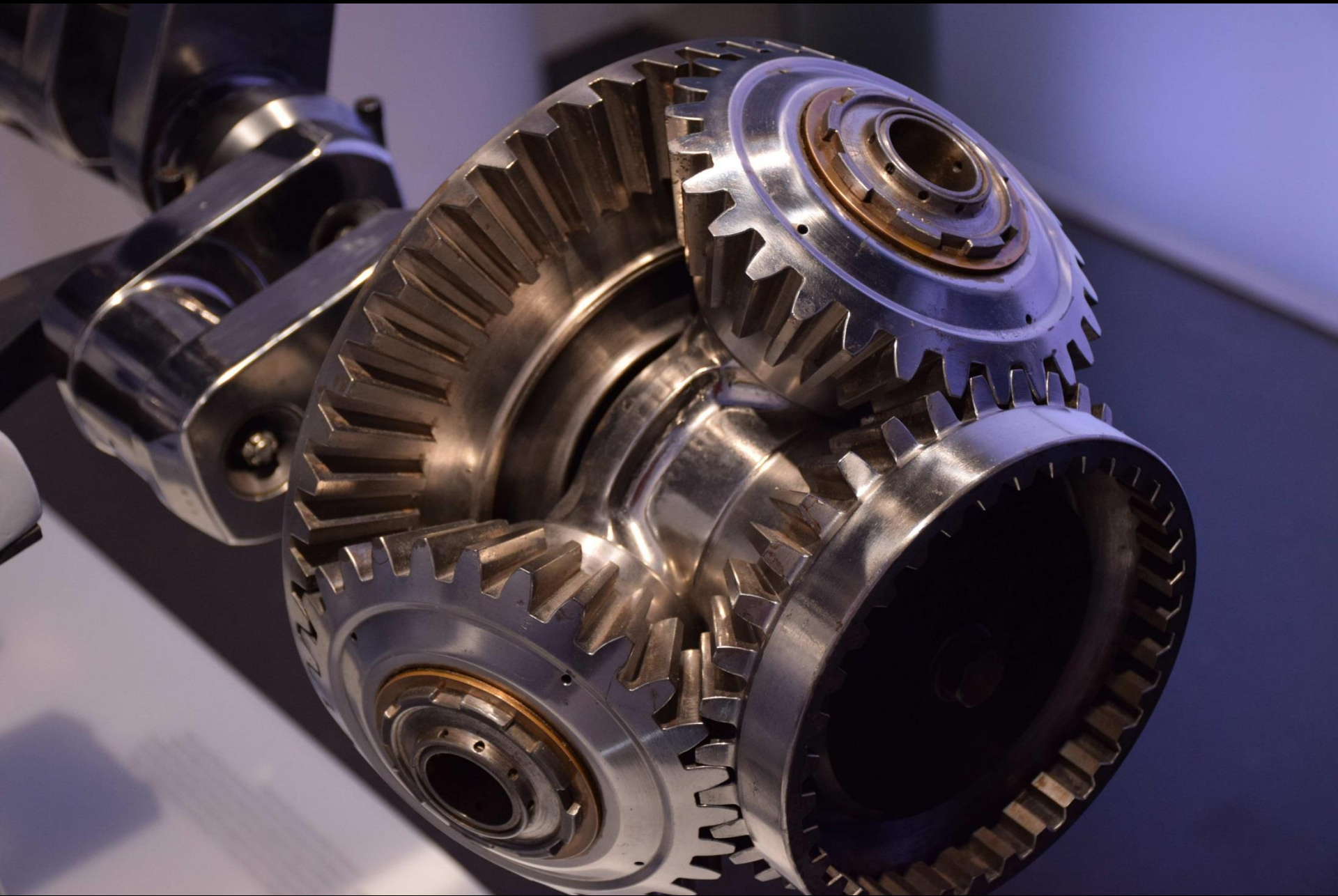
1968
BMW 3.3 Li





1990
BMW P75

Bitte nicht berühren.
Please do not touch.



...Qualität und wegweisende
engines during the First World War. The new
product, the BMW IIIa inline six-cylinder engine.
...ing civil aviation in Europe. In the following
...cooled radial engines, and in the 1940s
...diness. In due course, BMW's engineers and
...ded for aircraft engine construction to the
...ressive standards of quality and incorporated

1944
BMW 003

1944
BMW 801

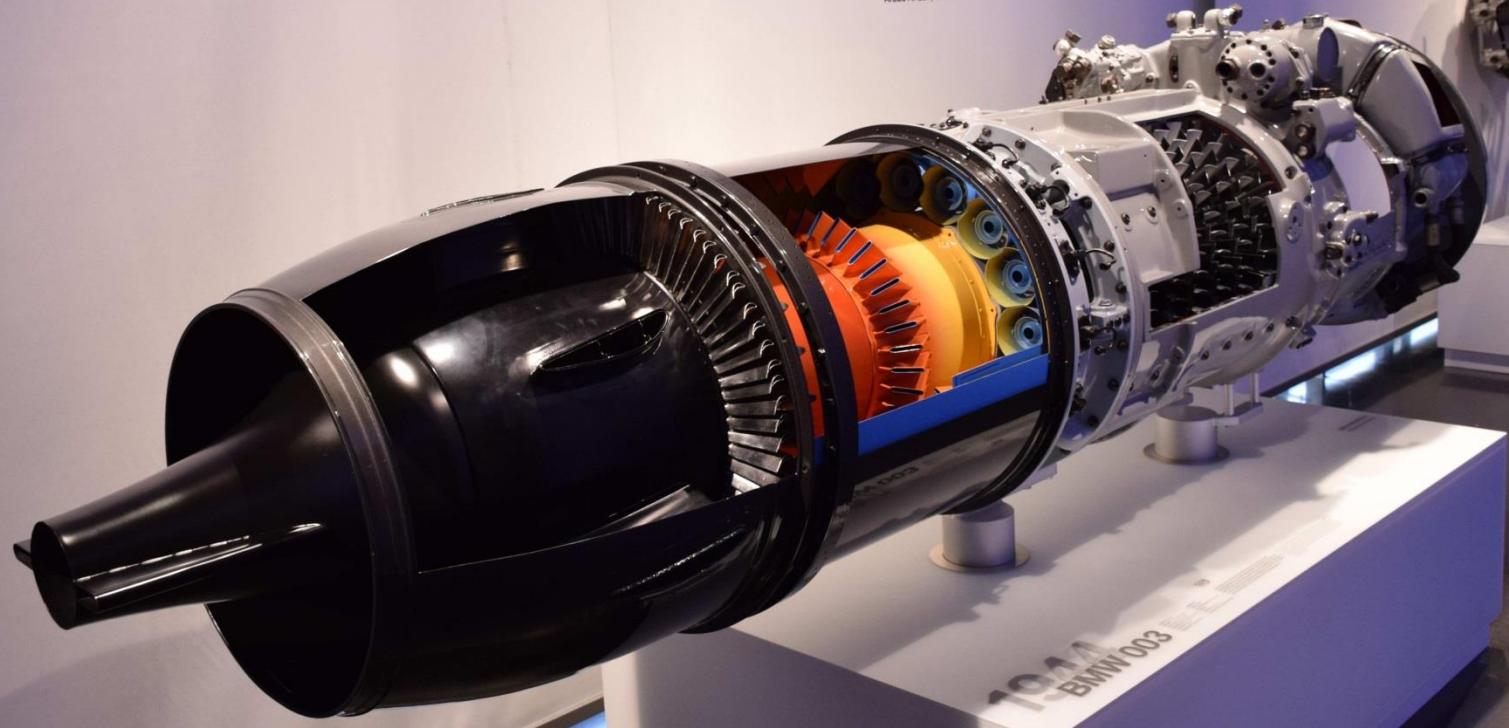
1933
BMW 132



Arado Ar 234, 1944.



BMW 801

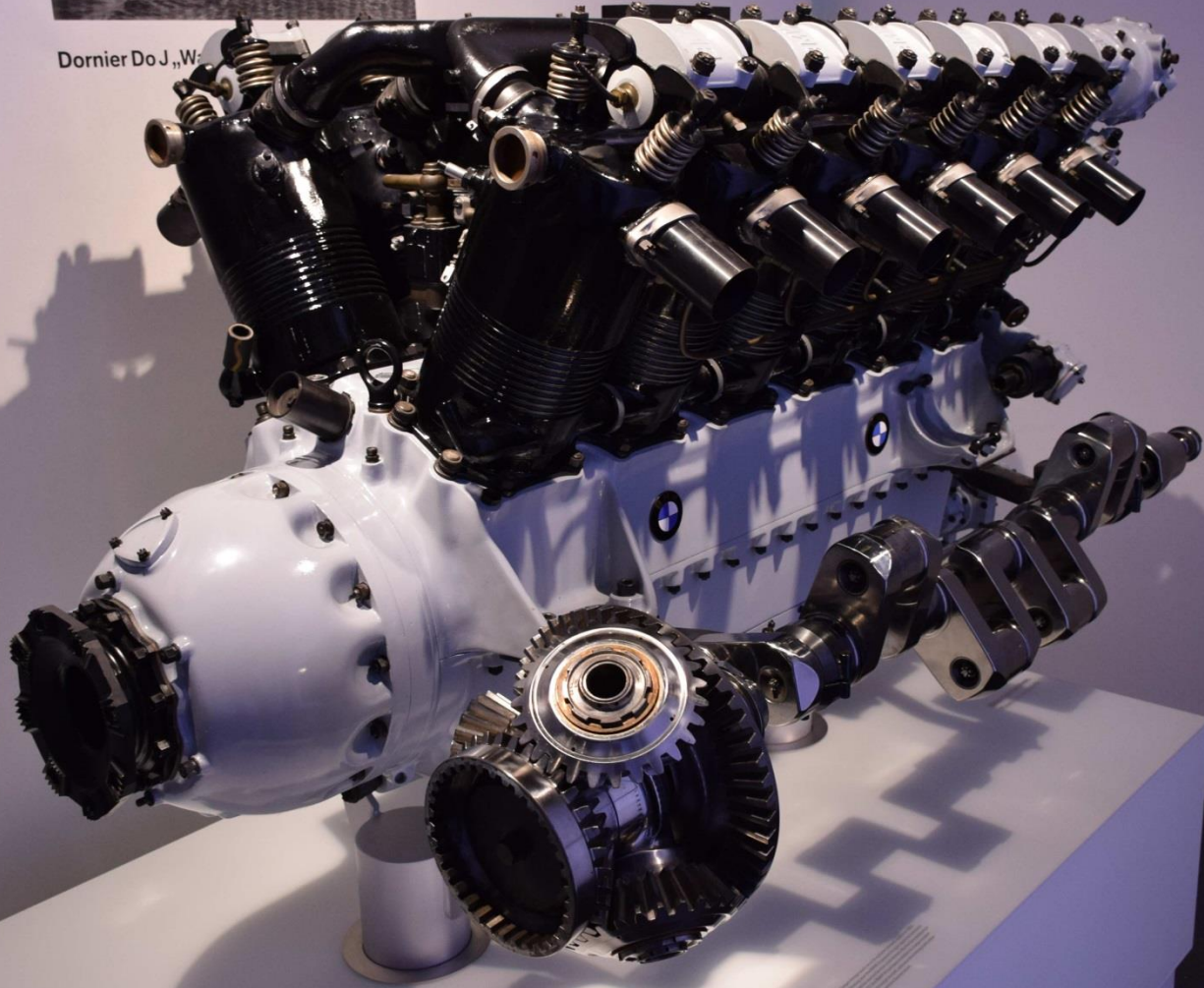


1944
BMW 003

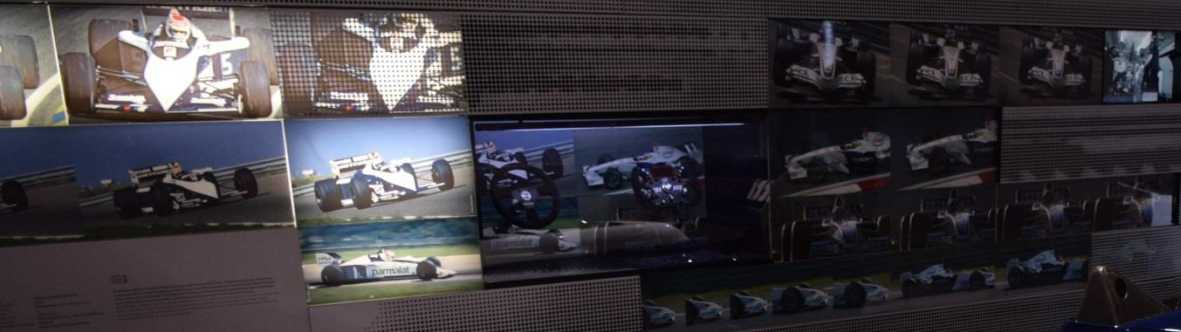




Dornier Do J „W-



... used in racing. Both in motor sport and in series production, BMW was the first manufacturer, in cooperation with the Bosch company as its development partner, to adopt what are still known as 'Digital Motor Electronics'.



57

Am 24. April 1981 gab BMW sein erstes Engagement in der Formel 1 bekannt. Das erste BMW-Rennwagen-Team trat im Sommer 1982 an Start. 1983 und 1984 wurde BMW als Motorsponsor für die Mercedes-Benz-Motorsport AG übernommen. Im Anschluss an die Saison 1984 wurde das Engagement in der Formel 1 beendigt. Seitdem hat BMW kein weiteres Engagement in der Formel 1 angetreten. Die Mercedes-Benz-Motorsport AG ist seit 2010 ein Teil der Mercedes-Benz Group AG. Die Mercedes-Benz Group AG ist ein Unternehmen, das sich mit der Entwicklung und dem Vertrieb von Kraftfahrzeugen beschäftigt. Die Mercedes-Benz Group AG ist ein Unternehmen, das sich mit der Entwicklung und dem Vertrieb von Kraftfahrzeugen beschäftigt.



1977

BMW 745i



1976

BMW 336



1972

BMW 520i



1975

BMW 320i

r.
sor.

Die erste Generation.
The first generation.

Das erste 3er Cabrio.
The first 3 Series
Convertible.

Raum und Allrad.
Space and all-wheel drive.

Dynamik und Eleganz.
Dynamic performance and elegance.

Zeichen der Zeit.
Sign of the times.

Mehrfach unser Klassik.
The corner of the class.

Erweiterter Bereich.
Extended area.



48

Small image of a car on a vertical display panel.

Small image of a car on a vertical display panel.

Small text on the wall to the right.

rive.

Dynamik und Eleganz.
Dynamic performance and elegance.

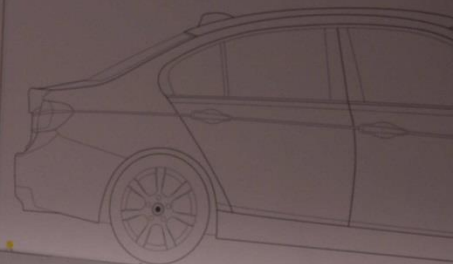
Zeichen der Zeit.
Sign of the times.

Maßstab seiner Klasse.
The standard in its class.

Innovativer Vorreiter.
Innovative pioneer.



Innovativer Vorreiter.
Innovative pioneer.





OTH WORLDS.

ELECTRIFYING
DRIVING PLEASURE.

PERFORMANCE

BMW CONNECT
YOUR PERSONAL MOBILITY COMPANION.



BMW 1 Series Hatch 5-door



ing you do
Sir Henry Royce

ROYCE

Power in reserve
Space in abundance

ATHLETE
BUSINESS







ENERGY
17:42

500 m, A N





- 8 Salzburg
- Passau
- 9 Nürnberg
← München
- Messe / ICM











Mulțumim ospitalitatea institutului
MPQ și ajutorul sponsorilor

fotografii: Gyéresi Hunor András și dr. Bartos-Elekes István