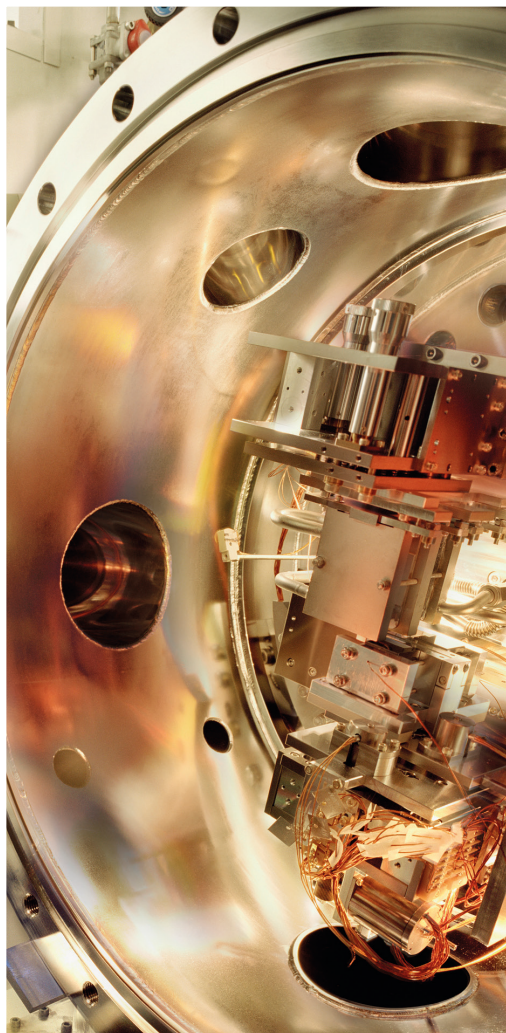
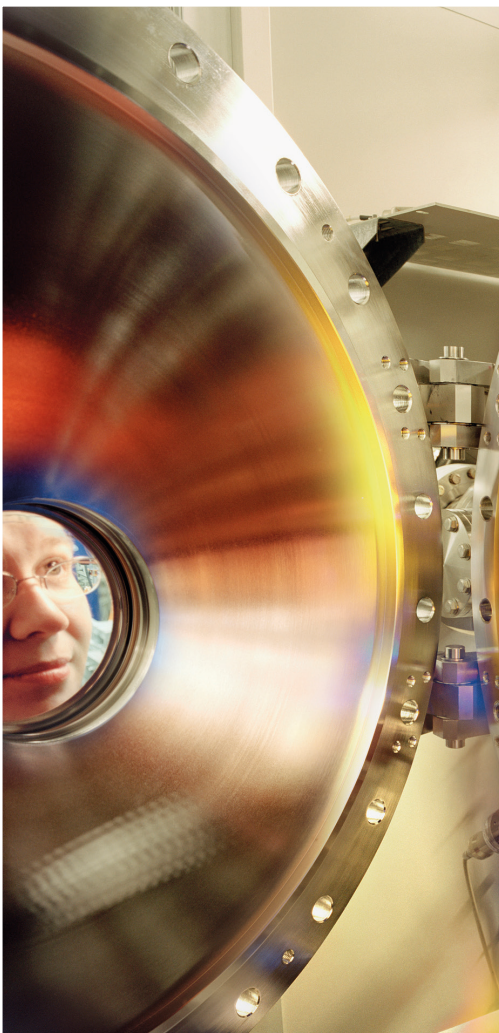


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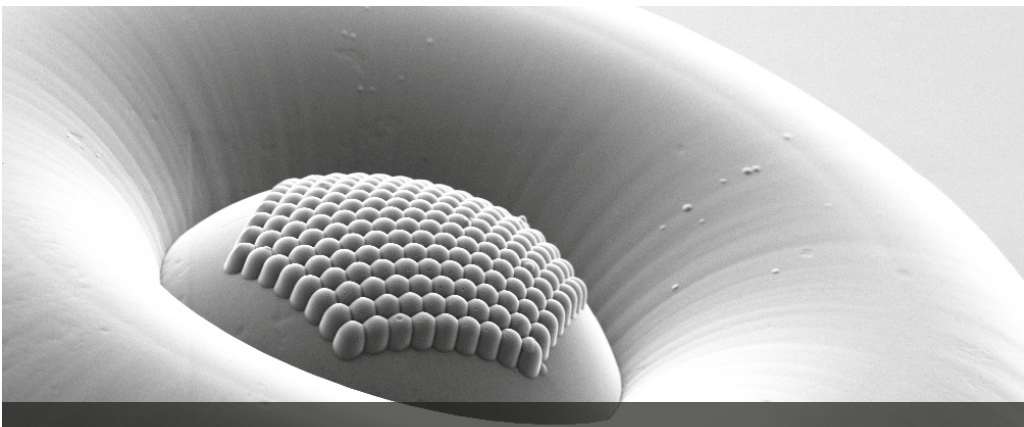


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INSTALLATION 01

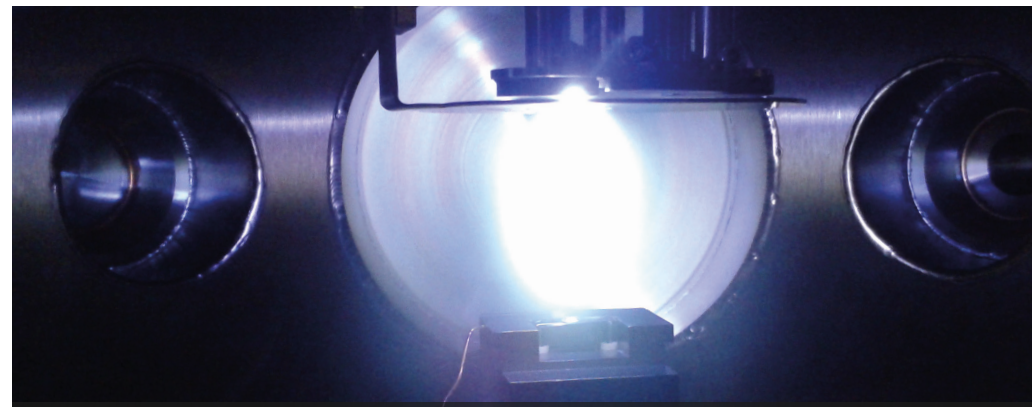
## LITHOGRAPHY & PATTERNING

### 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



INSTALLATION 02

## GROWTH & SYNTHESIS

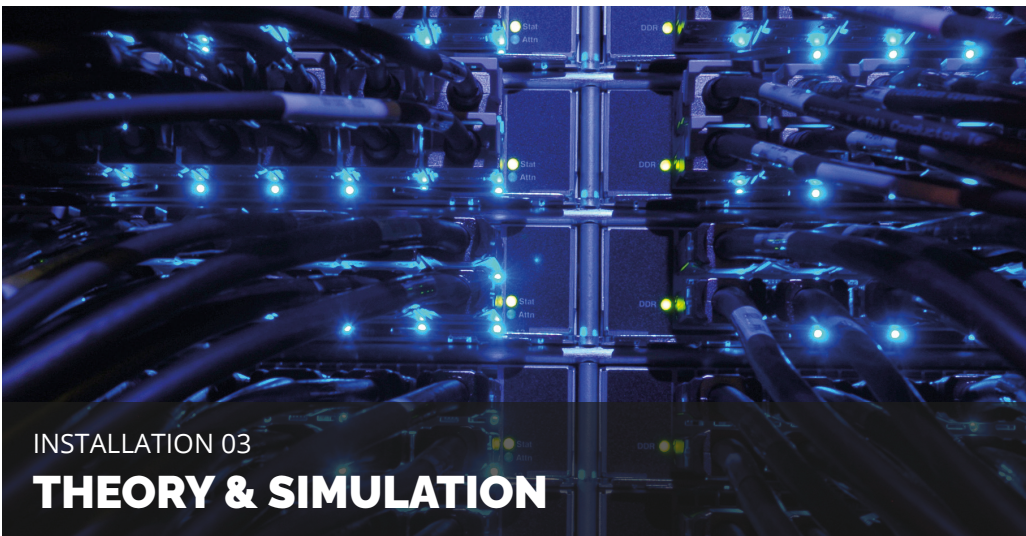
### Nanostructured materials and surface functionalisation

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 and storage





INSTALLATION 03

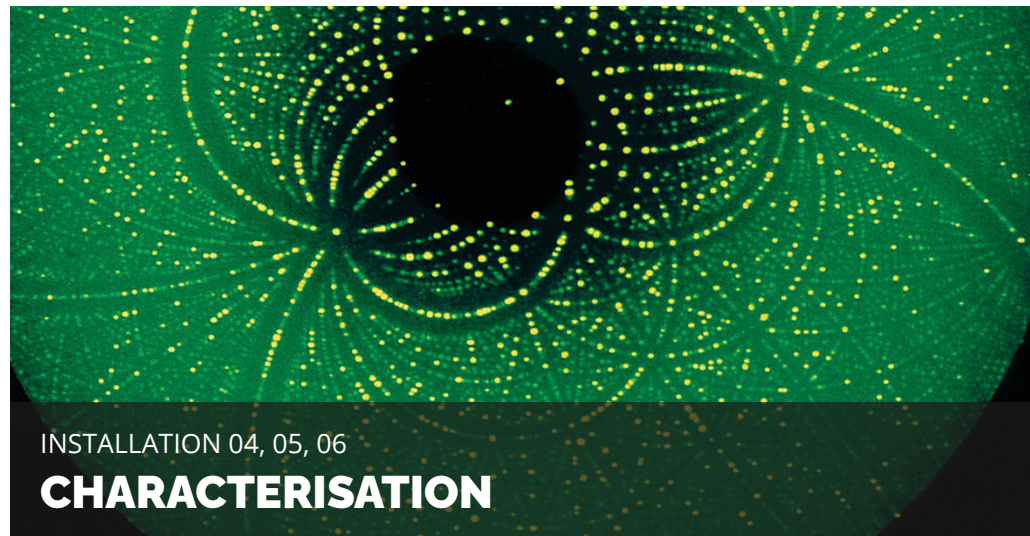
## **THEORY & SIMULATION**

### 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.



INSTALLATION 04, 05, 06

## **CHARACTERISATION**

### Fine analysis down to molecular and atomic level

Structural and morphological features;  
electronic and chemical properties;  
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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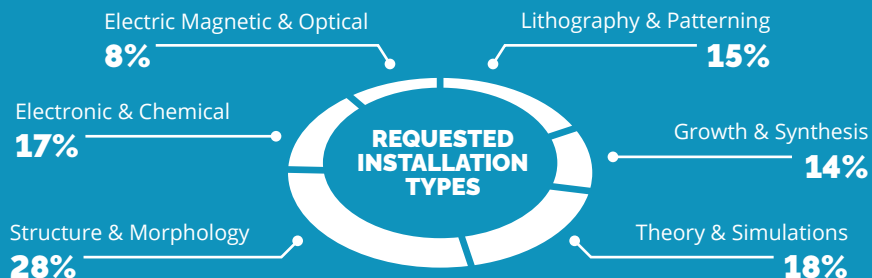
\* Limitations apply

# FACTS AND FIGURES

STATISTICS OF SUBMITTED PROPOSALS (after 6 calls)

more than  
**60%**  
**ACCEPTED PROPOSALS**

**~220** submitted proposals  
**~3** users involved per proposal  
**10%** with theory  
**6%** with industries  
**26%** with Large Scale Facilities (LSF)



# TYPICAL PROPOSALS

SOME EXAMPLES OF RESEARCH PROJECTS

**Micro/nano structured functional composite coatings with self-cleaning and anti-bacterial properties**

SCANNING ELECTRON MICROSCOPY | ATOMIC FORCE MICROSCOPY | OPTICAL SPECTROSCOPY | PHOTO LUMINESCENCE | X-RAY DIFFRACTION | SOFT MATTER PREPARATION

**HAX PEEM analysis of passive films formed on a duplex stainless steel and thermal changes**

SCANNING ELECTRON MICROSCOPY | HARD X-RAY PHOTOELECTRON EMISSION MICROSCOPY

**Unravelling ferromagnetism in transition metal oxide thin films and heterostructures**

PULSED LASER DEPOSITION | X-RAY DIFFRACTION | TRANSMISSION ELECTRON MICROSCOPY | SQUID | XMCD | XPS | DFT CALCULATIONS (THEORY)

**Patterning of metallic substrates for the growth of gas tight monolayer graphene membranes**

UV LITHOGRAPHY | REACTIVE ION ETCHING | PHYSICAL VAPOR DEPOSITION | RAMAN SPECTROSCOPY | XPS (LSF)

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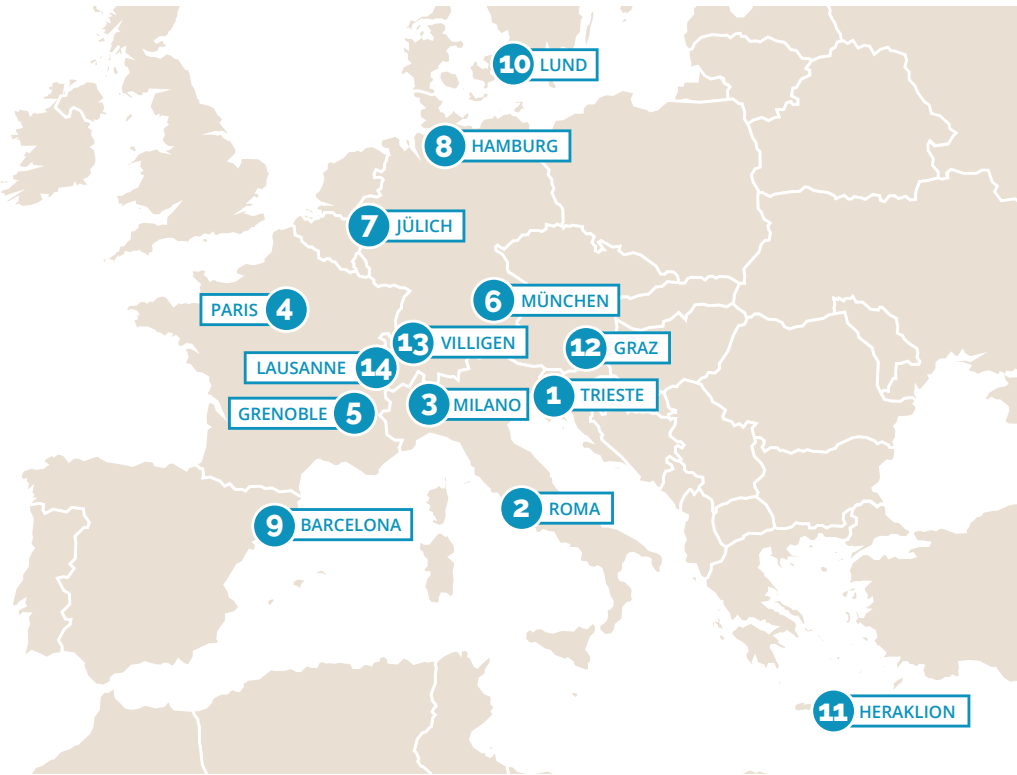
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**CEA** Commissariat à l'énergie atomique et aux énergies alternatives 4 5

**CNRS** Centre National de la Recherche Scientifique 4

**CSIC** Consejo Superior de Investigaciones Científicas 9

**DESY** Stiftung Deutsches Elektronen-Synchrotron DESY 8

**EPFL** École Polytechnique Fédérale de Lausanne 14

**FORTH** Foundation for Research and Technology - Hellas 11

**ICN2** Fundacio Institut Català de Nanociència i Nanotecnologia 9

**JÜLICH** Forschungszentrum Jülich GmbH 6 7

**LU** Lunds Universitet 10

**PSI** Paul Scherrer Institute 13

**SOLEIL** SOLEIL Synchrotron 4

**TUG** Technische Universität Graz 1 12

**UAB** Universitat Autònoma de Barcelona 9

**UMIL** Università degli Studi di Milano 1 3





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**PARTNERS** / **CEA** Commissariat à l'énergie atomique et aux énergies alternatives / **CNRS** Centre National de la Recherche Scientifique / **CSIC\*** Consejo Superior de Investigaciones Científicas / **DESY** Stiftung Deutsches Elektronen-Synchrotron DESY / **EPFL** École Polytechnique Fédérale de Lausanne / **ESRF** European Synchrotron Radiation Facility / **FORTH** Foundation for Research and Technology - Hellas / **ICN2** Fundació Institut Català de Nanociència i Nanotecnologia / **Jülich** Forschungszentrum Jülich GmbH / **KIT** Karlsruhe Institut für Technologie / **LU** Lunds Universitet / **Promoscience srl** / **PRUAB** Parc de Recerca UAB / **PSI** Paul Scherrer Institute / **SOLEIL\*** Source optimisée de lumière d'énergie intermédiaire du LURE / **STFC** Science and Technology Facilities Council / **TUG** Technische Universität Graz / **TUM** Technische Universität München / **UAB\*** Universitat Autònoma de Barcelona / **UMIL** Università degli Studi di Milano / **UNG** Univerza v Novi Gorici

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