Technological transfer

- *5 joint laboratories with industrial partners*
- *6 start-up based on IRAMIS technologies created since 2009*
- *More than 70 jobs created*
- *~30 industrial contracts*

Main technologies

- *Chemically functionalized surfaces*
- *Magnetic sensors*
- *Environment sensors*
- *Lasers*
- *Nanomaterials*

Inkjet processing for plastics metallization. Printed electronics.
Prototyping of high performance magnetic sensors.
New concepts, innovative diagnostic techniques and equipment in the field of intense femtosecond lasers.
Development of nanoporous gas sensors for detection and measurement.
Development of innovating products based on carbon nanotubes for energy and transport …

Partners :

Europe (2009-2015)

Infrastructures :
NMI3, Pan-Data ODI, SiNe2020, SoNDE, NFFA Europe (neutrons) - LaserLab, CREMLIN (lasers) - SPIRIT, ITsLEIF (ions) - EuHIT (turbulence) – ETSF (theoretical spectroscopy)

9 ERC grants :
3 advanced, 3 consolidator, 3 starting + 2 Proof of concept

PIA initiative

Strong involvement in the new high education and research structuration of France.

ATTOLab : Ultra short light sources for ultrafast dynamics in the condensed and gas phase
CILEX : Extreme light interdisciplinary center
TEMPOS: Transmission Electron Microscopy at Orsay-Palaiseau-Saclay
GENESIS : Nano-analysis of Radiation effects

PALM : Physics of Atoms, Light and Matter
NanoSaclay : Interdisciplinary Nanosciences and Nanotechnologies
EMC3 : Energy Material and Clean Combustion Center
CHARMMMAT : Chemistry of multifonctionnal architectures and materials

IRAMIS is an Institute of the Physical Science Division (DSM) of CEA, the French Alternative Energies and Atomic Energies Commission (Commissariat à l'Energie Atomique et aux Energies Alternatives).

Institut **Ra**yonnement **M**atière de **S**aclay
Saclay Institute of Matter and Radiation

Gathering 6 research units, IRAMIS develops fundamental research in close connection with societal challenges and the CEA programs, open to technological transfer and creation of economical value.

http://iramis.cea.fr/

IRAMIS – CEA – Centre de Saclay – bat 462
91191 – Gif sur Yvette Cedex - France

6 research units

Nanosciences et Innovation pour les Matériaux, la Biomédecine et l'Energie
UMR 3685

Service de Physique de l'Etat Condensé
UMR 3680

Laboratoire Interactions, Dynamiques et Lasers
URA 2453

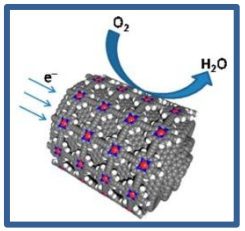
Laboratoire Léon Brillouin
UMR 12

Laboratoire des Solides Irradiés
UMR 7642

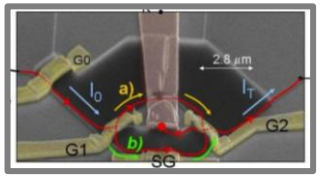
Centre de recherche sur les Ions, les Matériaux et la Photonique
UMR 6252

3 main research areas

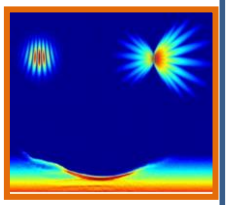
- Low carbon energy (nuclear energy and new technologies for energy),
- Nanosciences for information and health technologies.
- Interaction of all kinds of radiation with matter : neutrons, ions, electrons, laser beams.



Carbon nanotube functionalized by an auto-organised porphyrine-based polymer: a catalyst for oxygen reduction



Mach Zehnder interferometer in the integer quantum Hall regime, to probe the mechanisms limiting the phase coherence of electrons



Attosecond lighthouse : 2D Fourier transform of the electric field after HHG (high harmonic generation) interaction

Facts and figures :

- ~ 550 publications per year
- ~ 20 patents filed per year
- ~ 160 active patents
- ~ 250 active research contracts

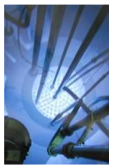
- CEA-IRAMIS budget in 2014 :

42 M€ (40% from research contracts)
13 M€ third party funding (ANR-Europe …)

728 people working at IRAMIS

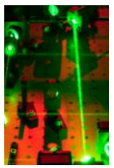
Permanent staff : 487		94 post-doc	113 PhD students
300 CEA	187 academic		

Infrastructures open to users



LLB-Orphée : the French national neutron scattering facility.

22 instruments, covering spectroscopy (triple-axis, time of flight, spin echo), diffraction (powder and liquid, single crystal) and large scale structures (SANS and VSANS, reflectivity, stress and strain, neutron imaging).



SLIC : a laser facility designed to produce intense, ultrashort pulses

State-of-the-art femtosecond laser systems : UHI100, LUCA and FAB1-10. The ATTOLab platform combines ultra short light sources (femtosecond IR laser chains and extreme UV attosecond secondary sources) and experimental devices for ultrafast dynamics in the condensed and gas phases.

The nuclear microprobe medium-scale facility

Ion beam analysis techniques, quantitative analysis and imaging of light elements. Main topics addressed : Material science, environmental and biological science, planetary sciences. In operando experiments dedicated to materials for energy like electrodes for batteries are developed.

SIRIUS : an irradiation electron facility equipped with in situ experiments

Electron energy : 150 keV – 2,5 MeV, current : 150 n1 – 50 µA, irradiation possible at low temperatures (4K-20K). Spectroscopic methods (UV-Visible absorption, luminescence) and conductivity measurements in situ during irradiation.

CIRIL : Interdisciplinary physics with the GANIL ion beams.

4 beamlines (ARIBE, IRRSUD, SME and HE), C to U ion beams from eV to GeV. Irradiation temperature from 8 K up to 1000 K, grazing incidence optional. In situ measurements : X-ray diffraction experiments, in situ absorption and iono luminescence spectroscopies, spectrometry gas analysis.