

# LabEx NanoSaclay

Juin 2015:

**Bilan, Faits marquants et Stratégie pour la Phase 2**

Serge Palacin

# Bilan réalisé pour l'ANR: rapport à mi-parcours (mars) et **audition** (2 juin 2015)

1/ Presentation of NanoSaclay: missions and organization

2/ NanoSaclay meets the ambitions of excellence, attractivity and structuration

3/ Overview of Phase 1: research highlights, dissemination and budget

4/ Future: 2015 and strategy for the 2<sup>nd</sup> phase



Questionnaire  
"équipe" annuel



# 1/ Presentation of NanoSaclay: missions



*NanoSaclay: Paris-Saclay multidisciplinary Lab in Nanoscience and Nanotechnologies*

- **3 main missions:** research, valorisation, education

- Improve local dynamism and creativity in science
- Promote **technology transfer**
- Attract good students in the local **training program**

- **Research missions:** 3 axes underpinned by 3 challenges + open calls

## **Quantum and Spin-based nanoelectronics:**

understand and control charge and spin at the nano-scale

## **Nano-drugs for the treatment of severe diseases:**

discover new and more efficient nanomedicines and nanotheranostics

## **Nanophotonics, Nano-objects for energy control:**

understand and control the interaction between light and matter (electrons, phonons) at the nano-scale

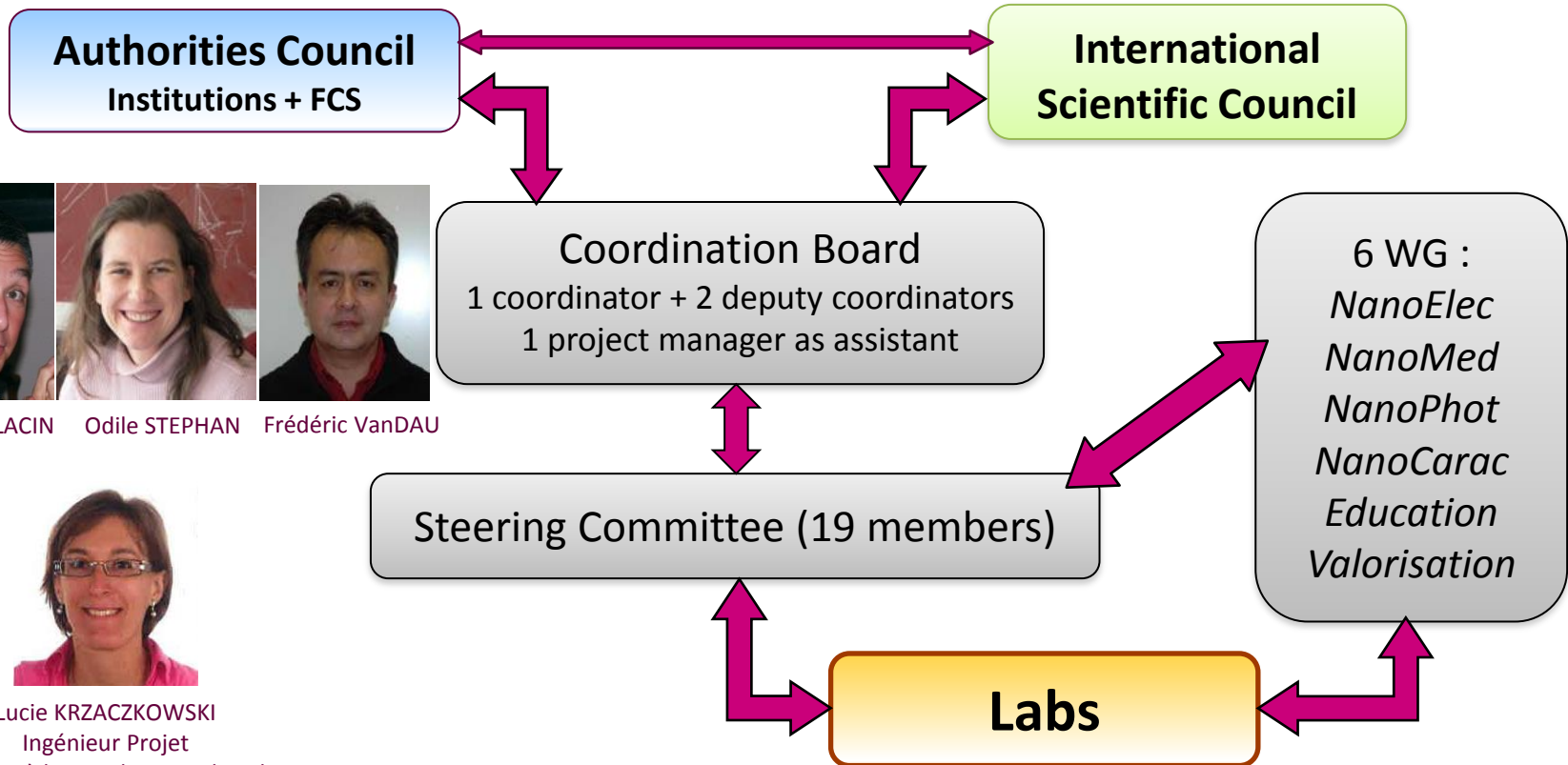
**Annual open call:** gather news ideas and reinforce local structuration

**Objective:** to build an efficient worldwide-sized cluster in nanoscience and nanotechnologies centered on interdisciplinarity and reactivity

# 1/ Presentation of NanoSaclay: organization



- **Resources:** 30 labs, 78 research teams, >450 scientists  
2000m<sup>2</sup> of clean rooms + state-of-the-art equipment  
Funding: 11,5M€/8,5 y
- **Governance:**



Serge PALACIN Odile STEPHAN Frédéric VanDAU



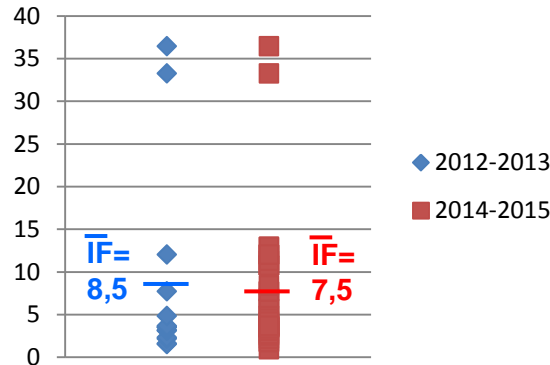
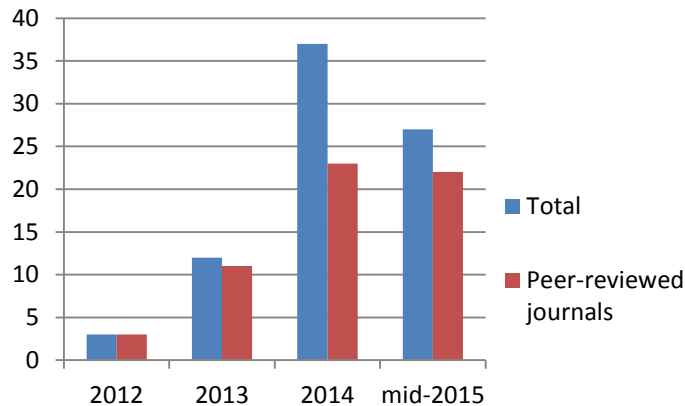
Lucie KRZACZKOWSKI  
Ingénieur Projet  
Assistante à la coordination du LabEx

# 2/ NanoSaclay meets the expected ambitions

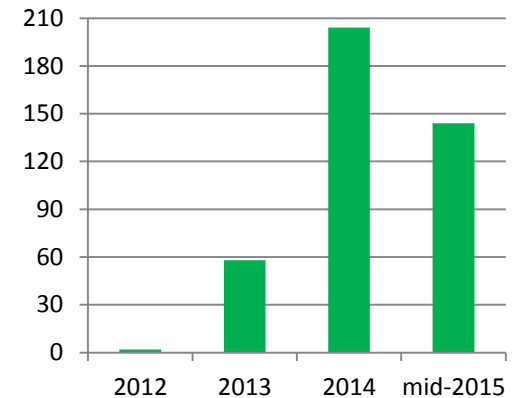


## Research excellence and originality

- **10 patents**
- **81 publications** including 60 in peer-reviewed journals



## Number of citations



- **Targeted innovative project: Chair “Reliability of nanodevices”**

Objective of NanoSaclay: to develop research in this R&D area where industry needs are critical, and existing local strength limited

Strategy: open call in 2013 directed towards NanoSaclay labs

Selection: 1 project selected for 4 years (Feb. 2014 – Feb. 2018)

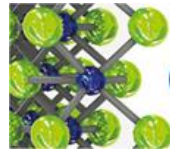
**Impact:** attracting co-funding: >1,6 M€ besides NanoSaclay support  
leverage effect at national/European levels: 5,5M€ (inc.7 ANR and 2 ERC projects)  
5 new teams recently joined NanoSaclay

# 2/ NanoSaclay meets the expected ambitions

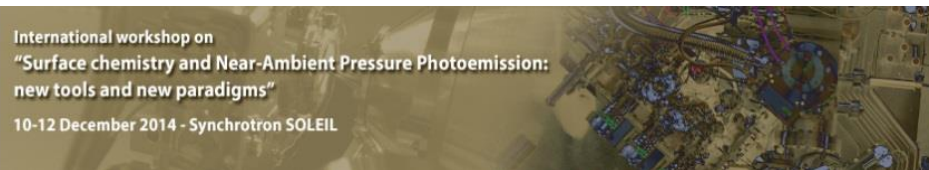
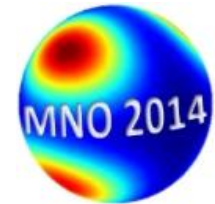


## International scientific visibility

- **Invitation of 20 renowned experts:** from few days to 6 months
- **26 national/international workshops and conferences (past and future):**



**International Symposium on 2D Materials:**  
Fundamentals, Elaboration and Devices  
May 19<sup>th</sup>, 2015 Paris



- **Attractivity for students and post-doctorants**

Distribution of candidates funded by NanoSaclay:

	Number	% of foreigners	% of foreign recruitment
Master students	19	63	53
PhD students	3 (+4)	33	0
Post-doctorants	30	80	50



**Impact: 13 new international collaborations**

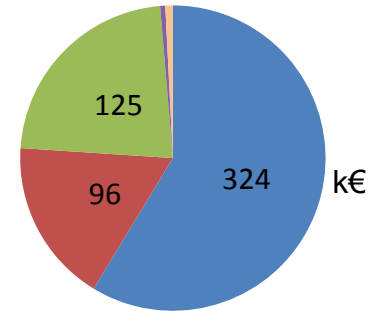


# 2/ NanoSaclay meets the expected ambitions



## Educational excellence

- **Training program for Bachelor and Master:**  
Equipment upgrade for teaching platforms (100 students/y)



- **NanoSchool: design of innovative training for general education**

Building up 5 demonstrators for general public and schools:

Courses in high schools: lectures, quiz, labworks in classrooms or in clean room, seminar-discussion

Courses in elementary schools: labworks for discovering the colors of nanoworld

Training sessions in IEF for school teachers



Talks for >2000 pupils and students: 80 actions in 30 colleges and high schools

- **Grants for high-level students:**

For students enrolled in the master “nanosciences” (in- and out-coming mobility)

Abroad internships for PhD students in NanoSaclay labs



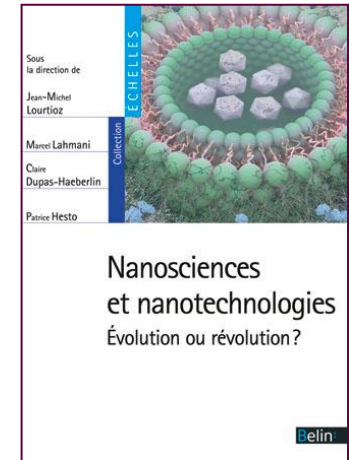
Impact: 6 granted M2 students are going on with a PhD in Paris-Saclay

# 2/ NanoSaclay meets the expected ambitions



## NanoSciences and society

1. Meeting with the local association « Collectif citoyen Nanotechnologies du Plateau de Saclay » in October 2014. Common actions towards general public
2. Publication (2014) of the book « Nanosciences et nanotechnologies. Evolution ou révolution? ». End of 2014, 500 copies sold
3. Support to the publication (2015) of a special issue of the review "La Recherche" in the framework of the International Year of Light
4. Annual events towards general public with NanoSchool: **>30 events** as Science Festival, meeting-debates "Nanosciences, Parlons-en?", "One researcher, one experience" in Palais de la Découverte (2015), specific exhibitions... Use of the 5 NanoSchool demonstrators
5. Web site: <http://nanosaclay.fr>





# 2/ NanoSaclay meets the expected ambitions



## Increasing the innovation and technological transfer

- Annual call for ITT projects (2012-2014):**

23 projects submitted  
 11 projects funded  
 Engaged: 523 k€ (average: 48 k€/project)

- Awards and distinctions:**

Grand Prix Tremplin Entreprises, 2012  
 Fibre Innovation Award, Opticsvalley 2013  
 Concours Mondial de l'Innovation, 2014

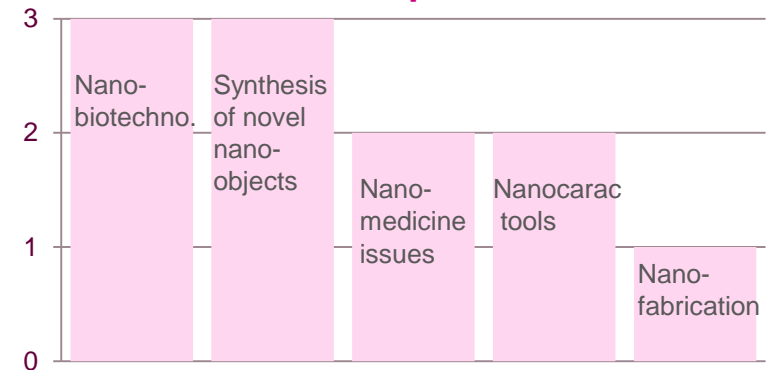
- Financial leverage effect:**

Funder	Entire budget (k€)	NanoSaclay projects
Idex, Prematuration	260	4
SATT, Maturation	1000	2

- Socio-economic impact:**

2 start-up companies SILTENE (2012) and AJELIS (2014)  
 Joint Lab CEA-Biowintech  
 4 projects still in progress are in close partnership with industrials

### Topics distribution



**Follow-up:** mid-term and final-term meetings between the project manager and project leaders to evaluate the progress of the projects followed by reports



# 2/ NanoSaclay meets the expected ambitions

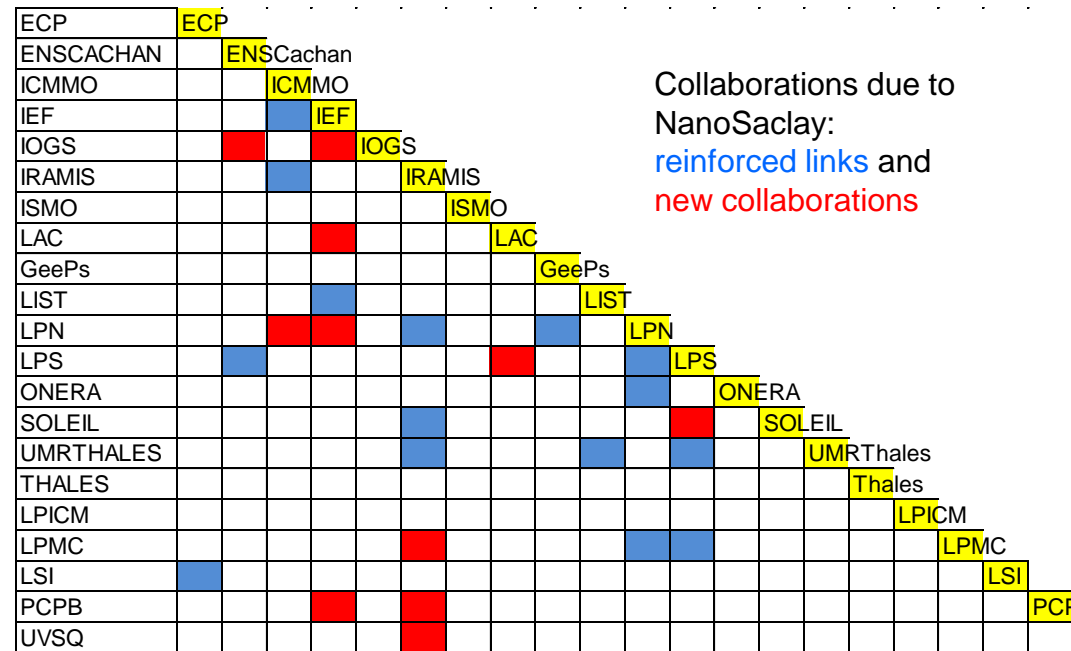


## Local networking effect

- New local collaborations:**

	Total (2008-2013)	NanoSaclay (2012-2015)
Nb of publications "nanos"	1560	81
Nb of publications in collaboration within NanoSaclay	173	26
<b>% collaboration</b>	<b>11</b>	<b>32</b>

Joint research laboratory MiNaO (LPN and ONERA), March 2015



- Coordination of LabEx activity with Equipex**
- Strengthening the dynamism of Idex Paris-Saclay**
  - Valorisation actions on the Campus Paris Saclay (NanoSaclay, Idex, SATT)
  - Education actions on the Campus Paris Saclay (NanoSaclay, Idex)
  - Disciplinary research departments of the Paris-Saclay University

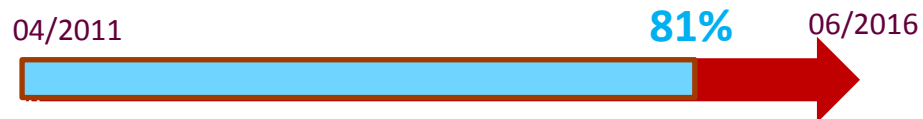
# 3/ Bilan budgétaire 2014



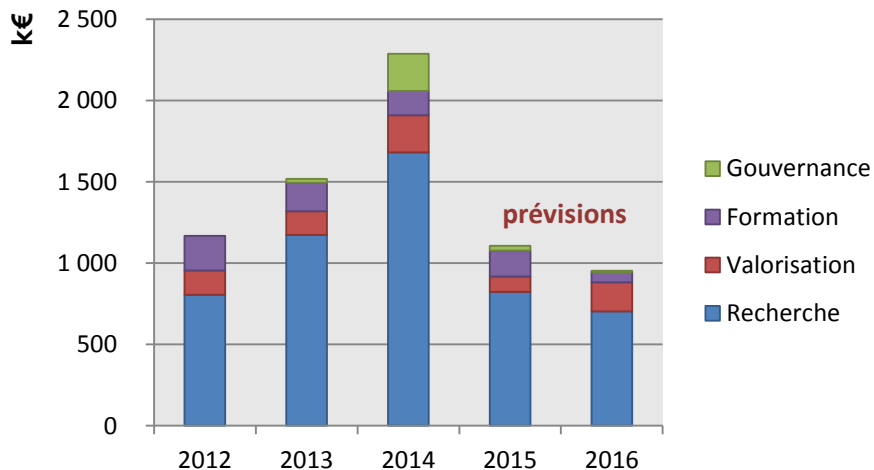
**Engagement au 24/06/15: 5 707,2 k€**

- Recherche: 4 219,7 k€
- Valorisation: 614,8 k€
- Formation: 586,7 k€
- Gouvernance: 286,0 k€
- 45 projets sélectionnés via AAP
- 51 CDD.an embauchés

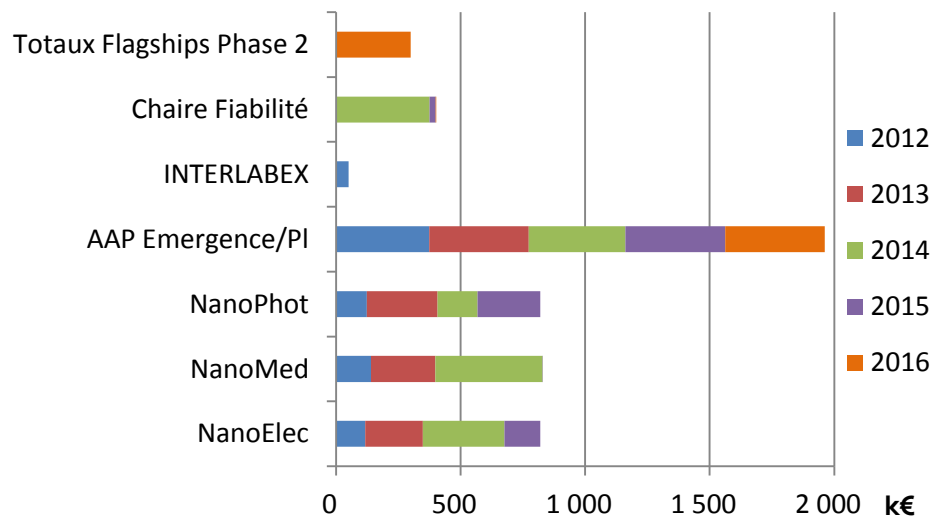
<b>Budget Phase 1 (04/2012 - 06/2016)</b>	<b>6 734 k€</b>	
Total des engagements au 24/06/2015	5 707 k€	85%
Total des dépenses au 31/12/2014	2 501 k€	37%



**Rythme des AE par axe et par an**



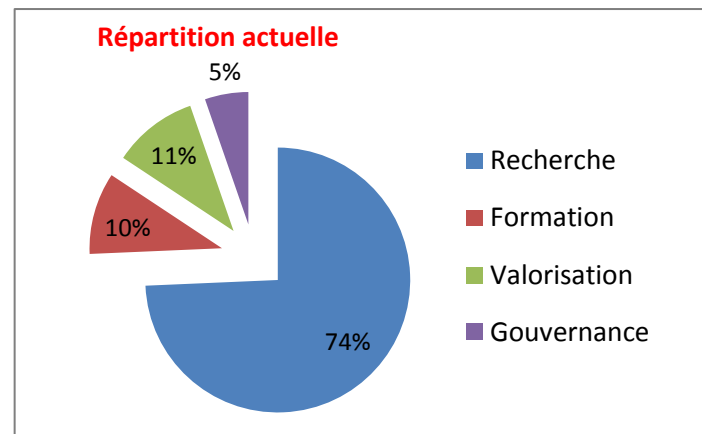
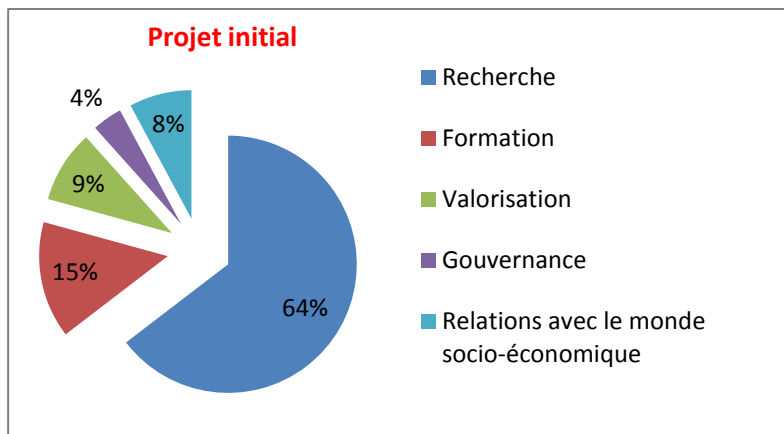
**Répartition des AE Recherche**



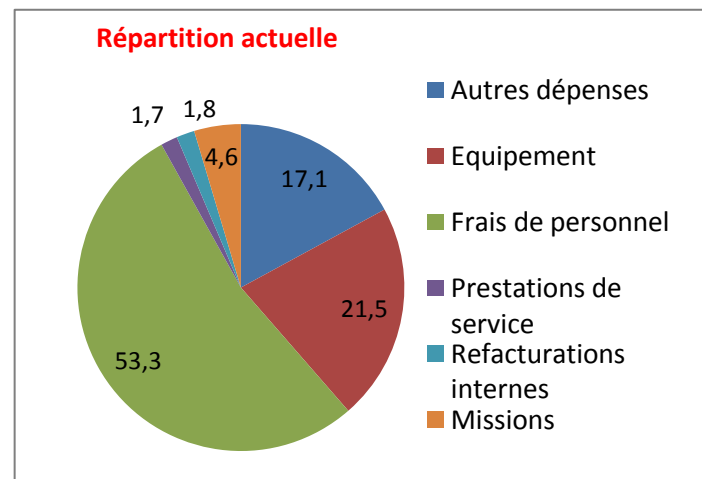
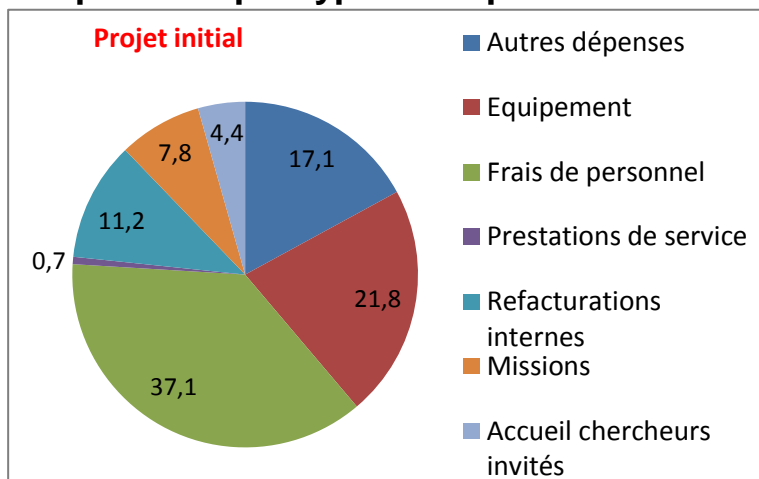
# 3/ Bilan budgétaire 2014 vs projet initial



## Répartition par axe:



## Répartition par type de dépense:



# 4/ En 2015 et stratégie pour la phase 2



## AAP Recherche 2015

8 projets sélectionnés sur 32 reçus, dont **4 thèses** et **6 nouvelles collaborations**

**Budget : 514 k€** au lieu de 400 k€ initialement prévus

NOM	PRENOM	Labo / Equipe	Type de projet	Acronyme	Titre	Budget alloué (k€)	Durée (an)	
CAMPIDELLI	Stephane	CEA/IRAMIS	Blanc	GANESH	Synthesis of Graphene Quantum Dots and Nanomeshes	104	3	thèse
MAILLY	Dominique	LPN	Plateforme	NANOFIBHEL	Contribution à l'achat d'un microscope à faisceau d'hélium	50	2	
GARCIA	Vincent	UMPhy	Blanc	FERROMOTT	Ferroelectric Control of Mott Insulators	94	3	thèse
HWANG	Gilgueng	LPN / Nanoflu	Plateforme	RAPID_3D	Module d'écriture rapide pour nanolithographie 3D	50	3	
OUGHADDOU	Hamid	ISMO	Blanc	SILICENE	SILICENE : NOUVEAU MATERIAU 2D	53	3	thèse
SCHNEEGANS	Olivier	LGEP	Blanc	OxCOM	Oxydes de cobalt pour dispositifs à modulation de résistance	9	2	
SAINT-MARTIN	Jérôme	IEF / COMICS	Blanc	MONANOT	MOdélisatiON Avancée de naNOfils Thermoélectriques	104	3	thèse
DEGIRON	Aloyse	IEF / CRIME	Blanc	ROMA	Vers une nouvelle forme de matière artificielle	50	1	
<b>TOTAL</b>						<b>514</b>		

# 4/ En 2015 et stratégie pour la phase 2



## AAP Valorisation 2015

8 projets sélectionnés sur 10 reçus, dont **5 émanant d'équipes de NanoSaclay**

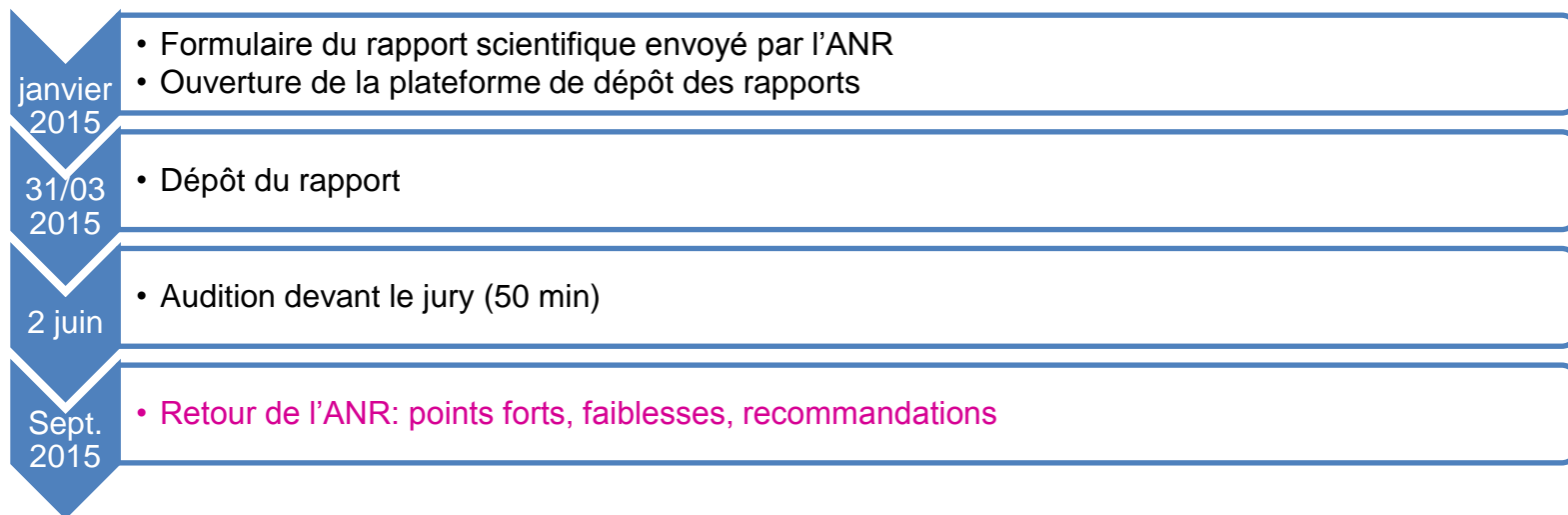
**Budget total:** 305,9 k€ dont 91,8 k€ pour NanoSaclay

Acronyme	Titre	Porteur	Laboratoire	Alloué (k€)
PRODIGE	PRODUCTION d'Imogolite à Grande Échelle	THILL Antoine	CEA/IRAMIS	40
GRADIAN	Générateurs d'Harmoniques Large-Bande et OPA	GOBERT Olivier	CEA/IRAMIS/LIDyL	57,1
PISTIL	Piston and Tilt interferometry	BELLANGER Cindy	ONERA/DOTA	40
BdGraph	Barrière de diffusion métallique à base de graphène	NOEL Sophie	LGEP	35,8
MASIL	Miroirs absorbants saturables pour impulsions laser ultra-courtes	OUDAR Jean-Louis	LPN	16
DICHRO50mK	Dispositif de mesure de dichroïsme magnétique à 50mK	OHRESSER Philippe	SOLEIL	50
3DPAuW	Alliage or-tungstène sous toutes ses formes	DERANLOT Cyrile	UMPhy CNRS/Thales	50
AMEFI-STRIPP	Amélioration d'efficacité de l'imagerie industrielle par STRIPP	SCHMIDHAMMER Uli	LCP	17





## « Point d'étape » de l'ANR



## « Petits déjeuners » avec industriels

Stratégie: rencontre **thématique** entre chercheurs du LabEx et industriels du Plateau de Saclay

Objectif: présentations croisées de ce qui est fait au sein du LabEx et de ce qui est attendu par les industriels

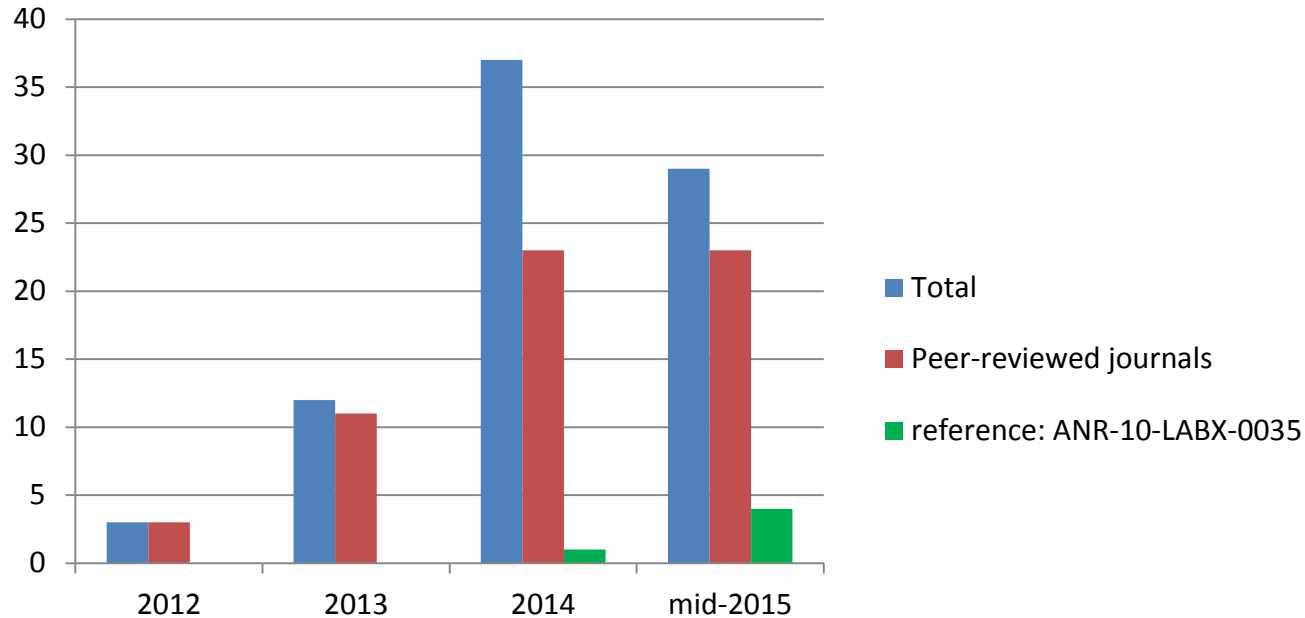
Flyer NanoSaclay mis en place afin de faciliter le 1<sup>er</sup> contact

1<sup>er</sup> petit déjeuner organisé par NanoElec, été 2015

# 4/ En 2015 et stratégie pour la phase 2



## Financement LabEx et publications

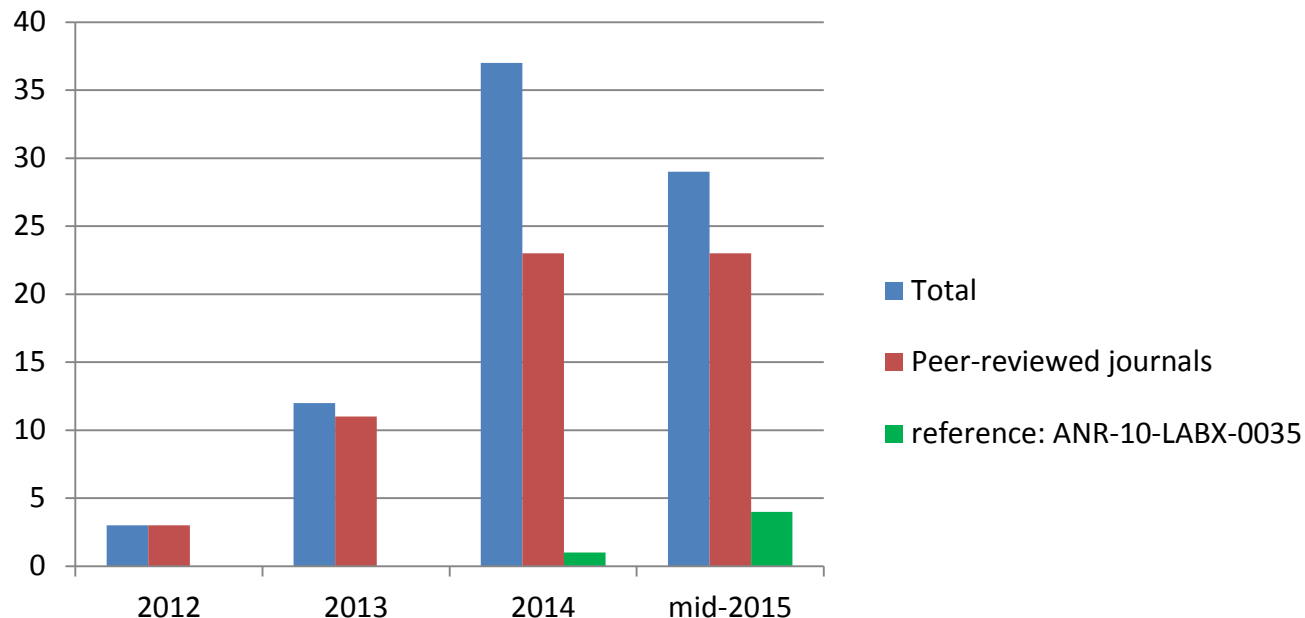


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This work has received support from the French State through the National Agency for Research under the program of future investment EQUATION (No. ANR-10-LABX-0035) reference ANR-10-EQPX-50 as well as from the French Directorate for Armament and the Labex "Nanosack" (the name BioCL. The research leading to these results has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska Curie Grant Agreement No. n312483 (ESTEM2).



## Financement LabEx et publications



“This work is supported by a public grant overseen by the French National Research Agency (ANR) as part of the “Investissements d’Avenir” program (Labex NanoSaclay, reference: ANR-10-LABX-0035) ”

# 4/ In 2015 and strategy for the Phase 2



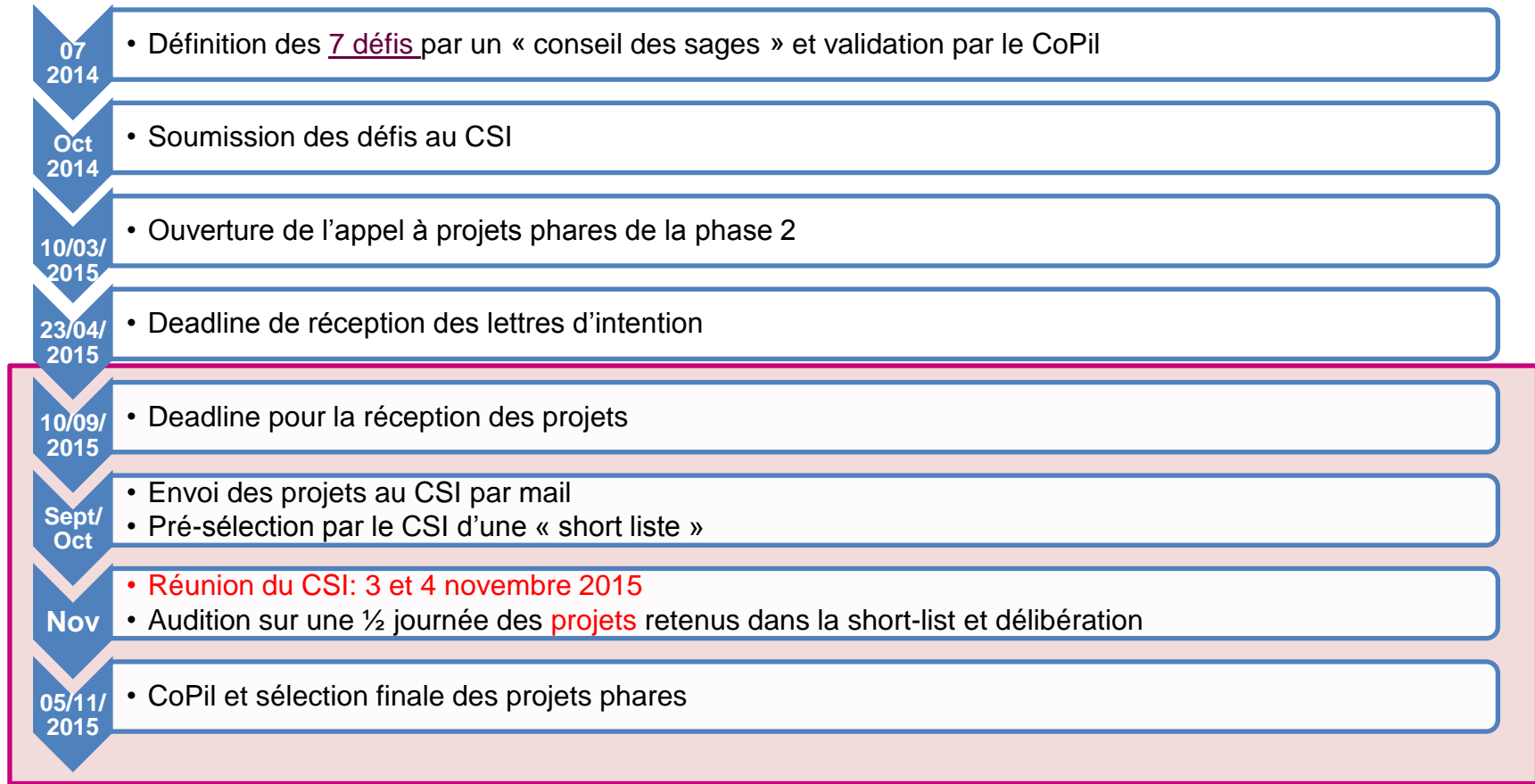
Major decisions for Phase 2 (2016 – 2019):	Budget/goal
To select new targeted flagships projects (CGI recommendation)	2 000 k€
To keep alive the 3 main communities of NanoSaclay	270 k€
To favor PhD theses	12
To abandon the chair “Toxicology of Nano-objects”	/
To keep a project manager until the end of the LabEx	180 k€
To gradually increase the valorization budget	190 k€/y
To decrease the education budget at the same level of Phase 1	590 k€

Relying on  
4,4 M€ net  
for Phase 2

# 4/ En 2015 et stratégie pour la phase 2



## Sélection des projets phares de la phase 2 (2016 – 2019)



# 4/ En 2015 et stratégie pour la phase 2



## Sélection des projets phares de la phase 2 (2016 – 2019)

Challenge	Lettre d'intention
Doter le territoire Paris Saclay d'une source de graphène à l'état de l'art mondial	1
Réaliser des nanocomposants multifonctionnels pour développer des architectures de calcul en rupture	1
Réaliser des hétérostructures d'oxydes fonctionnels sur de grandes surfaces	1
Vers une convergence de la nanophotonique et de l'information quantique	1
Les nanostructures au service des dispositifs photoniques	4
Vers de nouvelles méthodes de mise en forme des matériaux hybrides	0
Traitements à base de nanomédicaments et nano-bio-détection à haute performance	2
Autre	1

### Critères d'éligibilité

Effet structurant du projet: rassemblant au moins 4 équipes de 4 laboratoires différents de NanoSaclay

Nouvelles collaborations recommandées

### Critères de sélection

Qualité du consortium

Qualité scientifique du projet

Organisation et gestion du projet

Devenir et envergure du projet



# Retrouver toute l'actualité du LabEx sur le site web



Et même plus...

The screenshot shows the NanoSaclay website with the following sections and annotations:

- Navigation:** Accueil, Laboratoires, Vie du LABEX, Recherche, Formation, Emploi, Contacts.
- LES DÉPÊCHES:** A section for news, highlighted with a pink circle. It features an article about 'La Recherche hors série, juillet 2015' with a 'La Recherche La lumière' cover image.
- Journée annuelle du LabEx NanoSaclay :** A section for the annual event on June 29, 2015, with a detailed program and contact information.
- FAITS MARQUANTS:** A section for notable events, highlighted with a pink circle. It includes articles like 'Une nouvelle classe de photocatalyseurs' and 'A la recherche de nouveaux nanovecteurs furtifs'.
- Brochure de présentation:** A link to a presentation brochure, highlighted with a pink arrow.

Rubrique recherche:  
Flagships + Projets  
des AAP

Rubrique emploi: Labex  
ou « nano » hors LabEx

Plaquette de présentation