YOU IMAGINE, WE CREATE
SUPERCONDUCTING MAGNETS TO CONFINE SUPER-HOT PLASMA!

WHAT WE DO: Four out of six Poloidal Field Coils (PF Coils)

HOW WE DO IT: Set-up manufacturing activity, train and qualify operators

The unmatched ITER plasma power will be confined by gigantic superconducting which need to be produced on-site.

In F4E’s PF Coils facility, CNIM is responsible for the on-going manufacturing and qualification of four PF Coils. Parts of the ITER magnetic confinement system is being produced with tailor-made tooling.

- 1 magnet
- 8 workstations
- 18 months of manufacturing & test
- 6 to 8 km of Niobium-Titanium cable
- 400 tons

1,600 tons of superconducting magnets on-site assembled

WHAT WE DID
D-shaped 14 x 9 m radial plates for the Toroidal Field coil magnets

HOW WE DID IT
/ Large 9 x 36 m portal machining center
/ Local vacuum electron beam welding

WHAT WE DO
Divertor cassette body full-scale prototype

HOW WE DO IT
/ Material machining and welding for application under high radiation

ITER, the biggest machine to deliver fusion energy
LASER FUSION

Complex systems & instruments for harsh environment

WHAT WE DID
High-precision alignment system and plasma diagnostics

HOW WE DID IT
/ Very high stability and accuracy opto-mechanics

WHAT WE DID
Remote handling systems

HOW WE DID IT
/ 8 tons payload platform design
/ Innovative omnidirectional wheels drive

176 LASER BEAMLINES TO IGNITE THE SUN ON EARTH!

WHAT WE DID: LMJ Reference and Target Positioner

HOW WE DID IT: Theoretical models for high-accuracy mechanics, integrated development of mechanicals arms and control systems

The success of LMJ highly depends on the target alignment accuracy with the laser beams. 176 beams aligned on a single target is a world premiere.

A close collaboration between CNIM/Bertin and the French Alternative Energies and Atomic Energy Commission (CEA) to analyze the physics challenges. This resulted in an innovative design a high alignment reliability and stability. This multi-year partnership delivered an operational with alignment system.

A temperature in excess of 100,000,000 degrees is reached in the heart of the target.
Flight proven optical payloads

TARANIS, 1st upper-atmosphere luminous flash observations satellite

WHAT WE DID
Active on-board subsystems photometer

HOW WE DID IT
/ Equipment design for space use
/ Assembly, Integration, Testing and Validation (AITV)

Custom optical sensing structures

GAIA, chartering the 1 billion stars in our Galaxy, the Milky Way

WHAT WE DID
CCD Support structure

HOW WE DID
/ Silicon Carbide ultra-accuracy polishing

CHEMCAM, cutting-edge instrument analyses Mars rocks around the Curiosity rover. The instrument must perform remote analysis in rough terrains without complex rover motion.

通过与法国国家航天局（CNES）的合作，Winlight设计了这台独特的仪器的光学元件。世界级的抛光能力以及丰富的太空专业经验使Winlight成为制造CHEMCAM光学元件的首选合作伙伴。新火星车将在2020年上车。
ASTRONOMY

Complex optical systems

WHAT WE DID
4 Subaru Prime Focus Spectrographs and 10 DESI spectrographs

HOW WE DID IT
/ High diameter aspherical lenses manufacturing
/ Lenses and mirrors integration on mechanical structure

High performance large manufacturing

WHAT WE DID
404 modules for vacuum chamber

HOW WE DID IT
/ Electron beam welding of thick and large components
/ Manufacturing for ultra-high vacuum level (clean room of 1,000 m²)

THE TIME MACHINE TO TRAVEL IN OUR UNIVERSE HISTORY!

WHAT WE DID: Slicers mirrors and spectrographs

HOW WE DID IT: Molecular Assembly, Industrialization for 24 slicers on MUSE

The Very Large Telescope (VLT) of the European Southern Observatory (ESO) takes the challenge of simultaneously performing wide range observation and local spectral analyses. This requires a novel instrumentation for a better understanding the universe evolution.

The Marseille Astrophysics Laboratory (LAM) and Winlight developed a genuine image slicing concept to enable simultaneous spectroscopic images. Winlight, the LAM and the National Scientific Research Council (CNRS) have jointly created a breakthrough and patented molecular assembly technology, then industrialized for repeat production.

6 years of collaboration: challenge met!
SYNCHROTRONS

NEVER ACHIEVED DISCOVERIES AT THE NANOSCALE LEVEL!

WHAT WE DID: Integrated subsystems for X-ray beamlines
HOW WE DID IT: Superior quality very long X-ray mirrors production, integration in ultra-high vacuum vessel

Delivering ultra-high precision matter images at the nanoscale level requires beyond state-of-the-art X-ray beam concentration. This is the objective for the National Synchrotron Light Source II (NSLS II) in Long Island, USA.

Winlight has met the challenge raised by the Brookhaven National Laboratory (BNL) to deliver longest ever polished X-ray mirrors and to integrate them in a turnkey vacuum vessel.

Come and visit the Brookhaven facility, it’s impressive!
Advanced critical manufacturing

WHAT WE DID: Nuclear vessel reactor

HOW WE DID IT: Inox and aluminium welding,
Oil free metal machining

The Jules Horowitz Nuclear Reactor (JHR) is necessary to experiment tomorrow’s nuclear technologies. This facility must incorporate a safe reactor vessel that can accommodate up to twenty simultaneous experimentations. Such reactor vessel has never been engineered so far.

CNIM manufactured a neutron-resistant reactor with complex materials such as aluminum, welded in 3D shaped thick parts. CNIM has closely worked with the French Alternative Energies and Atomic Energy Commission (CEA) to adapt its processes to the demanding and nuclear standards. Currently CNIM is assembling the reactor within its facilities and will install it on-site.

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Boosting Nuclear Technologies of the Future!

WHAT WE DID: Nuclear vessel reactor

HOW WE DID IT: Neutron extractors

/ Complex vessels manufacturing with nuclear RCC–MX codes
/ Electron beam welding of Ag3NET aluminum

Credit
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Medicine is waiting for the JHR to produce high quality radioisotopes.
Combining technical expertise and world class engineering and manufacturing, CNIM Group with its subsidiaries Bertin and Winlight deliver superior quality equipment and turnkey systems.

Ultra-high precision optics, specialty material assembling and complex system integration make our offering unique. We cater to most daunting Big Science challenges, being involved in high visibility projects worldwide.

CNIM Group is your partner of choice from early concept stages, through close collaborations with leading scientific teams, to create innovative equipment. Flexibility, imagination, performance-driven spirit are spurring our intent to advance Big Science.

Just imagine. We create.