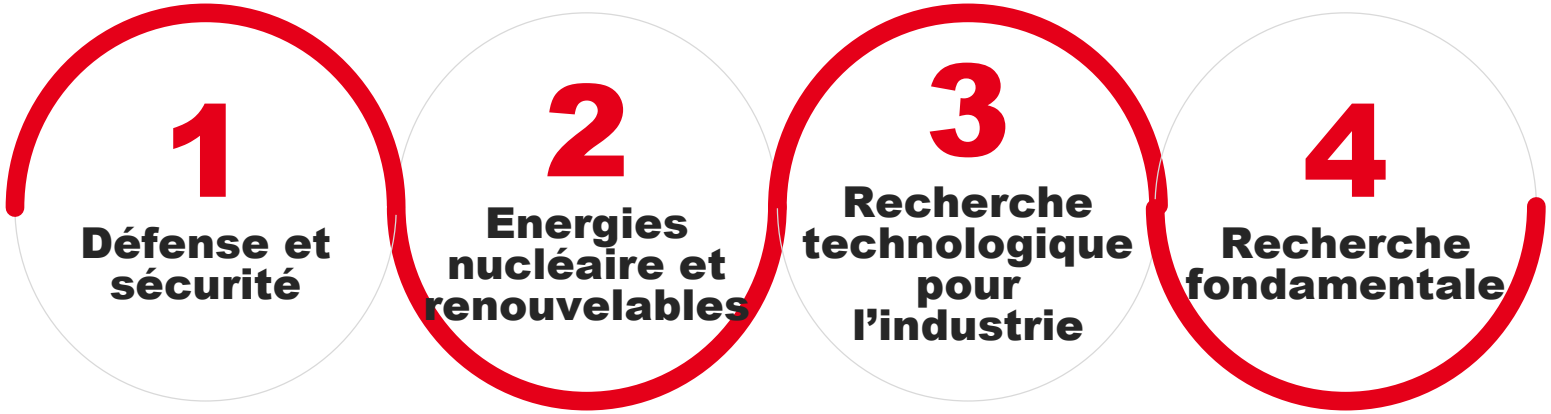
Construire aujourd'hui la société de demain

L’engagement du CEA

Le CEA s’engage, au travers de ses 4 directions, au service de la **souveraineté scientifique, technologique et industrielle de la France et de l’Europe** pour un **présent et un avenir mieux maîtrisés et plus sûrs**.



De la découverte fondamentale à la pré-industrialisation

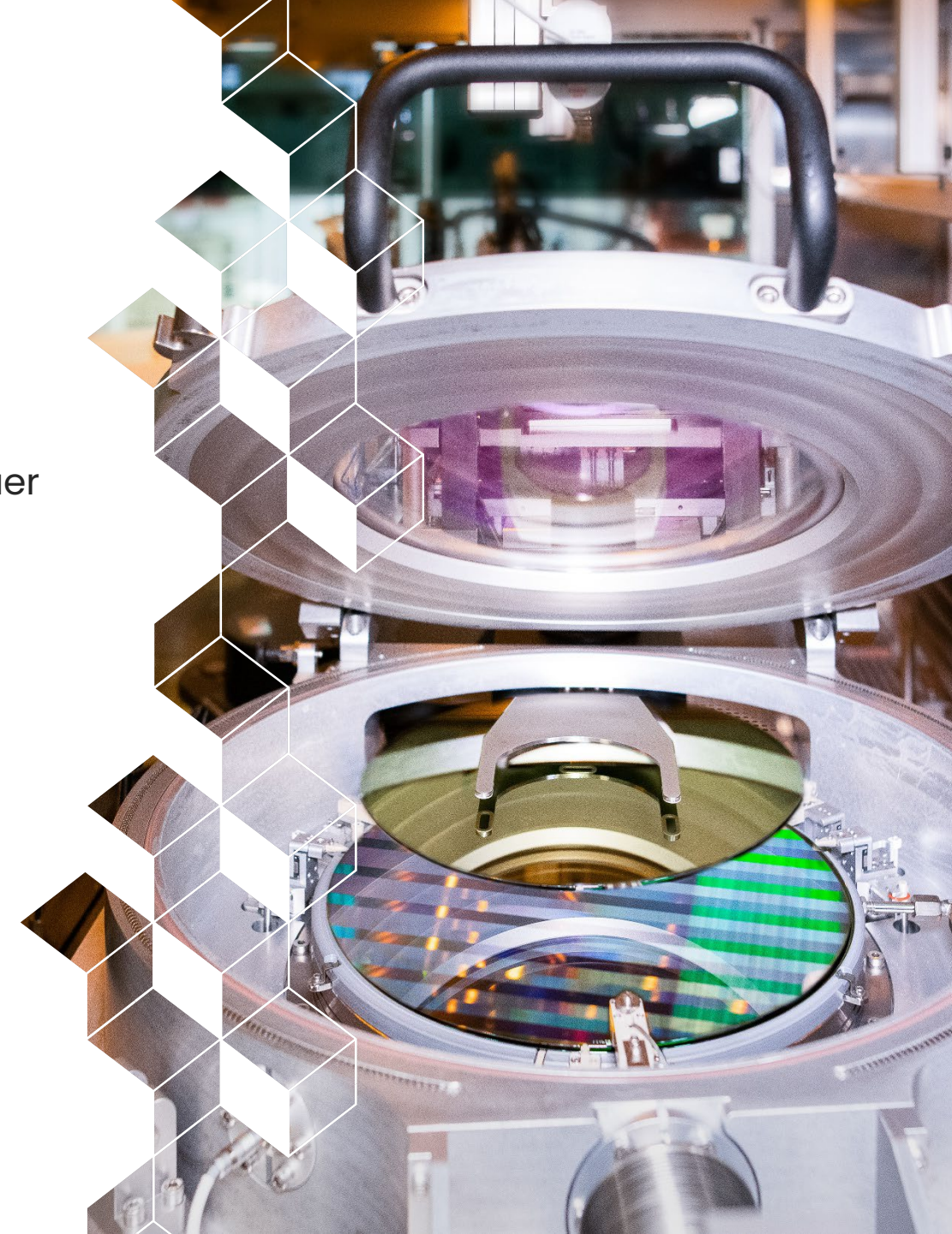
21 433
EFFECTIF TOTAL

1 528
DOCTORANTS
DE DROIT PRIVÉ

- **1er organisme** de recherche déposant de **brevets** en **France** et **en Europe** pour irriguer les acteurs industriels.
- Il contribue à **l'émergence et à la pérennisation de filières industrielles** (hydrogène décarboné, biomédicaments, calcul quantique…) **stratégiques**.

45 000 emplois
qualifiés créés
(directs, indirects et induits)

700 partenariats
industriels simultanés
tous secteurs d'activités confondus



cea list

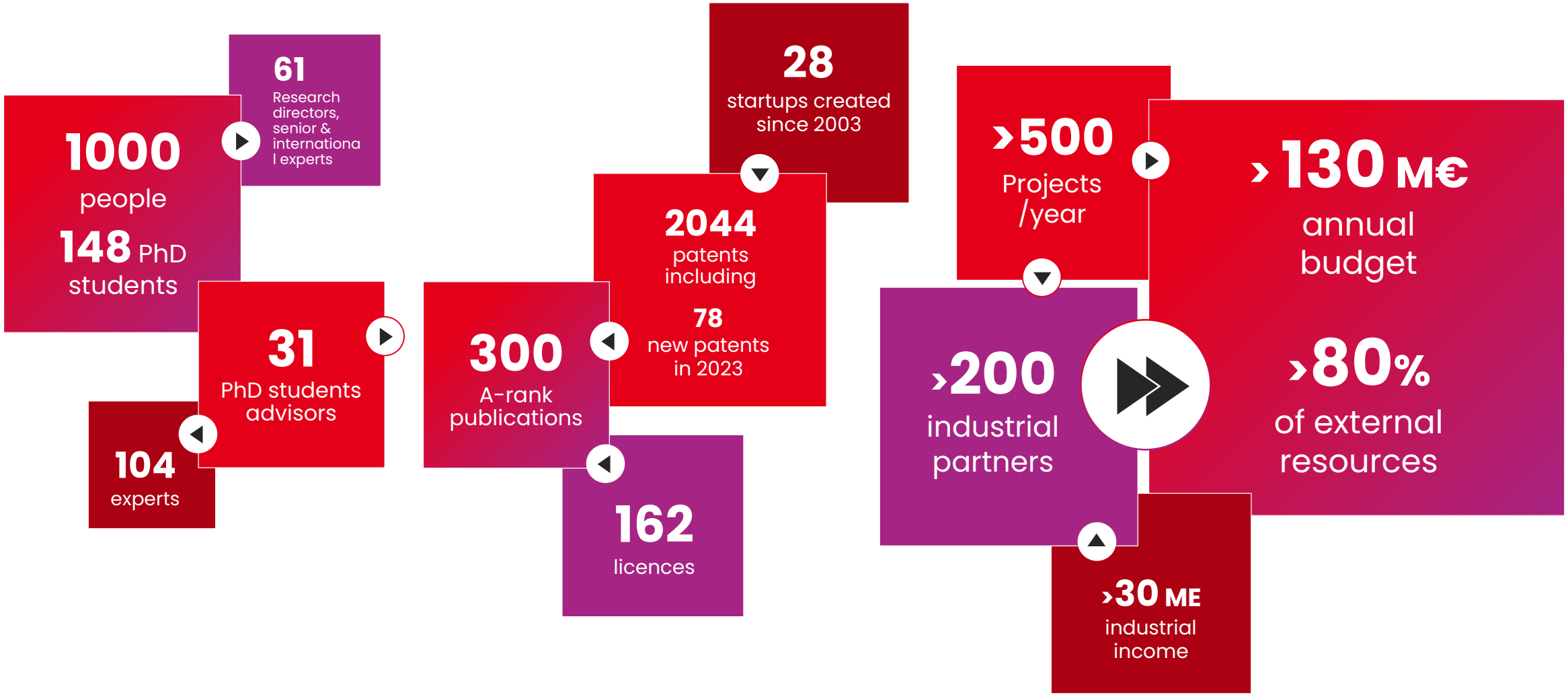
Systèmes numériques intelligents

INSTITUT CARNOT CEA LIST

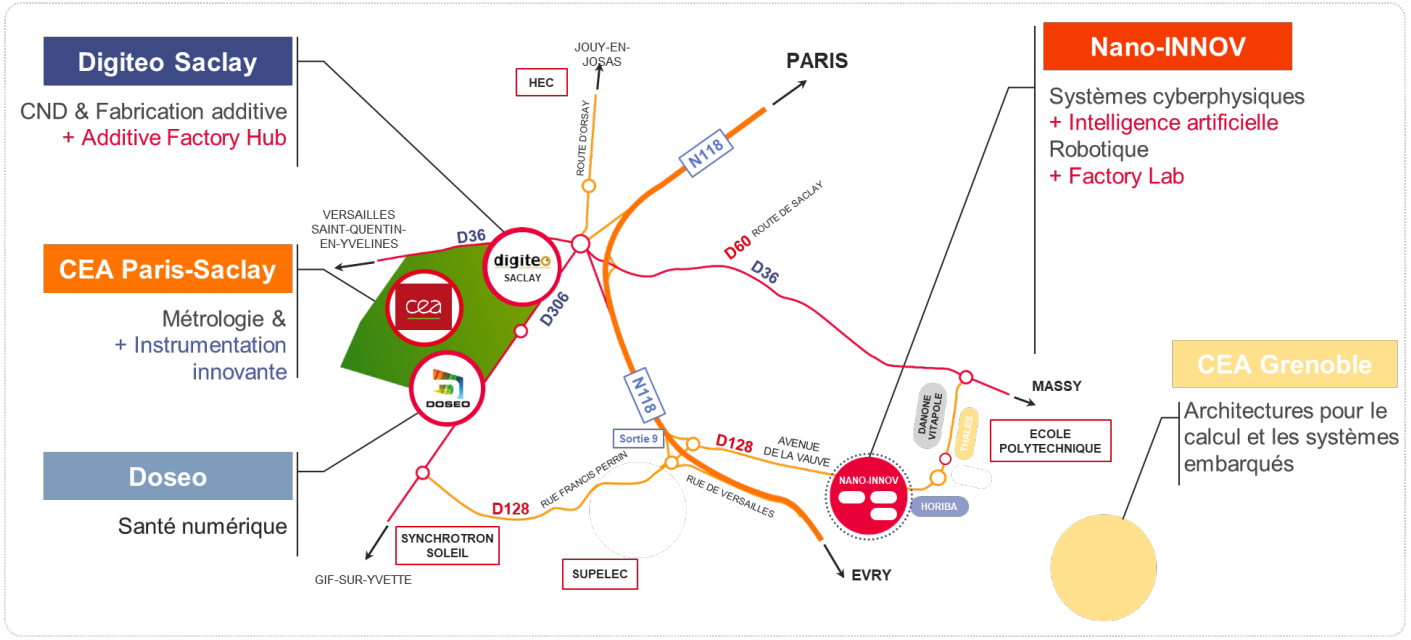
université PARIS-SACLAY

UGA Université Grenoble Alpes

CEA-List Key figures



Our sites @ Paris-Saclay & @ Grenoble



GRENOBLE

Cyberphysical systems

+ Design architectures

Expertise and key Programs

Commissariat à l’énergie atomique et aux énergies alternatives - www.cea.fr

Smart Digital Systems (1/2)

SOFTWARE ENGINEERING

- Formal mathematical methods
- Model based Software & Systems engineering

SIMULATION

- VR & AR
- Non-destructive testing
- Monte Carlo simulation

DATA INTELLIGENCE

- Data analytics
- AI under constraints
- Distributed & trusted AI

5G & CYBER-SECURITY

- Software security level assessment
- Network supervision

Smart Digital Systems (2/2)

ROBOTICS

- Collaborative robotics
- Dextral manipulation

CORTEX SCORE

IIOT, INSTRUMENTATION & METROLOGY

- Sensors & instrumentation
- IR references
- Radiotherapy & imaging

COMPUTING & EMBEDDED SYSTEMS

- Algorithm to chip design
- HPC & quantum
- Low power AI accelerators

N2D2

HUMAN-SYSTEM INTERFACES

- Haptic interaction
- Surfaces functionalization

Technology transfer to industry

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Examples of CEA's innovations available on the market

AI@CEA List

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Main CEA axes of research in AI

AI for Science & Society

AI use for research domains

- Medicine, Biology
- Materials, Climate, Astrophysics, High energy Physics, Nuclear physics
- Cybersecurity

AI use for industry needs

- Manufacturing: Automation, Control, Optimization, Diagnosis, Prediction
- Vision & NLP: Information Analysis, Automotive, Health, Instrumentation...

AI research: Finding the good model and data

500 pers.

Science of AI

AI Frugality, embedded AI

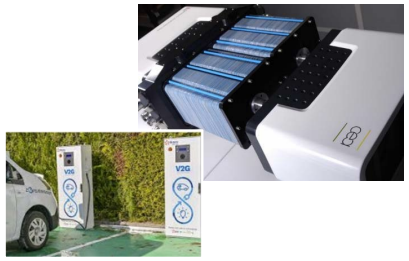
- Data management, generation, algorithms, computation complexity
- Model optimization, embedded code generation
- Electronic architecture, AI accelerator

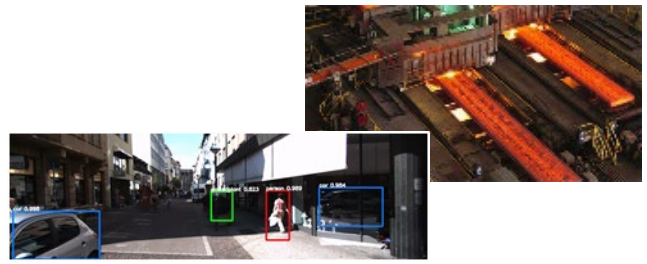
AI Trust

- Data qualification, model robustness evaluation
- Safety, privacy verification, certification process
- Interpretability, explainability

AI research: Generic new methods and tools







Main objectives at CEA List

Develop advanced, sovereign solutions to facilitate the deployment of AI in products, equipment and systems, and give industry back the choice of technology sources it wishes to use.

200 pers.

Together with preserving very high performances

- **Trust (quality, safety, security)**
  → to ease conformity assessment to regulations
  - Adapted and tooled development methodologes and processes
  - Design algorithms and architectures
- **Frugality (data, compute, energy)**
  → to reduce development cost and enlarge deployment opportunities
  - Lower data and computation learning methods
  - High performance and low consumption technologies
- **Applications development around the teams expertizes**
  - Vision, Natural Language Processing, Physical Data analysis
  - Nuclear instrumentations, Quality Control, Robotics & Autonomous Systems, Defense, Health…

Openness for creativity, efficiency and trust to ensure adoption/business dev.

Thanks!

Imagine new usages & understand real needs

Applications

Design, V&V Certification

Deployment technologies HW/SW

New tools
New process

Performance
Cost

TRUST & FRUGALITY

will make the difference

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