

BISS LUND MAY 20, 2025

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# MAX IV – Now and the coming 10 years

# Mission and Vision

- World-leading synchrotron for science and innovation.
- Vision 2036: sustain frontier capabilities via MAX4<sup>U</sup> and beamline expansion.

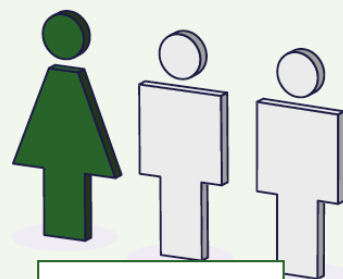
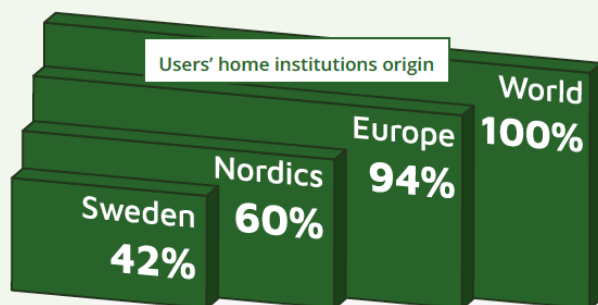
MAXIV



# 2024 – another record year

## USERS

**1921** visiting users from **292** institutions across **35** countries



**1 in 3**  
users is a  
female scientist

## INDUSTRY

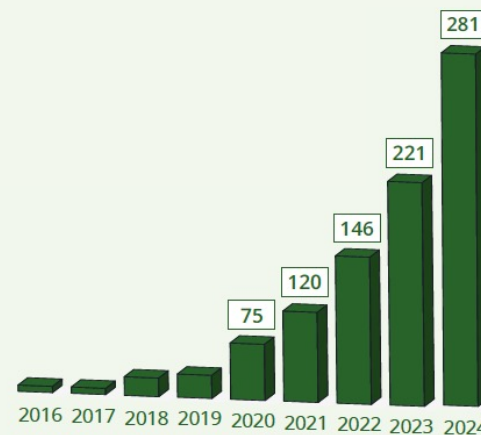
**28** proprietary user groups including mediators

**54%** proprietary industry users from Sweden

**4068 hours**  
of beamtime for  
user scientific  
projects connected  
with industry

**1143 hours**  
paid  
proprietary  
beamtime

## PUBLICATIONS



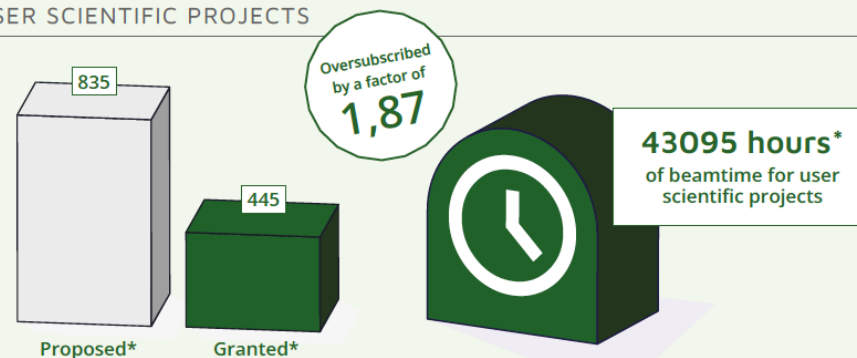
Publications per year\*

\*As of March 2025, correction rights reserved

**+27%**  
increase of publications  
compared to 2023

**932**  
publications  
2016–2024

## USER SCIENTIFIC PROJECTS



\*2024 sum of Standard Access and BAG proposals, excluding Fast Access

\*Following the Swedish Research Council's definition of beamtime hours, based on cycles, including proprietary use.

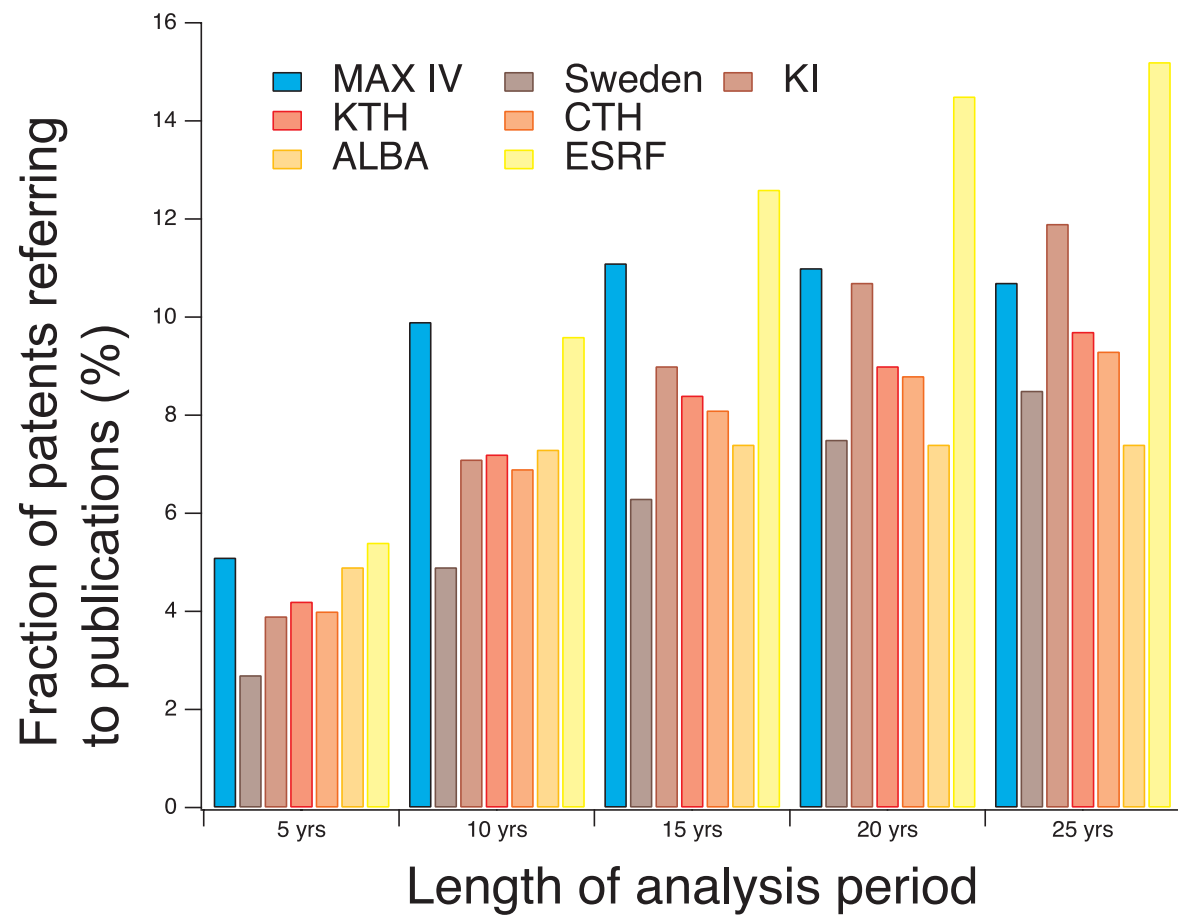
**MAX IV sold more  
than 1000 hours of  
experiment time to  
industry in 2024.**

**The largest user  
group is the  
pharmaceutical  
industry.**

**MAXIV**



**Analysis of patent citation rates demonstrates MAX IV's role in driving innovation.**



# Circular and sustainable materials – Tetra Pak



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Image: Elin Persson Jutemar and Eskil Andreasson, Tetra Pak, in the ForMAX sample preparation lab at MAX IV. Credit: Anna Sandahl/MAX IV



- Tetra Pak investigating the properties of paper straws
- Fast study to product turnover

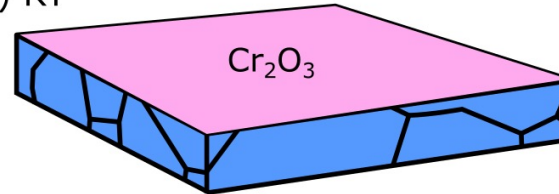
Read the science  
highlight at [maxiv.se](https://maxiv.se)



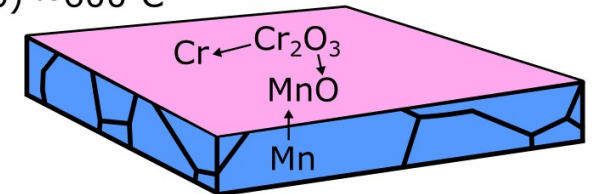
# Properties of stainless steel – Alfa Laval

Protective surface oxide layer of Stainless Steel

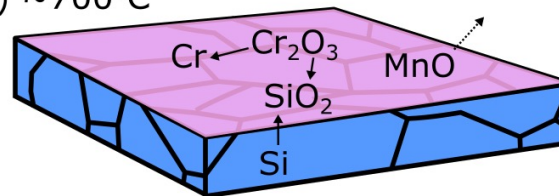
a) RT



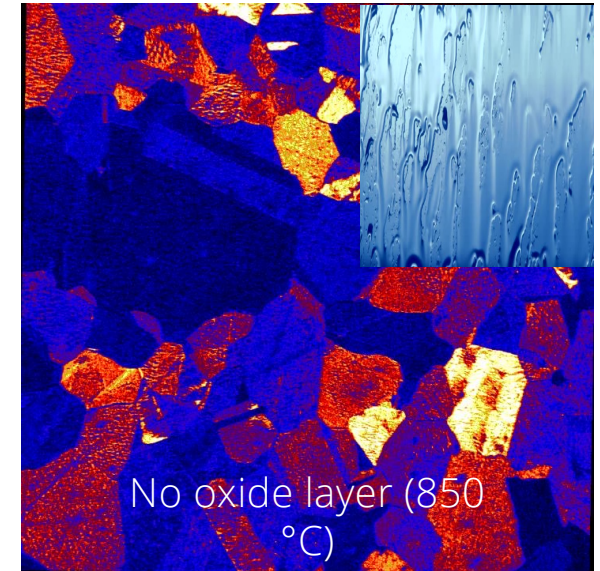
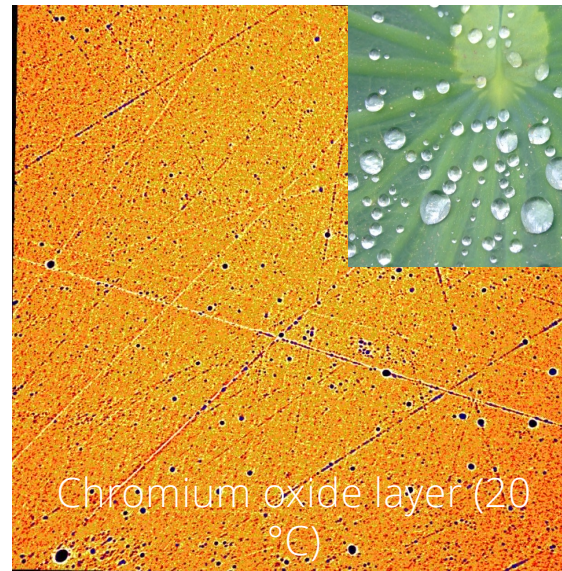
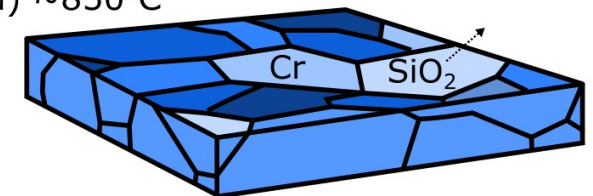
b)  $\sim 600^\circ\text{C}$



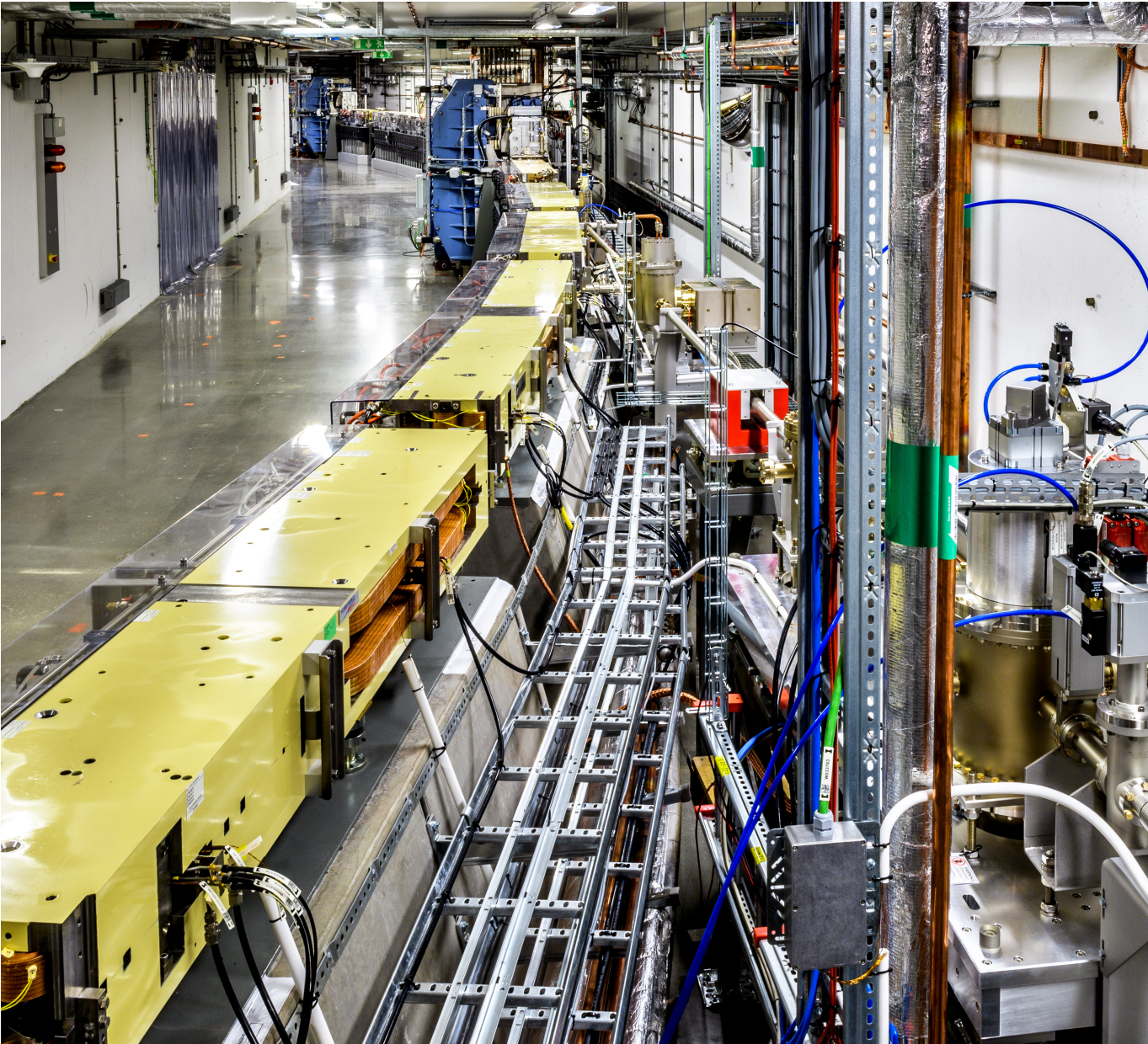
c)  $\sim 700^\circ\text{C}$



d)  $\sim 850^\circ\text{C}$



Figures: Alfa Laval



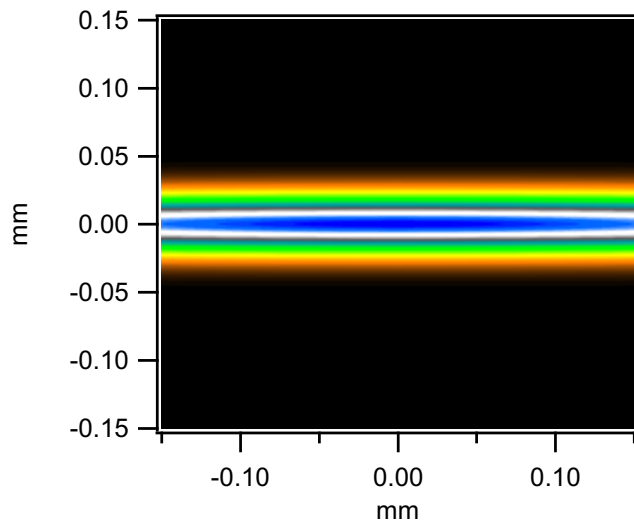
## MAX4U Upgrade

- 10 times higher brilliance and coherence gain for 3 GeV ring.
- Keeps worldwide competitiveness and ensures a leading position.
- CDR 2025
- TDR 2026
- Funding in next bill?

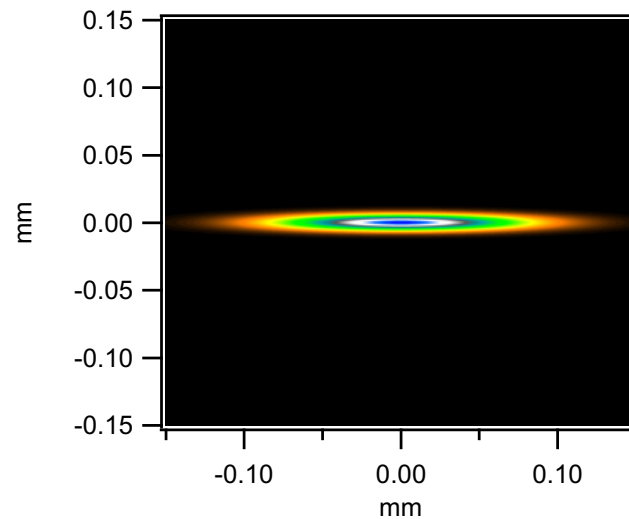


# MAX 4<sup>U</sup>: Towards the next generation

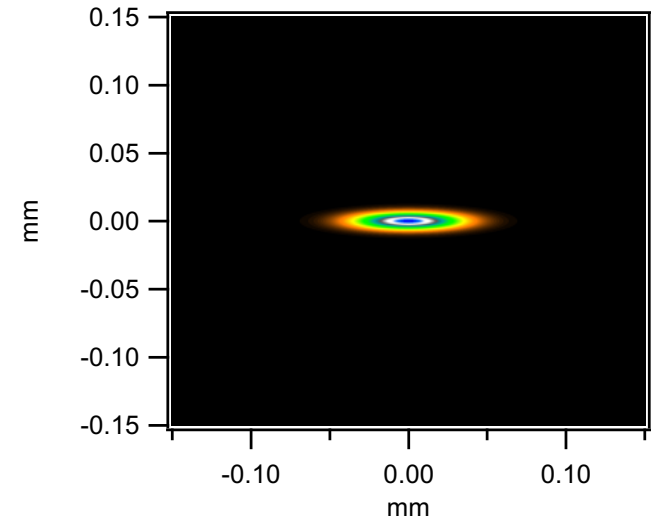
**MAX II (1996 – 2015)**



**MAX 4 (2016 – 2030)**



**MAX 4<sup>U</sup> (2030 –)**



*Electron beam transverse cross-section*

Higher Brightness and Coherence



# MAX 4<sup>U</sup>: A Package

## Higher Brightness and Coherence

A "surgical upgrade" on R3 to keep downtime at minimum while keeping user operation on the R1 and SPF beamlines.

In addition to the storage ring upgrade:

- ✓ Beamline readiness program on R3 beamlines to fully utilize the new possibilities
- ✓ Beamline expansion – adding new capabilities

Will in addition, require increased focus on AI & ML methods for data management and analysis.

# Beamline Expansion

- WISE beamline project start 2025
- MedMAX TDR 2026
- Two more beamlines by 2032
  - Will pursue unfunded WISE beamline

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QUESTIONS & DISCUSSION

**Thank you**