

Research axes

Institut Néel is a fundamental research laboratory devoted mainly to condensed matter physics, having activities in engineering and chemical sciences. Based on exceptional technological expertise, its 450 members explore a wide scientific field encompassing superconductivity, quantum fluids, new materials, crystallography, surface science, quantum nano-electronics, nano-mechanics, quantum and non-linear optics, spintronics, magnetism...

The three main missions of Institut Néel are: the production of world-recognized fundamental research including topics of high risk but with large potential interest; a commitment in training PhD and Master students, as well as undergraduates, in response to university needs; a strong involvement in the promotion of its innovative results, through active intellectual property policy and partnerships with industries.

Research at Institut Néel addresses major societal challenges such as information science and technology, energy, health and heritage. The laboratory benefits from well-established links between CNRS, Université Joseph Fourier, Grenoble INP, CEA, ILL and ESRF.

Actions within LANEF

II-VI, III,V, IV semiconductors. Search for novel materials (NEEL-INAC joint group), doped diamond, dilute magnetic semi-conductors, nano wires, dots ...



Fig. 1: Molecular beam epitaxy

Functional spintronic heterostructures, building block materials for memories, filters, sensors etc...

Macro- and micro- permanent magnets with identified applications in biology and energy, supported by a long term Toyota collaboration.

Highly correlated fermions. Novel superconductors, quantum magnets, competing orders: charge (spin) density waves etc.

Energy storage and transport. Solid-state storage of hydrogen, McPhy, and superconductors for new generation of round-sectioned cables, Nexans.

Light and plasmonics, including instrumentation such as the i-SOM patented by the lab, which allows nanometer metrology.

Key figures:

- 50 faculty members (Université de Grenoble)
- 125 CNRS scientists
- 130 Engineers and technicians
- 145 Postdocs and PhD students (60% with a master obtained outside of Grenoble)



Fig. 2: Resonant spectroscopy of quantum dot.

Non linear optics. The creation of photon triplets instead of twins opens new challenges.

Nanoscience for biology: imaging of biological cells including living neurons by a dedicated fibered interferometric scanning optical microscope.

Quantum physics. Manipulating quantum states and mesoscopic superconducting nanostructures,

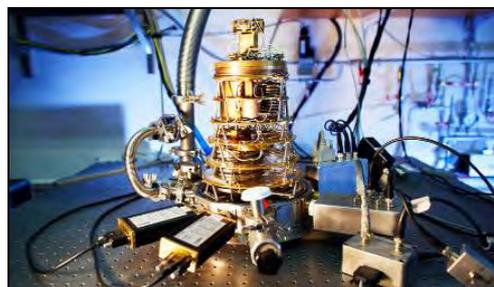


Fig. 3: "sionludi", a reversed dilution cryostat (10 mK)

Low temperature physics including expertise in cryogenics and bolometrics applied to the Planck satellite.