

“Photonics as key differentiator in tomorrow's innovations.”

15 years Demcon Focal.

Design and engineering optomechatronics.



FOCAL

Marc van Dijk, November 15th, 2023
Hall 3, Booth 553

Demcon Focal. The world of optomechatronics.

Semicon &
microelectronics



Metrology



Lasers



Light sources &
illumination



Optics



Remote sensing



Astronomy



Communication &
information



Defence & security



Biomedical optics &
imaging



Vision
technologies

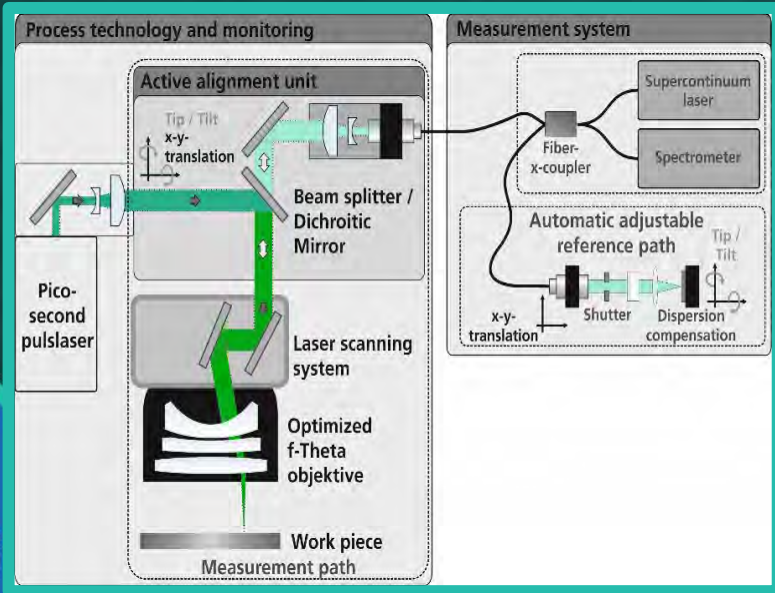


Energy





Metrology



Optical precision scanner

Optical metrology

connects packaging

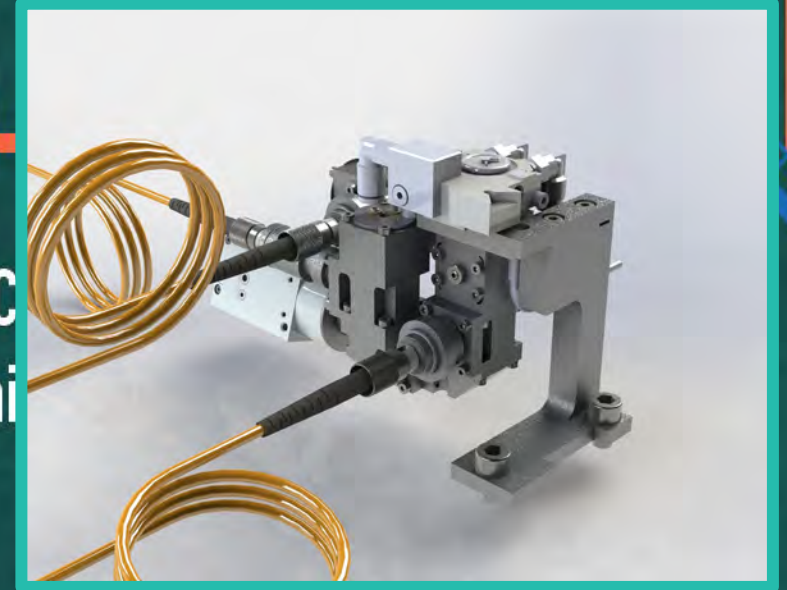
storage

Inline depth

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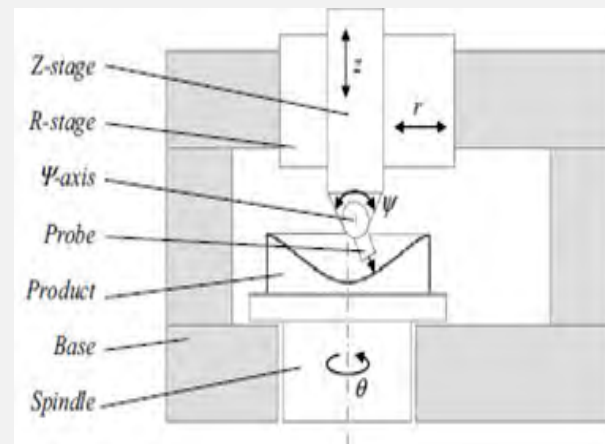
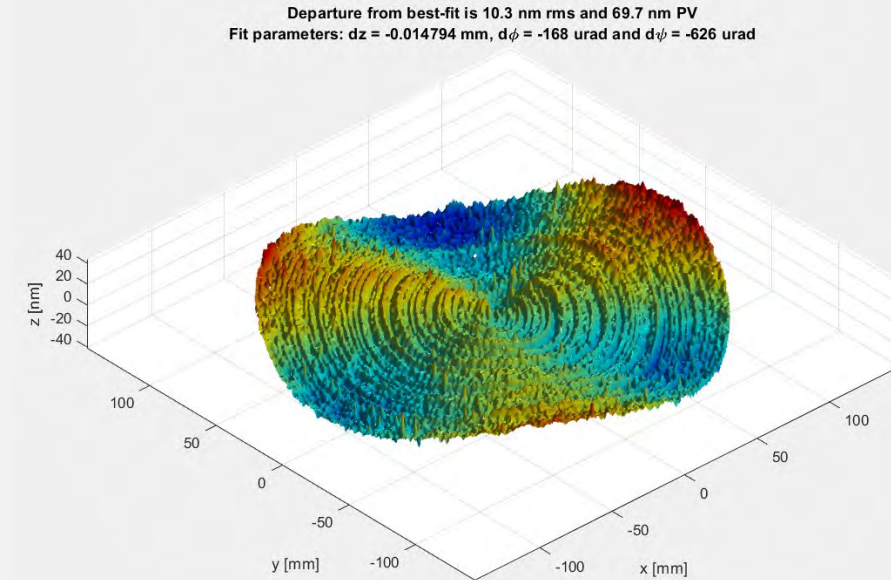
a precision free form measurement



Measurement system for asphere and freeform optics

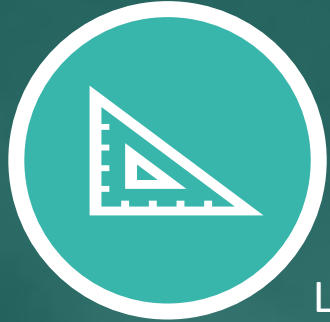
NMF2.0

- Fast (<15 min) and accurate (nm) contactless measurement of aspheres and freeforms
- Challenges:
 - Measurement accuracy I.C.W. 4 dofs
 - $\varnothing 1000 \times 125$ mm product size
 - Combination of freeform and accuracy
- Solution:
 - Measurement system that measures probe position relative to spindle
 - Patented measurement probe with 5 mm range and 7° angle
- Realized:
 - <15 nm uncertainty (3 sigma)
- From start to first alpha series in <1.5 years



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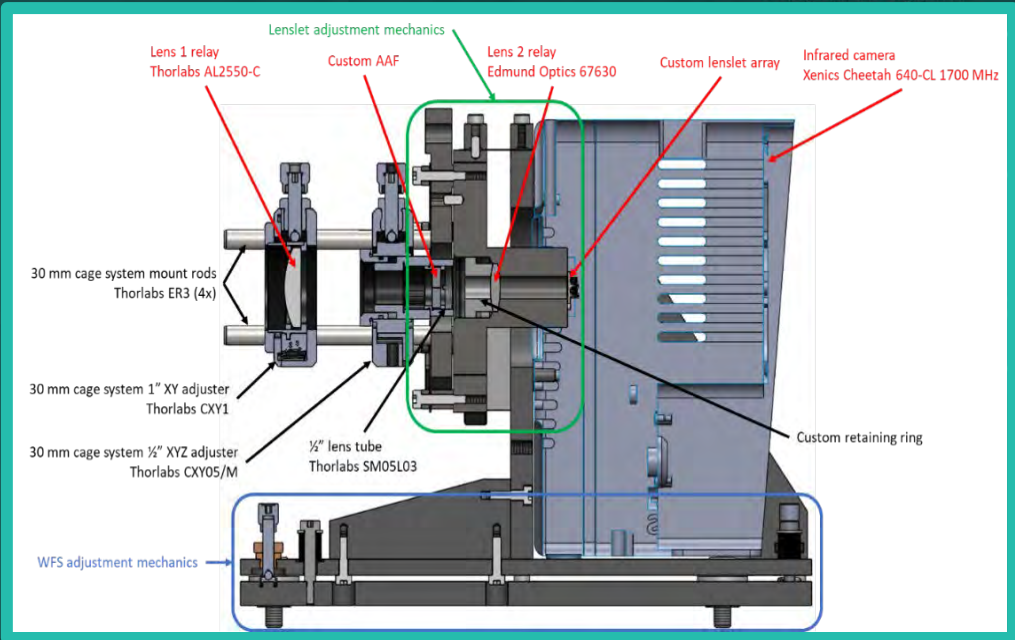
Vision
technologies



Energy



Gemini North



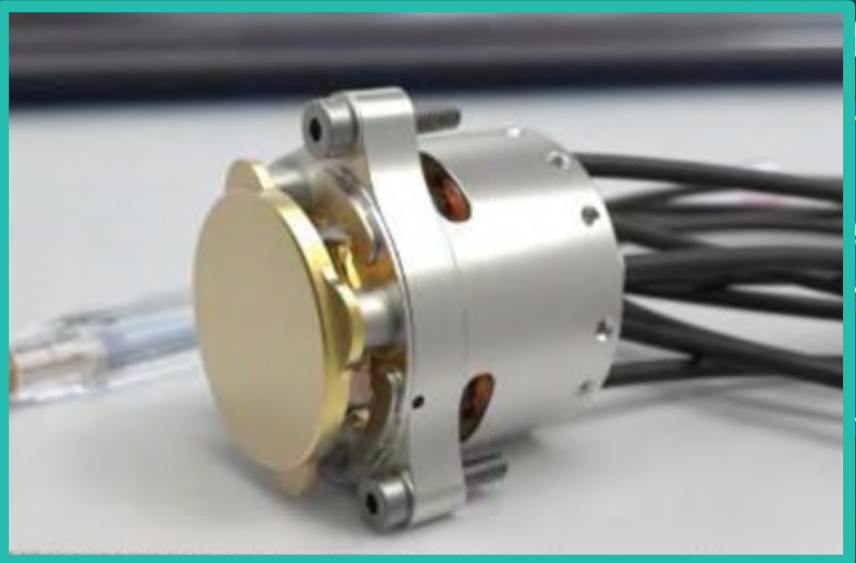
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Astronomy



Telescopes

Laser guide star - ELT



tions

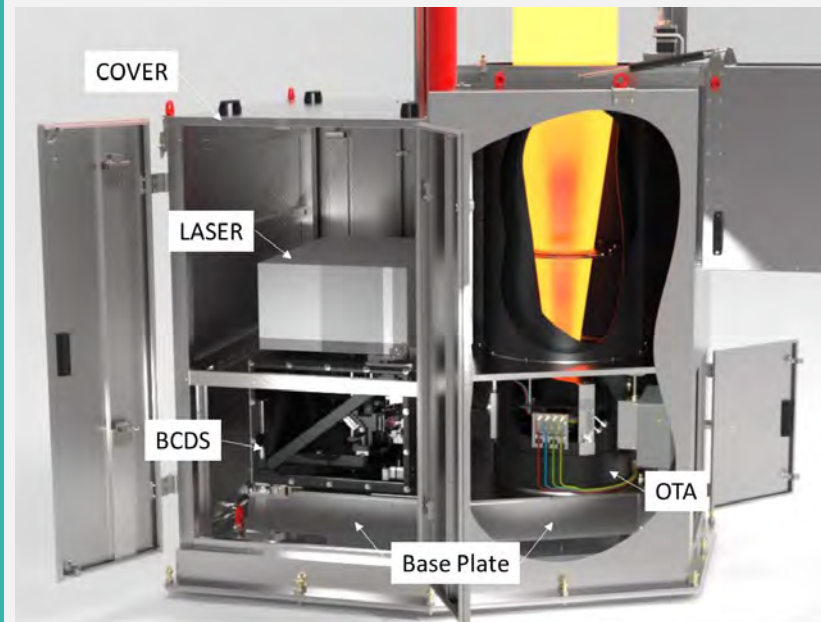
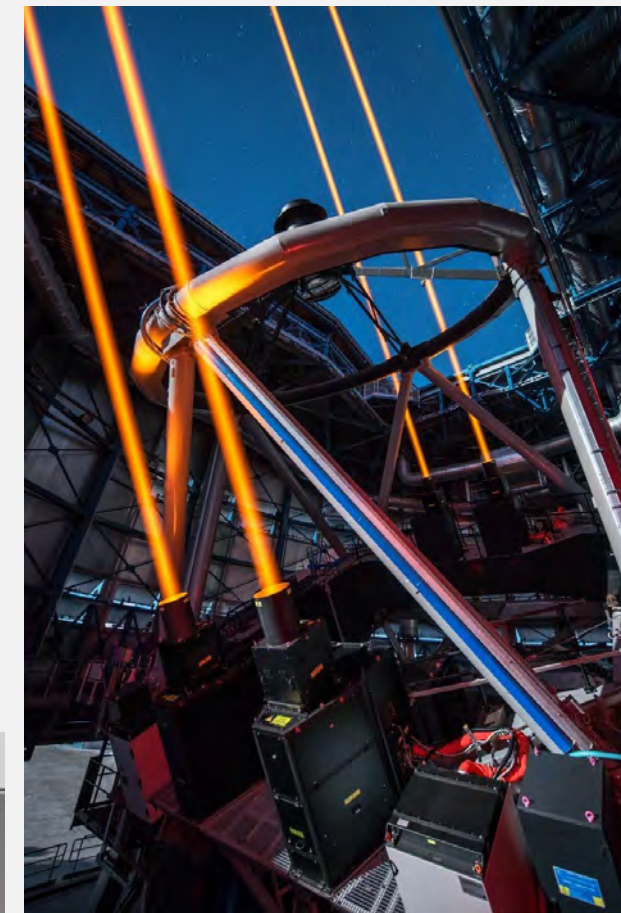
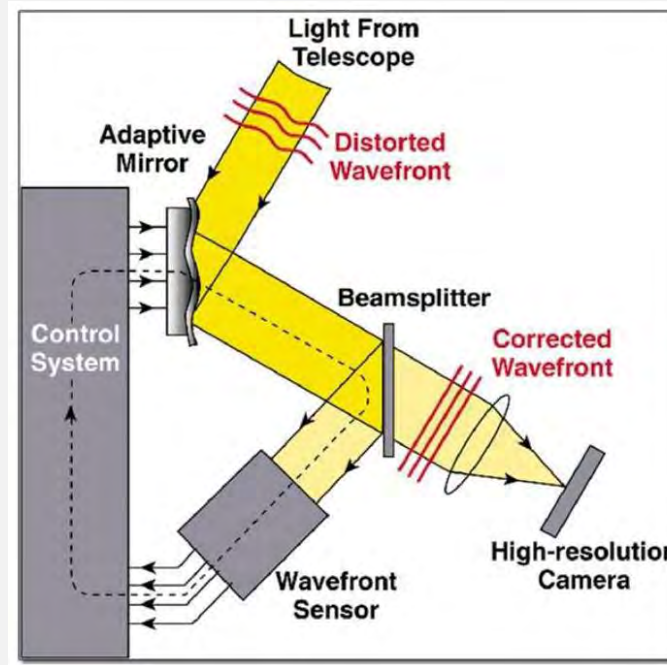
Laser guide star

LASER BEAM CONDITION UNIT

- The LGS System produces artificial reference stars for the ELT
- These LGSs are used to drive the ELT post-focal adaptive optics (AO) modules and instruments in their high order correction of image blurring caused by atmospheric turbulence.

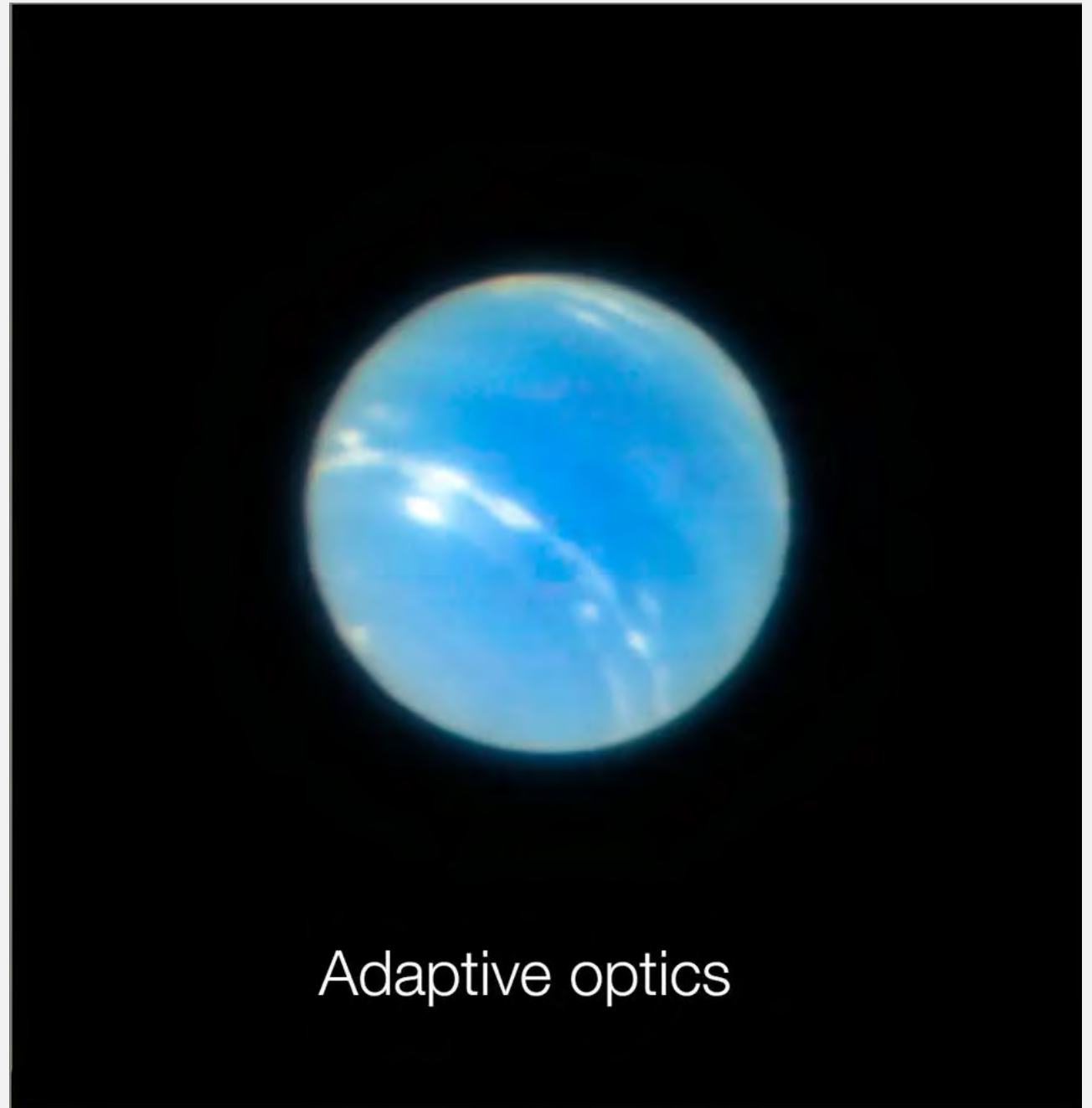
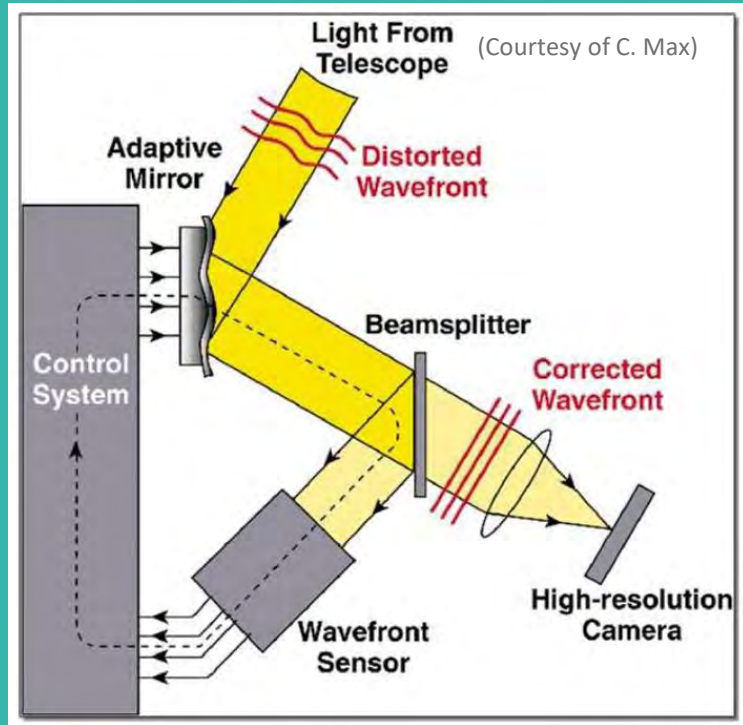
Challenges

- Maintain high beam quality and beam positioning for temperatures from 0 to 15 degrees C and for zenith angles ranging from 0 to 60 degrees.
- Modular design of the subsystems as line replaceable units (LRU) to allow for a time and cost-effective service on site of the ELT.
- Anticipated lifetime of 30+ years.



Extremely Large Telescope

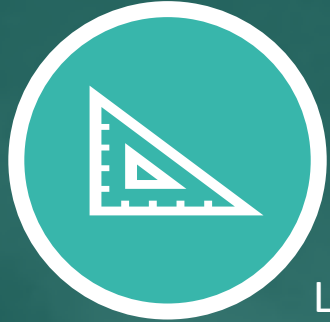
ADAPTIVE OPTICS PRINCIPLE



Credit: ESO/P. Weilbacher (AIP)

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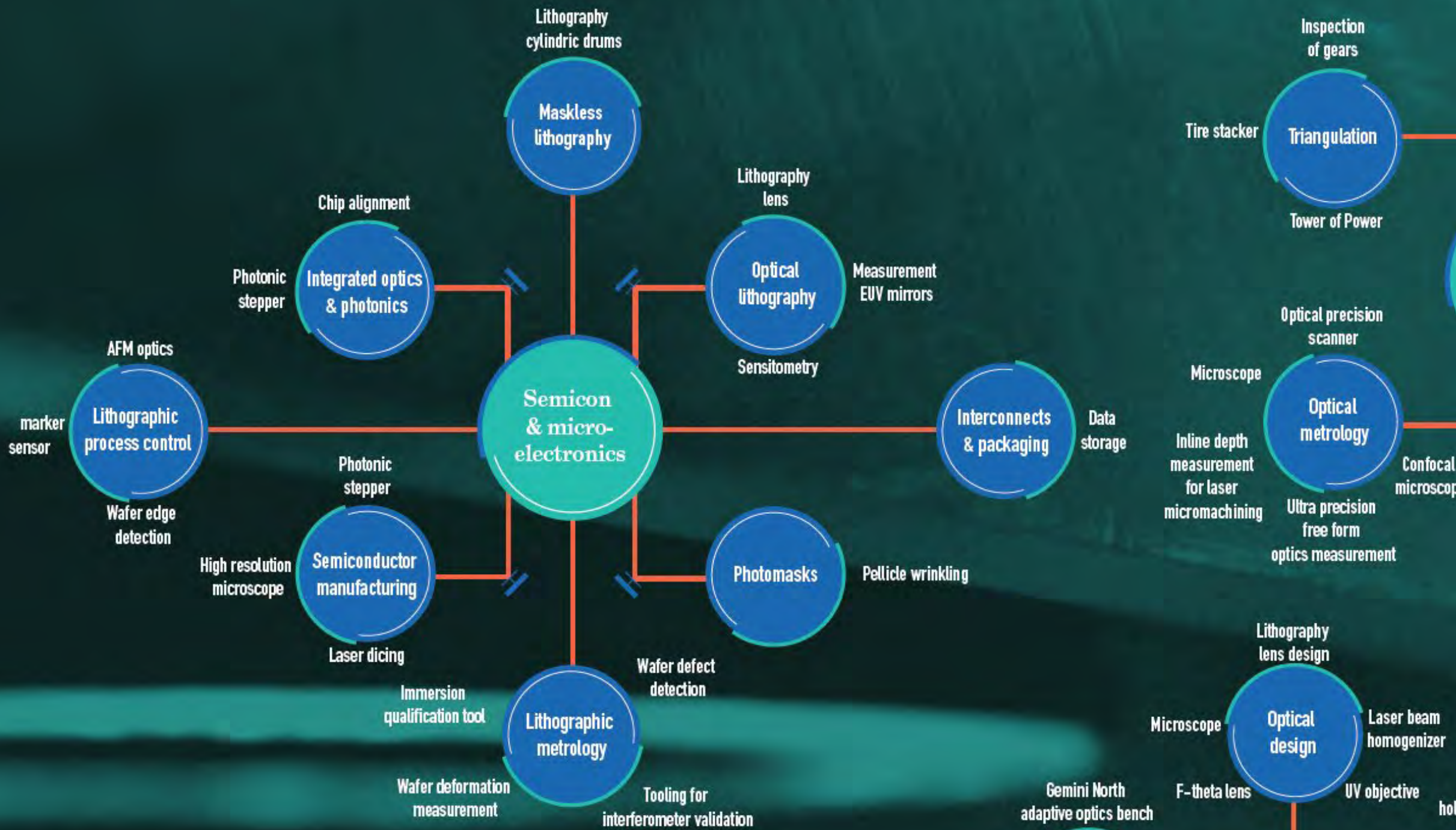


Vision
technologies



Energy





AFM optics

Sensitometry

Semicon
& micro-
electronics

Lithographic

Marker

Photonic
stepper

Semiconductor
manufacturing

Resolution
microscope

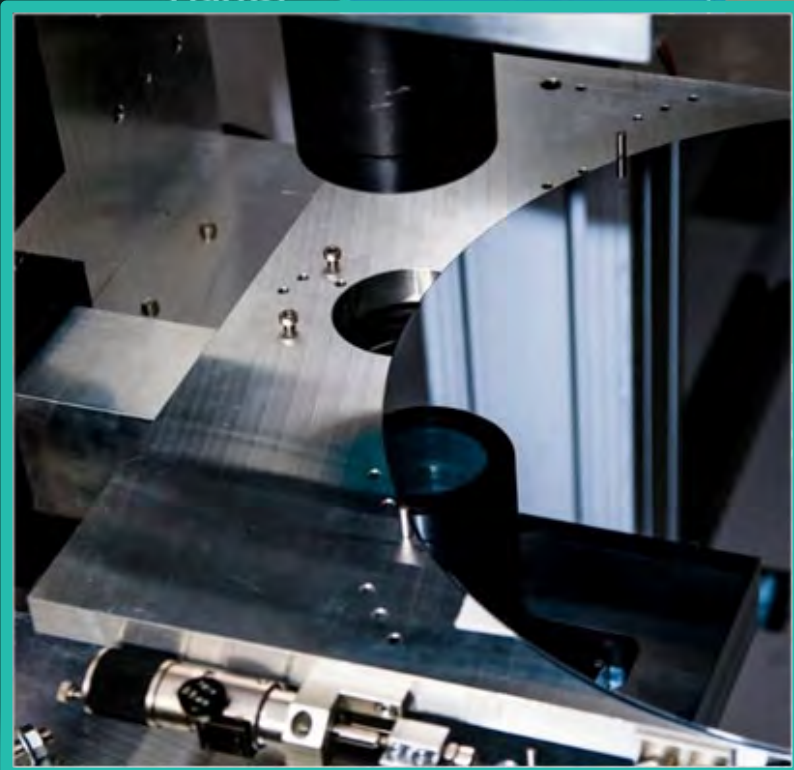
Laser dicing

Immersion
qualification tool

Lithography
metrology

Wafer deformation
measurement

Tooling for
interferometer validation



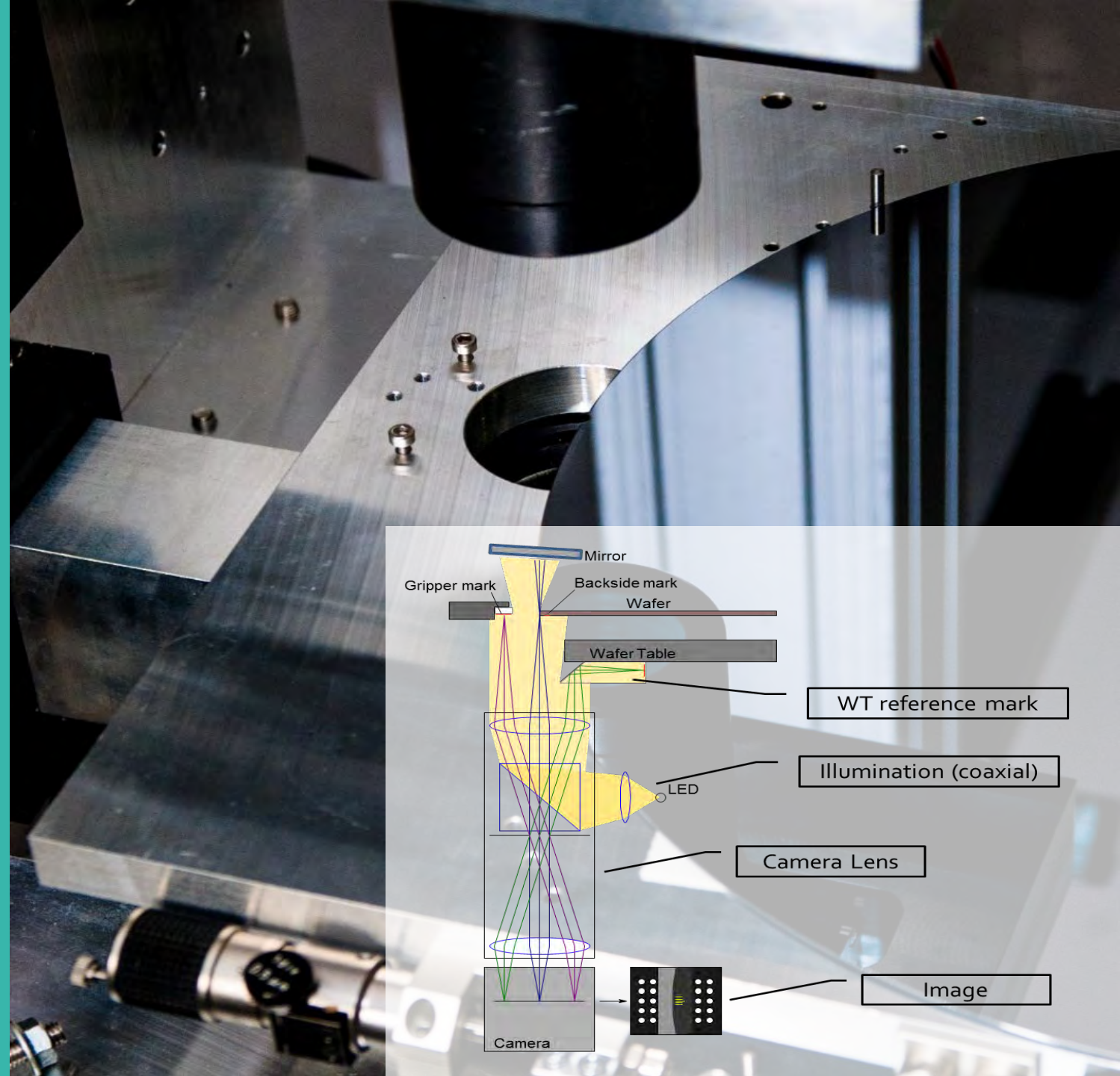
Wafer edge aligner

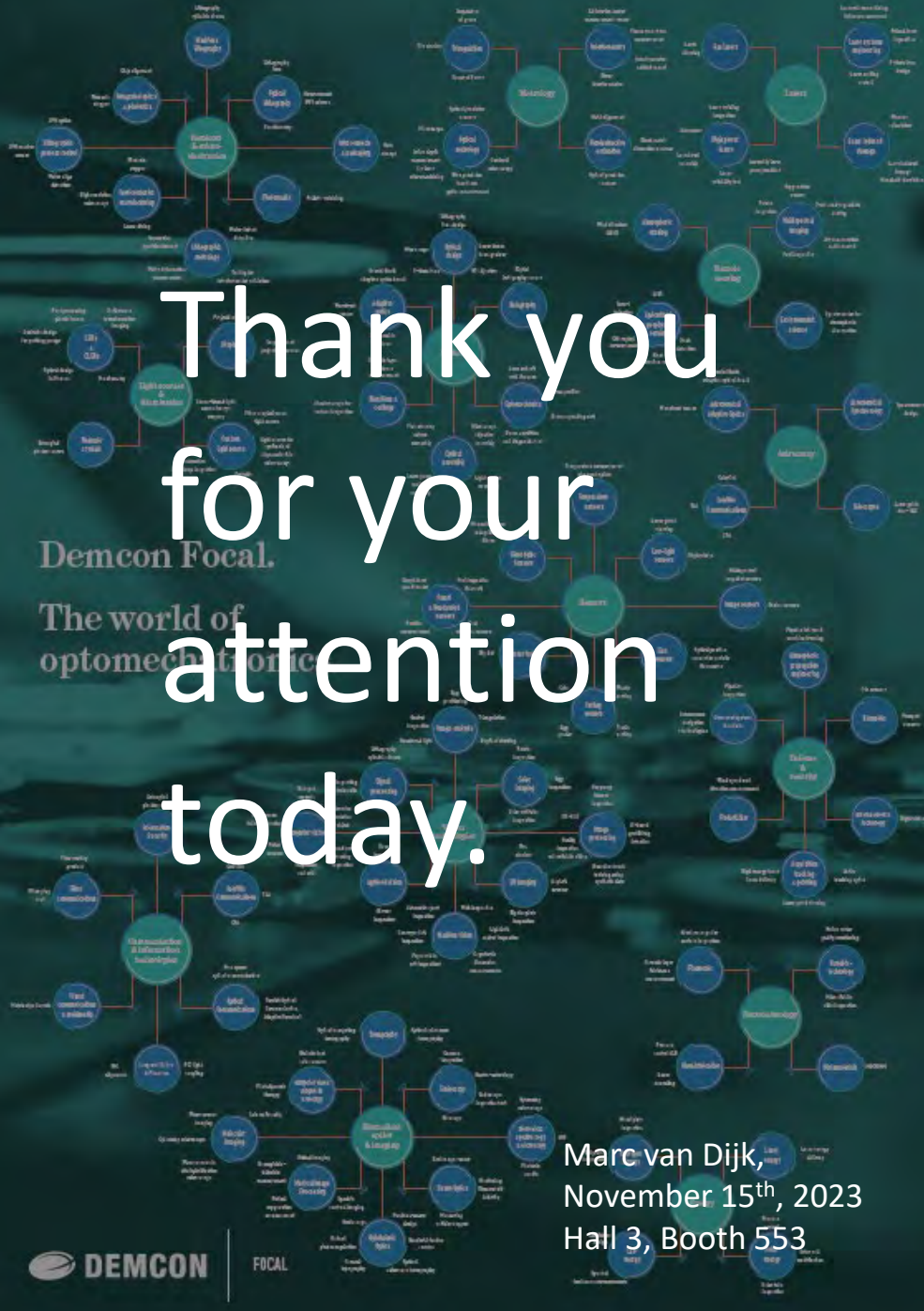
WITH LARGE DOF

Sub-micron positioning of 450mm Wafers.

R&D and alpha series by Demcon

- Extremely large Depth of Field
- In focus: $< 250\text{nm}$ accuracy
- At 6mm out-of-focus: $< 1\mu\text{m}$ accuracy
- At 12mm out-of-focus: $< 2\mu\text{m}$ accuracy





Thank you
for your
attention
today.

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