

THE ANR'S FOCUS

**15 years
of Franco-Taiwanese
cooperation
2007-2022**



THE ANR'S FOCUS

**15 Years
of Franco-Taiwanese
Cooperation
2007-2022**

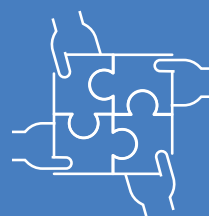
The ANR's focus

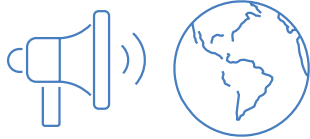
This new collection of brochures, entitled *The ANR's focus*, aims to introduce the analyses produced by the French National Research Agency (ANR) regarding its actions and funding instruments. These studies, which we regularly publish, are based on several approaches combining surveys, data analysis and bibliometrics.

Each issue of this collection evaluates an action over a certain period, by describing various indicators (aid or funding amounts, scientific fields, partners, bibliography, etc.) and by providing an overview of the research projects funded and their outcomes.

These brochures are primarily intended for policy-makers, institutional partners and research funding stakeholders in France and abroad. They include summaries and assessments of the ANR's funding impact and decision-support tools. They will be uploaded on the ANR website.

Thierry Damerval
Président and CEO of the ANR





By developing transnational cooperation with funding agencies in various countries, the ANR provides French researchers with the opportunity to set up or expand their collaborations with scientists from other countries, to create European and international teams of excellence.

These partnerships aim to fund innovative binational projects, demonstrating a strong synergy among teams of each country and a real integration of joint researches. Since 2007, the bilateral agreement between the ANR and the Taiwanese Funding Agency has facilitated the set up and completion of nearly one hundred scientific projects, submitted jointly by French and Taiwanese teams.

This document reviews 15 years of fruitful cooperation between the ANR and the current NSTC (National Science and Technology Council).

Contents

4

Context

5

Key figures

6

Partners

8

Research areas

9

Publications

10

Outreach

11

Feedback

12

Scientific projects – examples

The data and analyses presented are derived from the ANR's internal review conducted in 2022 by the Scientific Operations Direction and the Digital Strategy and Data Direction.

General Director

Thierry Damerval

Executive Director

Fabrice Impériali

Editorial coordination

Honorata Plewinska, Nathalie Mamosa

Eléa Decostaire

in collaboration with the Review Studies and Impact Unit of the Digital Strategy and Data Direction.

Graphic design

Romuald Maurel

Printing

Dynaprint

The Bilateral ANR – NSTC Cooperation

Context

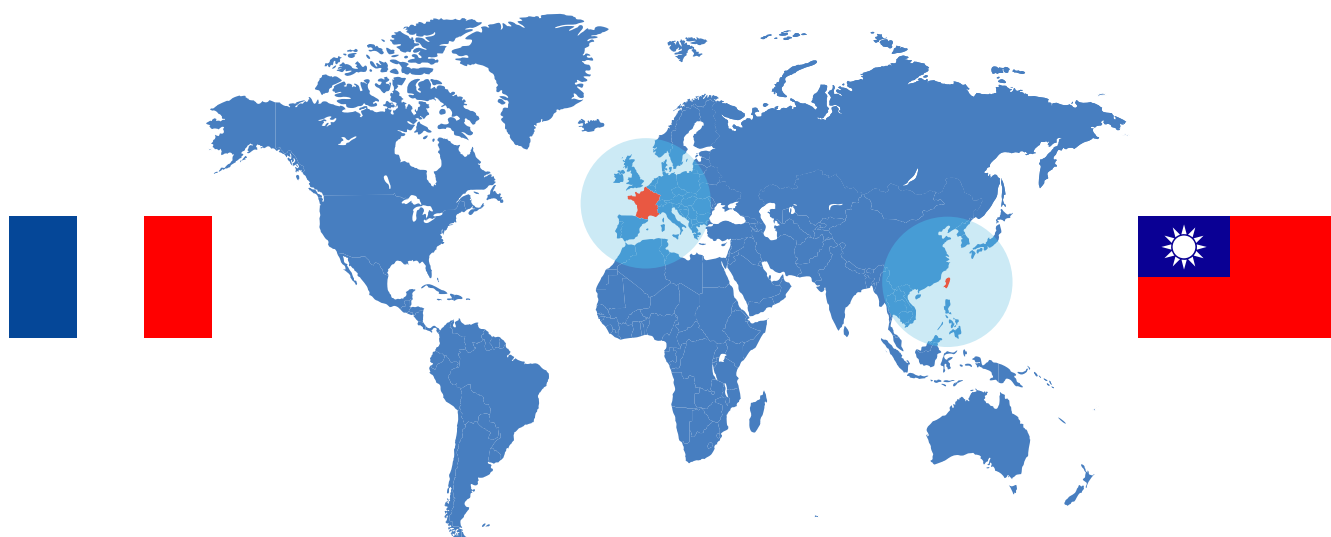
Since 2007, more than a hundred projects have been co-funded by the ANR and the Taiwanese NSTC (National Science and Technology Council) in the framework of bilateral and multilateral collaborations.

87 projects have been launched in the framework of the bilateral cooperation between both agencies, each project being coordinated both in France by at least one ANR-funded partner, and in Taiwan by at least one NSTC-funded partner.

The other Franco-Taiwanese collaborations were integrated in multilateral projects (including the ANR, NSTC and other foreign funding

agencies), funded under initiatives such as the Belmont Forum, ERA-NETs Euronamed and CHIST-ERA, or EJP SOILS.

The ANR has funded around 3.000 international research projects since 2005, in collaboration with European and international funding agencies.



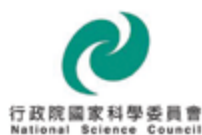
2007

Beginning of the collaboration between the ANR and the Taiwanese NSTC funding agency (National Science and Technology Council).

First bilateral agreement established

- between the ANR and a funding agency outside Europe¹
- between the NSTC and a European agency

NSTC History over the 2007-2022 period



2014



2022



[1] Europe: Beneficiaries and members associated with the Horizon Europe programme of the European Commission

The Bilateral ANR – NSTC Cooperation

Key figures

2007-2022

The Franco-Taiwanese cooperation led to

87 bilateral projects

Aid granted

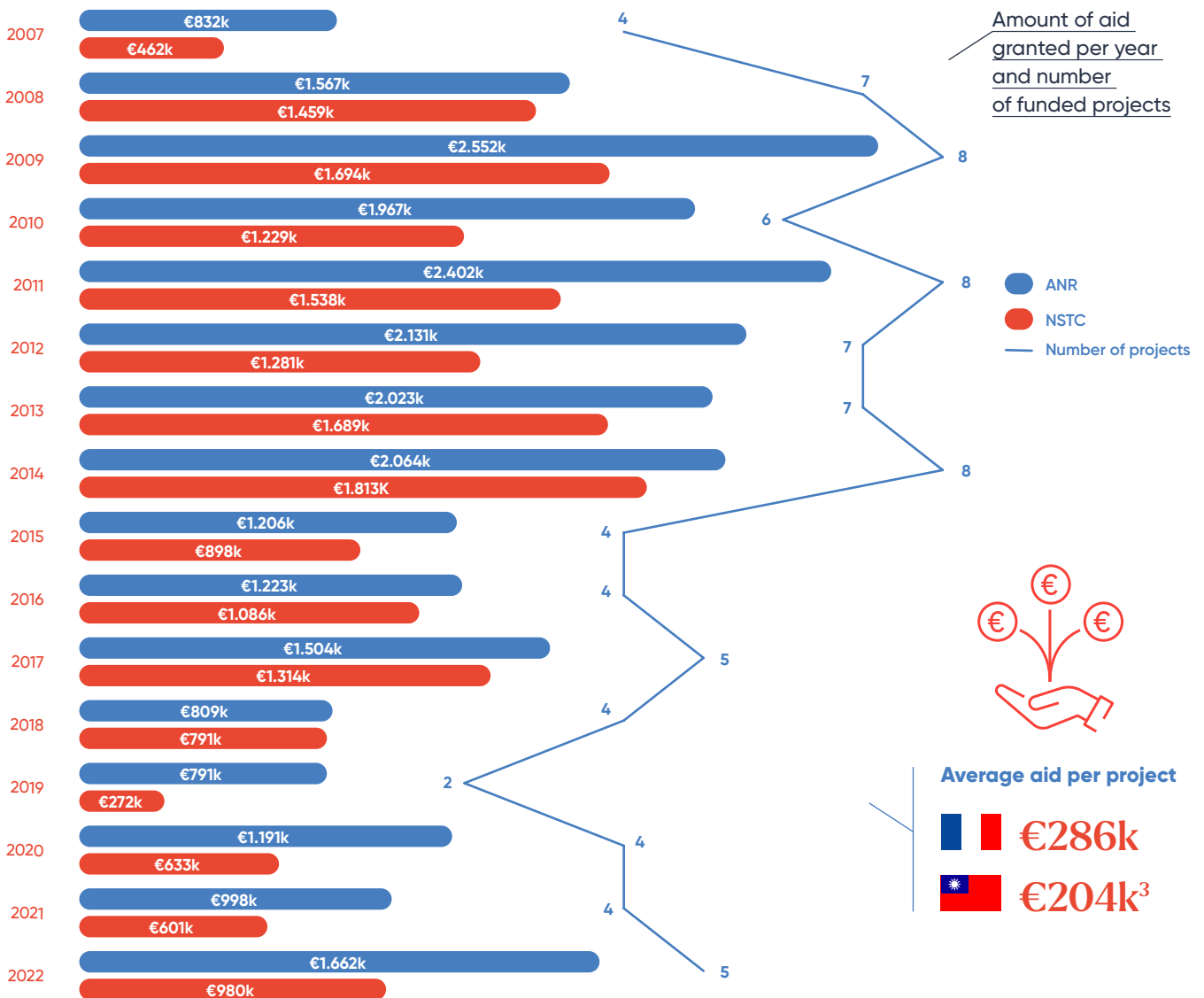
ANR
€24,9 million

NSTC
€17,7 million²

289

scientific partners

with an ANR or NSTC funding agreement, under bilateral projects.



[2] NT\$ 568.7 million - November 2022 Exchange Rate

[3] NT\$ 6.5 million - November 2022 Exchange Rate

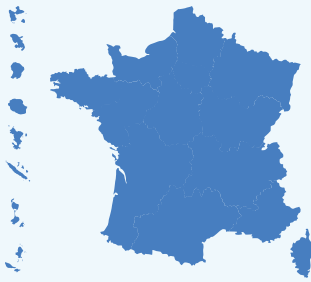
The Bilateral ANR – NSTC Cooperation

Partners

Number of partners by country

161

French partners



128

Taiwanese partners



The ten most involved institutions by number of partners

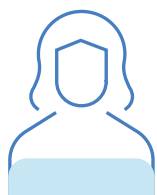
In France



In Taiwan



Le genre dans les projets bilatéraux ANR – NSTC



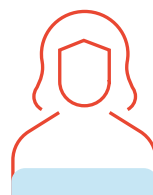
20 %

French female coordinators



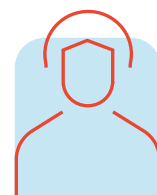
80 %

French male coordinators



15 %

Taiwanese female coordinators



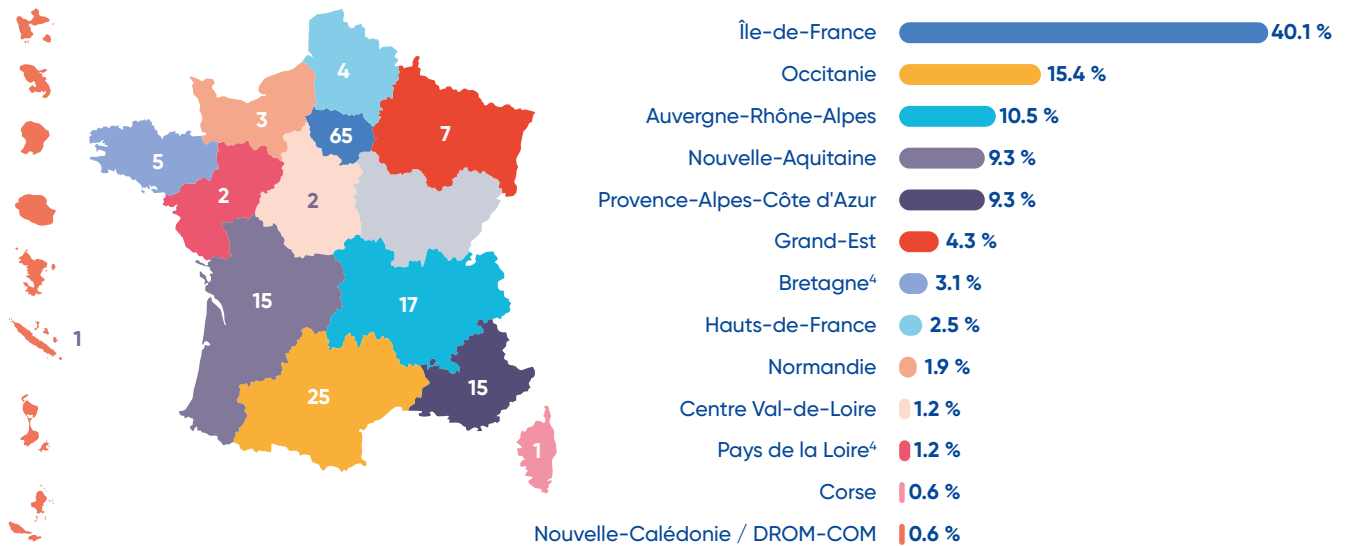
85 %

Taiwanese male coordinators

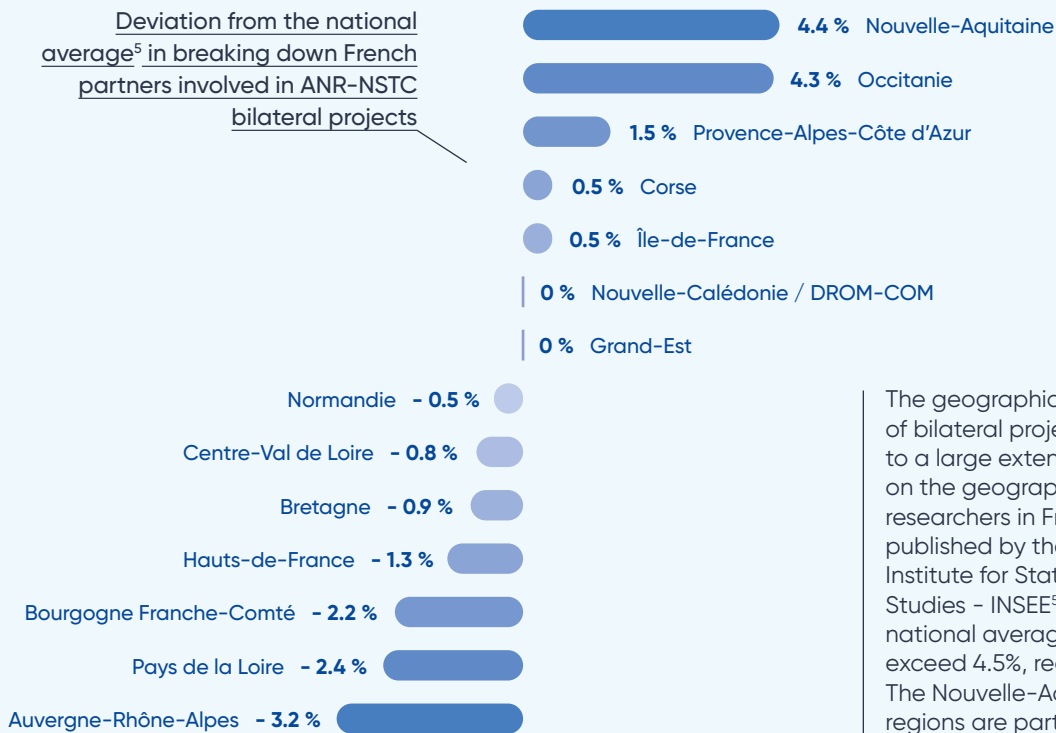
The Bilateral ANR – NSTC Cooperation

French partners

Geographical breakdown of French partners



Deviation from the national average⁵ in breaking down French partners involved in ANR-NSTC bilateral projects



The geographical distribution of bilateral projects partners corresponds to a large extent to national statistics on the geographical breakdown of researchers in France (latest data published by the French National Institute for Statistics and Economic Studies – INSEE⁵). The deviation from the national average distribution does not exceed 4.5%, regardless of the region. The Nouvelle-Aquitaine and Occitania regions are particularly well represented in this cooperation.

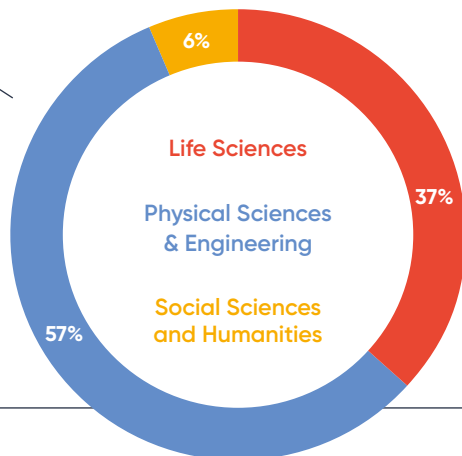
[4] One partner is attached to the CNRS: Regional delegation of Brittany and Pays de la Loire, and thus counts for both regions.

[5] Source: Mesri-Sies (semi-finalized data, 2017) <https://www.insee.fr/fr/statistiques/5039895?sommaire=5040030#graphique-figure3>

The Bilateral ANR – NSTC Cooperation

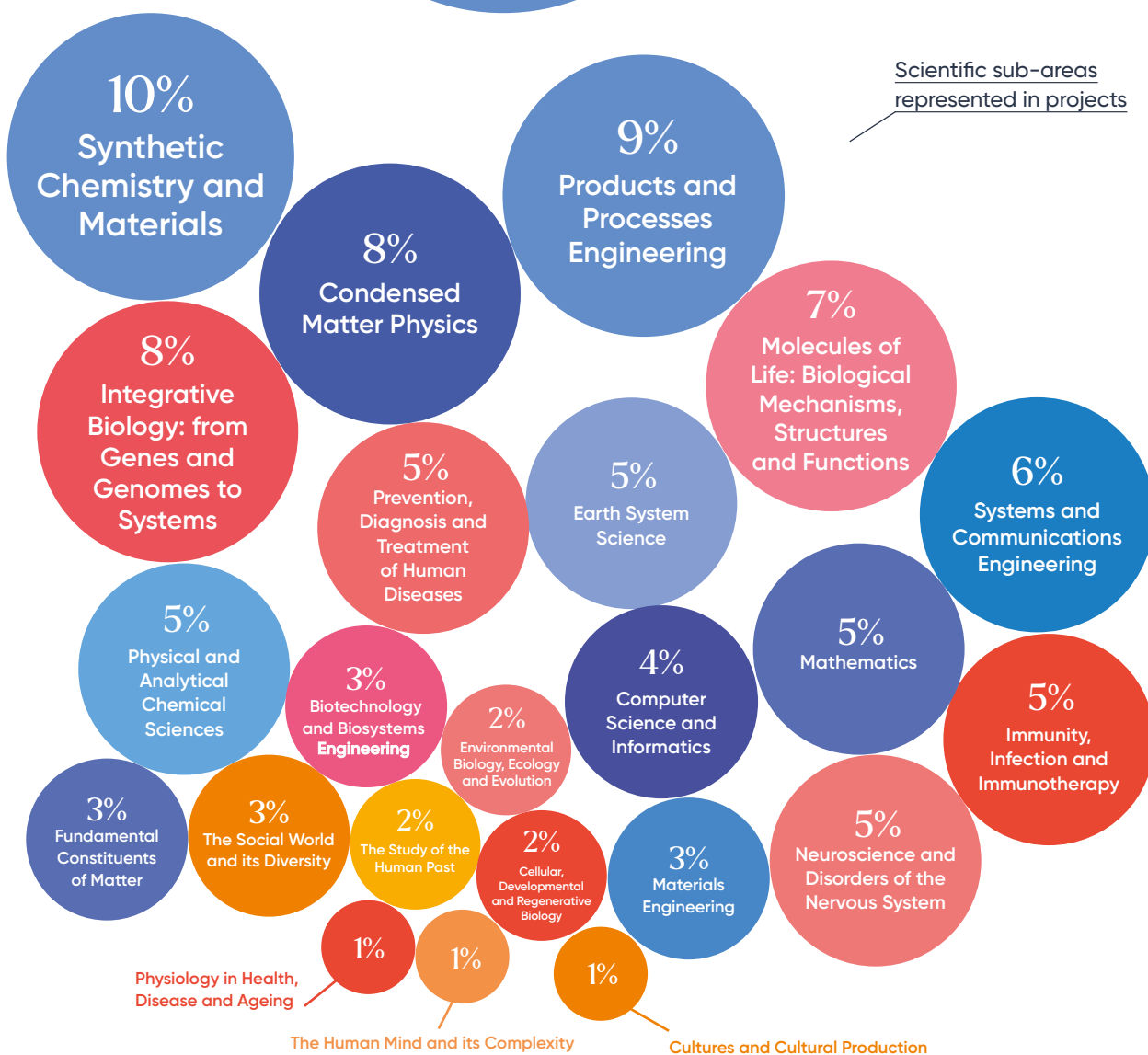
Research areas

Scientific fields of research represented in the projects



The scientific fields to which the funded projects are attached, are based on the European Research Council's (ERC) code repository. Data from ERC codes comes from the information provided when coordinators submitted their projects⁶, and were updated in September 2022 through a questionnaire sent to French coordinators.

Scientific sub-areas represented in projects



[6] Editions prior to 2014 do not have any ERC code available



The Bilateral ANR – NSTC Cooperation

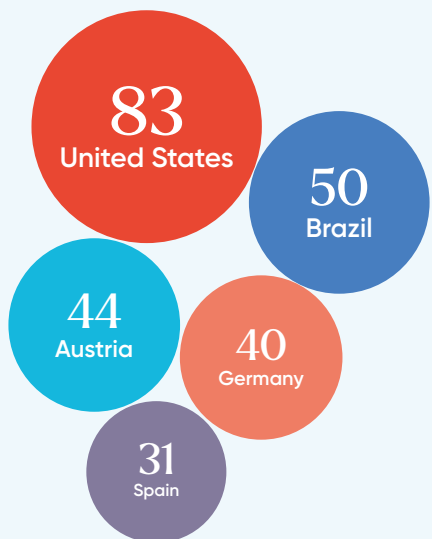
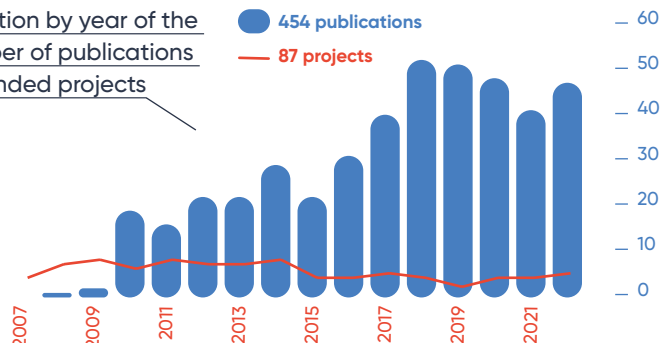
Publications

The results of these bilateral projects resulted in

454

scientific publications identified by project references⁷ on the HAL archive and the Web of Science.

Evolution by year of the number of publications by funded projects



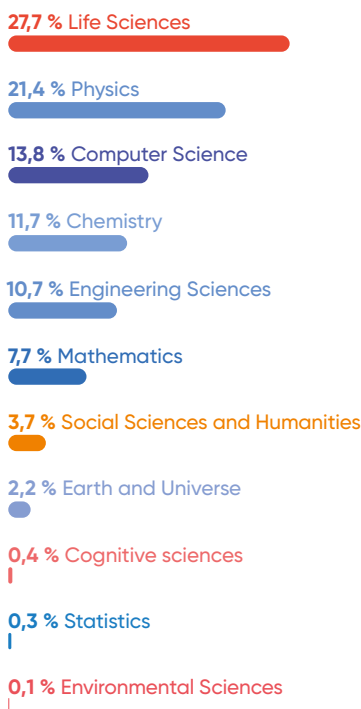
Number of occurrences of the main countries represented among co-authors of publications

The main co-authors of these publications are mostly affiliated to France and Taiwan. However, the study also shows that other co-authors from

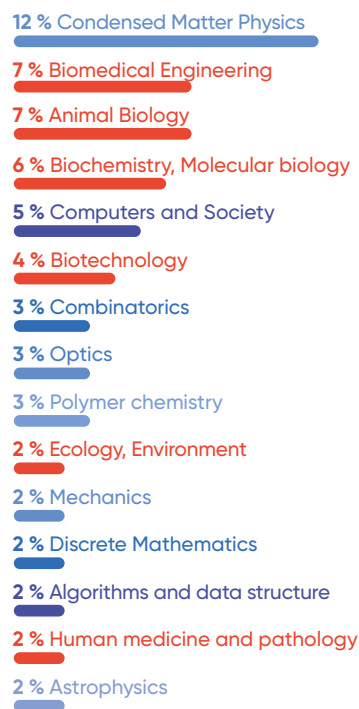
53 countries

are involved, primarily the USA, Brazil, Austria, Germany and Spain.

Main scientific fields represented in publications



Main scientific sub-areas represented in publications



These publications cover a broad range of scientific fields⁸, mainly Life Sciences (28%) and Physical Sciences (21%).

70 % of the publications are referenced more precisely by associating a sub-area, the most important of which are "Condensed Matter Physics"

(12%), "Biomedical Engineering" (7%) and "Animal Biology" (7%). Within the subsection of 389 publications with a DOI (unique identifier), **64%** are in open access⁹ and **28 %** are referenced in an HAL-ANR portal.

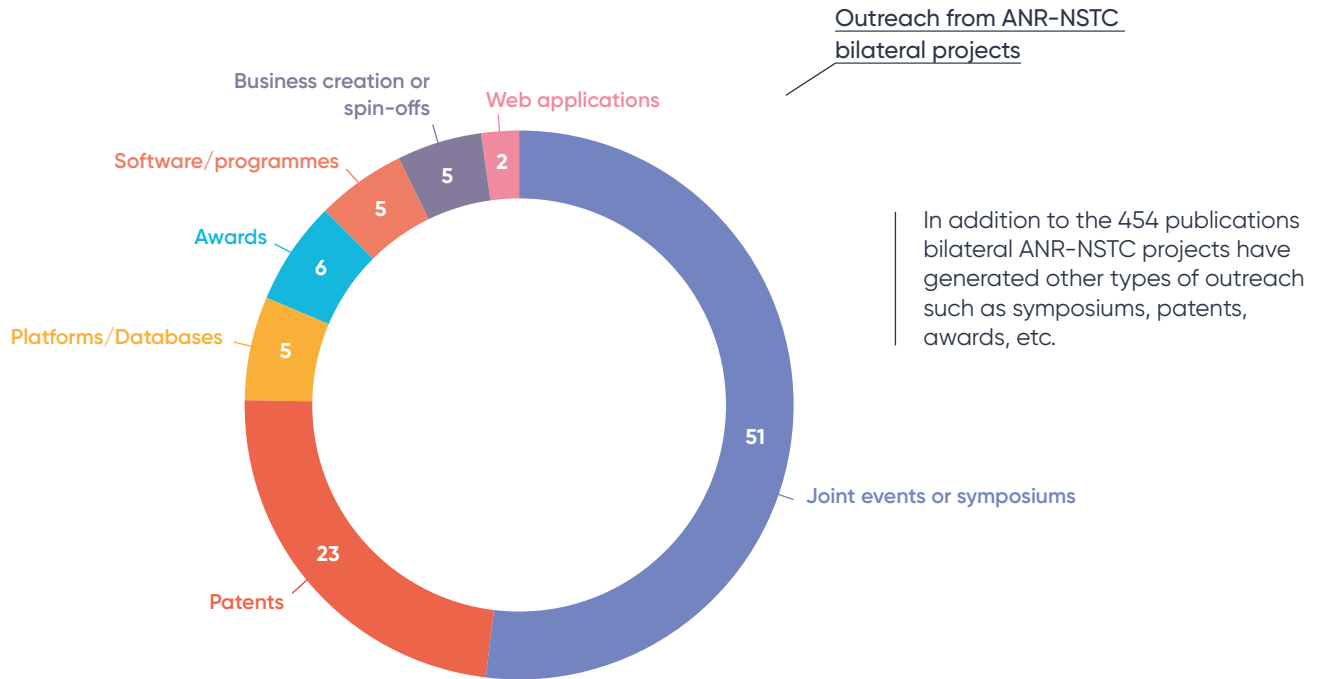
[7] Acronym of the ANR or NSTC project

[8] Qualification based on HAL and Web of Science level 1 repositories

[9] Source unaywall.org – January 2023 export

The Bilateral ANR – NSTC Cooperation

Outreach



Examples



23
patents

At least 10 projects resulted in French or international patent applications. The Angio-ANR_NSC¹⁰, 3DXIR-Pathology¹¹ and BIOPSY¹² projects have each declared at least 4 patent applications.



5
softwares

5 softwares have also been developed. For instance, the SafEE¹³ project helped set up an interface that nursing homes can use to monitor their activities, and a cognitive simulation software (*Solar Games*).



5
new
businesses

The Franco-Taiwanese cooperation has also contributed to the creation of companies, such as the start-up CAVISKILLS, linked to the SonInCaRe project¹⁴, which specialises in ultrasounds for targeted drug delivery.

[10] ANR-07-BLAN-0003

[11] ANR-13-TECS-0001

[13] ANR-13-TECS-0002

[12] ANR-16-CE18-0029

[14] ANR-10-TECS-0003



The Bilateral ANR – NSTC Cooperation

Feedback from French partners

In September 2022, a questionnaire was sent to the French coordinators to receive their feedback. It addressed various aspects of this collaboration, such as its origin, development, and future.



Reasons to collaborate

27%

of respondents were interested in the Taiwanese team's international recognition and the importance of its area of expertise for their research.

25%

of respondents consider that the collaboration was motivated by the international reputation of their respective teams and the importance of their areas of expertise.

18%

of respondents were interested in an infrastructure/platform/technology implemented by the Taiwanese team and considered as useful for their research.

16%

of the respondents stated that they were already conducting joint research and wished to further their collaboration.

11%

of respondents stated having useful infrastructures/platforms/technology for the Taiwanese team's research.

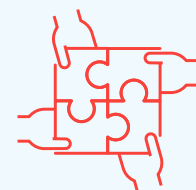
Questionnaire sent in September 2022 to the French coordinators of the 87 projects co-funded by the ANR and NSTC between 2007 and 2021.

40%
participation rate

Added value of the collaboration

58%

of respondents declared that the project facilitated the mobility of persons¹⁵ between the two countries during its implementation.



Future of the project & collaboration

For **79%**

of respondents, there would have been no collaboration without this funding.

For **73%**

of respondents, the collaboration continues or is expected to continue beyond the project.

For **61%**

of respondents, the collaboration strongly contributed to the international visibility of their research.

Origin & development of the project

76%

of respondents stated that they already knew their Taiwanese partner well or quite well before the project began.

40%

of respondents had already collaborated with their Taiwanese partner in an ANR and/or other funding organisation/agency-funded project.

For **76%**

of respondents, the project's set up process was smooth and easy.

52%

of respondents mentioned that the partner's reputation was a determining factor at the start of the project. 29% also mentioned the importance of the partner's infrastructures.

[15] Students, post-docs, guest researchers, etc.

The Bilateral ANR – NSTC Cooperation

Scientific projects – examples

ADAMANTIUS¹⁶


Automatic detection and characterisation of residual masses in patients with lymphomas, through fusion of whole-body diffusion-weighted MRI on 3T and 18F-fluorodeoxyglucose PET/CT

Grant amount
ANR: €225k
NSTC: €218k¹⁷

Public bodies and a private partner were involved in this basic research project. It helped establish a “whole body” MRI protocol and an image analysis software for objective and non-invasive quantitative measuring. The achieved results could have a significant clinical impact on caring for patients with lymphoma. This project was the subject of several articles and patent applications.

Duration
36 Months

Coordination



Alain RAHMOUNI
Henri Mondor University Hospitals

Tzu-Chen YEN
Chang-Gung Memorial Hospital

TYSOMIN is the successor to DIAMIN, a project funded during the ANR's Programme BLANC 2008 edition. This is the first large-scale research on linguistic typology and diachronic syntax in a Chinese dialect other than Mandarin: Southern Min.

This Sinitic language - or Chinese dialect - is spoken by more than 40 million people in the southern part of the Fujian province and by 73% of the Taiwanese population (around 18 million inhabitants). Southern Min is considered to be one of the Sinitic languages that has retained many features of Archaic Chinese and Medieval Chinese. This project was the subject of 50 articles and a collective book published in 2020.


TYSOMIN¹⁸

Typologization of synchronic and diachronic processes in Southern Min (a Sinitic language)

Grant amount
ANR: €271k
NSTC: €212k¹⁹

Duration
36 Months

Coordination



Hilary Chappell
Collegium de Lyon

Chinfa Lien
National Tsing Hua University

[16] ANR-11-ISV5-0002

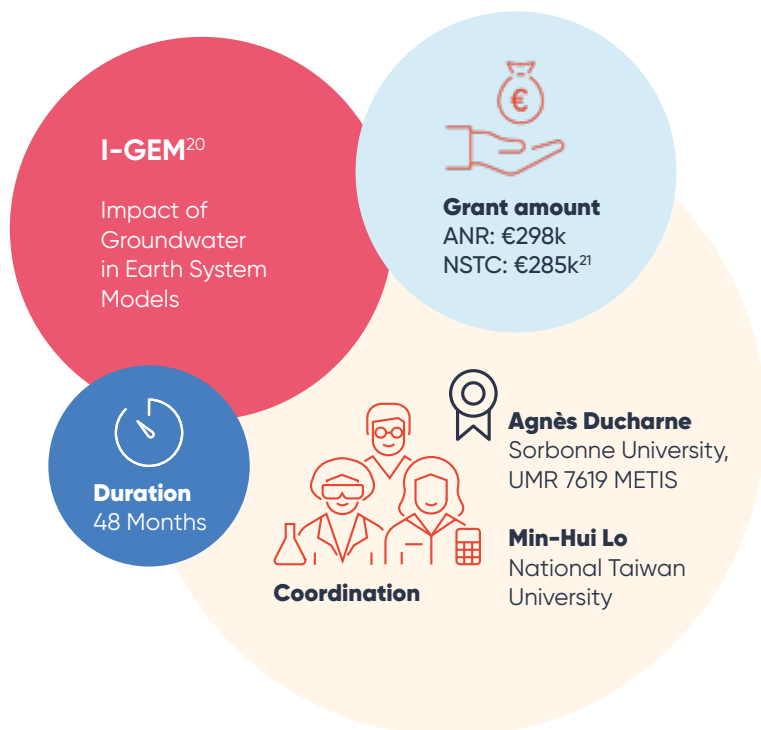
[17] around NT\$ 7,000,000 – November 2022 Exchange Rate

[18] ANR-11-ISH2-0001

[19] around NT\$ 6,795,000 – November 2022 Exchange Rate



Scientific projects – examples



The research conducted under this project, based on digital modelling, helped demonstrate the significant impact of groundwater on simulated climate in certain regions where soil moisture is limited, such as the Mediterranean rim or the Sahel region.

It confirmed that the presence of groundwater is able to mitigate anthropogenic warming, i.e., warming is somewhat slower when models include groundwater, whose level is sensitive to climate change.

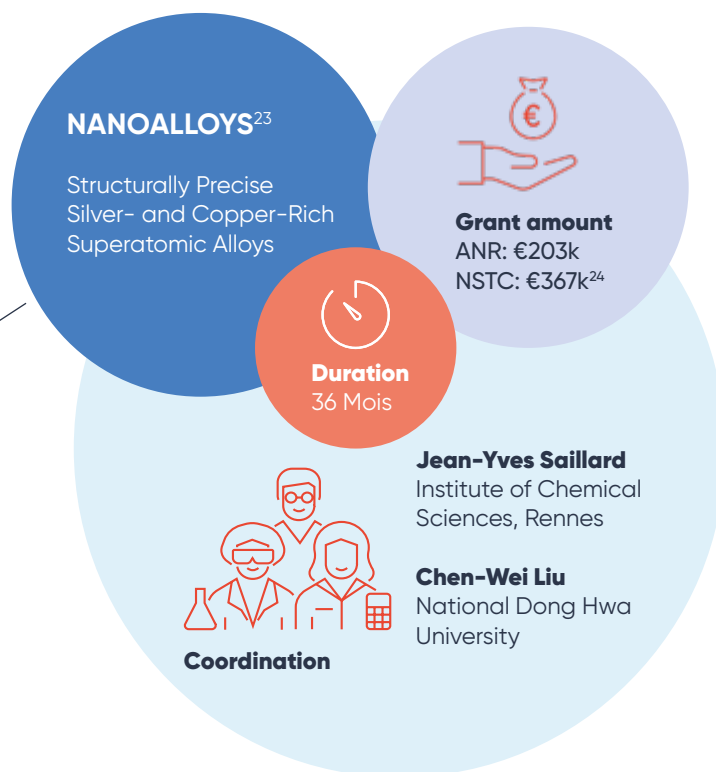
This partnership resulted in the organisation of two international groundwater workshops²², and helped improve IPSL and CNRM models, in view of the 6th phase of the international CMIP programme (Coupled Model Intercomparison Project) assessed by the IPCC.

In 2021, both coordinators received the 23rd Franco-Taiwanese Scientific Grand Prize, awarded by the former Taiwanese Ministry of Sciences and Technologies (now National Science and Technology Council) and the French Academy of Sciences.

This basic research project relies on a Taiwanese team, expert in nanocluster chemistry, to carry out the experimental part, and a French team in charge of theoretical rationalization, modelling, orientation and prediction of syntheses and properties. It aims to develop new stable nanoclusters of exact composition whose metal core, stabilised by dichalcogenolate ligands, consists of at least two different types of metals (nanoalloys).

Theoretical approaches helped describe these new compounds as superatoms whose composition and emissive properties can be adjusted under certain conditions.

In this context, the research also contributed to the development of a supermolecule concept, by characterising a first system consisting of three condensed superatoms equivalent (isolobal) to the molecular ion I³⁻. The joint work led to 15 publications and the organisation of a mini-symposium²⁵ on "Clusters, nanoclusters and nanoparticles" in January 2022.



[20] ANR-14-CE01-0018

[22] <https://byjoydesign.com/igem>

[24] around NT\$ 11.755.000 – November 2022 Exchange Rate

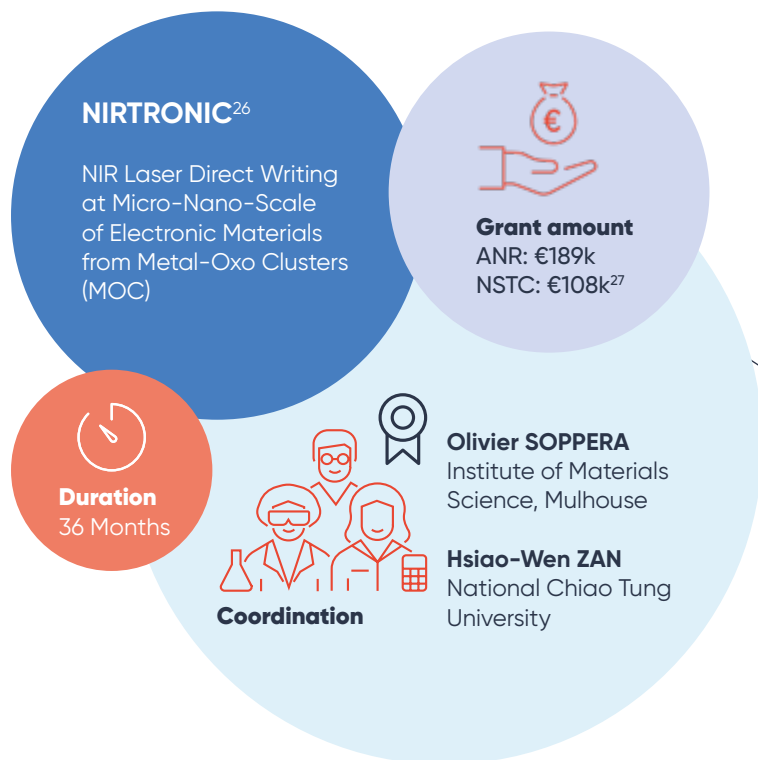
[21] Around NT\$ 9.136.000 – November 2022 Exchange Rate

[23] ANR-18-CE09-0037

[25] This event brought together more than 80 participants across three continents

The Bilateral ANR – NSTC Cooperation

Scientific projects – examples



This long-term collaboration, with a 48 month-long funding, follows a first project entitled PHOTOMOC^{28/29}. The NITRONIC project aims to develop new fabrication processes for advanced miniaturized (bio)sensors that will be useful for human being monitoring. It proposes a technology based on a solution and laser treatment process. This process will be used to fabricate field-effect transistors and photodetectors to design biosensors as end-product. It targets a specific application, i.e., a sensor for salivary urea, a determining factor for chronic kidney disease patients.

In recognition of this lengthy joint research on light-matter interactions at molecular and nanoscale to prepare operational nanocomposite materials, the Taiwanese National Science and Technology Council and French Academy of Sciences awarded its project coordinators with the 2022 Franco-Taiwanese Grand Scientific Prize.

[26] ANR-18-CE24-0028

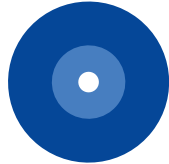
[27] around NT\$ 3.450.000 – November 2022 Exchange Rate

[29] Metal Oxo-clusters as versatile building blocks for low-temperature preparation of semi-conductive and conductive direct write micro-nano patterning

[28] ANR-14-CE26-0039



The French National Research Agency (ANR) funds project-based research in France. A public institution under the authority of the French Ministry of Research, the Agency's mission is to fund and promote the development of basic and applied research, technical innovation and technology transfer, as well as national, European and international partnerships between research teams from the public and private sectors. The ANR is also the main operator of the France 2030 Investment Plan in the field of higher education and research, for which it selects, funds and monitors projects in connection with initiatives of excellence, research infrastructure and support for the advancement and technology transfer of research. The ANR is ISO 9001 certified for all of its "project selection" processes.



www.anr.fr

Follow us on social networks



@agencerecherche



ANR



ANR