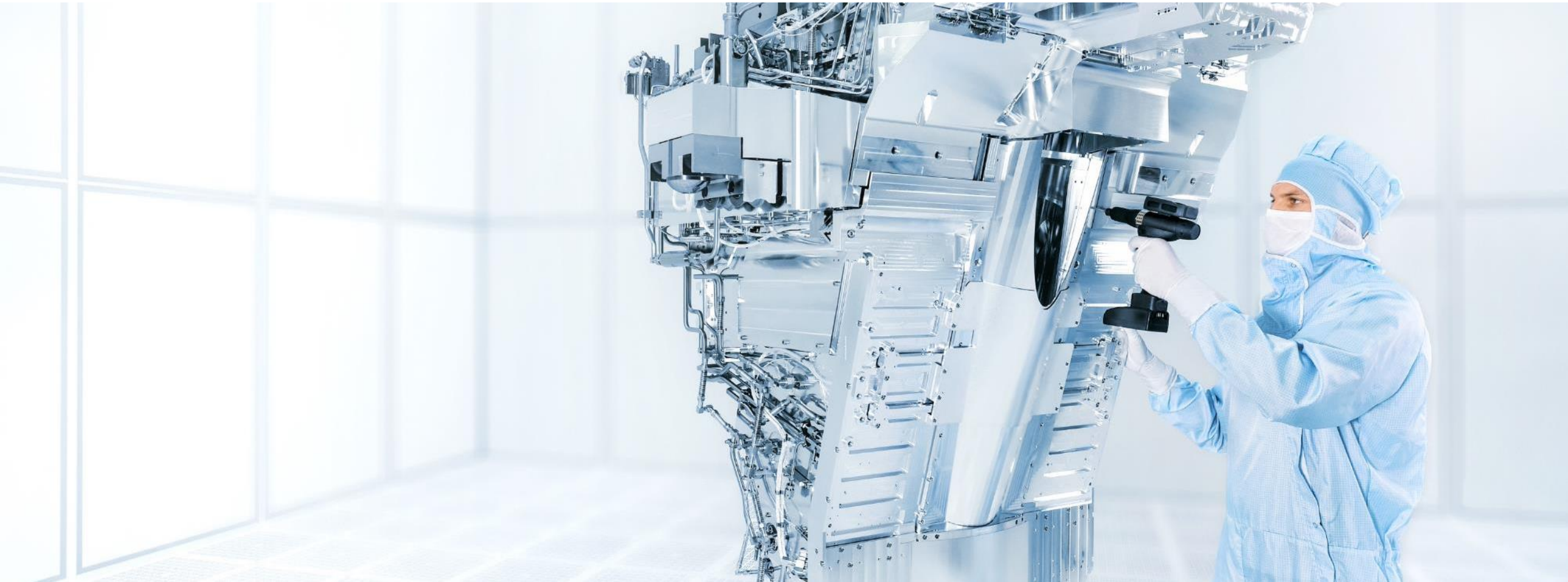
Microchips for Megatrends -
Work where tomorrow is made

Dr. Miriam Carlberg
Research Assistant

26.11.2022



My curriculum

Abi Bac
German and French high school diploma

Bachelor in Physics
Bachelor Thesis in Thin Film solar cells

Master in Physics
Master Thesis in reliability of thin film solar cells

PhD in Physics
Optical properties of metallic nanoparticles in thin films

Position at ZEISS Segment Semiconductor Manufacturing Technology since 3/2018: research assistant (Wissenschaftliche Mitarbeiterin)

My tasks:

- Procurement of 2 40T vacuum chambers
- Development of high end processes
- Project management

Motivation:

- High focus on **R&D**
- High proportion of **Physicist**
- Working at the **limit of what is technologically possible**

Shaping the Future

Semiconductor Manufacturing Technology

2.298 € billion in revenue

5,211 employees

Industrial Quality & Research

1.801 € billion in revenue

7,363 employees

Medical Technology

1.951 € billion in revenue

5,866 employees

Consumer Markets

1.394 € billion in revenue

12,721 employees

Status: September 30, 2021

F A C T S

ZEISS Contributions as an **Enabling Partner**

36

Nobel laureates

used ZEISS systems to advance scientific progress

80%

of microchips worldwide

made on ASML lithography systems with ZEISS optics

50

ZEISS Camera Lenses were sent into space

during the NASA Apollo Mission

3

Technical Oscars

for ZEISS Cine lenses and various Oscar nominations for films shot with ZEISS lenses

300,000

Surgical procedures per year

with the ZEISS KINEVO 900

ZEISS Semiconductor Manufacturing Technology

Enabler for smaller, more powerful and energy-efficient microchips

Locations and Employees

Employees

5,211

thereof 30% in research and development

Locations

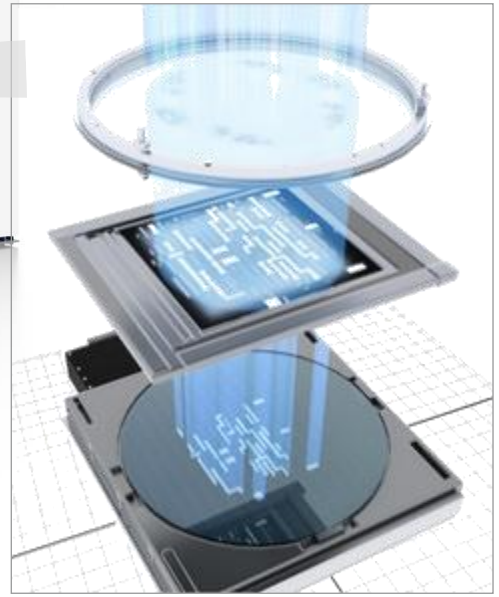
7

in 3 countries: Oberkochen, Jena, Wetzlar, Rossdorf, Dublin (USA), Danvers (USA), Bar Lev (Israel)

Headquarters:
Oberkochen, Germany

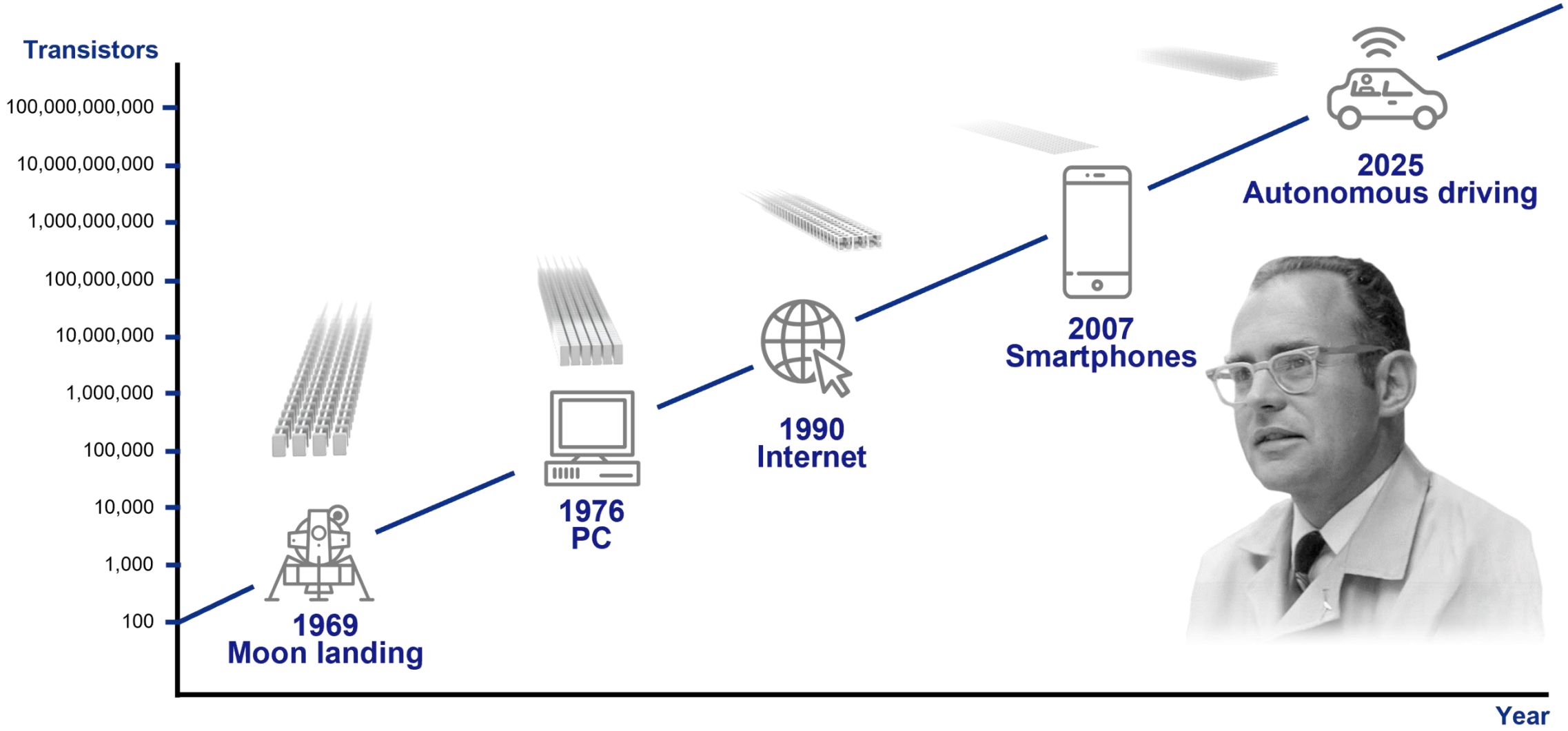
Strategic Partner ASML

Integration of ZEISS systems into the Wafer scanners



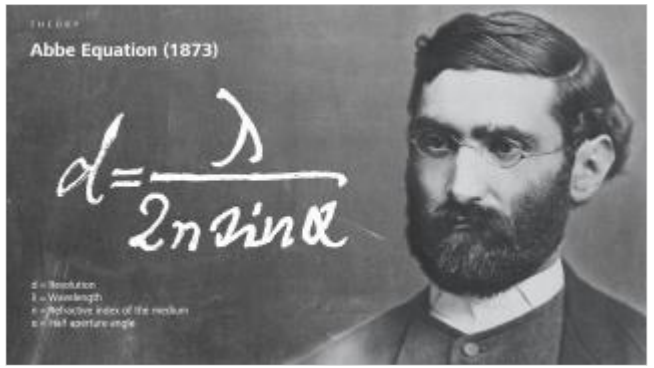
Around **80 percent** of the world's microchips are manufactured using ASML lithography systems with ZEISS optics.

In the Middle of the Information Age – Moore's Law Lives!



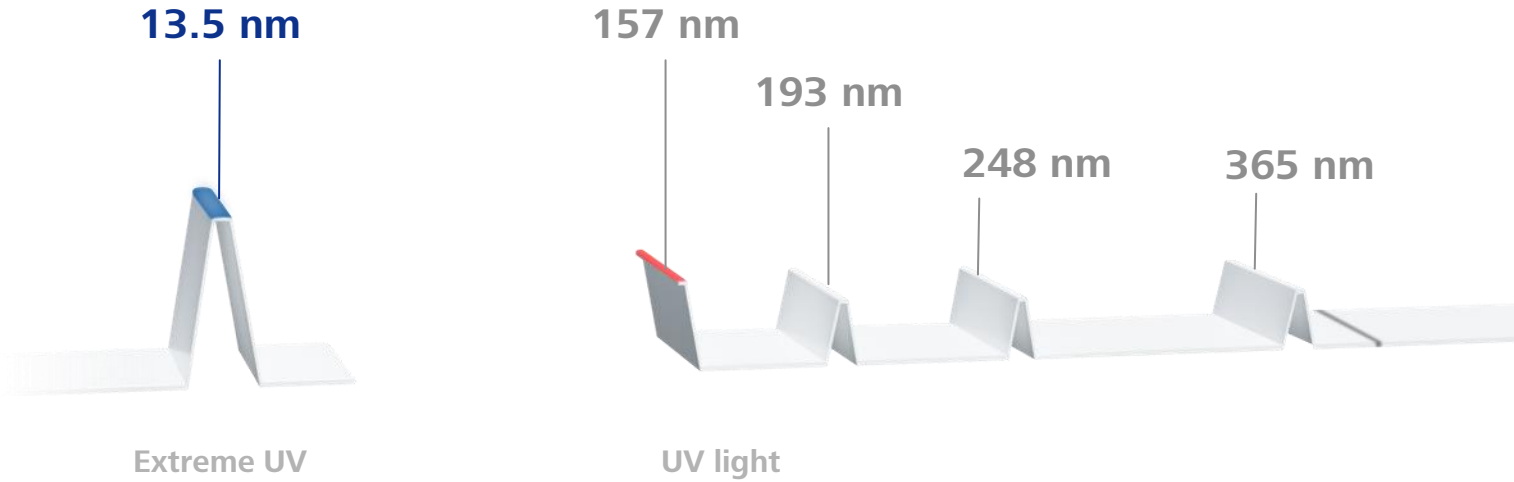
From DUV to EUV Technology

Pushing the limits of what is technologically possible

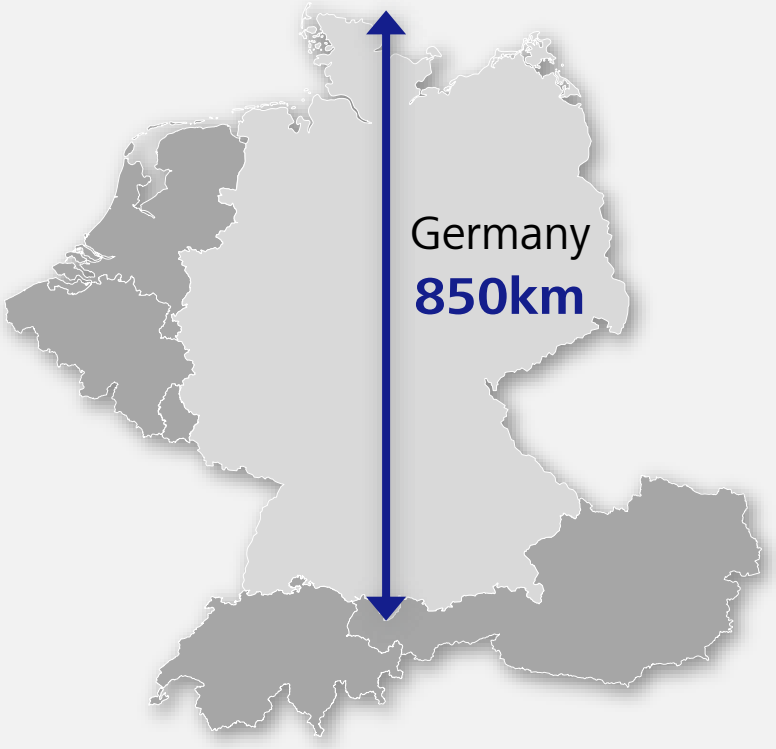


Previous DUV lithography systems use light with a wavelength of **193 nanometers.**

Extreme ultraviolet light (EUV) has a wavelength **15 times shorter** (13.5 nanometers) and thus enables chip structures 5,000 times thinner than human hair.



Starlith® 3400: Projection optics
What does a deviation of 50pm mean?



Zugspitze
2962m

The most precise mirror in the world: If we were to enlarge an EUV mirror to the size of Germany, **the largest deviation from the nominal shape would be just 0.1 millimeters.**

The SMT-EP department

We develop processes and equipment for lithography optics

Department

EP

Process development with focus on

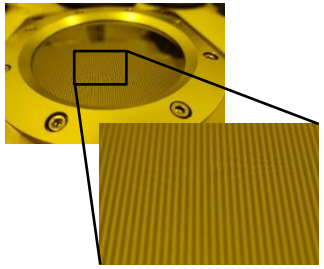
EPO

Optics technology

Surface treatment until its final shape and roughness

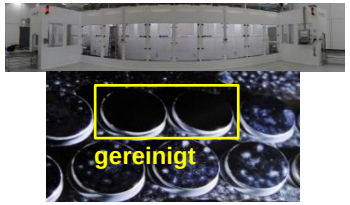
EPS

Structuring technology



EPR

Cleaning technology



EPB

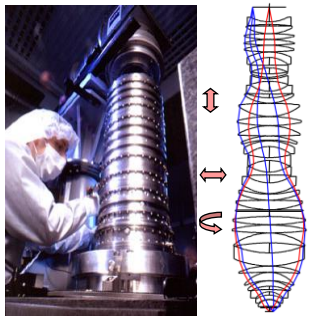
Coating technology

EPM

Mechatronics and Integration technology

EPJ

Adjustement technology



Optics technology

Surface treatment until its final shape and roughness

EPO

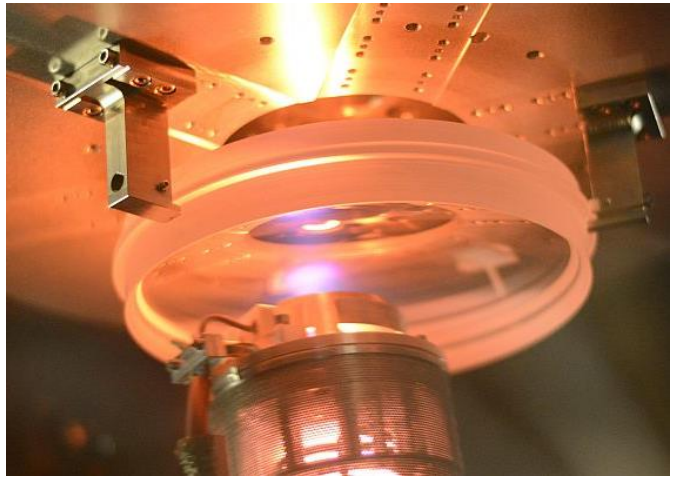
Digitalisation

Grinding

Polishing

Beam figuring

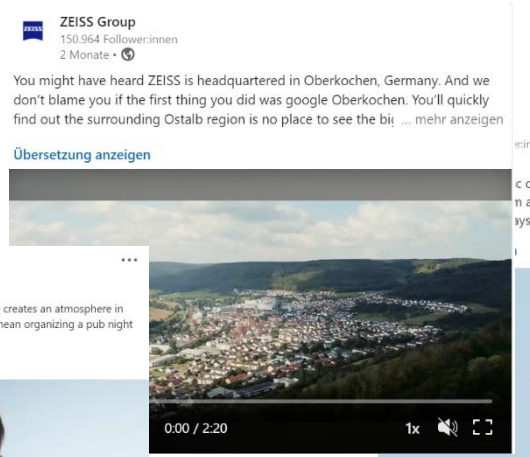
And some stuff we do not talk about

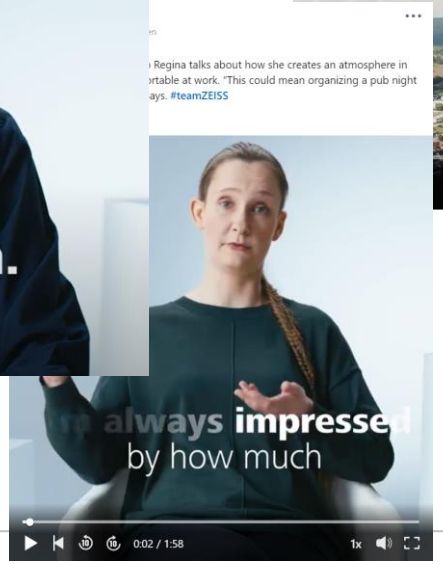


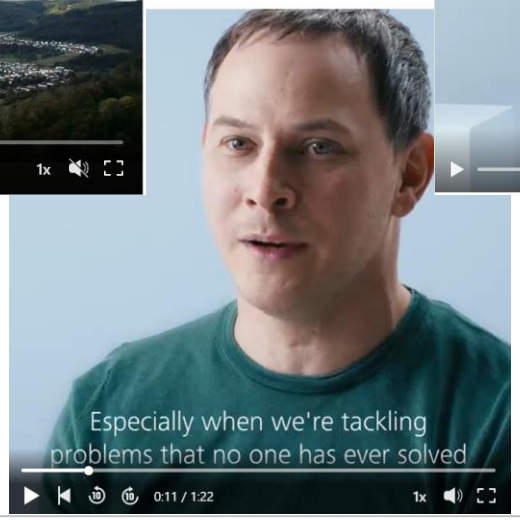
https://www.opteg.de/ionenstrahlbearbeitung-optik-polieren-etching/

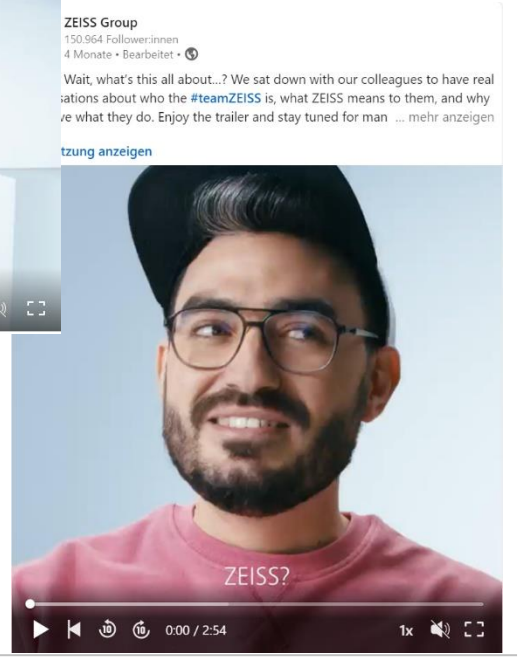
RealTalk @ ZEISS

- LinkedIn channel **ZEISS Semiconductor Manufacturing Technology** und **ZEISS Group**
- https://www.youtube.com/ZEISSCareer
- Instagram **zeisscareer** and **zeissgroup**
- www.zeiss.com/career









Any Questions?

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Q&A

Seeing beyond