EPIC Board of Directors and Annual General Meeting | 4/16/2024

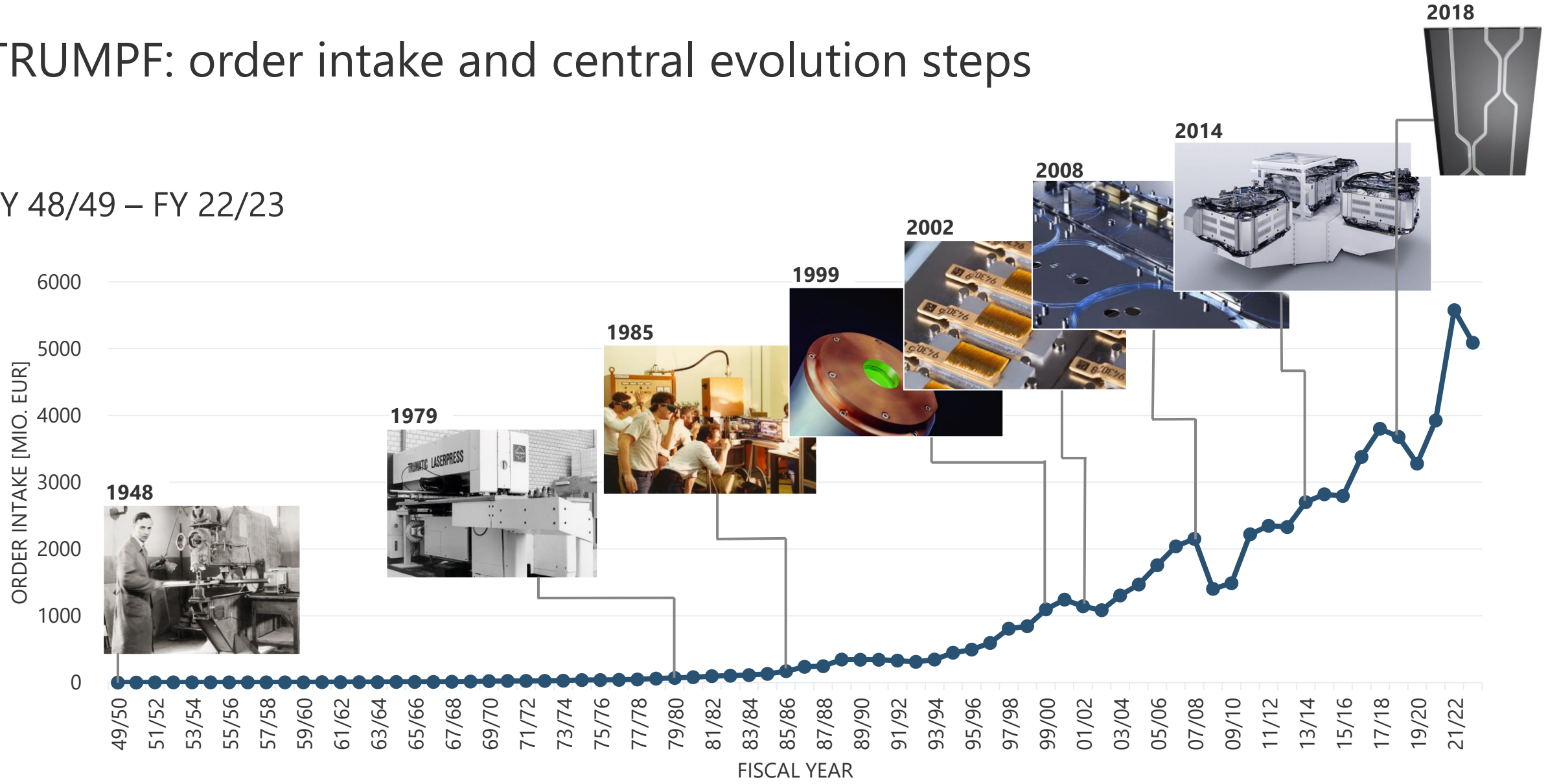
From tin droplets to secondary sources

Dr. Berthold Schmidt

TRUMPF

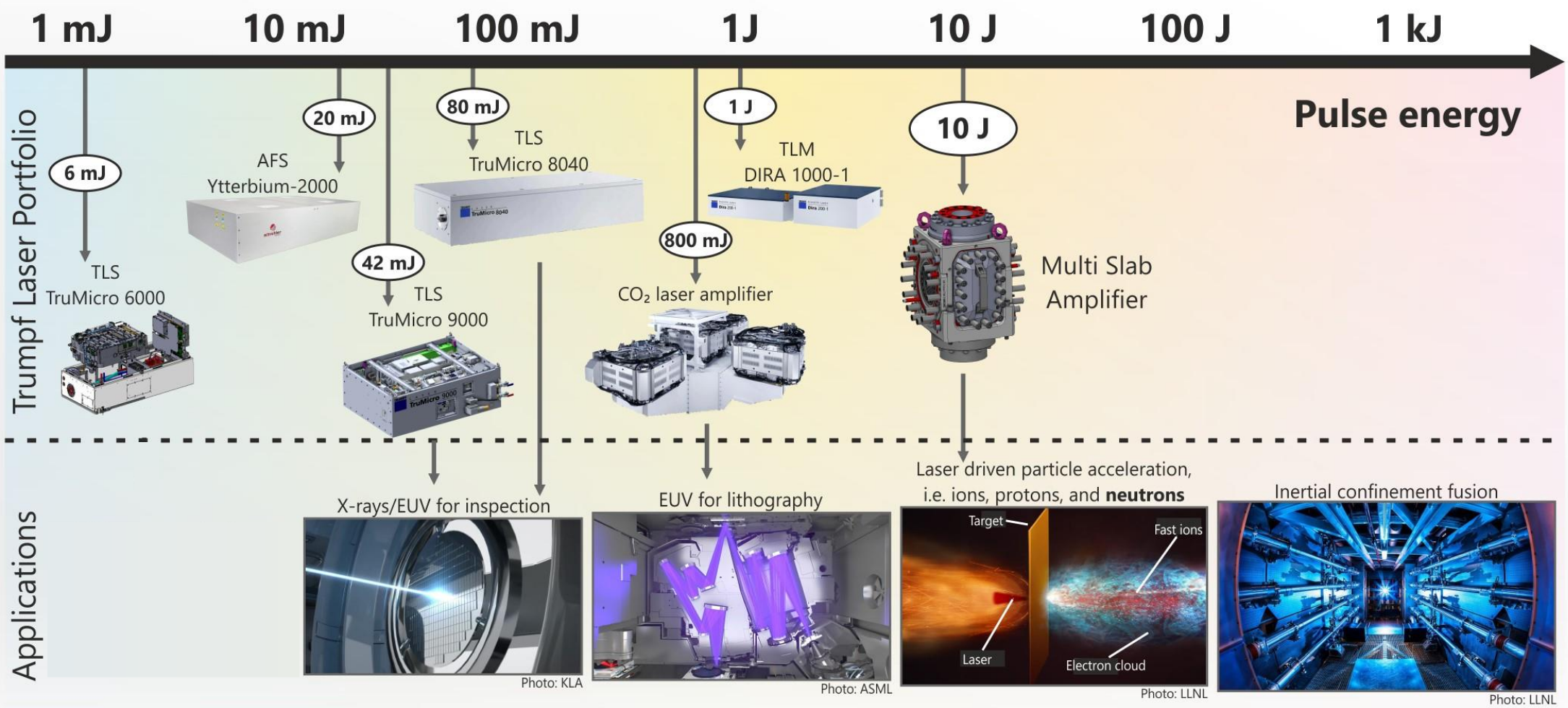
TRUMPF: order intake and central evolution steps

FY 48/49 – FY 22/23



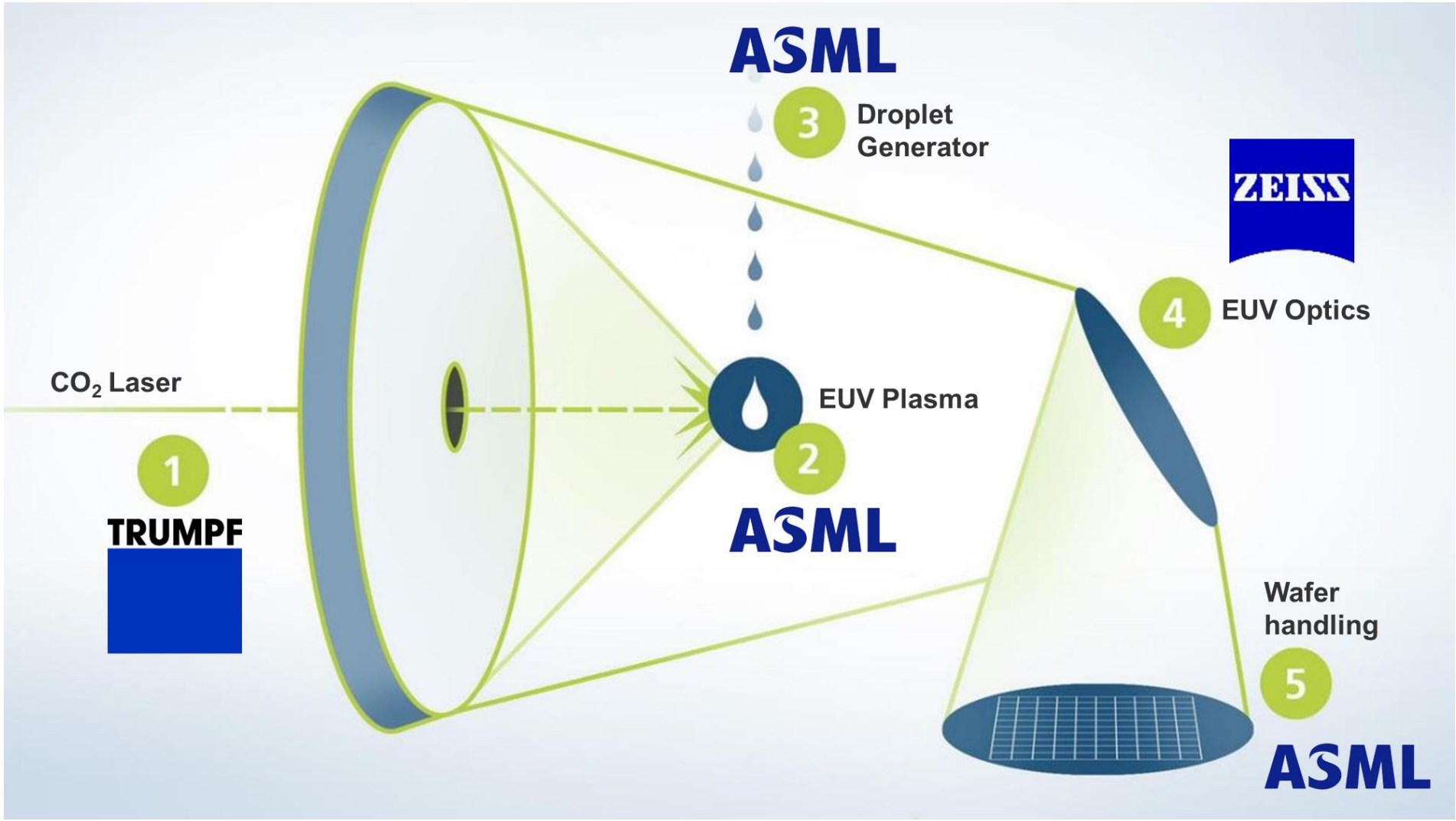
TRUMPF's high-energy laser (HEL) capabilities

TRUMPF has a variety of industrialized 1…10J class laser sources for intense laser plasma physics!



EUV Lithography

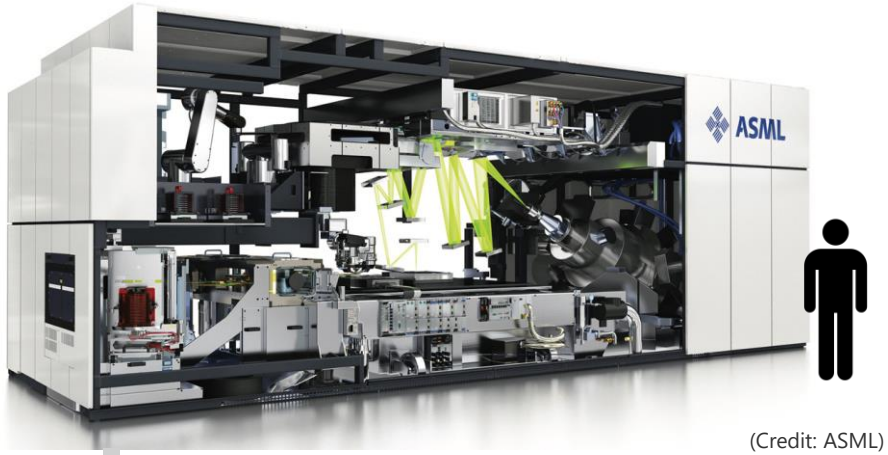
Principle of generating EUV light



TRUMPF

New horizons: drive laser for EUV lithography

Lasers from TRUMPF are enabling the continuation of Moore's Law



(Credit: ASML)

ASML's EUV lithography system

Fab (Floor 1)

Sub-Fab (Floor 0)

TRUMPF's CO_2 laser amplifier system is used to generate the plasma which emits 13.5-nm light.

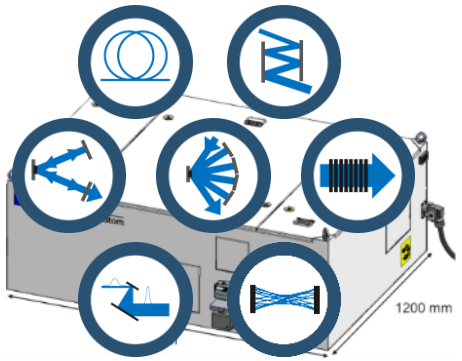
TRUMPF

Building Blocks for Secondary Sources

Collaborate with Partners for Full Technological Depth

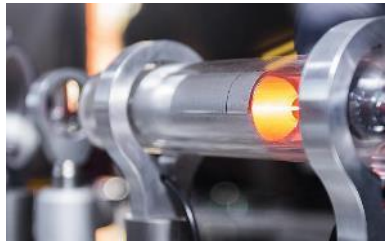
Laser Source

- modelocked Oscillator
- Picker
- CPA (Stretch&Compress)
- Amplifier Chain
- NL-Postcompression
- ...



Laser Beam Delivery

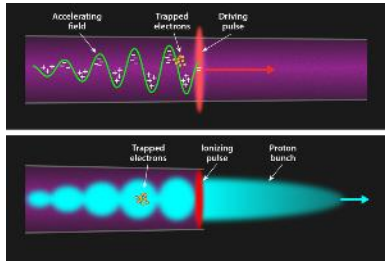
- Focussing
- Debris Protection
- ...



Target

- Kα-Target (X-Rays)

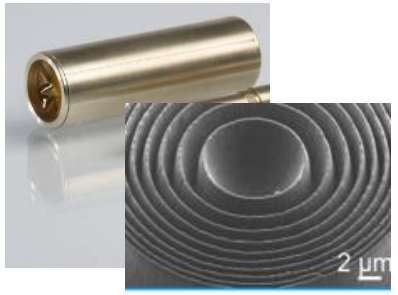
- LWFA (Electrons)



- ...

Delivery of Secondary Radiation

- X-Ray Optics,



- Electron Optics

- ...

Application

- Sample-Holder
- Cryo-Preparation
- Detector
- Software
- ...

TRUMPF

Secondary Sources

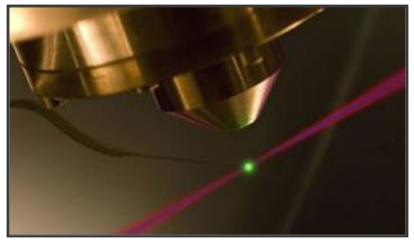
and required Intensities (OoM)

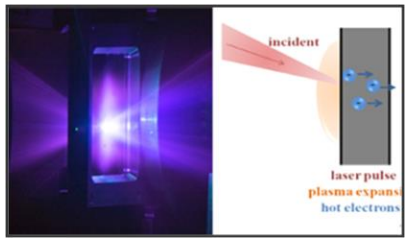
EUV Generation

~10^{9} W/cm^2

High-Harmonic Generation

~10^{14} W/cm^2



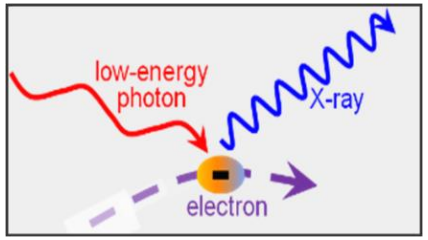


X-Ray Generation

~10^{18} W/cm^2

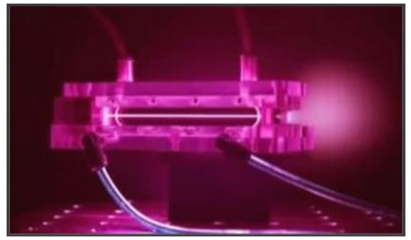
Inverse Compton Scattering

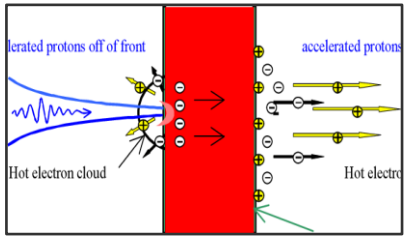
~10^{14} W/cm^2



Electron Acceleration

~10^{19} W/cm^2



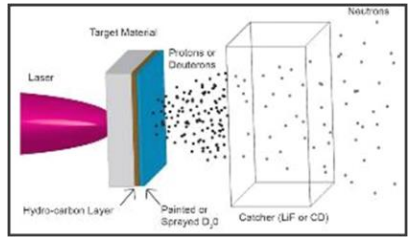


Proton Acceleration

~10^{20} W/cm^2

Neutron Generation

~10^{20} W/cm^2



TRUMPF

Secondary Sources

and required Intensities (OoM)

EUV Generation

~10^9 W/cm^2

Metrology & Lithography

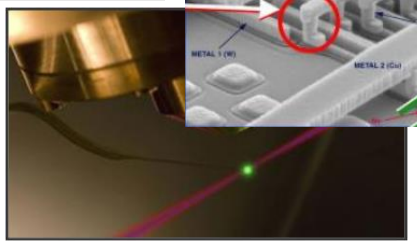
Radiotherapy

Electron Acceleration

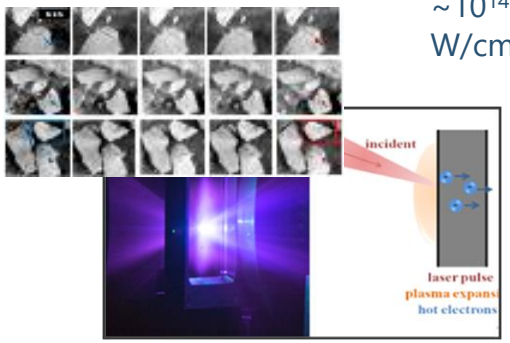
~10^{19} W/cm^2

High-Harmonic Generation

~10^{14} W/cm^2

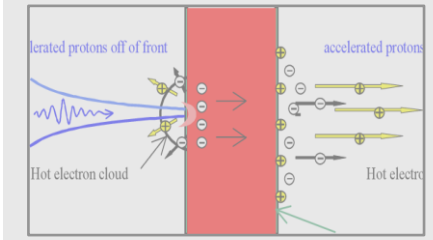


Battery Inspection



X-Ray Generation

~10^{18} W/cm^2



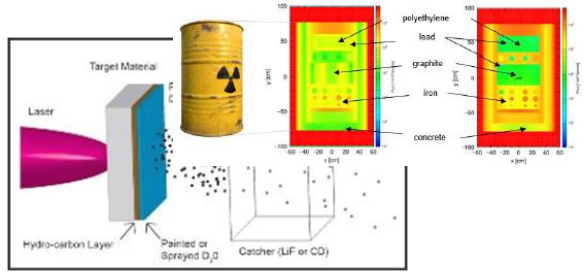
Proton Acceleration

~10^{20} W/cm^2

Nuclear Waste

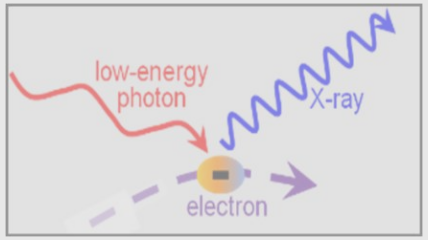
Neutron Generation

~10^{20} W/cm^2

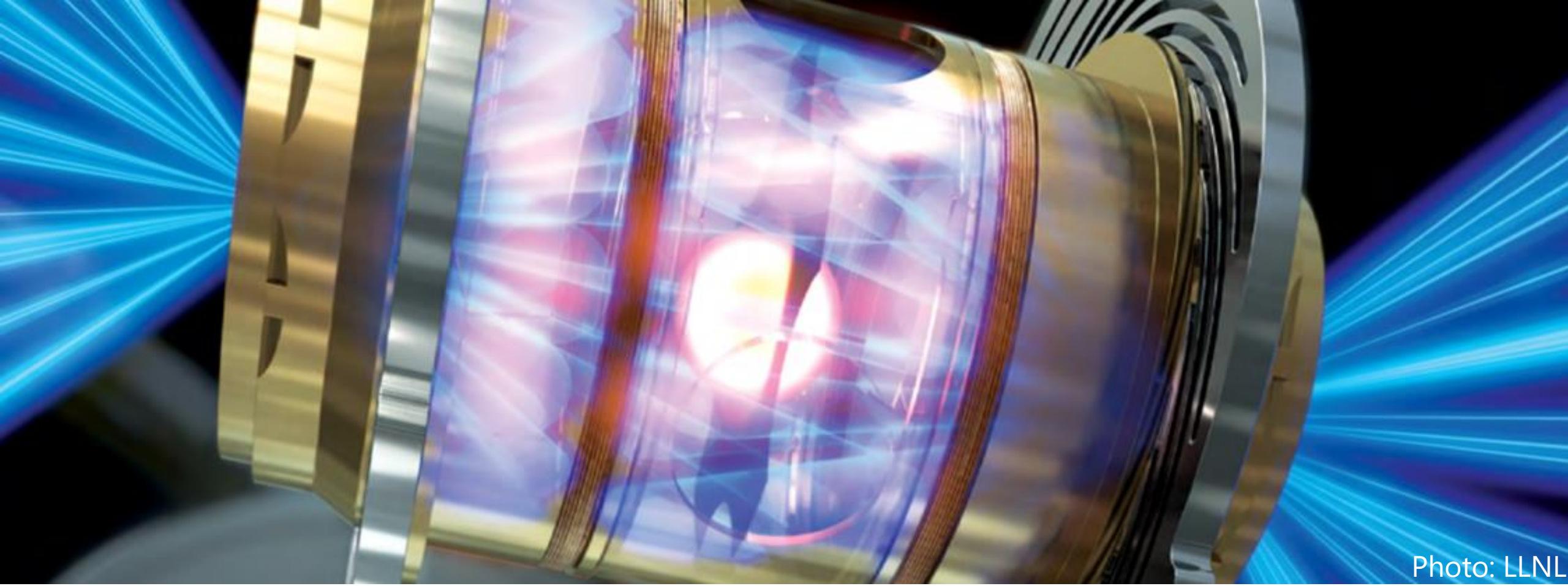


Inverse Compton Scattering

~10^{14} W/cm^2



TRUMPF



Thank You.

Contact Person

Dr. Berthold Schmidt, Member of the Managing Board and CTO

TRUMPF

Backup

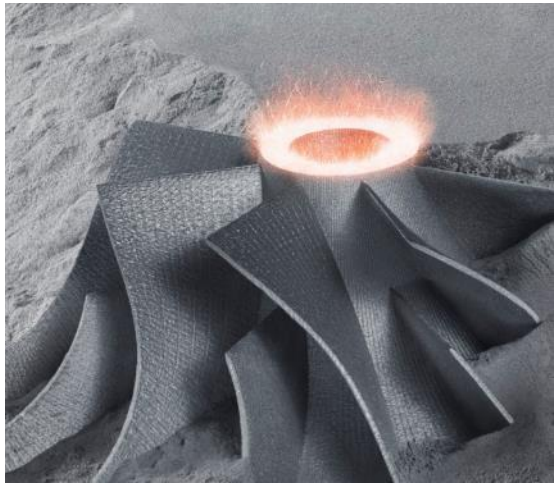
COMPANY PRESENTATION TRUMPF

TRUMPF is…

Family business

Technology leader

Close to the customer



Innovation guarantor

Independent family business

Our Managing Board

Dr. rer. nat. Hagen Zimer

Dr.-Eng. Stephan Mayer

Dr. rer. nat. Berthold Schmidt

Oliver Maassen

Dr. rer. pol. Lars Grünert

Dr. phil. Nicola Leibinger-Kammüller

Dr.-Eng. Mathias Kammüller

Chairman of the Supervisory Board:
Dr.-Eng. E. h. Peter Leibinger (not in this picture)

At a glance - Key corporate figures

Fiscal year 2022/23

Sales revenues (in bn. €)

5.4

+27 %

Earnings before taxes and interest (EBIT) (in m. €)

615

+31.4 %

EBIT margin

11.5 %

R+D costs (in m. €)

476

+6.3 %

R+D quota

8.9 %

Order intake (in bn. €)

5.1

-8.8 %

Employees on June 30, 2023 (Quantity)

18,352

+10.9 %

Investments (in m. €)

316

+44.7 %

Successful worldwide

Sales revenues by region in 2022/23

Germany	14.5 %
Revenue	779 m. €
Development	+32.2 %

Europe (without Germany)	23.9 %
Revenue	1,280 m. €
Development	+26,4 %

Asia Pacific	21.6 %
Revenue	1,159 m. €
Development	+16.0 %

America	21.6 %
Revenue	1,161 m. €
Development	+42.8 %

Cooperation (EUV)	18.1 %
Revenue	971 m. €
Development	+22.2 %