Jean-Christophe Gomez-Lavocat

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Home Address

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Objective A six month internship as research assistant

Educational Background

2008 - 2009 **Université de Luminy** (Marseille, FRANCE)
– M.S. in Theoretical Physics (Degree expected Sept 2009)
Master of Science in Theoretical physics
Relevant courses : *Statistical physics, Particles Theory, Gauge Theory, Non Linear Physics, Cosmological Perturbations Theory, Standard Model, Electromagnetism*

2006 – 2009 **Ecole Centrale Marseille** (Marseille, FRANCE)
– M.S. in Applied Physics (Degree expected Sept 2009)
One of France's leading science and engineering graduate schools, specialized in optics and chemistry.
Relevant courses : *Quantum mechanics, Quantum chemistry, Electronics, Fields Theory, Solid state, Optics/Photonics (NL, Laser ...)*

2004 – 2006 **Lycée Masséna** (Nice, FRANCE)
– French classe préparatoire (MP)
Undergraduate program. Intensive preparation for the national competitive entrance exams to leading French engineering schools « Grandes Ecoles ».
Relevant courses : *Mathematics, Physics, Algorithmics*

Professional Experience

2008 **Laboratoire Fresnel** (Marseille, FRANCE) **– Optical research lab of french CNRS** (national scientific research institute)
Eight weeks internship as research assistant with Dr Stefan Enoch (PhD.)
Development of an invisible cloak made of meta-materials.

2007 -2008 **Ecole Centrale Marseille** (Marseille, France) **- Interdisciplinary Project**
Designed a 3D-measurement system using phase-shifting profilometry.
Lead a team of five international students.

2007 - 2008 **POPSUD** (Marseille, FRANCE) **– Non-Profit Organisation managing a European Competitive Photonics Cluster**
Participated in the organization of a conference dealing with optical complex system (OCS2008).
Creator and Webmaster of http://www.ocs2008.org (not yet available)
Managed registration and call for papers.

2007 **Corstyrene** (Aleria, FRANCE) **– Polystyrene manufacturer**
Designed a new hollow-core slab using CAD.
Examined the impact of heat on the slab.

2006 **Laboratoire Fresnel** (Marseille, FRANCE) **– Optical research lab of french CNRS** (national scientific research institute)
Worked as research assistant with Dr Ludovic Escoubas (PhD.)
Conducted a simulation of organic photovoltaic cells.

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Languages

- **French :** Native Language
- **English :** Excellent command (TOEIC : 965, TOEFL iBT : 100)
- **German :** Good command
- **Spanish :** Good reading

Computer skills

- **Environments :** Linux (Debian, Mandrake), Windows (95, 98, 200 and XP)
- **Web :** Webmastering (html, php, mysql), Network administration (apache, ftp, pop, imap, smtp, ...) and SEO
- **Publication :** Open Office.org, LateX
- **Software :** Solidworks, Mathlab, Scilab, Maple, Labview, Rsoft suite
- **Programming :** C, CaML, Prolog, Php, Python *(learn new languages easily)*

Additional information

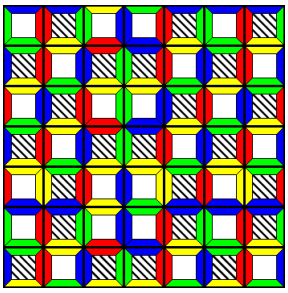
- **Sports :** Windsurfing, Member of Ecole Centrale Marseille Sailing team
- **Volunter work :** Led a Corsican astronomy club twice weekly for three months and produced a website in 2004.
- **Associations (since 2006) :**
  - *Massilia Défi Voile :* Secretary of Ecole Centrale Marseille Sailing team
    Contacted sponsors and organizations
  - *M.W.F. :* Founder of Ecole Centrale Marseille windsurfing club
    Responsible for a group of 30 students and a 4,000€ budget
  - *Ginfo :* Member of Ecole Centrale Marseille computer science association
    Helped students when they had a computer or internet problem
  - *E.W.B. :* Member of Engineers Without Borders -France
    Organized events dealing with Africa and India
    Prepared school information for children concerning climate change

References

- **Stefan Enoch :** PhD Researcher at Fresnel Laboratory (CNRS)
  stefan.enoch@fresnel.fr
- **Michel Lequime :** PhD Researcher at Fresnel Laboratory (CNRS)
  michel.lequime@fresnel.fr
- **Katia Mirochnitchenko :** Network manager of Popsud
  katia.mirochni@popsud.org
- **Bastien Fernandez :** PhD Researcher at CPT (CNRS)
  bastien.fernandez@cpt.univ-mrs.fr

Research Experiences (updated 23/11/2008)

2006 - My first involvement in research dealt with mathematics and algorithmic. Indeed, when I was young (2003) I made a mathematical article concerning '*Penrose tiling*'. Since then I have been interested in the periodicity and aperiodicity problem. One of the major contribution have been made by Hao Wang. He showed that any Turing machine can be turned into a set of 'Wang tiles'. During my research I wrote **software** to **compute every possible tilings given a set of Wang tiles and a square of size *n***.

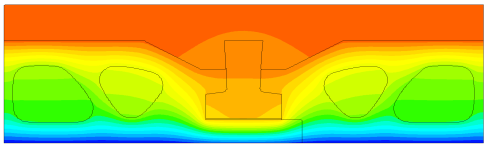


A quasiperiodic tiling using Wang tiles

- Written report : http://jice.lavocat.name/doc/wang_tiles – tipe.pdf
- Presentation slides : http://jice.lavocat.name/doc/wang_tiles%20-%20slides.pdf

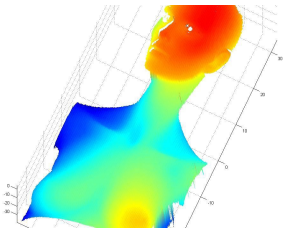
2006 - I worked as a research assistant at 'Institut Fresnel' (Marseille), a French optics laboratory. I worked with *Dr. Ludovic Escoubas* on the impact of the electromagnetic field from the sun upon an **organic photovoltaic cell**. I had to use a **percolation algorithm** and inject it into Rsoft – Fullwave. My work was used for the PhD thesis of *Renaud Bouffaron* (not yet published).

2007 - This third experience took place during an internship within the society 'Corstyrene'. This company produces manufactured goods made of expanded polystyrene. They wanted to shape a new product aimed at isolating houses. I conducted the research using software to **stimulate the heat transfer**.



Heat transfer through a polystyrene slab

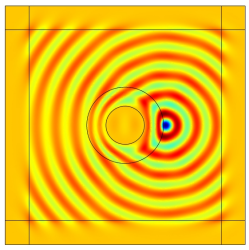
2008 - I was involved in an interdisciplinary project in which I lead a team of Brazilians and French students. We had to implement some **3D-shape measurement** methods with a webcam. I especially studied different **phase-shifting methods**. We used Matlab and our software will be used by Ecole Centrale Marseille for its students.



3D acquisition of a plastic model

- Written report : http://jice.lavocat.name/doc/physics/profilometrie.pdf

2008 – I worked within the Team CLARTE at Institut Fresnel. I had to implement an **invisible cloak** in the visible spectrum area, built with **meta-materials**. I used Comsol Multiphysics to perform finite elements calculus. Results wen not published



Ideal cylindrical cloak

- Written report : http://jice.lavocat.name/doc/physics/cape_invisibilite.pdf

2008 – I helped *Dr. Michel Rouleux* at 'Centre de Physique Théorique' (Marseille) to perform research on the **decay of magnetic correlation in a spin lattice**. We extended the result of *Toma & Tasaki* (for the Heisenberg model) to the **XY model**.

- Presentation slides : http://jice.lavocat.name/doc/physics/magnetic_correlation.pdf