

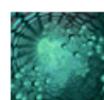
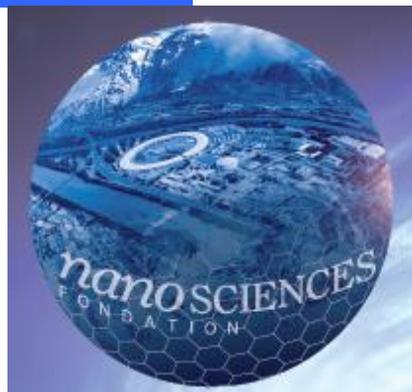
nano SCIENCES

FONDATION  
sous l'égide de la Fondation  
Université Grenoble Alpes

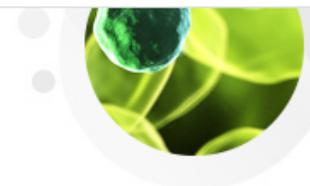


[www.fondation-nanosciences.fr/](http://www.fondation-nanosciences.fr/)

Alain Fontaine,  
Director



NANOSCIENCES  
NANOTECHNOLOGIES



Recherche

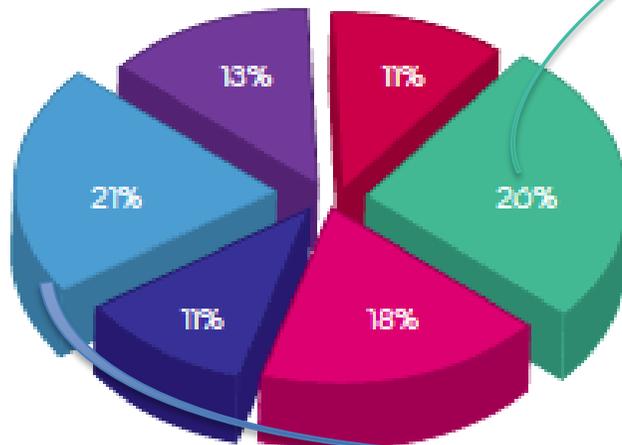
**ESONN**  
Grenoble, France  
Next session:  
From August 26 to September 15, 2018  
ORGANIZED BY: UGA & Grenoble INP  
CO-ORGANIZED BY: CNRS & CEA

Our school  
From 2004, ESONN is a three-week course aimed at providing training for graduate students, postdoctoral and junior scientists from universities and laboratories, all around the world, in the field of Nanosciences and Nanotechnologies.

Read more



## Nano in France



- Ile de France
- Sud Ouest
- Grand Est
- Rhône Alpes
- PACA
- Nord Ouest



[www.fondation-nanosciences.fr/](http://www.fondation-nanosciences.fr/)

2007-2018....

The Nanosciences Foundation's network in Grenoble = 33 laboratories

chartreuse

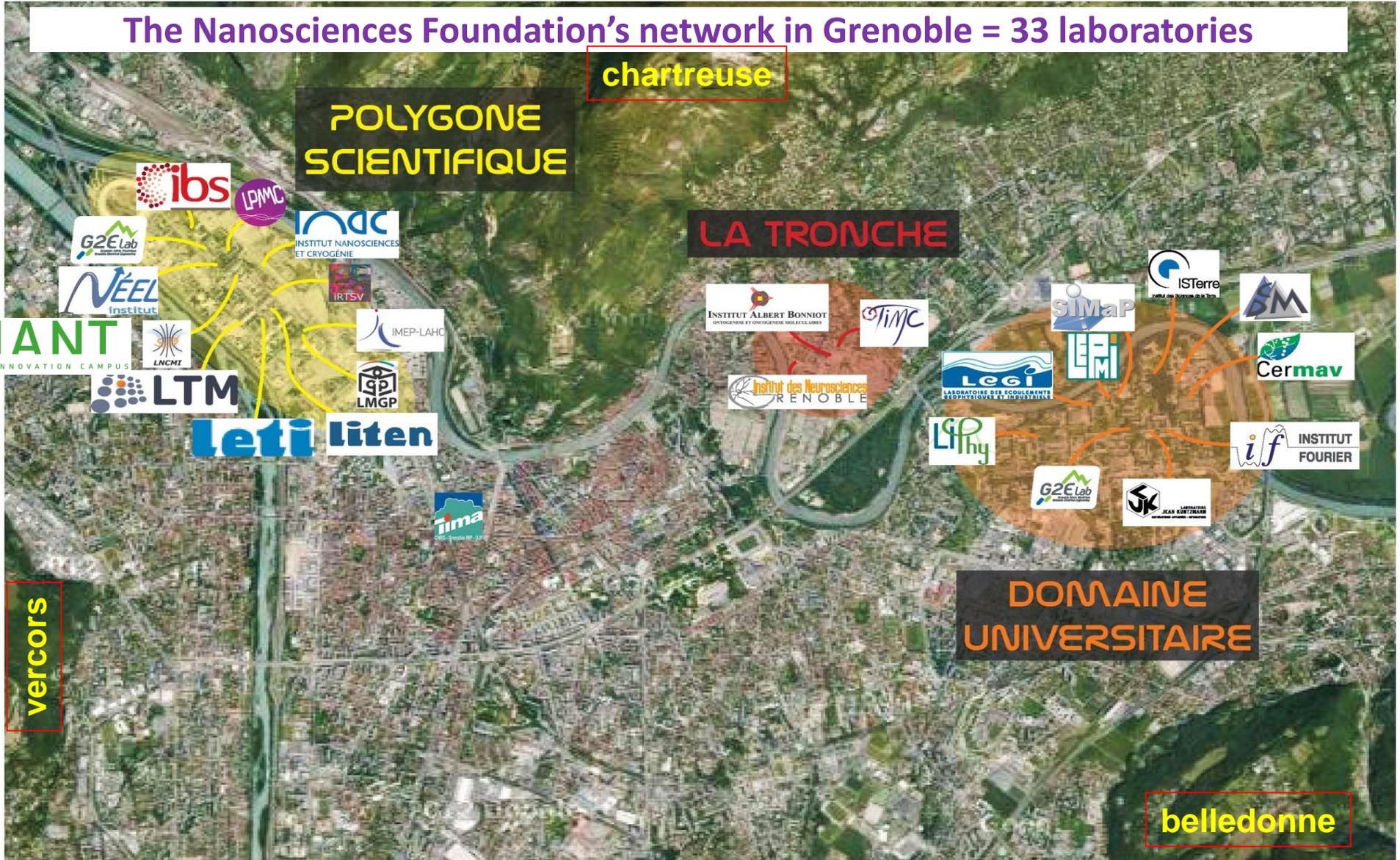
POLYGONE SCIENTIFIQUE

LA TRONCHE

DOMAINE UNIVERSITAIRE

vercors

belledonne



## 3 LEADING COMMITMENTS TO DRIVE THE FOUNDATION

### → Networking: Human resources

❖ *international recruitment*

**chairs of excellence: top level scientists**

**outstanding PhD students & post-doctoral fellows**

### → Networking: investment

- **upgrading** experimental facilities to the current international level,
- **full sharing** by the Grenoble scientific community

### → Networking: a challenge, for all the laboratories

❖ *basic research labs as well as the R&D-based labs*

- to achieve a local **better integration**
- to **boost the ecosystem** in Grenoble

**La Fondation Nanosciences, une approche fertile «long terme» de la recherche centrée sur :**

- l'attraction de ressources humaines - l'essentiel de la recherche - puisées au meilleur niveau international,
- le renforcement des réseaux grenoblois, créés et portés par les équipes nano multidisciplinaires,
- l'excellence et l'engagement cohérent de la communauté scientifique créant force et visibilité, bien au delà des seuils critiques.

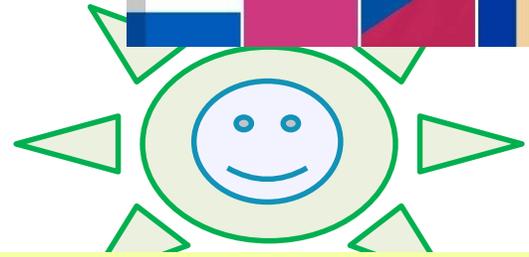


-  Chaire excellence (35)
-  Post-doc (59)
-  PhD student (68)

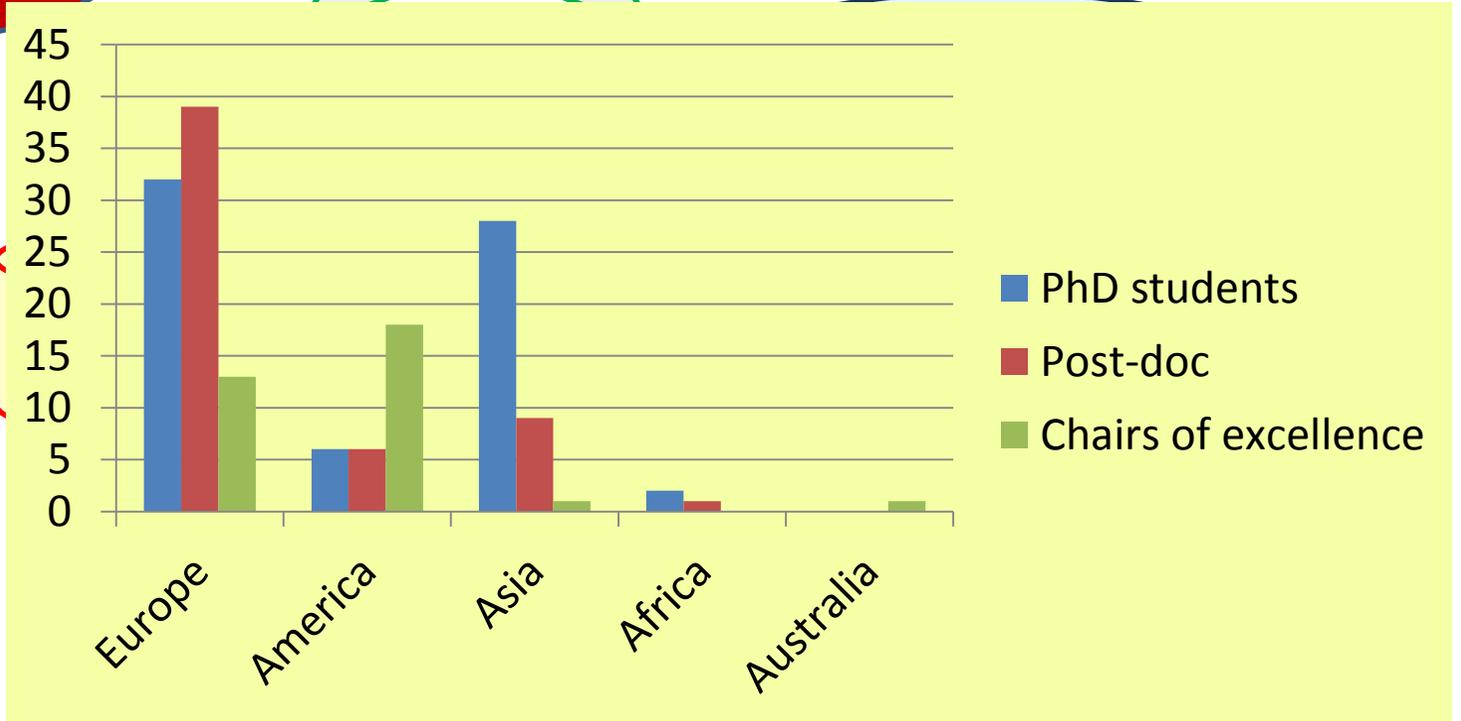
**Human resources**



**Main actions**



**Chairs of excellence**





Donald Martin + d'infos Joaquin Fernandez + d'infos Leonid Glazman + d'infos Michael Roukes + d'infos



H.S. Philip Wong + d'infos Vaclav Holy + d'infos Vincent Bayot + d'infos Mair Chshiev + d'infos



Tetiana Aksenova + d'infos Alexander Zaslavsky + d'infos Leonardo Fonseca + d'infos Marcelo Franca Sant + d'infos



John R. Kirtkey + d'infos Normand Mousseau + d'infos Yong Zhang + d'infos Max Hoffheinz + d'infos



Yoshio Nishi Harold Baranger David Graves Jian Min Zuo



### Fondation Nanosciences

sous l'égide de la *Fondation Université Grenoble Alpes*



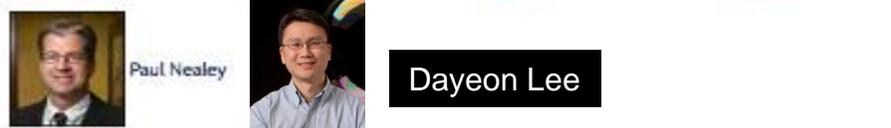
Val Zwiller + d'infos Ralf Richter + d'infos Dillon Fong + d'infos Jean-Louis Barrat + d'infos



Sergey Frolov + d'infos Iouli Nazarov + d'infos David Ceperley + d'infos Eric Colinet + d'infos



William Bailey + d'infos Amy Wagoner + d'infos Jukka Pekola + d'infos Michel Barsoum + d'infos



Paul Nealey Dayeon Lee

34 chairs of excellence





**Daeyeon LEE, 42**, Professor. @ PENN (Dept of Chem. & Biomol. Eng.).  
*PhD MIT-2007, post-Doc Harvard,*



- 
- 
- 

Kick off 5 mars 2018



**“Scalable manufacturing of ZnO and TiO<sub>2</sub> based biofouling resistant nanostructured membranes for water purification”**

# Grand Challenges for Engineering (US National Academy of Eng.)



Make solar energy economical



Provide energy from fusion



Develop carbon sequestration methods



Manage the nitrogen cycle



Provide access to clean water



Restore and improve urban infrastructure



Advance health informatics



Engineer better medicines



Reverse-engineer the brain



Prevent nuclear terror



Secure cyberspace



Enhance virtual reality



Advance personalized learning



Engineer the tools of scientific discovery





## Start up from Grenoble, electronic nose able to identify the odors.

- coordinator : *on leave from CEA-INAC SyMMES (2000-2016).*

*Expert in bioanalysis & the bio-sensors miniaturisation.  
Holds 25 patents & have created 3 start-ups,  
including GENOPTICS 2002 being now part of Horiba Jobin-Yvon.*

- partners: DOPT (CEA-LETI) & SyMMES (CEA-CNRS-UGA).



**Thierry Livache**  
**(CSO)**

Start  
01/01/2018



**Isabelle DEMOARES**  
born 27/08/89

- **Master Electrical Engineering Rio Janeiro**

*scientist @ Petrobras in parallel for 6 years*

*Gold medal at the Brazilian Astronomy Olympiade (2006 & 2007)*

Néel, au **24/10/2017**

**Nora Dempsey** : NEEL-CNRS UGA, & SPINTEC CEA-INAC-CNRS UGA

**Model nanosystems for hard magnetic materials, composites.**

Increase coercivity by about 30%, up to 180°C.



**Jonathan**  
**WEERAKKODY**  
born 04/08/91

- **Master Nano2016-2017, ERASMUS MUNDUS M2 Grenoble**

**Louisiana University 2010-2015**

**Yanxia HOU-BROUTIN** : SyMMES CEA-CNRS UGA, au **08/01/2018**

& LIPhy UGA CNRS, GIPSA-Lab UGA-CNRS, Aryballe Technologies

**Development of an opto-electronic nose**





**Jury 1 june 2018:** 31 applicants, **19** @ Fondation, **2** positions, 3 laureates,  
(cofund with LANEF, GreQuE, QuEnG)



**Massimiliano COMIN**, 26 ans, NEEL  
Gabriele D'Avino, Xavier Blase, NEEL, Ivan Duchemin INAC



*Doping of molecular semiconductors and the insulator-to-metal transition*



**Pablo GARCIA\_CAMPOS**, 24 ans NEEL  
Klaus Hasselbach, plus INAC



*Study of chiral superconductivity in UPt3 by  $\mu$ squid microscopy*



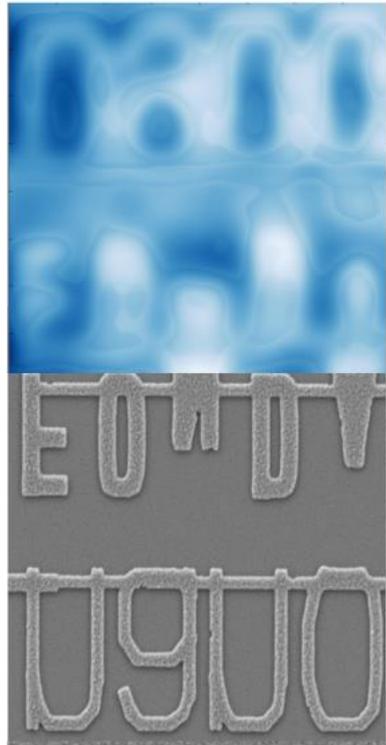
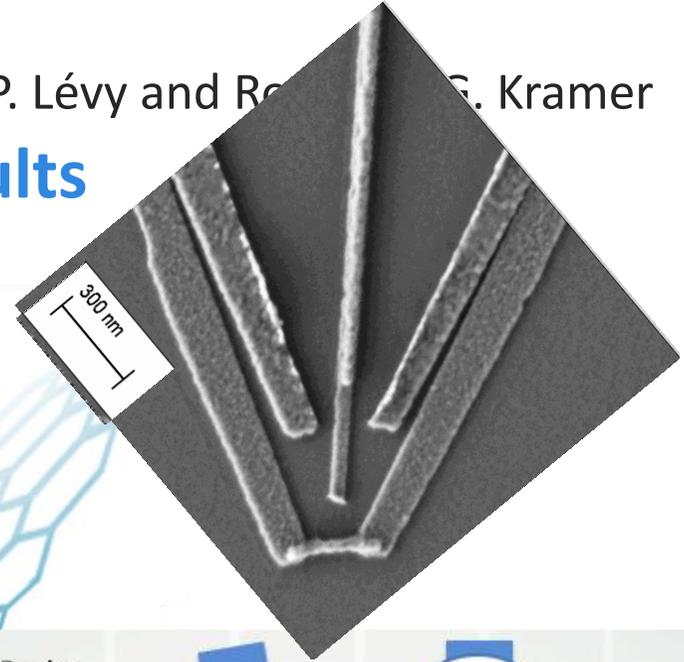
**Amhed SIDI ELVALLI**, 23 ans SPINTEC  
Ursual EBELS plus LETI, C.Cyrille et D.Morche



*RF-to-DC conversion in PMA magnetic tunnel junctions,*

Jorge P. Nacenta Mendivil, Laurent P. Lévy and R. G. Kramer

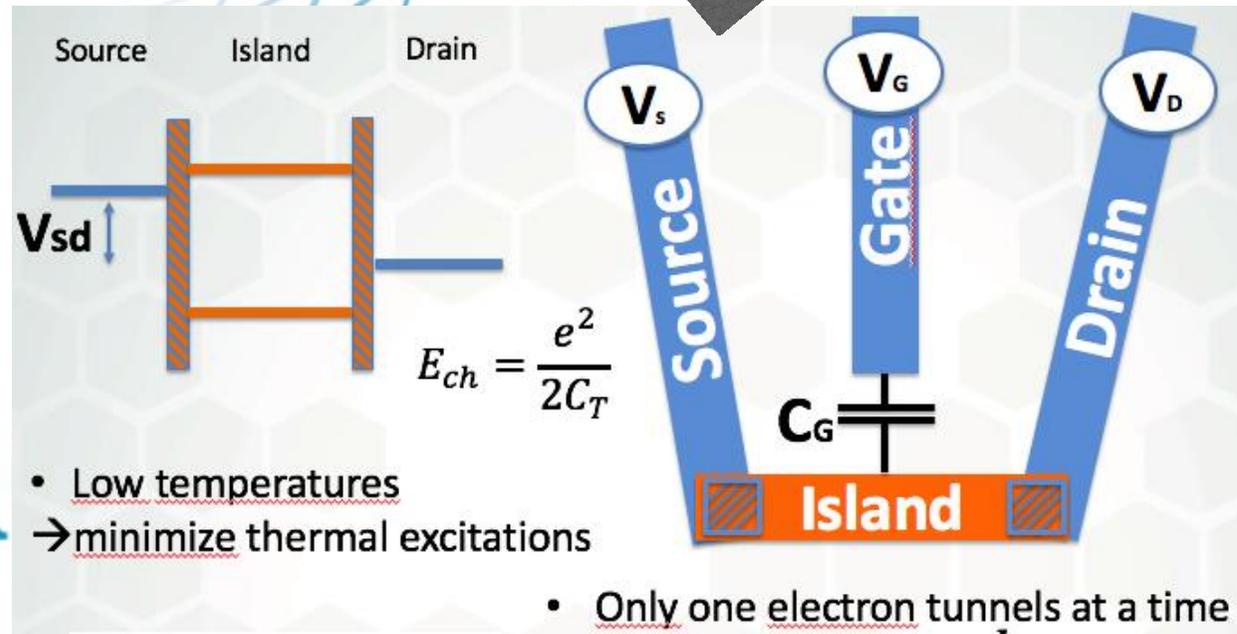
funny results



SCIENCES

T I O N  
T I O N

SCIEN



Scanning Single Electron Transistor Microscopy

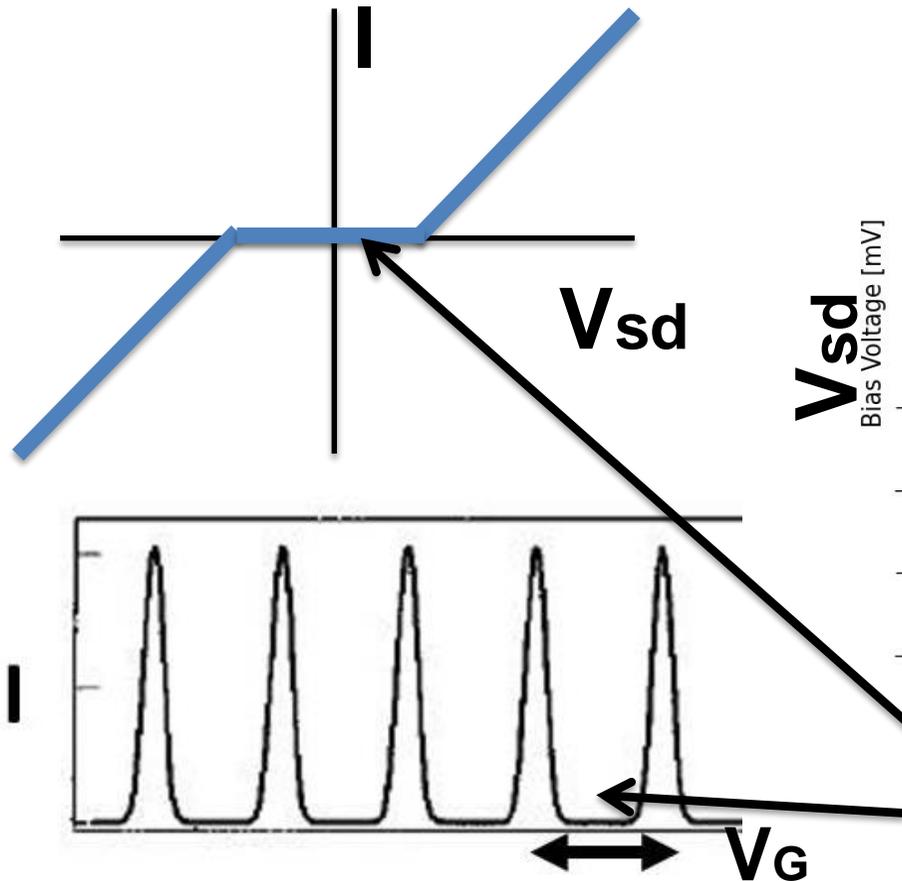
first images on a test sample



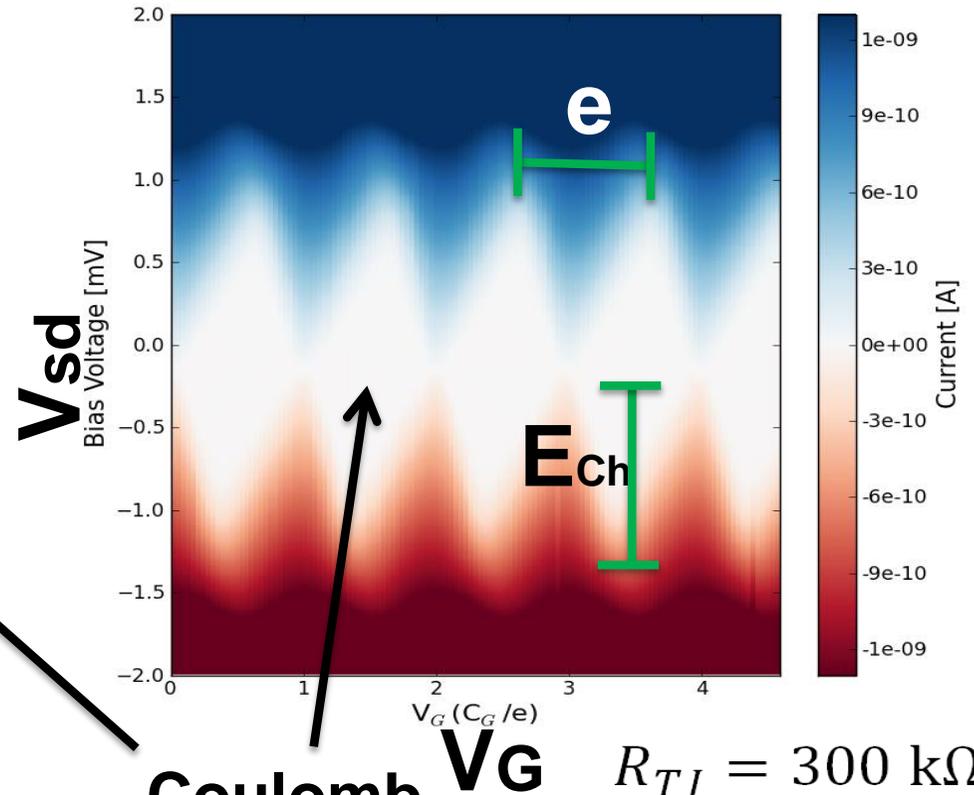
# Real experimental conditions

$$E_{Ch} [K] = 10 \pm 1 K$$

Stability diagram  $\rightarrow$  Coulomb diamonds



**B=0.5T**    **T=100 mK**



**Coulomb Blockade**

$$R_{TJ} = 300 \text{ k}\Omega$$

$$C_G = 3 \text{ aF}$$



Mairbek CHSHIEV, UGA

**ESONN 2018  
YEAR # 15**



**European School On  
Nanosciences  
& Nanotechnologies**

## Organizing Committee.



Mairbek CHSHIEV, UGA



Liliana PREJBEANU, Gr.



Hervé COURTOIS, UGA



Chantal TARDIF, CEA



Marianne WEIDENHA.



Dmitry ALDAKOV, CNRS



Gilles NOGUES, CNRS



Yoann ROUPIOZ, CNRS



Martial Baland, UGA



Clotilde BONHOURE-E.



Isabelle GAUVIN, UGA



Yulia MAZET, UGA

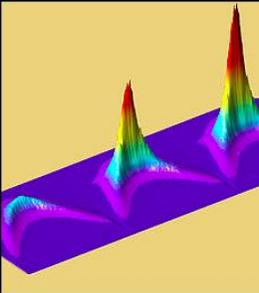


Joseph GERMIANO, U.



**Grenoble, France  
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CO-ORGANIZED BY: CNRS & CEA**



**All the partners**

### Our school

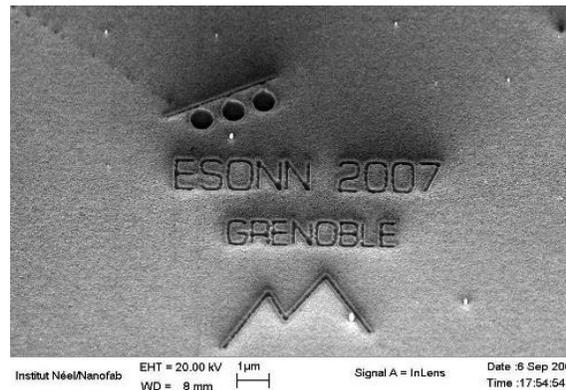
From 2004, ESONN is a three-week course aimed at providing training for graduate students, postdoctoral and junior scientists from universities and laboratories, all around the world, in the field of Nanosciences and Nanotechnologies.

[Read more](#)



## Practicals @ University clean rooms: CIME

- 450 m<sup>2</sup> of clean rooms at the Minatec innovation center
- “Nanomonde” platform for local probes
- Biotechnologies,
- Electrical characterization,
- Simulation, conception ...



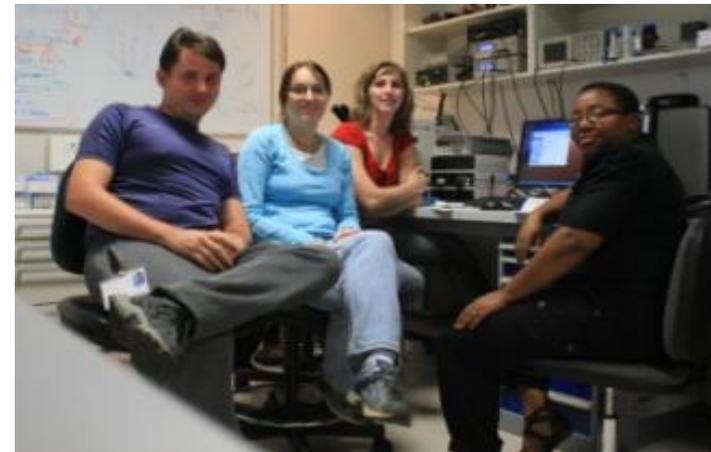
Centre Interuniversitaire de Micro-Electronique :  
U. Grenoble-Alpes and Grenoble-INP



ESONN'08

August 24<sup>th</sup> - September 13<sup>th</sup>, 2008 - Grenoble, France

Microsystems Labs





# Nanosciences & Nanotech Master @ U Grenoble Alpes *a multi-disciplinary program*

## The Erasmus Mundus Master Nano

### 3 Research Tracks

- Nanobiology & Nanobio technology
- Nanochemistry & Nano objects
- Nanophysics & Nanostructures

### 1 professional track

- Micro & Nanosystems Engineering



[david.ferrand@neel.cnrs.fr](mailto:david.ferrand@neel.cnrs.fr)



[cyrille.train@Incmi.cnrs.fr](mailto:cyrille.train@Incmi.cnrs.fr)



[Elisabeth Charlaix@univ-grenoble-alpes.fr](mailto:Elisabeth.Charlaix@univ-grenoble-alpes.fr)

**NETWORKING** is the **THE** solution

a **COMPULSORY** approach

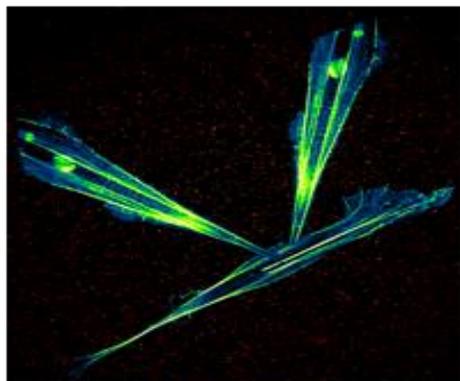
- to face
  - i) the science complexity  
*(interdisciplinarity but also to gather manpower with required & diverse expertise)*
  - ii) the cost of the top equipments  
*which have to be friendly open & shared platforms*
- to be part of -and open to- the **international** competition-collaboration  
*to push the frontiers of knowledge*
- to keep bringing new **knowledge** in resourcing innovation, in raising human capability

Alain Fontaine,  
Thanks for your attention

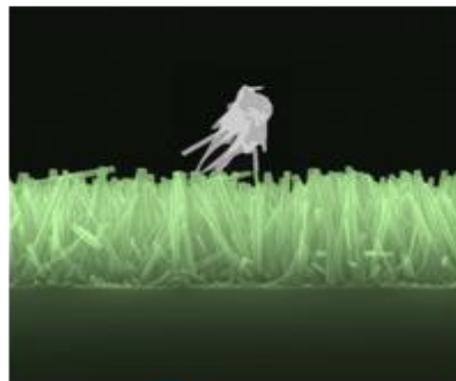


nanoSCIENCES  
FONDATION de la Fondation Université Grenoble Alpes

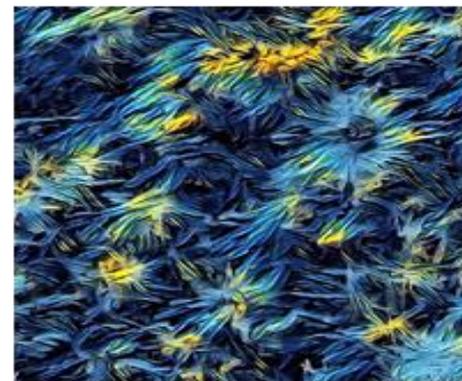
The 2017  
NanoArt  
contest



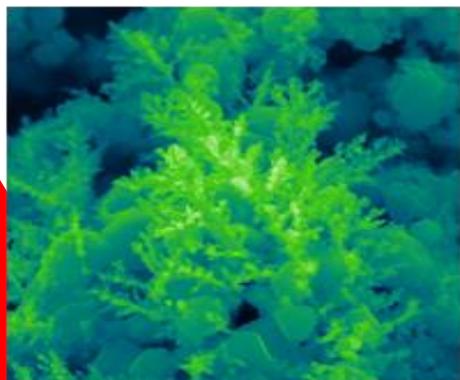
January



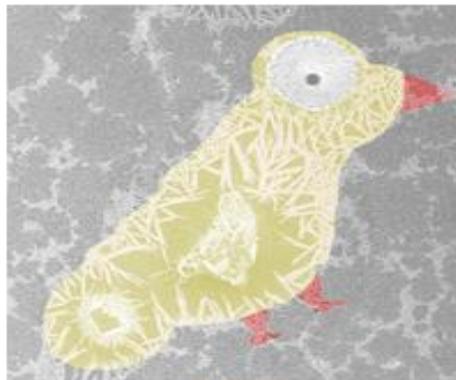
February



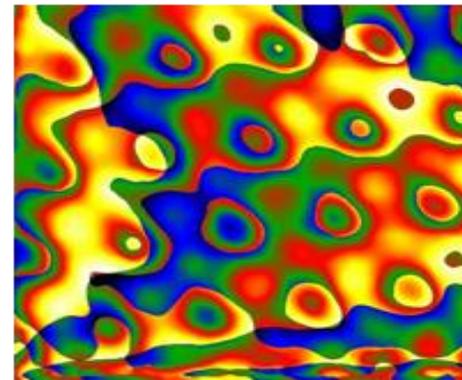
March



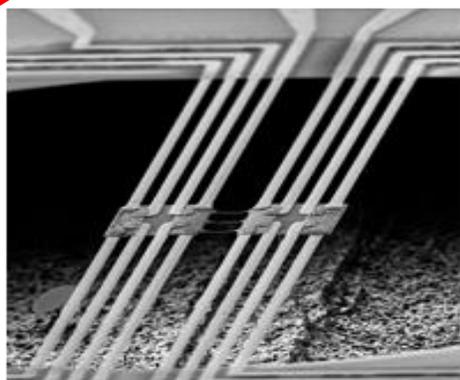
April



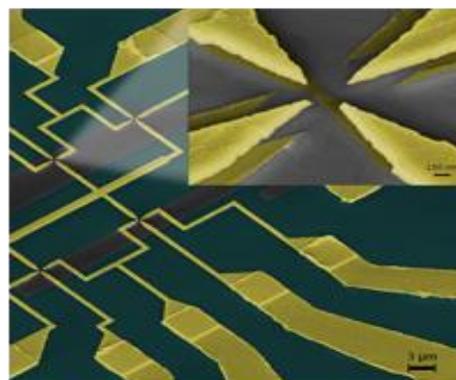
May



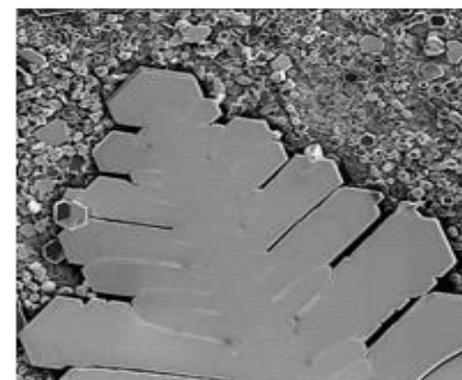
June / July / August



September



October / November



December

<http://www.emm-nano.org/>

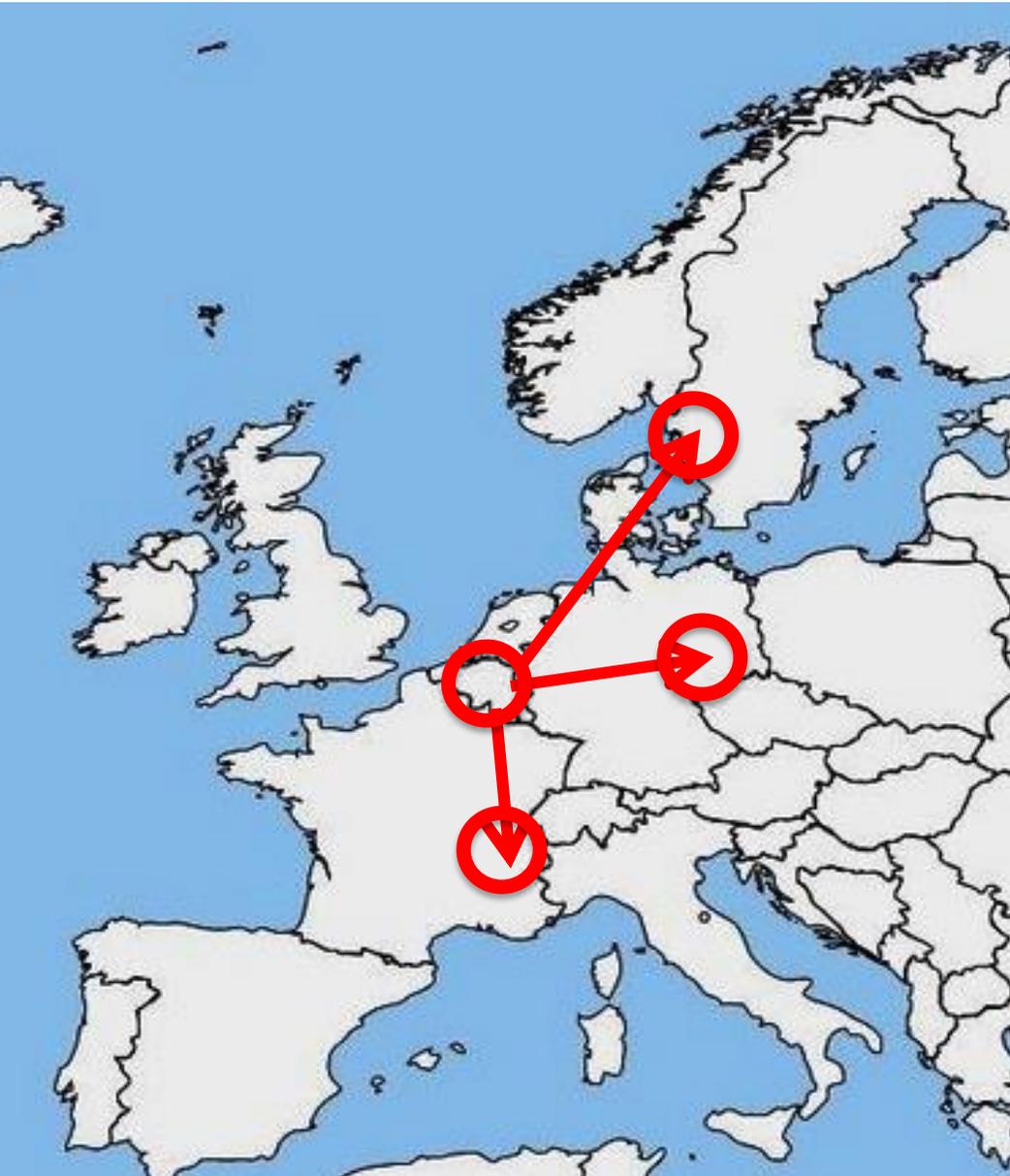
**Master N2 & the european consortium.**

## 4 European Universities

- K.U. Leuven (BE) - coord
- Dresden University of Technology<sup>★</sup> (DE)
- University Grenoble-Alpes (FR)
- Chalmers U. of Technology, Goeteborg(SE)

- **2 years** master programme
- **First year in KU Leuven**
- Second year in any of the other 3

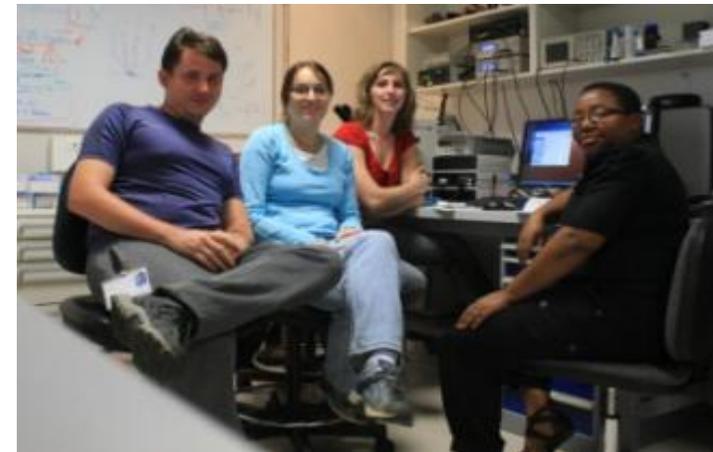
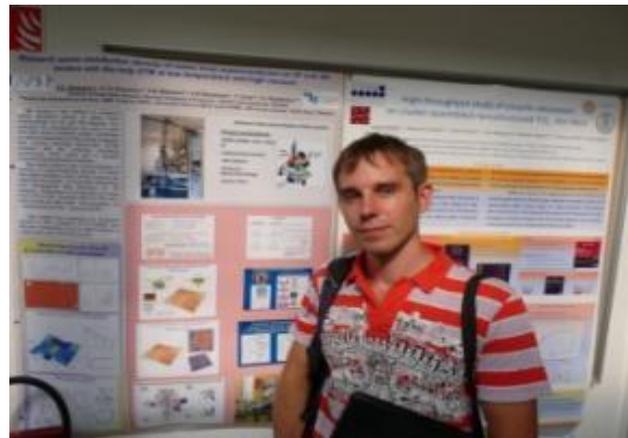
Award of a **joint degree**  
to all successful students



ESONN'08

August 24<sup>th</sup> - September 13<sup>th</sup>, 2008 - Grenoble, France

Microsystems Labs



- Alexander ZASLAVSKY
- David CEPERLEY
- David GRAVES
- Dillon FONG
- Harold BARANGER
- Jian Min ZUO
- John KIRTLEY
- John LANDERS
- Leonid GLAZMAN
- Loren SWENSON
- Michael ROUKES
- Sergey FROLOV
- Philip WONG
- Yong ZHANG
- Yoshio NISHI

- Miryam ELOUNEG JAMROZ
- Normand MOUSSEAU

- Anne BERNARD MANTEL
- Anne MARTEL
- Aurélien MASSEBOEUF
- Benjamin SACEPE
- Benoît BERTRAND
- Billiel SAHLI
- Cécile DELACOUR
- Karim AISSOU
- Laure DELFOUR
- Thomas NOGARET
- Thomas QUAGLIO
- Vincent CONSONNI
- Vincent RENARD
- Sander DORENBOS
- Val ZWILLER

- Andreas PFEFFER
- Cornelia SCHWARZ
- Hartmut WEGE
- Kathrin ZIMMERMANN
- Marc GANZHORN
- Max HOFHEINZ
- Sven ROHR
- Thomas WEISSL
- Tobias BAUTZE

- Aleš HRABEC
- Václav HOLY

- Alan KALITSOV
- Alexandra DAVYDOVA
- Alexey DOBRYNIN
- Dmitry ZAKHAROV
- Mair CHSHIEV
- Mikhail KUSTOV
- Vitaly POLOVINKIN

- Chonglong CAO
- Hongxin YANG
- Jiale HUA
- Jing WAN
- Kanhao XUE
- Minhao YAN
- Peng LIU
- Shidong WANG
- Xiaojun CHEN
- Xu WANG



- Natalia ARES

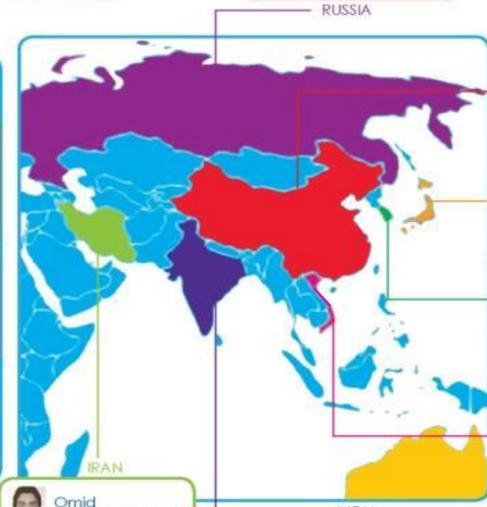
- Daniel VALENTE
- Jean Faber FARREIRA DE ABREU
- Leonardo FONSECA
- Marcelo FRANCA SANTOS
- Márcio MEDEIROS SOARES
- Vinicius FERRAZ GUIMARES



- Daniel HERNANGOMEZ PEREZ
- Joaquín FERNANDEZ ROSSIER
- Libertad ABAD MUNOZ
- Paul CLAPERA
- Ralf RICHTER

- Elisa MIGLIORINI
- Francesca COSCIA
- Giada GHEZZI
- Lavinia LIGUORI
- Valentina CANTELLI

- Kitti RATTER
- Alexander GRIMM
- Georgiana Irina GROZA
- Teodora Ancuta SCHEUL
- Tsanka TODOROVA



- Omid FAIZY NAMARVAR
- Hadi ARJMANDITASH

- Andrey YELSYEYEV
- Olexiy FEOFANOV
- Sergiy BOKOCH
- Tefana AKSENOVA
- Vitaly HOLOVACH

- Akash CHAKRABORTY
- Anupam KUNDU
- Arpan DEB
- Bhaarithi NATARAJAN
- Dibyendu HAZRA
- Dhruv THAKAR
- Kalpana MANDAL
- Nitin Singh MALIK
- Purvi JAIN
- Sandeep AGNIHOTRI
- Siddarth NAMBIAR
- Soumya BERA
- Subhadeep DAITA

- Hideyuki MIZUNO
- Jae Woo LEE
- Jun-Seok HWANG
- Chi VŌ VÂN
- Vân Đại NGUYỄN
- Don MARTIN

> 150

- Chair of Excellence
- Post-doc
- PhD student

**2016 Chair of excellence.**

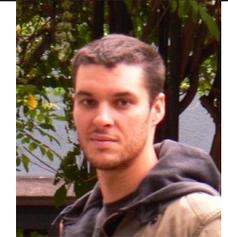
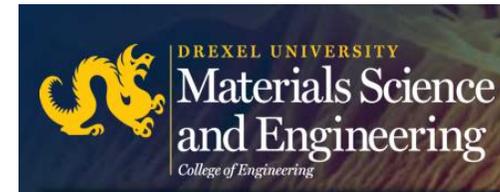
**Michel BARSOUM,**  
**Pr DREXEL University Philadelphie.**

“Characterization of Mxene Monolayers and Mxene-based Heterojunctions”,

- coordinateur Thierry OUISSE, **LMGP, Institut Néel, INAC,**
- support 300 k€.



Thierry Ouisse



**Paul NEALEY,**  
**Pr University of Chicago .**

“Directed Self-Assembly of Block Copolymers: Towards Smart Functional Surfaces for Nanoelectronics, Energy and Biology. Acronym DiSABloC”,

- coordinatrice Raluca TIRON, **CEA Leti, INAC, CERMAV,**
- 300 k€ including 55 k€, to complement (co-financed by LANEF)



Raluca Tiron

