41 of the world’s most advanced characterisation facilities open for industry
The EARIV network is made up of 41 of the world’s most advanced analytical research infrastructures (ARIs). These ARIs are large-scale research facilities at the cutting edge of scientific discovery and advanced characterisation. Each ARI hosts unique instruments and expertise.

The suite of instruments available at ARIs go far beyond the capabilities of conventional characterisation techniques - resolving smaller features, faster phenomena and being more sensitive. They can probe deep inside materials and devices under real operating conditions.

- Characterising inside materials or products completely non-destructively whilst they are working.
- Studying materials as they are being heated, cooled or deformed.
- Studying liquids being mixed in situ and tracking chemical reactions.
- Characterising materials at atomic-, nano-, and microscopic lengthscales.
- Studying dynamic phenomena from milli- to femto-second time resolutions (time-resolved studies).
- Imaging structures and defects hidden deep within materials, and without damaging them.

ARIs are ideal for supporting pre-competitive and commercial R&D. They provide unique insights into existing products, help resolve technical uncertainties and enable innovation.

EARIV allows industry to quickly and easily connect with relevant experts and exploit the most appropriate, state-of-the-art tools.

It is a joint initiative led by a set of transnational Horizon 2020 projects and regional initiatives that promotes opportunities for industry to engage with European large-scale analytical research infrastructures (ARIs).
Automotive, Aeronautics & Space

- Non-destructively mapping stresses within real components (both new and used).
- Studying surface treatments and coatings, including ‘before and after’ studies on the same sample.
- Non-destructive radiography and computed tomography to locate organic materials, water, hydrogen and lithium, even when buried within several centimetres of metal.
- Investigating the atomic- and micro-structure of metals, alloys, glasses, ceramics, semiconductors, composites, metal foams and nanomaterials.
- Quantifying residual stresses in cast metal components in order to optimise manufacturing conditions and evaluate new alloys.
- Non-destructive quality-control testing to detect hidden defects and other manufacturing anomalies.
- High-speed imaging of car engine parts in running engines, including visualising water and oil flow, in situ.
- Analysing tyre composition and formulations.
- Characterising materials (e.g. plastics, composites, fabrics, metals and alloys) to improve performance, safety and comfort.
- Tracking material changes during deformation (from milli- to pico- or femto-second timescales) to reveal structure-property relationships.
- In situ fatigue testing to understand failure mechanisms.
- Imaging ash deposits in automotive engines and diesel filters.
- Tracking combustion and catalytic processes in situ (both structural and chemical), under standard catalyst operating conditions.
- Damage threshold determination of optical components induced by ultrafast laser pulses (LIDT).

A leading car manufacturer used high-energy X-ray and neutron diffraction to non-destructively map residual stresses in a new type of aluminium alloy that has been developed for automotive applications. The data obtained from the mapping experiment has been used to validate and improve models of how these stresses form. This will ultimately allow engineers to design safer and longer-lasting components and materials.

Approximately 800 pyrotechnic parts for the Ariane 5 rocket programme passed through a neutron imaging quality control process. This non-destructive technique is sensitive to light elements, such as hydrogen-rich explosives, which in this case allowed the explosive filling inside the aluminium components to be checked.

Researchers from a leading car manufacturer, in collaboration with a UK university, used fast computed X-ray micro-tomography to continually image expanded polypropylene (EPP) foams during compression. Such foams are used in car bumpers and headrests due to their energy-absorption properties. The tomography results were used to construct a computer model predicting EPP deformation behaviour which can be used to optimise the amount of EPP used in vehicles.

Advanced Materials & Nanotechnology

- Characterising materials in terms of their chemistry, structure and/or electronic/magnetic properties.
- Nanostructural characterisation of high-performance polymers and polymer fibres (e.g. skin-core studies).
- Tracking material changes under simulated production conditions (in situ), or at extreme pressures and temperatures.
- Investigating structural changes in situ as a function of stress and/or changing environmental conditions.
- Investigating failure mechanisms in composite materials and stress-transfer in fibre-reinforced composites during in situ deformation.
- Characterising the structure and composition of nanoparticles, and their fabrication.
- Characterising spintronic and magneto-electronic materials and devices.
- Visualising magnetic domains and nanostructures.
- Chemical species determination.
- Investigating oxidation states and surface corrosion under different agents and conditions.
- Structure-property relationship studies.
- Morphological and structural characterisation of nanomaterials using 3D imaging.
- Characterising thin layers (roughness, interfaces).
- Studying structural evolutions in ceramics during synthesis and manufacturing processes.

Room-temperature superconductivity would eliminate many of the world’s energy problems, offering lossless energy storage and distribution. Scientists have been studying superconductors using neutron and X-ray scattering to trace electron interactions and identify new magnetic behaviour. This knowledge could potentially be exploited to design new semiconducting materials that work at higher temperatures.

Self-healing could greatly prolong the lifetime of steels exposed to high temperatures and stresses. Under these conditions, damage typically accumulates through the formation of creep cavities. Scientists used X-ray nanotomography to show that, for model alloys, healing can be achieved by autonomous gold precipitation. The experiments will help to transition such materials from model systems to real-world applications.

Crossed nanowire structures are used in nano-devices. The intersections of the nanowires play a critical role in creating hybrid architectures. Researchers used a hard X-ray nanoprobe to study point contacts between single crossed nanowires grown by thermal evaporation. The experimental technique opens new routes for the study of real-world applications.
Food, Agriculture & Consumer Products

- Investigating freeze drying processes for foods (in situ).
- Characterising the impact and penetration of cosmetics on the skin, lips, etc.
- Investigating the dynamics and stability of food emulsions.
- Studying structural changes in plastics used for packaging and storage.
- Understanding crystallisation and phase processes in food.
- Evaluating toxic chemicals in foodstuffs, and speciation in meat, fish, legumes and vegetables.
- Identifying chemical elements or species in foodstuffs to use as biomarkers for proving and/or verifying origin claims (e.g., products that are protected by one of the various EU schemes that guarantee geographical origin, or similar).
- Determining the content of copper, and other metals, in wine and spirits during manufacture.
- Chemical imaging of plants, seeds, grains, algae, etc.
- Characterising polymer and metal parts used in consumer goods to assess the impact of stress, heat and humidity.
- Phase transitions in fat and rheological activity in carbohydrate food.
- Non-destructive studies on the degradation of materials used in consumer products.
- Identifying low-level chemical toxins in plants, microorganisms, and animal tissues, and determining their distribution.
- Monitoring toxic concentrations of heavy metals in soil samples.
- Speciation of environmental pollutants.

The European Union protects traditional specialities from specific geographical regions via a number of consumer-recognised designation schemes. Scientists used wide- and small-angle X-ray diffraction to study fat samples from Spanish and Italian cured ham products. Chemicals were isolated that can be used to identify the country of origin. This knowledge allows the origin of cured hams to be verified to help prevent fraud.

Scientists from a leading consumer product manufacturer used small-angle X-ray scattering to study microstructural changes in hair conditioners over a three month period. Their experiments provided the scientists with a mechanistic understanding of how the microstructure evolves from when it leaves the factory until used by consumers.

Most dehydrated fruits and vegetables are produced by air drying, but higher quality products can be obtained using more expensive freeze-drying methods. Scientists from a leading consumer product manufacturer used X-ray micro-computed tomography to quantitatively assess the impact of freeze-drying, blanching and various pre-treatments on the microstructure and rehydration properties of winter carrots. The results revealed the relationship between freezing rate and product quality.

Chemistry & Catalysis

- Characterising dispersions, emulsions, partially ordered materials, detergents, surfactants and colloidal solutions.
- In situ qualitative and quantitative measurements during catalysis, at millisecond time resolutions and across wide concentration ranges.
- Characterising the morphology of surfaces, thin films and interfaces (e.g., roughness, thickness, composition etc.), including liquid/liquid, liquid/solid, liquid/air and solid/air.
- Studying the core and/or shell of micelles under various conditions (e.g., temperature, shear, concentration etc.), including in situ studies of surfactant molecular interactions.
- Studying chemical reactions and industrial processes at the atomic level under both dynamic and steady state conditions, and also probing reaction intermediates.
- Interactions between particles and other substances (e.g., pollutants, polymers, etc.).
- Determining the distribution and dimensions of particles and pores.
- Studying the rheological properties of liquids to help optimise their viscosity for specific manufacturing, cooling and lubrication applications.
- Identifying and characterising chemical contaminants.
- Nanoscale characterisation of the shape, size and density of molecular aggregates.
- Obtaining information about chemical bonds.
- Analysing the shape, size and density of nanoparticles and catalyst particles, and phase distributions in catalyst pellets.

Industrial chemists from an Italian company regularly use inelastic neutron scattering to characterise the surface chemistry of complex materials containing activated carbons. This technique allows the vibrational spectra of the hydrogenous species in carbons to be observed. This kind of measurement can reveal new opportunities to optimise the design of support materials used in electro-catalysts.

Researchers from a leading car manufacturer used energy-dispersive X-ray absorption scattering and in situ transmission electron microscopy to study catalysis in a working vehicle exhaust system. The results revealed an oxidative redispersion of Pt nanoparticles during quick redox cycling that could potentially extend the lifetime of vehicle catalysts.

Researchers from a leading energy company, in collaboration with other partners, investigated Fischer-Tropsch catalyst pellets in action using a combination of X-ray diffraction-based computed tomography and pair distribution function computed tomography. The combination of techniques was used to unravel the complex Co nanoparticle phase evolution and provided the researchers with a complete understanding of structure–activity relationships in catalytic systems.
Investigating hydrogen distribution and flow inside hydrogen storage tanks and characterising hydrogen storage media.

Compositional and micro-structural characterisation of rechargeable batteries, their materials and their degradation mechanisms.

Investigating new battery materials and components inside functioning battery cells (e.g. electrodes, electrolytes, membranes and thin films).

Non-destructive stress-mapping of wind turbine components, visualising internal defects in wind turbine blades and evaluating blade coatings.

Characterising organic, inorganic and hybrid photovoltaic materials (e.g. cell crystal structure, ionic migration, metallic impurities etc.).

Investigating microstructural changes in photovoltaic materials with ageing and during radiation exposure.

Visualising electrolyte filling strategies for the improvement of industrial processes.

Tracking lithium ion exchange in working lithium ion batteries during charge/discharge cycles.

Imaging water flow in running hydrogen and electrolysis cells.

Studying conditions within working fuel cell membranes (e.g. hydration, oxidation/reduction and ageing processes).

Characterising the crystal structure of powders and mixed phases.

Evaluating the structure of new magnetic materials for use in electrical generators.

Radiation hardness testing of materials and components, including those used in space applications.

Hydrogen fuel cells work by converting hydrogen and oxygen into water using catalytic electrodes separated by a polymer-membrane electrolyte. Researchers used small-angle neutron scattering to investigate variations in water content within the polymer membrane. They discovered that water content in the membrane does not directly correlate with water content in the surrounding channels. This information can be used to design fuel cells with better water management.

Researchers used high-speed X-ray imaging to study short-circuits in commercial lithium-ion batteries. By analysing the high-speed images, they were able to study the formation of gas pockets and venting, and they could identify consistent failure mechanisms. These new insights can be used to improve battery safety.

Integrated electrical circuits can sometimes delaminate during manufacture. Researchers used neutron and X-ray reflectometry to characterise the thickness, roughness and density of delaminated and non-delaminated wafers. They identified hydrogen accumulation as being responsible for the lack of adhesion between layers. This knowledge can be used to control (and eliminate) delamination during the manufacturing process.

Large reserves of natural gas are held within an organic material called kerogen. Currently the gas can be extracted by hydraulic fracturing, but this is a controversial extraction technique. An international group of scientists studied different kerogen samples using X-ray scattering techniques. This allowed the scientists to develop molecular models of kerogen. These findings could open doors to improved extraction technologies.

Digital Rock Analysis is a technique for extracting nanometre- to centimetre-scale geological and petrophysical information from digitised rock samples. Researchers from a company specialising in digital rock analysis used X-ray nano-tomography to scan rock samples at a 280 nanometre voxel size. The acquired images provided a level of detail that cannot be achieved using lab-based CT, and can be used to create 3D rock models that predict rock properties with a high degree of confidence.

In its quest to reduce CO₂ emissions from aluminium production, a leading global mining group used neutron diffraction to observe the interactions of minerals and molten salts at high temperature (>800°C) over several hours. The industrial engineers are using the results to optimise their process parameters.
• High-throughput protein crystallography with automated systems for drug discovery and drug optimisation applications.

• Characterising active pharmaceutical ingredients and formulations under simulated manufacturing conditions (e.g. pressure, ball milling, etc...).

• Characterising the structure and function of enzymes for drug development, including the location and movement of hydrogen atoms.

• In situ studies investigating how storage and transport conditions impact drug lifetime (e.g. accelerated ageing, humidity, temperature, UV exposure etc...).

• Revealing structural information about how drugs interact with therapeutic targets at the atomic level.

• Structural and interaction studies of colloid suspensions, micro-emulsions and micelles.

• Characterising the mechanisms of self-assembly in solutions.

• Solving solubility and stability issues for drug development and manufacturing.

• Studying aggregation and crystallisation phenomena.

• Detecting impurities.

• Polymorphism studies for protecting intellectual property and detecting patent infringement.

• Determining drug structure at the atomic level, including chirality, absolute configuration and identifying drug-molecule binding sites.

• Monitoring the penetration of drugs and pharmaceutical formulations into biological tissues such as the skin.

Neutron crystallography allows the location and movement of hydrogen atoms to be determined. It can therefore reveal opportunities to enhance drug binding and reduce drug resistance. Researchers used neutron crystallography to study HIV-1, an enzyme essential for the replication of the HIV virus. It revealed why the enzyme’s catalytic activity is pH sensitive which could help design new, more effective antiretroviral drugs.

AMPK (AMP-activated protein kinase) substrates are highly promising therapeutic drug targets for treating diabetes, cancer and ageing. Researchers at one of the world’s foremost drug discovery companies successfully solved the structure of AMPK at a resolution of 2.9 Ångstroms. This was enough for the researchers to see detailed information about the chemical environment in the AMPK binding site.

Using full-field transmission microscopy, researchers could create a 3D image of an entire cell infected with the hepatitis C virus (HCV) under almost physiological conditions. This revealed how the HCV virus causes structural alterations in the cell and how specific antivirals repair the cell. Such tools are extremely valuable for checking drug effectiveness and allow complex biological processes to be better understood.

In situ studies investigating how storage and transport conditions impact drug lifetime (e.g. accelerated ageing, humidity, temperature, UV exposure etc...).
Where are the EARIV ARIs located?

The pin colours represent the types of facility in each location. Note that some ARIs host multiple facility types (e.g. one institute hosting both synchrotron and neutron sources).

Colour Key
- Synchrotron
- Neutron source
- FEL
- Laser (non-FEL)
- Other

The pin colour key is as follows:

- Austria: Orange
- Belgium: Blue
- Croatia: Green
- Czech Republic: Blue
- Denmark: Light Blue
- France: Red
- Germany: Grey
- Greece: Dark Blue
- Hungary: Green
- Italy: Yellow
- Poland: Blue
- Portugal: Orange
- Romania: Red
- Slovenia: Light Blue
- Spain: Green
- Switzerland: Red

The following facilities are listed:

1. **Berkeley II (BER-II)**
   - Location: Germany
   - Contact: info@helmholtz-berlin.de
   - Website: www.helmholtz-berlin.de/quellen/ber/index_en.html

2. **MLZ**: Garching (MLZ)
   - Location: Germany
   - Contact: useroffice@bnc.hu
   - Website: mlz-garching.de/englisch

3. **BNC**: Bragg Crystallography (BNC)
   - Location: Hungary
   - Contact: useroffice@bnc.hu
   - Website: bnc.hu

4. **IFE**: The Garmo Laboratory (IFE)
   - Location: Norway
   - Contact: firmastamp@ife.no
   - Website: www.ife.no/en

5. **ESS**: European Synchrotron Radiation Facility (ESS)
   - Location: Sweden
   - Contact: info@esss.se
   - Website: europeanspallationsource.se

6. **Reactor Institute Delft (TRI)**
   - Location: the Netherlands
   - Contact: m.blaauw@tudelft.nl
   - Website: www.tudelft.nl/en/faculty-of-applied-sciences/business/facilities/reactor-institute-delft

7. **ISIS Neutron & Muon Source**: The Open Laboratory (ISIS)
   - Location: United Kingdom
   - Contact: christopher.frost@stfc.ac.uk
   - Website: www.isis.stfc.ac.uk/Pages/Industry.aspx

8. **ASTRID 2**: The Danish Neutron Source (ASTRID 2)
   - Location: Denmark
   - Contact: isa@phys.au.dk
   - Website: www.isa.au.dk/facilities/astrid2/astrid2.asp

9. **European Synchrotron - ESRF**: France (ESRF)
   - Location: France
   - Contact: industry@esrf.fr
   - Website: www.esrf.eu/Industry

10. **SOLEIL**: The French National Synchrotron Radiation Facility (SOLEIL)
    - Location: France
    - Contact: industrie@synchrotron-soleil.fr
    - Website: www.synchrotron-soleil.fr/en/industry

11. **ANKA**: The German National Synchrotron Source (ANKA)
    - Location: Germany
    - Contact: esra.aran@kit.edu
    - Website: www.anka.kit.edu/28.php

12. **BESSY-II**: The Berlin Free Electron Laser Facility (BESSY-II)
    - Location: Germany
    - Contact: info@helmholtz-berlin.de
    - Website: www.helmholtz-berlin.de/forschung/oe/fg/mi-synchrotron-radiation/index_en.html

13. **Metrology Light Source**: The German National Metrology Institute (Metrology Light Source)
    - Location: Germany
    - Contact: info@ptb.de

14. **PETRA III**: The PetaHertz Indian Platform (PETRA III)
    - Location: Germany
    - Contact: innovation@desy.de
    - Website: www.photon-science.desy.de/facilities/petra_iii/index_eng.html

15. **CERIC-ERIC**: CERIC (partners listed below)
    - Location: Italy
    - Contact: ilo@ceric-eric.eu
    - Website: ceric-eric.eu

CERIC-ERIC (partners listed below)

- **CLIO**: The Light Source Laboratory (CLIO)
  - Location: France
  - Contact: accueil.clio@u-psud.fr
  - Website: old.clio.lcp.u-psud.fr/clio_eng/clio_eng.htm

- **European XFEL**: The European Free-Electron Laser Facility (European XFEL)
  - Location: Germany
  - Contact: contact@xfel.eu
  - Website: www.xfel.eu

- **FLASH**: The European XFEL Laboratory (FLASH)
  - Location: Germany
  - Contact: innovation@desy.de
  - Website: photon-science.desy.de/facilities/flash/index_eng.html

- **FERMI**: The Fermi Laboratory (FERMI)
  - Location: Italy
  - Contact: info@elettra.eu
  - Website: www.elettra.trieste.it/lightsources/fermi/fermi-machine/fermi-description.html

- **FELIX**: The Free-Electron Laser (FELIX)
  - Location: the Netherlands
  - Contact: felix@science.ru.nl
  - Website: www.ru.nl/felix

- **TARLA**: The Free-Electron Laser Facility (TARLA)
  - Location: Turkey
  - Contact: tel. +90 (312) 485 37 45
  - Website: tarla.org.tr/facility/free-electron-laser

- **ELBE - Centre for High-Power Radiation Sources**: The European Free-Electron Laser Facility (ELBE)
  - Location: Germany
  - Contact: kontakt@hzdr.de
  - Website: www.hzdr.de/elbe

- **ELI**: The European Laboratory for Integrated Light Sources (ELI)
  - Location: Various (CZ, HU & RO)
  - Contact: industry@eli-laser.eu
  - Website: www.eili-laser.eu

- **IESL-FORTH**: The Institute of Electronic Structure and Laser (IESL-FORTH)
  - Location: Greece
  - Contact: liap@iesl.forth.gr
  - Website: www.iesl.forth.gr

- **NPL CANAM**: The National Physical Laboratory (NPL CANAM)
  - Location: Czech Republic
  - Contact: useroffice@ujf.cas.cz
  - Website: canam.ujf.cas.cz/npl.html

- **ILL - European Neutron Source**: The Institute for Nuclear Physics (ILL)
  - Location: France
  - Contact: industry@ill.eu
  - Website: www.ill.eu/neutrons-for-society/industry-and-business

- **Laboratoire Léon Brillouin**: The Institute for Nuclear Physics (LLB)
  - Location: France
  - Contact: lib-sec@cea.fr
  - Website: www-llb.cea.fr/en/index.php

- **PSI**: The Paul Scherrer Institute (PSI)
  - Location: Switzerland
  - Contact: techtransfer@psi.ch
  - Website: www.psi.ch/industry/industry

- **ADRIAN**: The Advanced Neutron Source (ADRIAN)
  - Location: Italy
  - Contact: industrie@synchrotron-soleil.fr
  - Website: www.synchrotron-soleil.fr/en/industry

- **ANKA**: The German National Synchrotron Source (ANKA)
  - Location: Germany
  - Contact: esra.aran@kit.edu
  - Website: www.anka.kit.edu/28.php

- **BESSY-II**: The Berlin Free-Electron Laser Facility (BESSY-II)
  - Location: Germany
  - Contact: info@helmholtz-berlin.de
  - Website: www.helmholtz-berlin.de/forschung/oe/fg/mi-synchrotron-radiation/index_en.html

- **ELETTRA**: The European Free-Electron Laser Facility (ELETTRA)
  - Location: Italy
  - Contact: ilo@elettra.eu
  - Website: ilo.elettra.eu

- **SOLARIS**: The Solaris Synchrotron Facility (SOLARIS)
  - Location: Poland
  - Contact: industry-solaris@uj.edu.pl
  - Website: www.synchrotron.uj.edu.pl/en_GB

- **MAX IV**: The MAX IV Laboratory (MAX IV)
  - Location: Sweden
  - Contact: industry@maxiv.se
  - Website: www.maxiv.lu.se/industry/

- **PETRA III**: The PetaHertz Indian Platform (PETRA III)
  - Location: Germany
  - Contact: innovation@desy.de
  - Website: www.photon-science.desy.de/facilities/petra_iii/index_eng.html

- **SUPERFIR**: The Superconducting Free-Electron Laser (SUPERFIR)
  - Location: Italy
  - Contact: industrie@synchrotron-soleil.fr
  - Website: www.synchrotron-soleil.fr/en/industry

- **DAFNE & SPARC**: The DAFNE & SPARC Accelerators (DAFNE & SPARC)
  - Location: Italy
  - Contact: dirinf@lnf.infn.it
  - Website: w3.lnf.infn.it/accelerators/?lang=en

- **CERIC-ERIC**: CERIC (partners listed below)
  - Location: Italy (headquarters)
  - Contact: ilo@ceric-eric.eu
  - Website: ceric-eric.eu

- **Austrian CERIC partner facility at the Technical University Graz and in Trieste.**
- **Croatian CERIC partner facility at the Ruđer Bošković Institute in Zagreb.**
- **Czech CERIC partner facility at the Charles University in Prague and in Trieste.**
- **Hungarian CERIC partner facility at the Centre for Energy Research of Science (MTA EK) of the Hungarian Academy of Science (HAS) in Budapest.**
- **Italian CERIC partner facility at Elettra Sincrotrone Trieste.**
- **Polish CERIC partner facility at the National Synchrotron Radiation Centre SOLARIS in Krakow.**
- **Romanian CERIC partner facility at the National Institute of Material Physics (NIMP) in Magurele.**
- **Slovenian CERIC partner facility at the National Institute of Chemistry in Ljubljana.**
Supporting Projects

ACCELERATE supports the long-term sustainability of large scale research infrastructures (RIs) through the development of frameworks to improve the offer of tailored services to private and public entities, ensuring outreach to new scientific and industrial communities worldwide and defining common protocols for monitoring and assessing RIs’ socio-economic impact.

The aim of the CALIPSOplus project is to remove barriers for access to world-class accelerator-based light sources in Europe and in the Middle East. As part of its work, CALIPSOplus has dedicated networking activities for industry (outreach and training) and a pilot SME access programme with subsidised transnational access to the CALIPSOplus partners.

The European Cluster of Advanced Laser Light Sources (EUCALL) is a network between leading large-scale user facilities for free-electron laser, synchrotron and optical laser radiation and their users. Under EUCALL, they work together on their common methodologies and research opportunities, and develop tools to sustain this interaction in the future.

NFFA-EUROPE sets out a platform to carry out comprehensive projects for multidisciplinary research at the nanoscale extending from synthesis to nano-characterisation to theory and numerical simulation. Within NFFA, 20 European facilities provide integrated access at no charge for publishable research and paid-for access for proprietary R&D.

SINE2020’s Industry Consultancy programme demonstrates the potential of neutron measurement techniques and technologies to interested companies. As part of its objective to encourage industrial users to exploit the unique properties of neutron beams for R&D, SINE2020 can arrange for test measurements and feasibility studies to be performed free of charge.

In addition to the European Projects shown above, EARIV is also supported by various regional projects.

ARI Capabilities

Most of the ARIs are host institutes for synchrotron light sources, neutron sources, and lasers (including free-electron lasers). These are large-scale research facilities that provide beams of neutrons, photons, X-rays, electrons and ions for characterising materials. By studying how these beams interact with samples placed in their paths it is possible to obtain unique structural and chemical information. This goes far beyond the capabilities of standard lab-based instrumentation.

Although most of the ARIs are light and neutron sources, there are others that offer complementary techniques for materials characterisation. These include several world-renowned university departments and research institutes.

Many of the ARIs also have specialist support labs that industrial clients can use when using their facilities.

Neutrons & Photons

Synchrotrons and lasers both generate photons and are often referred to as light sources. They are mostly used for producing extremely intense X-ray and infrared beams. These X-ray beams are much brighter than those generated by standard lab-based X-ray instrumentation. Such high-brilliance beams can be used to carry out unique experiments, such as collecting data extremely quickly and collecting data from nanometre-scale sample volumes.

Neutron sources, as the name suggests, generate neutrons. Neutrons can provide unique information that is different to that from light sources. For example, they can easily penetrate through most materials, and can do so without causing any damage. They are also highly sensitive to certain elements so can highlight particular groups of atoms. Finally, neutrons are ideal for studying magnetism because they can act as a tiny, uncharged magnet.
ACCESS

Industry access to the Analytical Research Infrastructures (ARIs) can usually be arranged at short notice, and research can be carried out under non-disclosure agreements. It’s even possible to mail-in samples in some cases.

The cost of access will depend upon the type of experiment being done, the instrument being used and the additional expertise required (e.g. data analysis services). There are also free (funded) access schemes available via European Projects.

Industry is also welcome to apply for free ‘beam time’ via peer review at most of the ARIs directly.

For further information please contact us:

info@eariv.eu
www.eariv.eu

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