

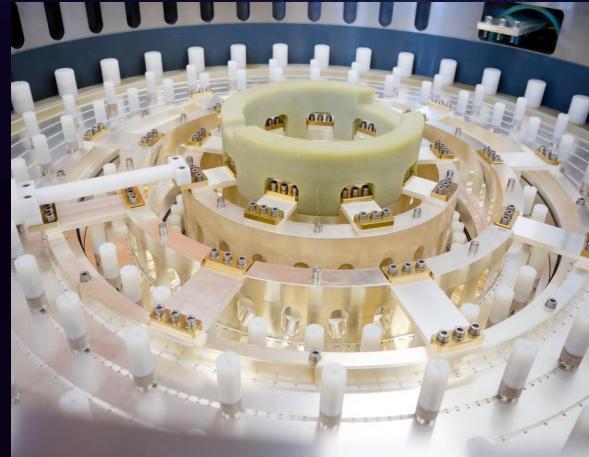


Welcome

Meike Arnold
18-09-2025

HFML-FELIX: National research infrastructure

Strongest resistive DC-magnets in Europe



6 magnets with a
force-field
of 30-38 tesla
(45T hybrid
magnet in
development)

+ largest IR/THz wavelength range in one facility

4 free-electron
lasers that
produce (far)
infrared light



A research facility for national and international users,
with a distinguished in-house research and engineering programme.

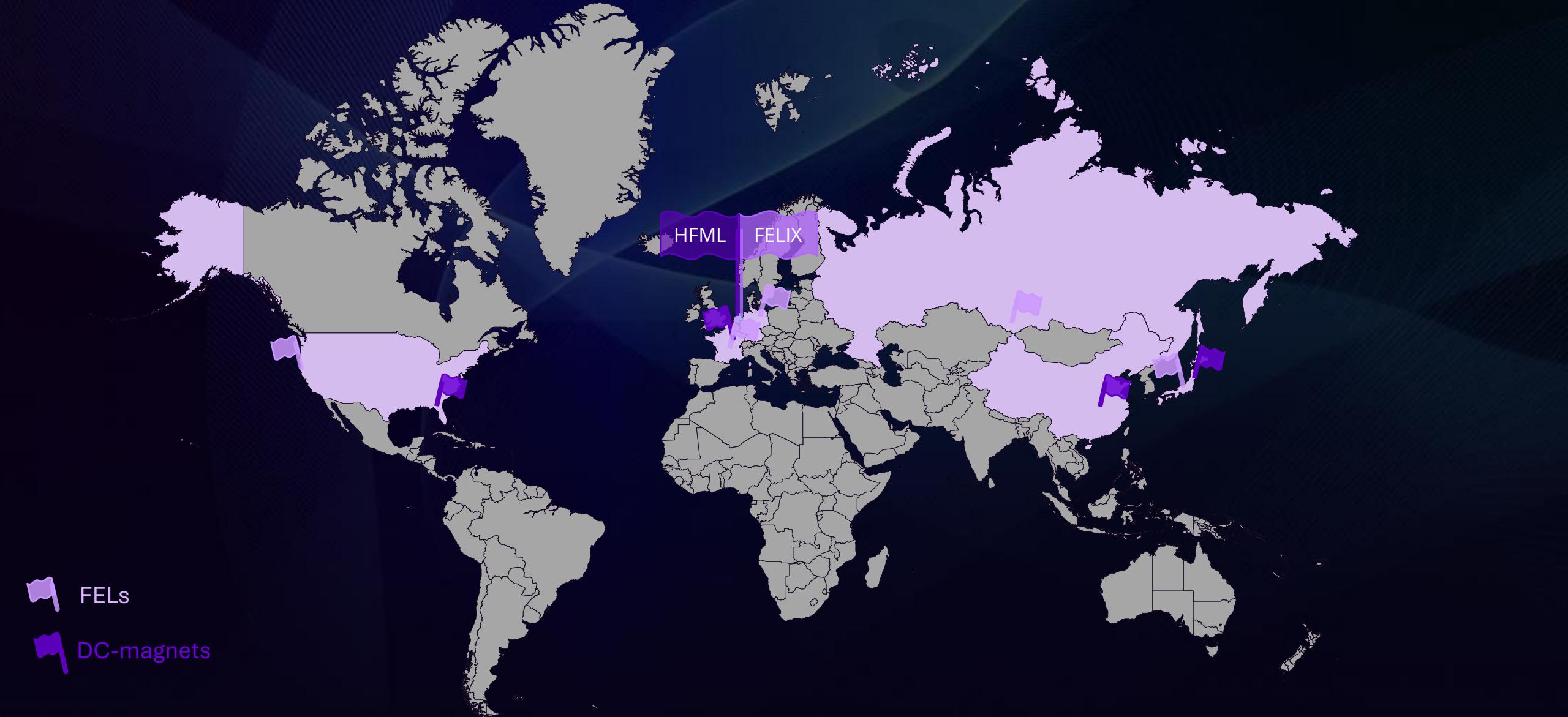
HFML-FELIX: a national collaboration



As the newest of **10 national NWO-I institutes**, HFML-FELIX is part of a large network consisting of **NWO**, **Radboud University**, **6 other Dutch universities** and **Radboudumc**.

HFML-FELIX: Large-scale Research Infrastructure

Unique combination of FELs and DC-magnets

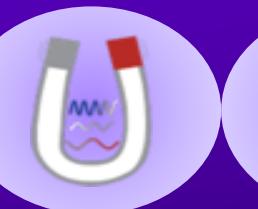
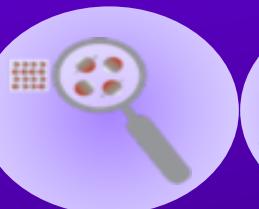
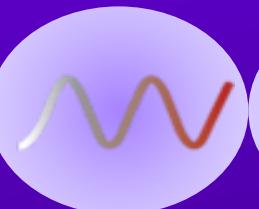


Material research in extreme conditions

EXTREME CONDITIONS

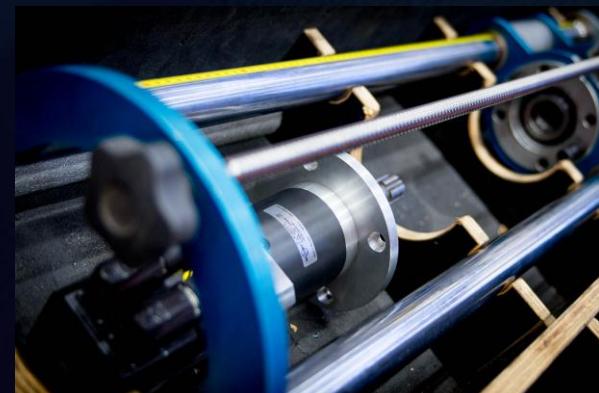
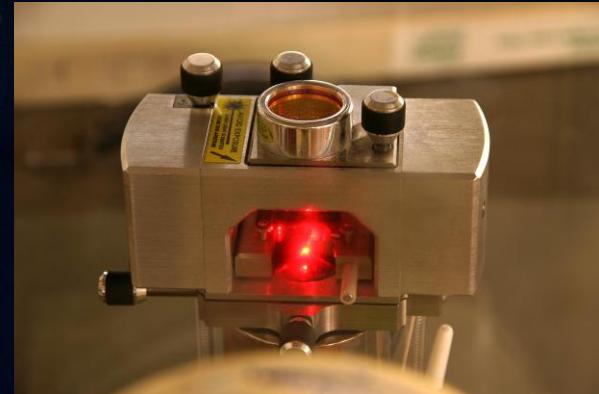


Materials & Molecules

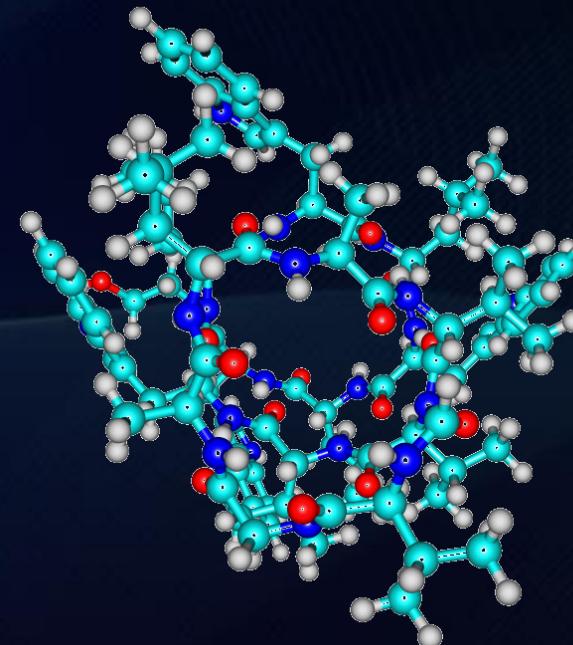


ADVANCED INSTRUMENTATION

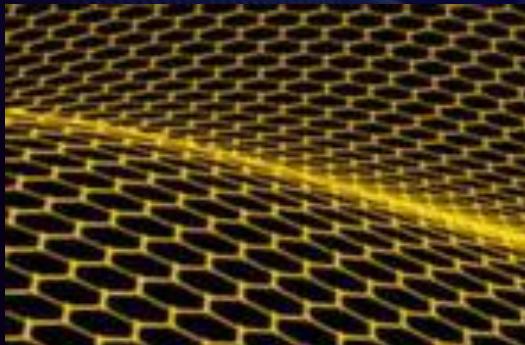
Discovery of new characteristics



Material research in extreme conditions



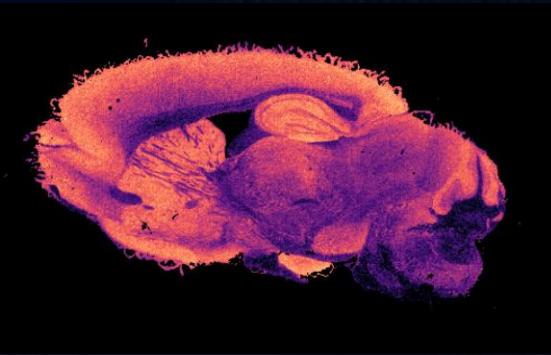
Distinguished In-house Research Programme



**SMART
MATERIALS**



**ENERGY AND
SUSTAINABILITY**

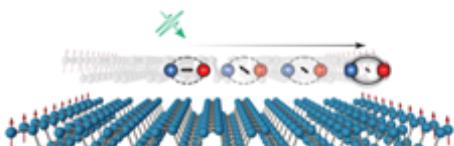


HEALTH

Research lines conducted with our partners

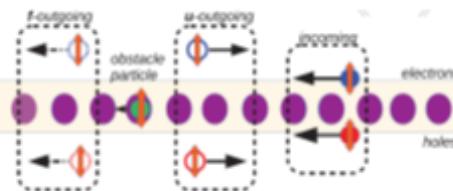
- Mapping and manipulating quantum phases of matter
- Molecular structure identification and reactivity in infrared
- Dynamic self-organization in soft molecular matter
- Non-equilibrium phases of matter
- Innovative instruments for advanced Spectroscopy

Nanoribbons



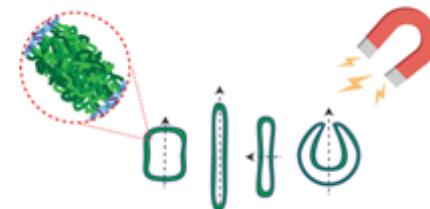
Nature 639, 8054 (2025)

Superconductivity



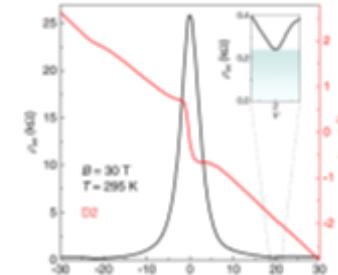
Science 382, 792 (2024)

Polymer Nanocapsules



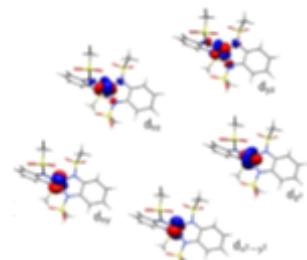
Soft Matter **20**, 730 (2024)

Graphene



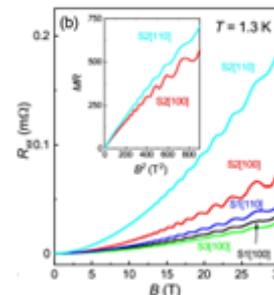
Nature Comm. 14, 318 (2023)

Molecular Magnets



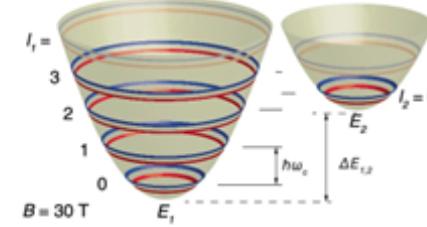
Nature Comm. 16, 2157 (2025)

Topology



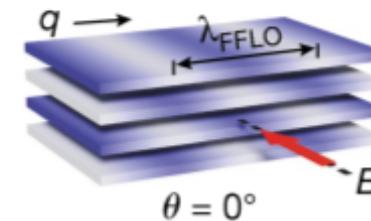
NPJ Quantum Materials 9, 63 (2024)

Quantum Hall Effect



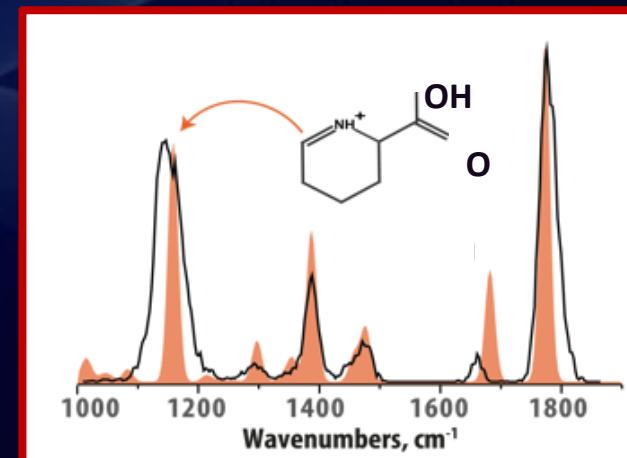
Nature Comm. 15, 10052 (2024)

Superconductivity

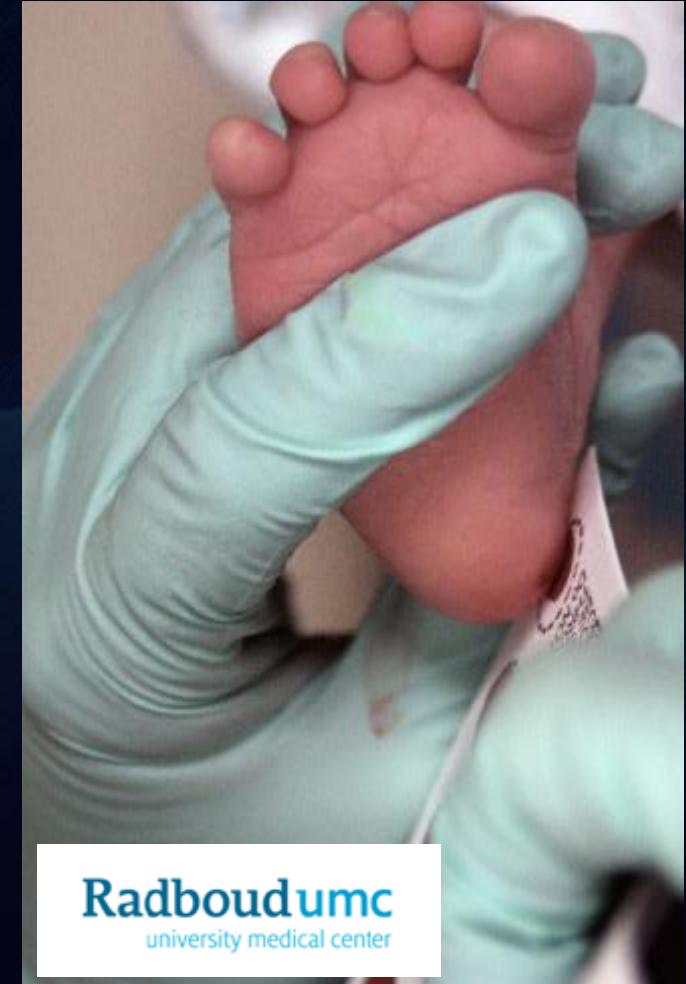


Nature 619, 7968 (2023)

Identification of biomarkers of metabolic diseases



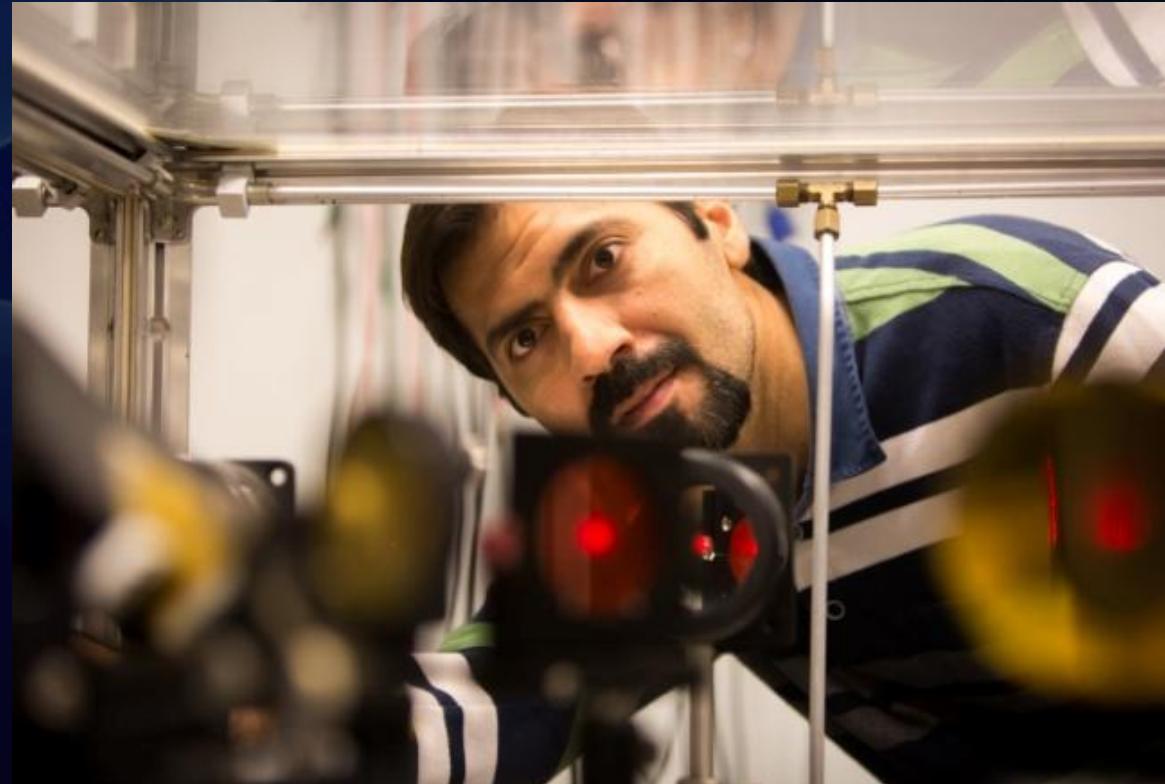
Biomarker
identification



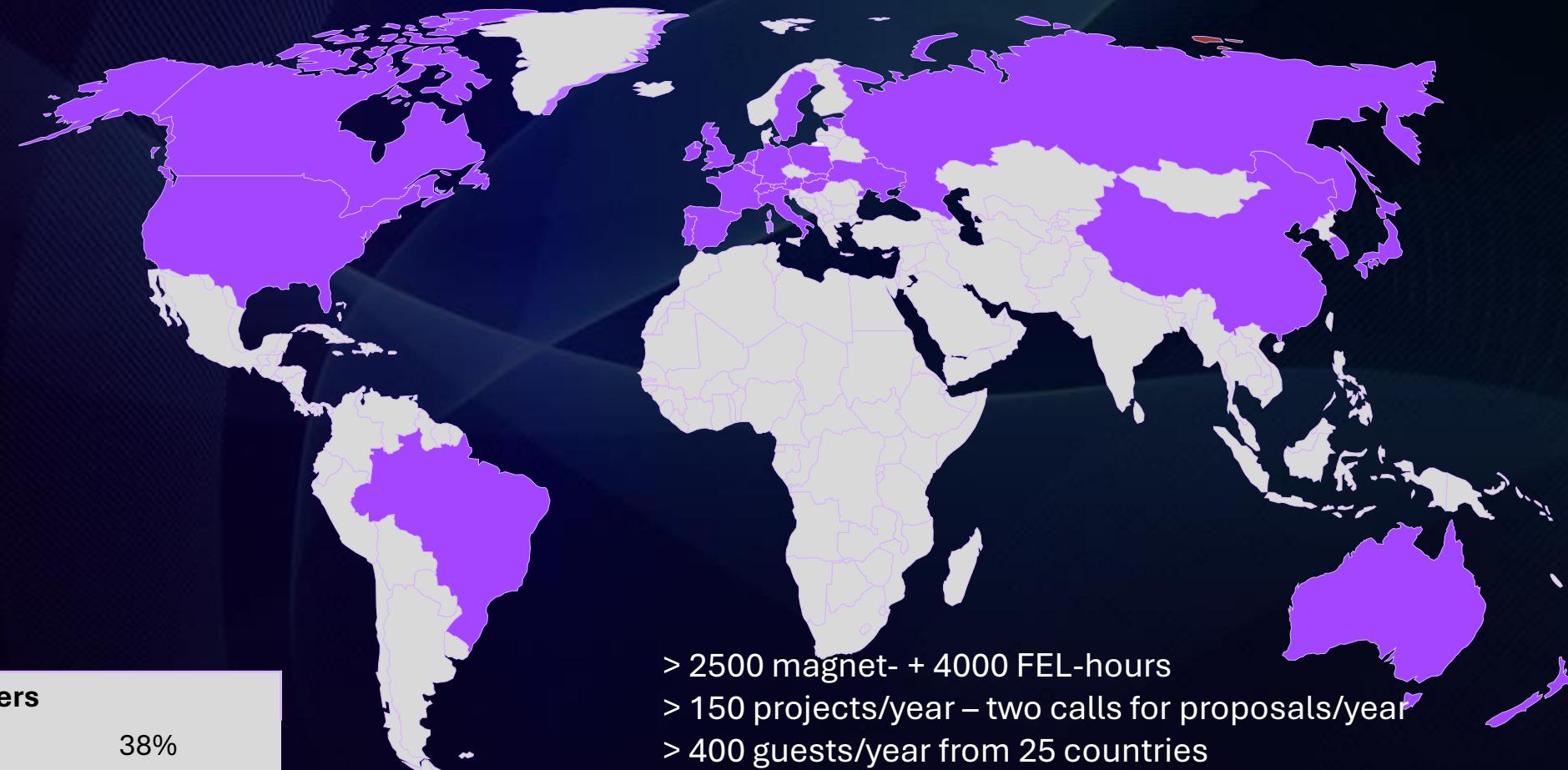
NIFTI - National Individual Floating Transport Infrastructure



Guest research programme



Facts and numbers



HFML-FELIX users

Netherlands	38%
EU	44%
Overseas	18%

- > 2500 magnet- + 4000 FEL-hours
- > 150 projects/year – two calls for proposals/year
- > 400 guests/year from 25 countries
- > 80 publications/year
- 85 employees (permanent & temporary) + students/internships
- Total investment ca. 100M Euro
- Annual budget 12M Euro

Industry collaboration

Industrial research at HFML-FELIX

- Application with scientific proposal at one of the two deadlines (15 May and 15 November)
- Publication of the results in open-access scientific literature and presented at scientific conferences and meetings.

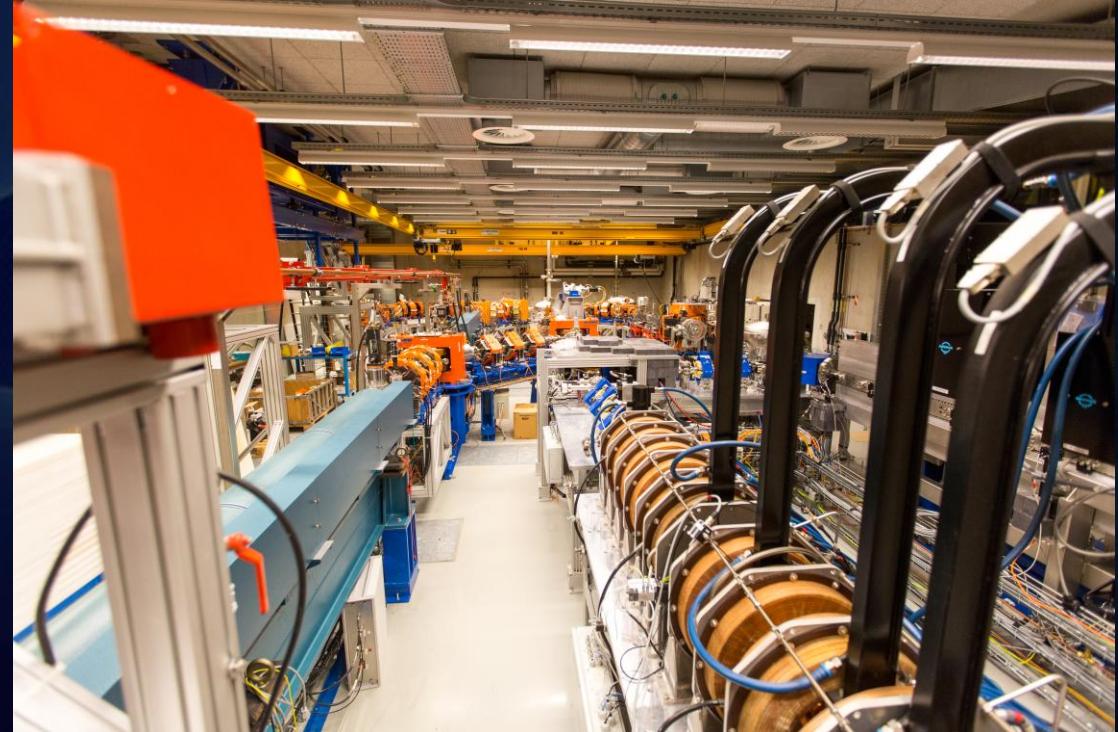
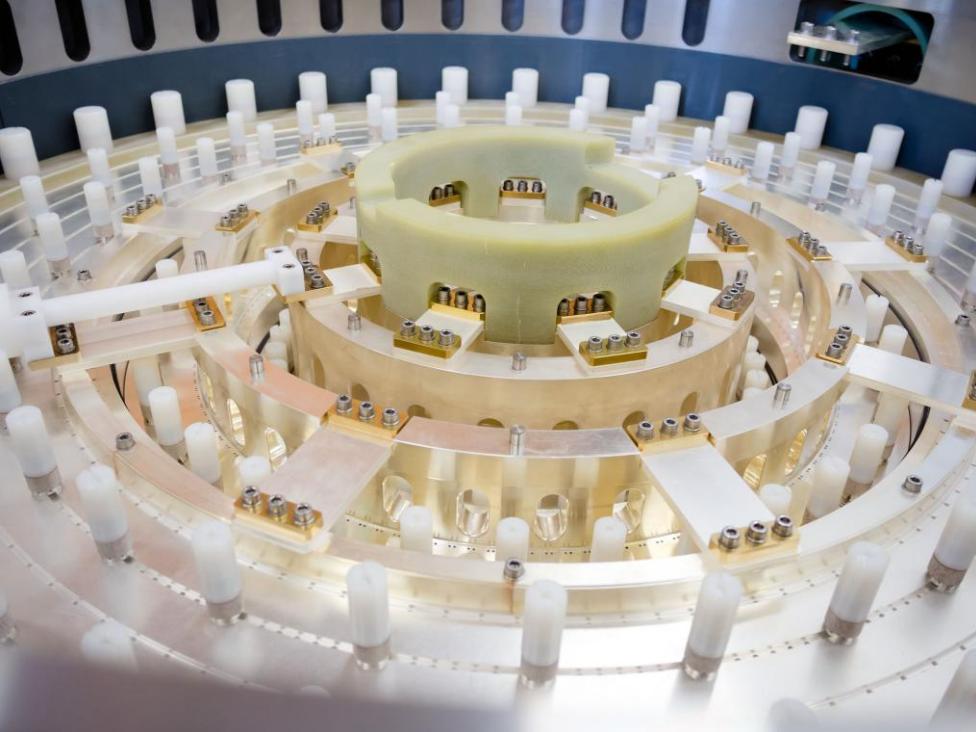
Examples of industrial research conducted at HFML-FELIX



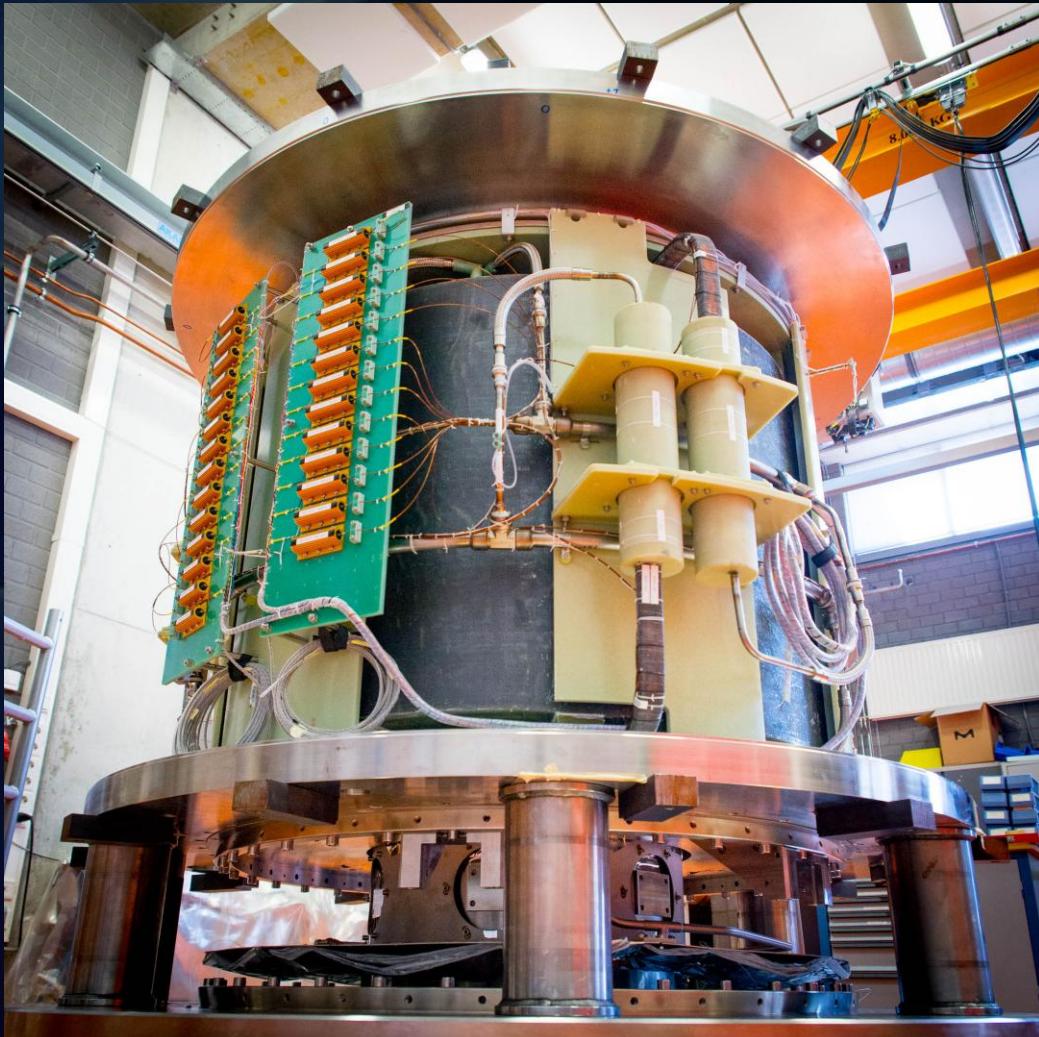
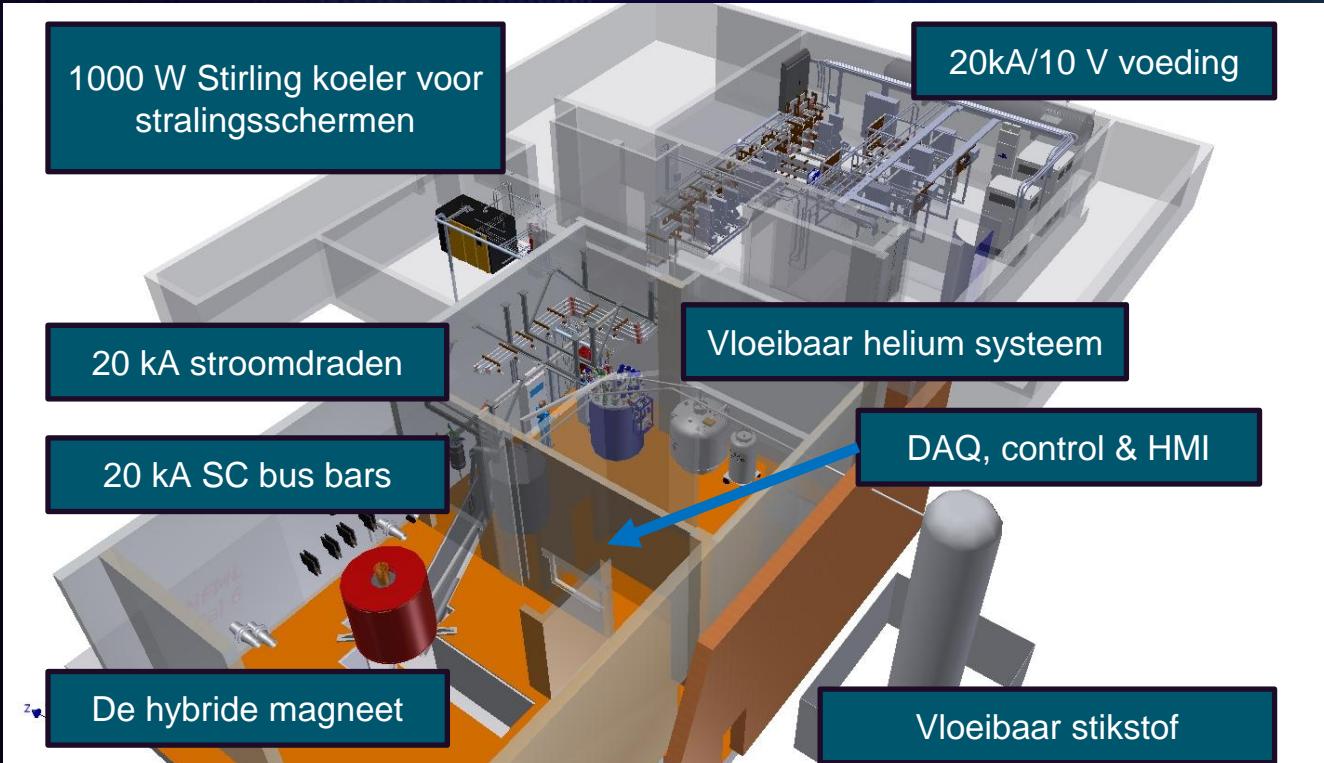
Public Private Partnership

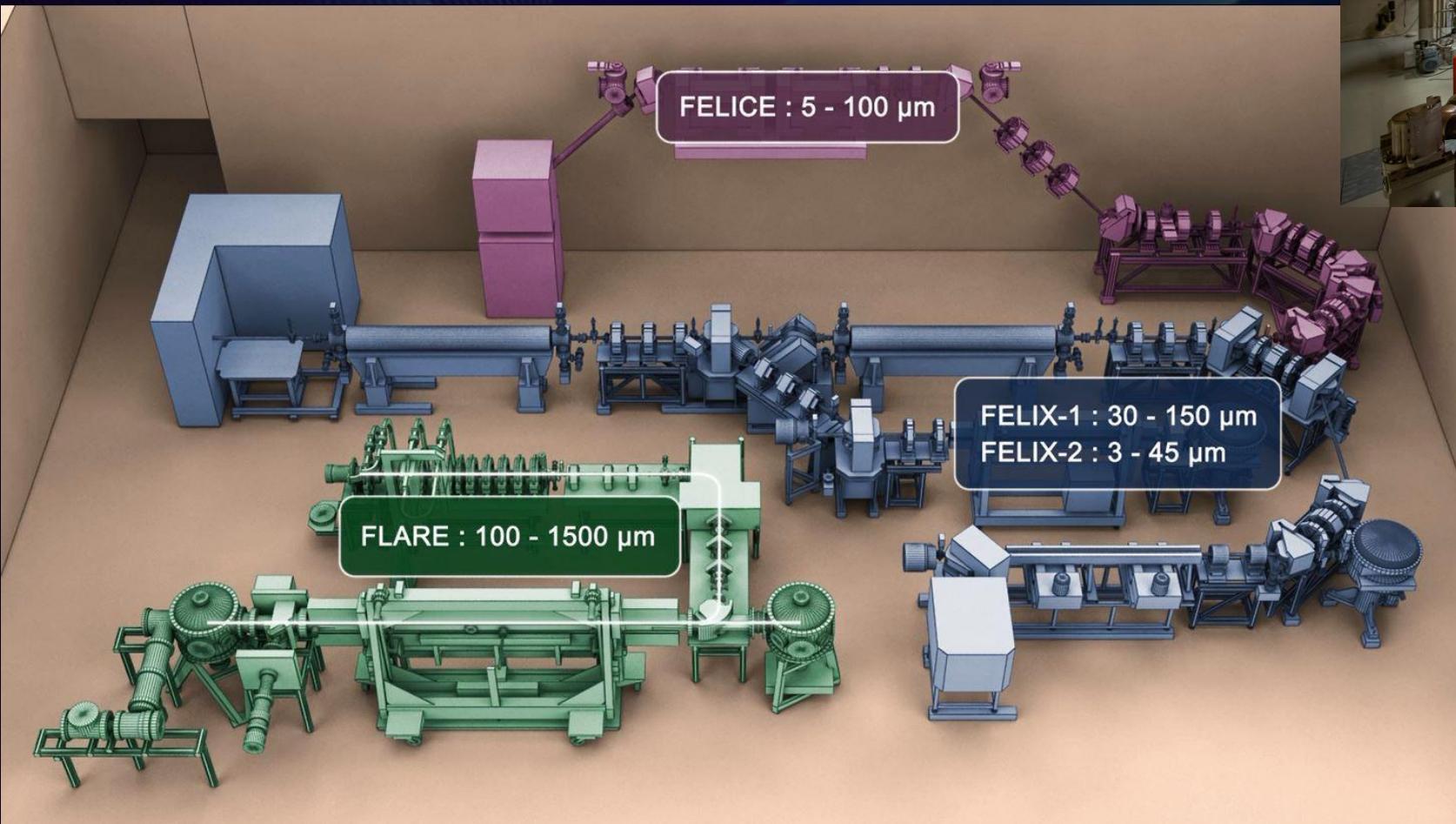
- Holland HighTech-Project: Accelerating Molecular Identification with Advanced Infrared Ion Spectroscopy (starting in 2026)

Technologie state-of-the-art magneten, lasers & instrumenten



45T-Hybrid Maget





Thank you for your attention!

Contact

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