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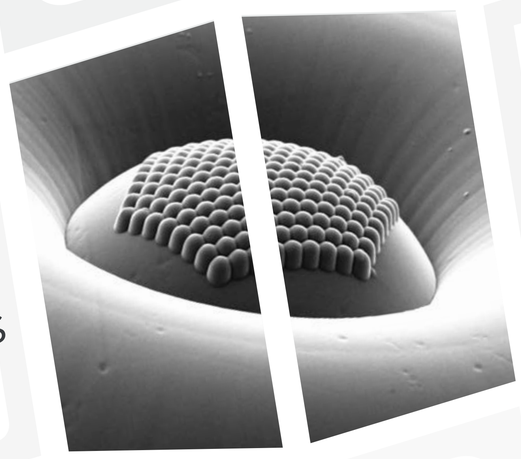
FREE OF CHARGE ACCESS

to the widest range of tools for research at the nanoscale

LITHOGRAPHY & PATTERNING

Nanoengineered devices

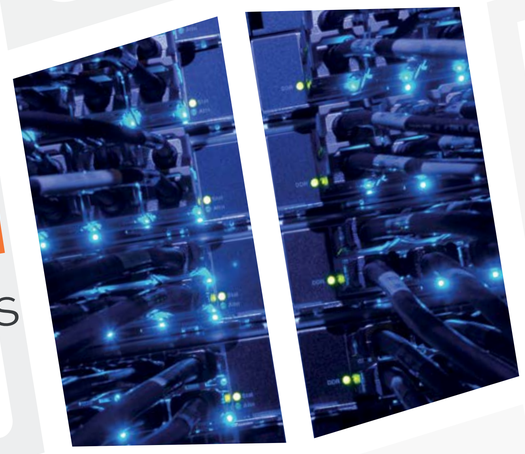


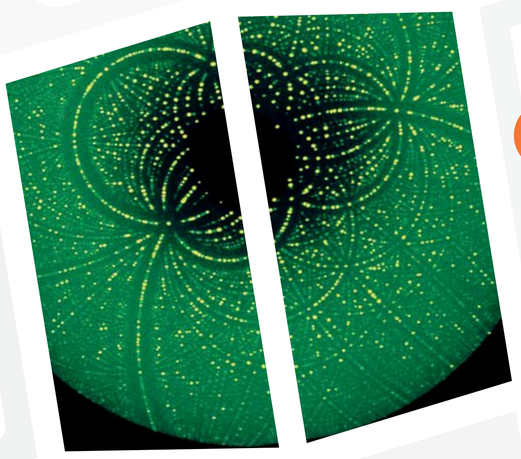
GROWTH & SYNTHESIS

Nanostructured materials and surface functionalisation

THEORY & SIMULATION

Atomistic computer modelling of materials





CHARACTERISATION

Fine analysis down to molecular and atomic level

NFFA-Europe has received funding from the EU's H2020 framework programme for research and innovation under grant agreement n. 654360

the widest range of tools for research at the nanoscale

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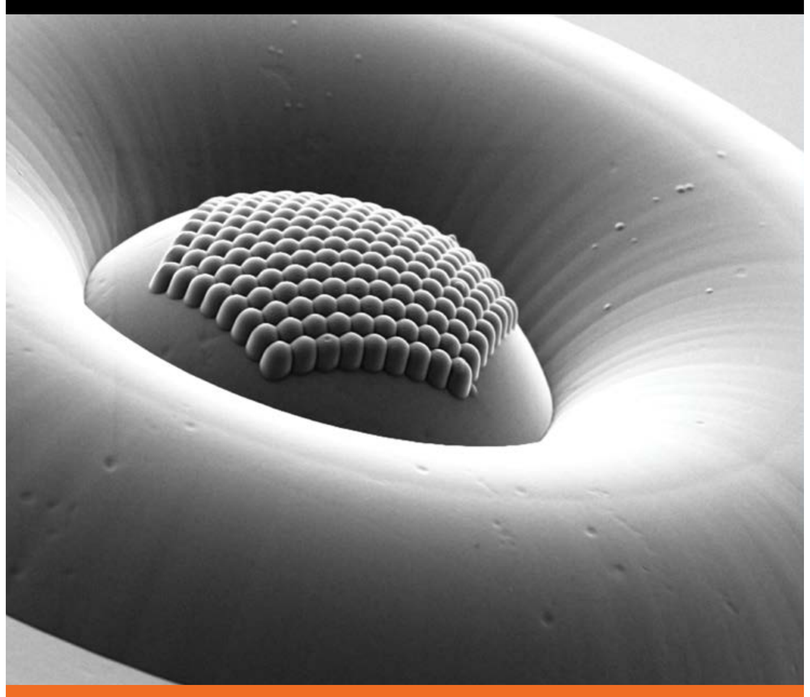
FREE TRANSNATIONAL ACCESS FOR ACADEMIA & INDUSTRY

LITHOGRAPHY & PATTERNING



Nanoengineered devices

High-resolution lithography for pattern generation; physical and chemical processes for pattern transfer and development. Ancillary processes for device making.

APPLICATIONS

Integrated circuits and microdevices

MEMS/NEMS (micro/nano electro-mechanical systems)

Lab-on-chips, sensors, molecular detectors, bio-electronics, microfluidics

GROWTH & SYNTHESIS

Nanostructured materials and surface functionalisation

Layer-by layer growth of thin films, multilayers and nanowires; synthesis of self-assembled monolayers, hybrid materials and nanoparticles; design of soft matter composites.

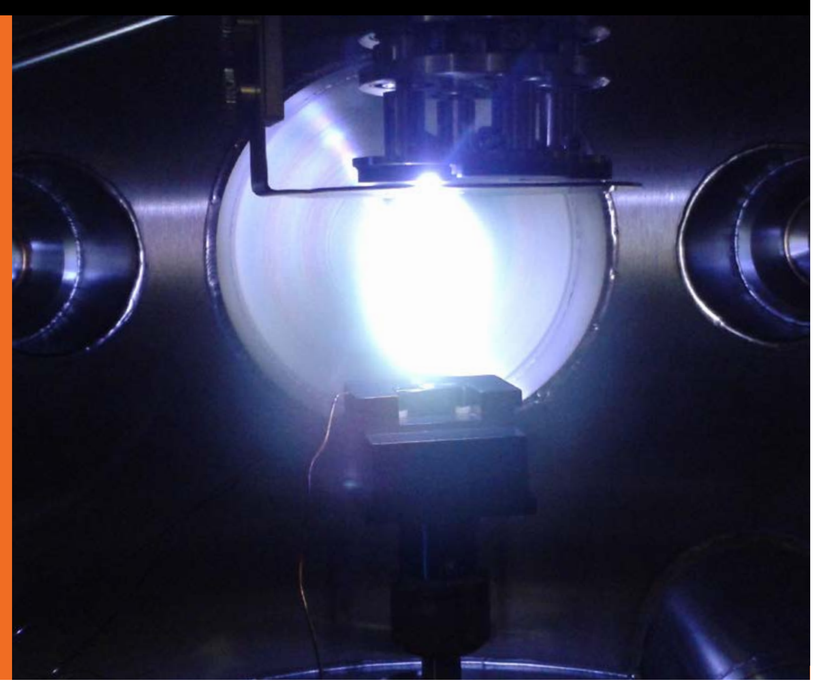
APPLICATIONS

Semiconductors, polymers and biomaterials

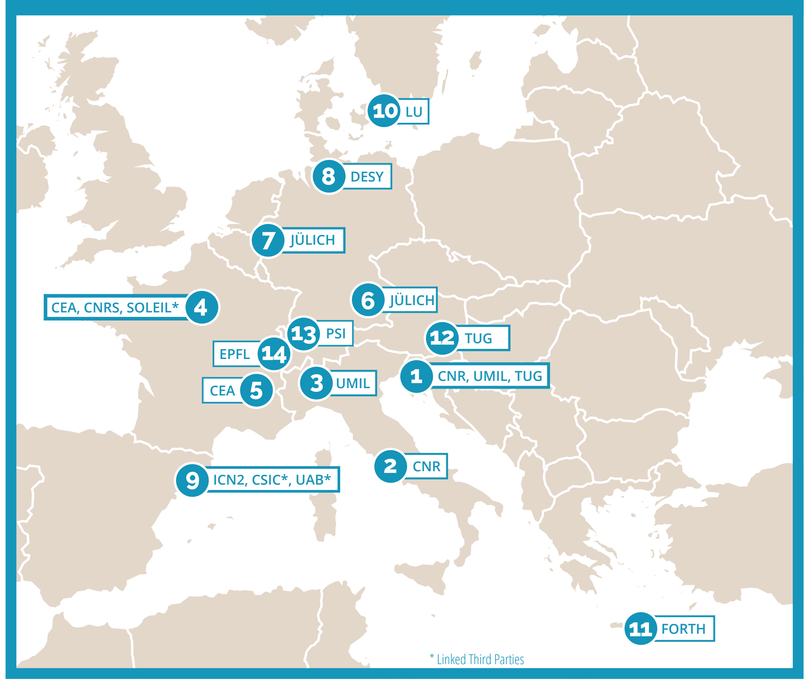
Electronics, optoelectronics, magnetic systems and spintronics

Catalysis

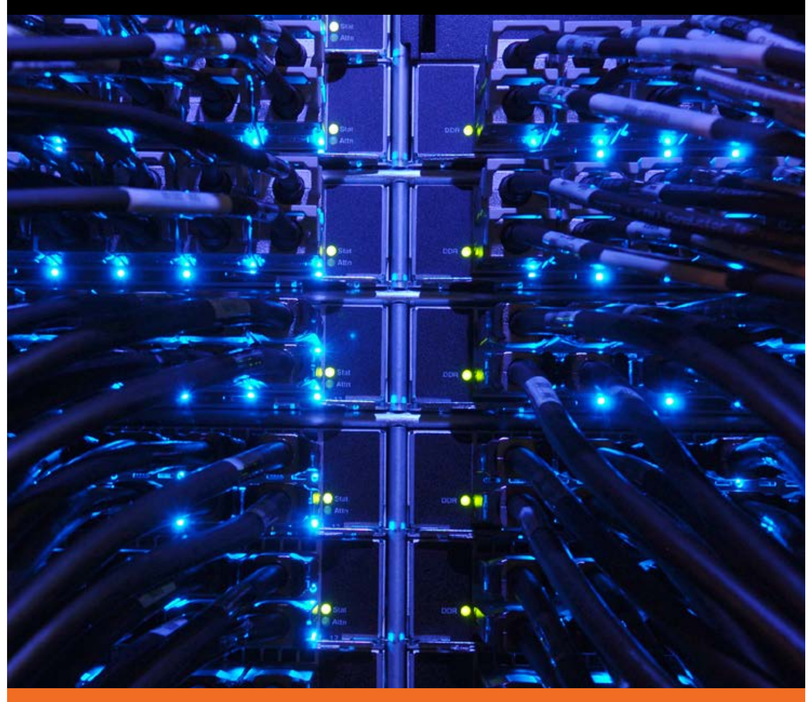
Energy conversion & storage



LABORATORIES



THEORY & SIMULATION



Atomistic computer modelling of materials

Scientific software, technical competences, and high-performance parallel computing for modelling the ground- and excited-state properties of nanostructured systems.

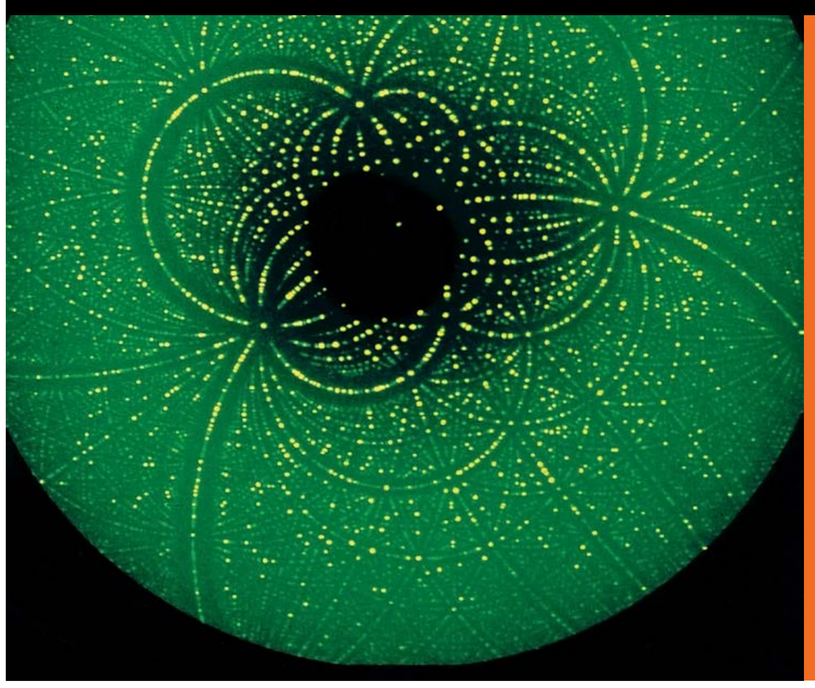
APPLICATIONS

Prediction and characterisation of structural, electronic, optical, magnetic and functional properties

Simulation and interpretation of spectroscopy and microscopy data

Insight and guidelines for the design, growth and synthesis of novel functional materials

CHARACTERISATION



Fine analysis down to molecular and atomic level

Structural and morphological properties; electronic and chemical features; magnetic and electric transport.

APPLICATIONS

Materials, surfaces and devices engineering

In-operando analysis

Interface behaviour analysis and design

Failure analysis and quality control

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This research project has received funding from the EU's H2020 framework programme for research and innovation under grant agreement n. 654360

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THE WIDEST RANGE OF TOOLS
FOR RESEARCH AT THE NANOSCALE

free transnational access for academia & industry

NFFA-Europe is an open access platform, granted by the EU for 48 months from September 1st, 2015, to carry out comprehensive projects for multidisciplinary research at the nano-scale extending from synthesis to nano-characterization to theory and numerical simulation.

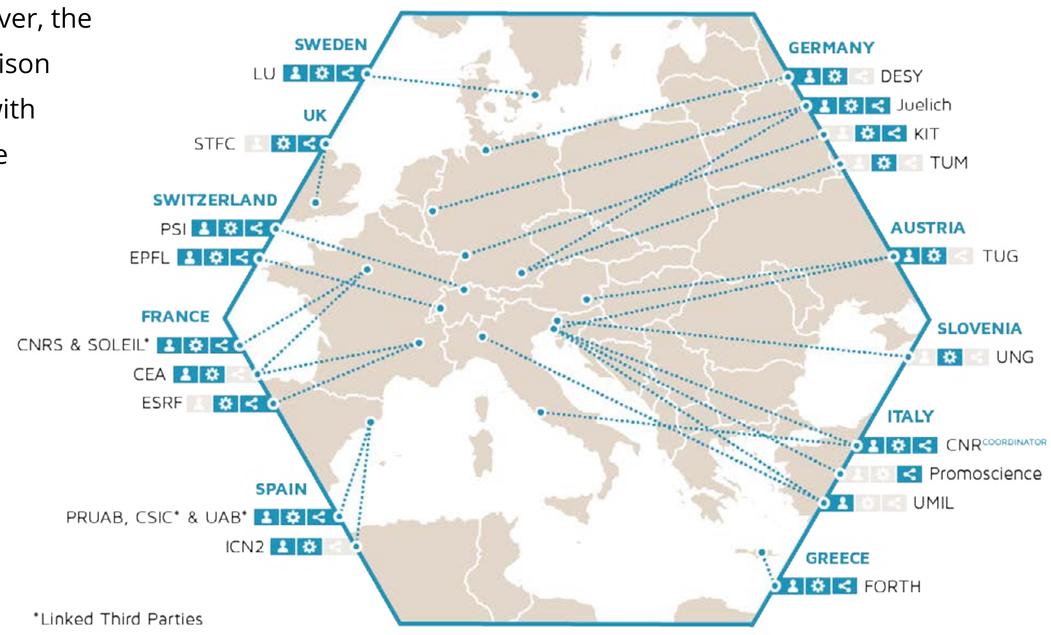
Advanced resources, made available by the 20 NFFA-EUROPE partners, specialized on growth, nano-lithography, nano-characterization, theory and simulation and fine-analysis with Synchrotron radiation, Free Electron Laser and Neutrons are integrated to develop frontier research on nanoscience and to enable European scientists from diverse disciplines to access state of the art and unique methods and tools.

NFFA-Europe enables coordinated access to nanoscience laboratories co-located with the large-scale infrastructures for fine analysis, or linked to High-Performance Computing facilities as well as Joint Research Activities and Networking Activities.

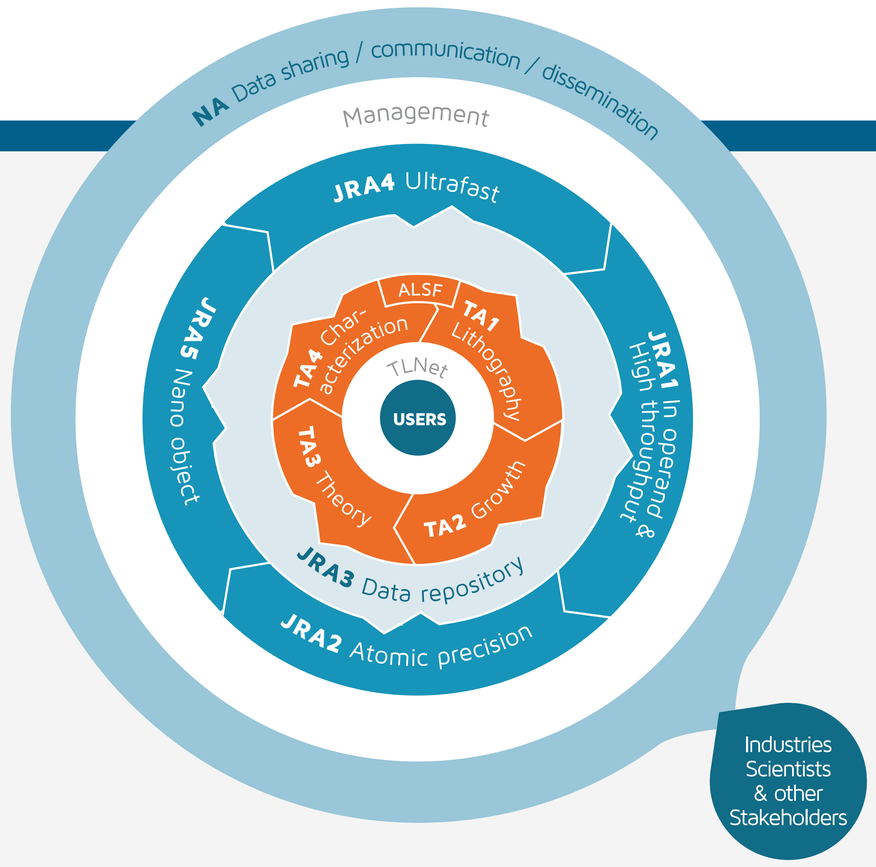
The access management structure optimizes the services to the users to pursue scientific excellence as well as industrial and technological innovation. Proposals can be submitted through the single entry point at the NFFA.EU portal to apply for all NFFA-Europe methods and instruments, and a panel of international experts is in charge of the peer-review selection to ensuring the scientific excellence and/or innovation potential of the accepted proposals. Moreover, the experts of the Technical Liaison Network (TLNet) dialogue with and assist the user from the proposal submission to the technical feasibility check and to the personalized access programme optimizing the use of the NFFA-Europe infrastructure.

THE CONSORTIUM

NFFA-EUROPE integrates **20 partners** of which **10 nanofoundries** co-located with Analytical Large Scale facilities



THE OVERALL OFFER



TA
TRANSNATIONAL ACCESS ACTIVITIES

Multidisciplinary research projects at the nanoscale performed at nanolaboratories and ALSFs through regulated access to state-of-the art **nanolithography & nanofabrication**, **growth & synthesis**, **structural & morphological / electronic & chemical / optical & electric characterization** installations.

Strong integration between **theory & simulation** and advanced characterization.

JRA
JOINT RESEARCH ACTIVITIES

Development of methods and tools at the frontier in nanoscience research.

Improved offer of the research infrastructure for both academic and industrial projects.

NA
NETWORKING ACTIVITY

Effective interface with the different users communities

Industrial exploitation of experimental data

Users training programme on innovative methods in nanoscience and nanotechnology and a forum for discussing emerging (cutting-edge) techniques.

TA 1
LITHOGRAPHY & PATTERNING

Nanoengineered devices

High-resolution lithography for pattern generation; physical and chemical processes for pattern transfer and development. Ancillary processes for device making.

ELECTRON BEAM LITH. / ULTRA VIOLET LITH. / EXTREME ULTRA VIOLET INTERFERENCE LITH. / NANO-IMPRINTING LITH. / X-RAY LITH. / DEEP X-RAY LITH. / TWO-PHOTON LITH. / FOCUSSED ION BEAM / ELECTROCHEMICAL DEPOSITION / REACTIVE ION ETCHING / INDUCTIVELY COUPLED PLASMA / CHIP PACKAGING / I & G-LINE STEPPERS

TA 2
GROWTH & SYNTHESIS

Nanostructured materials and surface functionalisation

Layer-by layer growth of thin films, multilayers and nanowires; synthesis of self-assembled monolayers, hybrid materials and nanoparticles; design of soft matter composites.

ATOMIC LAYER DEPOSITION / CHEMICAL VAPOUR DEPOSITION / MOLECULAR BEAM EPITAXY / PULSED LASER DEPOSITION / SOFT MATTER PREPARATION / AEROSOL DEPOSITION / CLUSTER BEAM DEPOSITION / OXIDATION & DIFFUSION THERMAL PROCESSES / FLAME SPRAY PYROLYSIS / ION IMPLANTATION

TA 3
THEORY & SIMULATION

Atomistic computer modelling of materials

Scientific software, technical competences, and high-performance parallel computing for modelling the ground- and excited-state properties of nanostructured systems.

STRUCTURAL & GROUND-STATE ELECTRONIC PROPERTIES: charge analysis, energetics of formation, simulation of vibrational & electronic spectroscopy / EXCITED-STATE PROPERTIES: neutral & charged electronic excitations time- & space-resolved experiments / Molecular & atomic dynamics at finite temperature / Chemical reactivity, growth & self-assembly / Electronic, heat & spin transport / Magnetic properties

TA 4
CHARACTERISATION

Fine analysis down to molecular and atomic level

Structural and morphological properties; electronic and chemical features; magnetic and electric transport.

STRUCTURAL & MORPHOLOGICAL / X-RAY, ELECTRON & SCANNING PROBE MICROSCOPY / TOMOGRAPHY / DIFFRACTION / REFLECTIVITY / **ELECTRONIC & CHEMICAL** / X-RAY ABSORPTION, PHOTOEMISSION, VISIBLE-ULTRA VIOLET, INFRARED & RAMAN SPECTROSCOPY / PUMP & PROBE / **MAGNETIC, OPTICAL & ELECTRIC** / NEUTRON SCATTERING / DICHROISM / MAGNETOMETRY / KERR EFFECT / SQUID / **AND MORE**

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