

## Postdoctoral Positions at FUNDP - University of Namur

Project 1: **Digital libraries and copyright**

Promoter: Prof. S. Dusollier, faculty of Law, Research Center for Computer and Law

Project 2: **Applications of contract theory to development economics**

Promoter: Prof. J.-M. Baland, faculty of Economics, social Sciences and Business Administration, department of Economics

Project 3: **Initiating the history of Belgian computing**

Promoter: Prof. D. Lambert, faculty of Philosophy and Letters, department of Philosophy

Project 4: **Strategic business-IT alignment: a model-based approach**

Promoter: Prof. M. Petit, Computer Science Institute

Project 5: **Regulation of Maged1 during cell cycle and its role in response to DNA damage**

Promoter: Prof. O. De Backer, faculty of Medicine, department of Biomedical Sciences

Project 6: **Towards the construction of 3-dimensional functional architectures: from mono- to multi-layered fullerene-based photovoltaic devices**

Promoter: Prof. D. Bonifazi, faculty of Sciences, department of Chemistry

Project 7: **Development and study of optimization methods for problems involving Partial Differential Equations constraints**

Promoter: Prof. A. Sartenaer, faculty of Sciences, department of Mathematics

Project 8: **Localized electromagnetic response and optical properties of metallic nanostructures**

Promoter: Dr. L. Henrard, faculty of Sciences, department of Physics

We invite applications for postdoctoral research positions in the framework of the "**Programme institutionnel des bourses de recherche post-doctorale FUNDP-CERUNA**". This programme, which involves researchers at the University of Namur, shall explore the eight aforementioned projects. Successful candidates will work in the teams led by the promoters in charge of the projects. Further information on the projects can be obtained from the program Web site at

[http://www.fundp.ac.be/recherche/Postdoc\\_FUNDP\\_CERUNA\\_2007.pdf](http://www.fundp.ac.be/recherche/Postdoc_FUNDP_CERUNA_2007.pdf)

Candidates (*not older than 40 years*) must have a PhD obtained *after September 1, 2002 and before September 1, 2007 from a non-Belgian university* in the required field of research. The award will include a two-way airline ticket and health insurances, and is offered with a fellowship of 1900 EUR (net) per month for 12 consecutive months. Applications must include a CV, a motivation letter, and three letters of recommendation. They should be addressed to

Prof. Paul THIRY  
Chairman of the Research Council  
FUNDP - University of Namur  
61 rue de Bruxelles, B-5000 Namur, BELGIUM

For facsimile transmission, dial +32 81 72 57 01

For electronic submission, e-mail to [secretariat.adre@fundp.ac.be](mailto:secretariat.adre@fundp.ac.be)

The positions are available for the next academic year 2007-2008 (starting October 1, 2007); **applications will be accepted until April 20, 2007.**

For general information, contact the Research administration at [secretariat.adre@fundp.ac.be](mailto:secretariat.adre@fundp.ac.be); for scientific questions concerning the projects, contact the promoters at the email addresses indicated below.

Project 1

## **Digital libraries and copyright**

Promoter: Prof. **S. Dusollier**  
Faculty of Law  
Research Centre for Computing and Law (CRID)  
Email: [severine.dusollier@fundp.ac.be](mailto:severine.dusollier@fundp.ac.be)

### **BRIEF DESCRIPTION OF THE PROJECT**

Libraries represent an essential element for a knowledge and education democratic society. The digital environment brings them new opportunities to make their collections available to the public. However, copyright regulations, protecting one part of their collections, complicate the digital development of libraries. This research project aims both to analyse the legal challenges faced by digital libraries and to propose solutions and recommendations for an effective participation of libraries in the knowledge society, which fully respects copyright regulations. This stake is particularly important for university and scientific libraries.

This research proposal deals with: copyright limitations in favor of libraries, the legal framework for “orphan works”, and the recently developed open access strategies for scientific publications. The proposition belongs to one of the key research axis of the CRID, related to Intellectual Property and Access to Knowledge in the Information Society. It will represent a first step for the development of a long term research.

### **PROFILE OF THE APPLICANT**

- PhD in copyright law, preferably including a reflection on copyright in the digital environment
- Knowledge of European copyright law, copyright exceptions, open access schemes
- Knowledge of English and French.

Project 2

**Applications of contract theory to development economics**

Promoter: Prof. **J-M. Baland**

Faculty of Economics, Social Sciences and Business Administration  
Department of Economics  
Centre of Research in the Economics of Development (CRED)

Email: [jean-marie.baland@fundp.ac.be](mailto:jean-marie.baland@fundp.ac.be)

**BRIEF DESCRIPTION OF THE PROJECT**

The project is concerned with the study of

- (i) how formal institutions interact with social norms in traditional societies, and
- (ii) how social interactions may solve or mitigate market failures.

Here are two specific questions that will be addressed, among others:

(i) Development strategies have relied on the application of formal law, in an environment where informal rules have traditionally played an important role, to achieve a variety of socio-economic objectives; for example, to encourage private investment by strengthening property rights, or to improve social equity by prescribing rules of inheritance or marriage. The project aims to study how changes in formal law would affect practices within such communities, where a formal court may have limited ability to enforce its legal rulings.

(ii) NGOs have increasingly adopted micro-credit as part of their strategy for poverty alleviation. While the success of micro-credit programmes has generally been attributed to the role of the community, the precise mechanism in which social networks would improve compliance is not well understood. Therefore, this project aims to investigate, by using tools of contract theory, what role social networks can play in a micro-credit loan.

Project 3

## **Initiating the history of Belgian computing**

Promoter: Prof. **D. Lambert**,  
Faculty of Philosophy and Letters  
Department of Philosophy

Email: [dominique.lambert@fundp.ac.be](mailto:dominique.lambert@fundp.ac.be)

### **BRIEF DESCRIPTION OF THE PROJECT**

So far, the history of computing in Belgium remains almost inexistent. This situation strongly contrasts with the massive production of historiography taking place in France, in the Netherlands, in Germany, in Finland, and, especially, in the US and in the UK.

The aim of this post-doctoral project is to palliate the lack of these studies. It is intended to create at the FUNDP - a university that pioneered modern computing in Belgium - a historical research programme aiming at collecting and analysing the documentation for a study of the history of computing in Belgium from the 1940s towards the 1970s.

This historical project will be organised in three stages. The first stage of the research will involve the creation of a repertory of written and electronic resources and, importantly, the gathering of oral archives, for the history of Belgian computing. These archives will be made available through a dedicated website at the FUNDP. The second step will consist of the establishment of a chronology of early computing development in Belgium using the collected documentation and available preliminary investigations. The third stage will consist of the analysis of the various factors, technical, political, economic, social as well as cultural, explaining the above mentioned chronology.

Project 4

**Strategic business-IT alignment: a model-based approach**

Promoter: Prof. **M. Petit**  
Computer Science Institute  
Research Center in Information Systems Engineering (PRECISE)  
Email: [michael.petit@fundp.ac.be](mailto:michael.petit@fundp.ac.be)

**BRIEF DESCRIPTION OF THE PROJECT**

In order to ensure the alignment of IT to business objectives, a model-based approach is required that consists of using several modelling languages for the various abstraction levels of the enterprise and for the various viewpoints that one can have in each abstraction level.

The project consists of contributing to a modelling framework allowing to improve business-IT alignment. This definition requires the study and formalisation of:

- Abstraction levels at which an enterprise can be described (enterprise architecture) ;
- Useful languages to represent important business and enterprise aspects at each abstraction level;
- Links that can be defined among these languages;
- Useful mechanisms for synchronising models expressed in these various languages.

**PROFILE OF THE APPLICANT**

Candidates must:

- hold a PhD degree in Management or Computer Science or similar;
- have a strong interest for IT and business aspects;
- have good knowledge and skills in modelling with structured languages;
- master English (spoken and written).

Project 5

## **Regulation of Maged1 during cell cycle and its role in response to DNA damage**

Promoter: Prof. **O. De Backer**  
Faculty of Medicine  
Unité de Recherche en Physiologie Moléculaire (URPhyM)  
Email: [olivier.debacker@fundp.ac.be](mailto:olivier.debacker@fundp.ac.be)

### **BRIEF DESCRIPTION OF THE PROJECT**

The Melanoma antigen gene (MAGE) family is of particular interest in tumor immunology as its expression pattern is restricted to tumor cells only with exception of the germ cells. The aforementioned expression pattern is true for type I MAGE genes: the type II genes are expressed in numerous adult and embryonic somatic tissues.

The *MAGED* genes, the archetypical *MAGE*s comprising *MAGED1*, *-D2* and *-D3* are remarkable type II genes and unlike their counterparts, they have been strongly conserved during mammalian evolution. *MAGED1*, identified as an interacting partner of the neurotrophin receptor p75 induces a mitochondrial apoptotic pathway. *MAGED1* has also been described as an interactant of many other proteins, including homeoproteins *Dlx5* and *Msx2*, anti-apoptotic proteins *IAP*, the axon guidance receptor *UNC5H1*, *BRCA2*, the ubiquitine ligase *Praja1*... Unraveling the function of the *MAGE* proteins is the motto of this project.

### **PROFILE OF THE APPLICANT**

You should have a Ph.D. and possess research experience in cell and molecular biology. You will be involved in the characterization of the molecular and cellular functions of *Maged1* and/or *Maged2*. Candidates should be self-motivated and career oriented. Excellent verbal and written communication skills are required. Knowledge of the biology of the *Mage* proteins and experience of working with mice are advantages. Interested candidates may provide cover letter, CV, and names and contact information of three references.

Project 6

**Towards the construction of 3-dimensional functional architectures:  
from mono- to multi-layered fullerene-based photovoltaic devices**

Promoter: Prof. **D. Bonifazi**

Faculty of Sciences  
Department of Chemistry

Email: [davide.bonifazi@fundp.ac.be](mailto:davide.bonifazi@fundp.ac.be)

**BRIEF DESCRIPTION OF THE PROJECT**

This project aims at creating novel three-dimensional organic patterned materials on surfaces, taking advantage of the molecular self-assembly approach.

Specifically, the main objective of this proposition will be the synthesis of specially derivatized fullerenes and porphyrins as molecular modules for the engineering of multilayered functional architectures on solid substrates following a layer-by-layer (LbL) “bottom-up” approach, where the photoactive donor and acceptor molecules are interconnected via metal-organic coordination as primary mode of binding.

It is expected that the use of coordination binding schemes will provide a precise control over the electronic, optical and structural properties of the multilayered material.

The approach proposed in this project lies at the frontier of knowledge in the field of organic chemistry and materials science since it is conceived to open the way towards nanostructured organic materials which will be ultimately exploited for solar-energy conversion prototypes.

**PROFILE OF THE APPLICANT**

Qualified candidates will have Ph.D. in organic synthetic chemistry and possess strong analytical and communication skills. Previous experience with coordination chemistry will be an advantage. Good command of both oral and written English is also required.

Project 7

**Development and study of optimization methods for problems involving  
Partial Differential Equations constraints**

Promoter: Prof. **A. Sartenaer**  
Faculty of Sciences  
Department of Mathematics

Email: [annick.sartenaer@fundp.ac.be](mailto:annick.sartenaer@fundp.ac.be)

**BRIEF DESCRIPTION OF THE PROJECT**

Optimization problems involving PDE (Partial Differential Equations) constraints form an important class of problems.

This research field involves various disciplines such as large-scale numerical optimization, which is the speciality of the numerical analysis team of FUNDP. The solution of such problems (involving PDE constraints) requires taking account of several aspects such as the incomplete character of the information on the problem (due for instance to the cost) and the lack of accuracy in the solution of the subproblems arising in the solution.

These various aspects are taken into consideration in current research work at FUNDP as well as by other international teams with which our team collaborates.

This proposal consists of promoting, via a post-doctoral work and in collaboration with the other teams, the confrontation and the merging of the various approaches, in order to progress in the development and the study of new robust and efficient techniques for optimization problems involving PDE constraints.

Project 8

**Localized electromagnetic response and optical properties  
of metallic nanostructures**

Promoter: Dr. **L. Henrard**  
Faculty of Sciences  
Department of Physics

Email: [luc.henrard@fundp.ac.be](mailto:luc.henrard@fundp.ac.be)

**BRIEF DESCRIPTION OF THE PROJECT**

The study of the optical properties of metallic nanoparticles is an expanding field of investigation, due to the possibilities of controlling and tailoring their visible and ultraviolet electromagnetic excitation spectra.

The aim of this project is to develop numerical methods for modelling the electromagnetic response of metallic nanostructures. In particular, the simulation of the Electron Energy Loss Spectra (EELS) of metallic nanoparticles of various shapes shall be performed in close collaboration with experimental investigations carried out at the 'Laboratoire de Physique des Solides' of the Université Paris-Sud.

**PROFILE OF THE APPLICANT**

The ideal candidate should have a strong background in simulation in solid state physics or optical properties of nanoparticles and/or a good knowledge of the EELS spectroscopy. A good communication skill, both with other theoreticians and with experimentalists is mandatory.