

PALLEAU Etienne

2014 Gorman Street  
Raleigh, NC, 27606 (USA)  
*French, 26 years old*



@ : [palleaue@gmail.com](mailto:palleaue@gmail.com)

## PhD in Physics from INSA, University of Toulouse (FRANCE)

**Key words:** Nanoxerography, Nanopatterning, Directed self assembly, AFM, KFM, Colloidal Nano-objects

### EDUCATIONAL BACKGROUND

► **October 2011 - Present:** **Postdoc funding by the French Army (DGA)** supervised by Professor Orlin Velev and Michael Dickey of the North Carolina State University (NCSSU), Raleigh, USA

**Topic:** Original assemblies of nano-objects combining electric field and microfluidic

► **2008-2011:** **PhD funding by the (French) National Center for Scientific Research (CNRS)** supervised by Professor Laurence Rossier and Professor Guillaume Viau of the Laboratory of Physics and Chemistry of Nano-Objects (LPCNO) Toulouse, France

**Topic:** Electrostatic directed assembly of colloidal nanoparticles on surfaces by nanoxerography using an atomic force microscope

► **2007-2008:** **Double degree**

**Masters (M.A) in Science 3N** “Nanosciences, Nanodevices and Nanomeasurements” from INSA (National Institute of Applied Sciences), University of Toulouse, France. A one-year postgraduate degree required before starting doctoral studies.

**Engineering Degree in Physics at INSA** (National Institute of Applied Sciences), University of Toulouse, France.

► **2005-2007:** **Student at INSA**, National Institute of Applied Sciences, a 5-year French Engineering School (“Grandes Ecoles”), University of Toulouse, France.

► **2003-2005:** **2 years of intensive studies in Physics** to prepare competitive exams for an admission to French engineering schools at the Lycée Gustave Eiffel in Dijon, France.

► **2003:** **French secondary school degree** majoring in Maths and Physics passed with honors.

## WORKING EXPERIENCE AND SKILLS

**Used Softwares:** Origin, Inkscape, Inventor, ImageJ, COMSOL Multiphysics 3.5, Labview, SPM softwares

►►► From February 2008 to present ◄◄◄

\* **PhD work at the Laboratory of Physics and Chemistry of Nano-Objects (LPCNO) Toulouse, France (Nanotech group supervised by Professor Laurence Ressier)**

- Development of directed self assembly processes applied to colloidal nano-objects:
  - ✓ **AFM nanoxerography**
  - ✓ **Convective self-assembly**
  - ✓ **Electrical micro contact printing**
- Study of **electrical properties** and **charge writing** of **electret** thin films.
- **Numerical simulations** performed with COMSOL Multiphysics on electrostatic forces driving assemblies
- Study of kinetics of **assemblies of colloidal nano-objects** during nanoxerography.
- Synthesis of nanoparticles supervised by LPCNO experimental chemistry team directed by Professor Guillaume Viau
- Characterizations techniques :
  - ✓ **AFM** and **KFM** characterizations of samples
  - ✓ Size and **Zeta potential measurements** of colloidal solutions

\* **Teaching Assistant in Physics (96 hours of teaching per year)**

- ✓ Introduction to SPM techniques
- ✓ Introduction to Labview programming
- ✓ Optics
- ✓ Electrokinetics

►►► June 2007 - September 2007 ◄◄◄

\* **Training period at Trinity College in Dublin, Ireland (Magnetism and Spintronics group supervised by Professor JMD Coey)**

- Study of the coupling between a hematite seed layer and an Ilmenite Hematite Solid Solution layer
- Growth of materials by PLD method
- XRD/XRR and SQUID characterisations of samples

\* **Multidisciplinary project for INSA**, one day a week for 9 months.

- Set up of scanning probe AFM and STM introducing experiments for master degree courses.
- Interpretation of CD/DVD reading and writing supports

\* **Microelectronic training in clean room for 2 weeks** in Toulouse, France.

- Fabrication of a N-MOS process from a wafer to simple integrated circuits devices
- Testing and packaging of final devices
- Sensitisation of the different steps and techniques in the process
- Conception assisted by computer

## LANGUAGES

- **French** : Mother tongue
- **English** : Good working knowledge (TOEIC : 760)
- **Spanish** : Reading knowledge and conversational skills

## ACTIVITIES AND ADDITIONAL INFORMATION

### Sports:

- Karate (brown belt)
- Canoe-Kayak (1<sup>st</sup> degree and 2<sup>nd</sup> degree diplomas, counselor at Winaukee camp Moultonboro, NH, during 2006 summer)
- Badminton

### Others:

- International driving license
- First Aid Certificate
- Student member of INSA scientific council in 2010
- President of INSA board games association in 2005-2007

### Awards:

- 2008 INSA funding for master degree based on excellence in work
- CNRS "Bourse Docteur Ingénieur" funding to pursue Ph.D work



## Publications

- ✓ **Combining Convective/Capillary Deposition and AFM Oxidation Lithography for Close-Packed Directed Assembly of Colloids**  
Ressier, L. Viallet, B. Beduer, A. Fabre, D. Fabié, L. Palleau, E. Dague, E.  
Langmuir, **2008**, (24), 23, p.13254–13257
- ✓ **How to Control AFM Nanoxerography for the Templated Monolayered Assembly of 2 nm Colloidal Gold Nanoparticles**  
Ressier, L. Palleau, E. Garcia, C. Viau, G. Viallet, B.  
IEEE Transactions on Nanotechnology, **2009**, (8), p. 487-491
- ✓ **Numerical simulations for a quantitative analysis of AFM electrostatic nanopatterning of PMMA by Kelvin Force Microscopy**  
Palleau, E. Ressier, L. Borowik, Ł. Mélin, T.  
Nanotechnology, **2010**, (21), p. 225706-225713
- ✓ **Control of the catalytic properties and directed assembly on surfaces of MADIX/RAFT polymer-coated gold nanoparticles by tuning polymeric shell charge**  
Beija, M. Palleau, E. Sistach, S. Zhao, X. Ressier, L. Mingotaud, C. Destarac, M. and Marty, J-D.  
J. Mater. Chem., **2010**, (20), p. 9433-9442
- ✓ **Coulomb Force Directed Single and Binary Assembly of Nanoparticles from Aqueous Dispersions by AFM Nanoxerography**  
Palleau E, N M, Sangeetha. Viau, G. Marty, J-D. Ressier, L.  
ACS Nano, **2011**, (5), 5, p. 4228–4235
- ✓ **Quantification of the electrostatic forces involved in the directed assembly of colloidal nanoparticles by AFM nanoxerography**  
Palleau, E. N M, Sangeetha. Ressier, L.  
Nanotechnology, **2011**, (22), p. 325603-325610

## Patent

- ✓ **Procédé de nanostructuration topographique et électrique d'un film de polymère électret et film mince de polymère électret obtenu**  
Ressier, L. Palleau, E.  
Brevet français (07/05/2010 - n°10/01967)  
US provisoire (21/09/2010 - n°61/384832)  
Extension PCT (22/04/2011 - n° PCT/FR 2011/050934).

## Oral communications

- ✓ **Templated assembly of 2 nm colloidal gold nanoparticles by AFM electrostatic nanopatterning (ORAL)**  
Palleau, E. Ressier, L. Garcia, C. Viau, G.  
Nano South-West European Conference (NanoSWEC2008)  
Bordeaux (France), 3-5 November 2008
- ✓ **AFM nanoxerography for the directed assembly of 2 nm colloidal gold nanoparticles (ORAL)**  
Palleau, E. Ressier, L. Garcia, C. Viau, G.  
Journées Nationales sur les Techniques Emergentes en micro-nanofabrication (JNTE08)  
Toulouse (France), 19-21 November 2008
- ✓ **Analyse quantitative de mesures KFM appliquée à des motifs chargés par AFM (ORAL)**  
Palleau, E. Ressier, L. Borowik, Ł. Mélin, T.  
Forum National Microscopie à sondes locales 2010  
Mittelwihr (France), 15-18 March 2010

✓ **Electrostatic assembly of colloidal nanoparticles by AFM nanoxerography (ORAL)**

Palleau, E. Ressier, L. Guieu, V. Viau, G.

3rd International Conference on Nanostructures SELF-Assembly (NanoSEA 2010)

Cassis (France), 28 June 2 July 2010

✓ **Single and binary assembly of colloidal nanoparticles on surfaces by AFM nanoxerography / Highlights on new results with 15 nm CdSe/CdSeS/CdS nanocrystals (POSTER)**

Palleau, E. N M, Sangeetha. Ressier, L. Viau, G. Dubertret, B.

Quantum Dots France 2011

Toulouse (France), 16-17 June 2011

✓ **AFM demonstration on nanostructured samples (SCIENTIFIC REVIEW FOR THE GENERAL PUBLIC)**

Palleau, E. Ressier, L.

Images et mirages @ nanosciences, international conference

Toulouse (France), 8-16 December 2010

## REFERENCES

Laurence Ressier

**Grade** : Professor

**Institute** : Laboratory of Physics and Chemistry of Nano-Objects (LPCNO), Nanotech Group, *Toulouse*

**Key words** : directed assembly techniques, scanning probe microscopy, nanodevices

**Coordinates**: [ressier@insa-toulouse.fr](mailto:ressier@insa-toulouse.fr)

+33 561 559 672

Robert Gunning

**Grade** : Research fellow

**Institute** : Oxford University, Dept. of Physics, Clarendon Laboratory, *Oxford*

**Key words** : photovoltaics, x-ray diffraction, crystallography, surface science, semiconductors

**Coordinates**: [r.gunning1@physics.ox.ac.uk](mailto:r.gunning1@physics.ox.ac.uk)

+44-1865-272354

Thierry Mélin

**Grade** : Research director

**Institute** : Institute of Electronics, Microelectronics and Nanotechnology (IEMN), *Lille*

**Key words** : Charge injection in nanostructures, KFM and EFM at ambient air and ultrahigh vacuum, CNTFETs.

**Coordinates**: [Thierry.Melin@isen.iemn.univ-lille1.fr](mailto:Thierry.Melin@isen.iemn.univ-lille1.fr)

+33 320 197 864