

Solutions
to get your projects
off the ground



ONERA

THE FRENCH AEROSPACE LAB

r e t u r n o n i n n o v a t i o n

Aerospace science at your fingertips

At ONERA, we understand and apply the technologies that will underpin the success of your new programs.

ONERA is 1,500 scientists, engineers and technicians strong, with expertise spanning all key aerospace and defense disciplines: physics, fluid mechanics, energetics, information processing, systems, materials, structures and more.

Contact us! We may already have the solution you need to get your project off the ground.



Simulating radar and optronic images

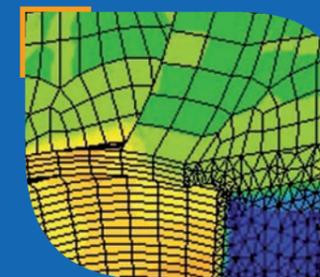
French company OKTAL-SE offers simulation software that uses electromagnetic physical models developed by ONERA. This software is marketed to companies that simulate 3D scenes imaged by either radar or optical (visible and infrared) sensors.

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Fiber lasers for the environment

French company LEOSPHERE is marketing a lidar based on a fiber laser source, with a signal processing concept developed by ONERA. The lidar is used to detect pollutants in the atmosphere, and to measure wind profiles and wake vortices.



Faster qualification of composite structures

ONERA has developed new methods to design complex composite structures, mainly ceramic and organic matrix composites, and to speed up their qualification. Leading players such as Snecma, EADS, CEA (French atomic energy commission) and CNES (French space agency) have all incorporated ONERA models in their computation tools.

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Creating scientific value-added

ONERA works with you to help meet the needs of your own demanding clients. We deliver real value-added aerospace science and technology that boost your competitive advantage.

Research and design studies

Do you need to expand your knowledge base to bring a project to fruition? ONERA can set up a dedicated research team for your project, covering multiple disciplines if needed. Of course, we guarantee quality, confidentiality and on-time delivery. ONERA has the full array of skills and resources needed for innovative solutions: from understanding the underlying physics to technology demonstrators, not to mention modeling, simulation, experimentation and testing.

Scientific software licenses

Aerodynamics, energetics, structures, materials, EM, radiation... in all of these core disciplines, ONERA has developed powerful numerical simulation tools, proven through extensive experimentation.

Technology transfer

ONERA regularly applies for patents on innovative solutions — which are available for licensing, along with scientific support to apply these solutions at the industrial level.

Industry support

ONERA is a team of world-class scientists and engineers spanning 40 cutting-edge disciplines. We provide invaluable advice and also give you concrete solutions to meet your specific requirements.

Top-flight testing

ONERA has earned a global reputation for its wind tunnels. But we also deploy over 150 world-class test benches in energetics, electromagnetism, optics, vibrations, materials and other disciplines. Our scientists can handle all your testing needs, with service packages including test design and analysis support.

Technology intelligence

Our research teams maintain a constant watch on major advances in their fields around the world. Special science and technology intelligence applications play an important role in shaping our research. By combining our own expertise with the information from a comprehensive technology watch, we can provide solutions targeted to your strategic concerns.

R&D directions

Our researchers can help you make the basic technology decisions for your next-generation programs — those that will enter the development pipeline in five and ten years, and stay in operation, with upgrades, for another 30 to 40 years.



Enhanced storm warning

Finnish company Vaisala, the world leader in meteorological systems, is integrating a new detection and forecasting technology in its latest storm warning systems. Derived from an ONERA development, this technology is based on the long-distance detection of intra-cloud lightning using VHF interferometry. The system was originally developed to protect sites such as the Guiana Space Center (Kourou, French Guiana) and the CEL flight test center. Today, storm detection networks based on this technology are being used in 15 countries.



Robust flight controls for Airbus

ONERA has taken part in the design of flight control systems for all Airbus jetliners. Our teams worked on the system architecture and development methods, up to the integration of systems on demonstrators. Airbus has confirmed its confidence in our researchers by funding the ambitious Future Flight Control program, which aims to increase the competitiveness of Airbus jetliners by advanced research into fly-by-wire controls.



Miniature, economical navigation systems

The miniature quartz accelerometer developed by ONERA has already been transferred to industry, with both Thales and Sagem acquiring licenses. Today, our researchers are gearing up for a new generation of instruments, based on new materials and approaches (silicon, piezoelectric, cold atoms, etc.). But our objectives are still the same: support new applications, enhance miniaturization and accuracy, and keep lowering costs.

Develop your international business, with ONERA!

ONERA has established contacts and partnerships with over 30 countries worldwide, most notably with national aerospace research organizations. We have built up broad experience in international collaboration with both research organizations and industry. In other words, ONERA can help you develop your own business in many areas:

- > tenders for European or international contracts;
- > proposals for specific R&D services, through international partnerships;
- > developments for export markets;
- > setting up and monitoring scientific and technological partnerships in strategic markets;
- > setting up specific training programs.

These actions may be part of your strategy for winning international contracts, expanding operations into new markets, or supporting offset agreements for export markets.

Expanding the knowledge envelope

Information processing

- Data processing
- Flight control, guidance, navigation
- Control and decision-making

Sensors: detection, observation, measurement

- Optical
- Electromagnetic and radar
- High-performance sensors

Aerospace environment

- Atmospheric environment
- Space environment

Systems

- Engineering complex systems
- Multidisciplinary methods and tools
- System studies and performance analysis

Innovative cross-functional technologies

- Microtechnologies
- Plasma
- Cold atoms
- Nanomaterials

Aerodynamics

- Physics of aerodynamic phenomena
- Aerodynamics of aircraft and associated systems
- Aerodynamics optimization and new concepts
- Aerodynamics environment and tools

Energetics

- Physics of reactive flows
- Fuels and energetic materials
- Energetics of propulsion systems
- New propulsion concepts
- Energetics environment and tools

Materials

- Physics of materials
- Metallic and refractory materials
- Composite materials
- New characterization methods

Structures

- Mechanics of behavior and damage mechanisms
- Structural design and strength
- Smart systems and structures
- Structural dynamics and vibrations, aeroelasticity
- Vibroacoustics



Aerospace experts help the agrifoods industry

Major agrifoods corporation Bonduelle uses fan drying for its prepackaged lettuce. But since their machine didn't deliver the expected results, the company's R&D department called on ONERA for troubleshooting. After taking on-site measurements of humidity, temperature and flow-rates, plus aerothermodynamic modeling, ONERA's specialists were able to resolve the problem in just two weeks.



Ground vibration testing

In 2005, ONERA completed ground vibration tests of the new Airbus A380 in just five weeks — a world record for this size aircraft. ONERA's experts have already conducted ground vibration tests on just about every type of air and space vehicle: commercial jetliners, light aircraft, gliders, models, helicopters, UAVs, satellites, launchers and missiles. These skills could well be applied to other sectors as well.



ONERA patent spurs startup

The startup Phasics was created in 2003, using a patent on optical control filed by ONERA in 1999. Located at the Ecole Polytechnique technology incubator, this new company develops and markets wavefront analyzers based on multilateral offset interferometry. These systems are already deployed by several leading international laboratories.

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ONERA is the French
aerospace and defense research center.

Over the years, it has provided Research & Technology services that have played a pivotal role in the major successes of the French and European aerospace industries. ONERA brings together 1,500 of the top scientists, engineers and technicians in France, at eight main sites.

Working closely with industry and government organizations, ONERA has world-class test facilities and proven multidisciplinary expertise. Its objective is to advance scientific knowledge for applications throughout industry, encompassing both large corporations and small businesses.



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