

## EXDCI Case Studies: HPC talent generation

### Nicola McDonnell: Consultancy & Solutions for Industry Activity Leader, ICHEC

Nicola (Nix) McDonnell is the Consultancy & Solutions for Industry Activity Leader at the Irish Centre for High-End Computing (ICHEC). Her work includes project management, project proposals coordination, and EC H2020 activities. Nix started as a chemist, briefly worked in marketing, and then began a love affair with computer science. Now, as a qualified Project Manager, she uses her talents and interests to propel her career in HPC.



#### Nix, tell us a bit about what you do.

My role is to coordinate the project management within ICHEC, with a focus on industrial projects. All projects need managers, and I ensure anyone who needs training gets it. I go to courses on new management methodologies, and consider how these might work for us. Project management is something I enjoy and in which I am certified (eg PRINCE2, Scrum Alliance). I've been a full-time project manager at ICHEC for 5 years, but I have always managed at some level.

#### How does HPC relate to what you do?

I work with industry partners who are in need of HPC resources and expertise. HPC resources are limited and efficiency is a key component of HPC, so both my project management experience and computer science expertise are highly important.

#### Where has your career taken you so far?

I studied Natural Sciences at Trinity College Dublin, specialising in Chemistry, but then wanted to explore my creativity so took a job in marketing with a biomedical equipment manufacturer in the USA. I sat beside the IT guy and grew interested in his work, especially the programming aspects. I began to code for him when opportunities arose, and did an evening course in programming. That job is where my passion for programming began, and I decided to pursue it by returning to college.

#### Please tell us more – what happened then?

I did a conversion Master's in Computer Science at Queen's University, Belfast, and around that time, I read "Distributed Objects", an article in *Wired* magazine by Steve Jobs. It happened that a Dublin company which made distributed object middleware, IONA Technologies, was recruiting

neuroinformatics

programming academia

science

management <sup>CUDA</sup> coordination

industry <sup>java</sup> visualisation

gaming

middleware



**EXDCI** is a European-funded project led by PRACE and ETP4HPC, the two most significant HPC bodies in Europe. It aims to co-ordinate the development and implementation of a common strategy for the European HPC ecosystem by supporting road-mapping, strategy-making and performance-monitoring activities.

This is one of a series of case studies designed to demonstrate the range of interesting careers in High Performance Computing (HPC). More case studies are available at <http://www.exdci.eu/CaseStudies/>

for a java programmer. Java was very cutting-edge at the time, as it had only recently been released, – but I had studied it in my Master's and got the job. After 3 years, I took a year off to travel the world!

### **That's very exciting! You drifted into gaming then, didn't you?**

On my return, I worked for a company which made hardware as well as software. My Master's was heavily software-focused, so I was intrigued to learn about hardware. This position was exciting, but after two years the IT industry hit a downturn. An interest in video games led me to a Postgraduate Diploma in Computer Games Development at Abertay University.

### **What happened then?**

It's a funny story. I applied for a short-term post in a spin-off from the University of Edinburgh, but at interview I was asked all kinds of really strange questions. Completely puzzled, I went back to look at the job spec – and realised there were two very different jobs open, and I had interviewed for the wrong one: a 2-year neuroinformatician post within the university instead of a 3-month Java contract in the spin-out company! Amazingly, I got the job, as they needed someone with 3D visualization / graphic experience to build models of rats' brains and monkey brains.

While working there at the Institute for Adaptive and Neural Computation, I discovered a common thread to much that had interested me over the years: I distinctly remember as a child watching fascinated as ants carried away food I had thrown on the ground; in video games my interest was in management simulation games like SimCity; I was interested in genetics in college; and my Master's project was to build an agent system. I learned that these all had the same underlying system: a self-organising system. This lifelong interest has now led me to a part-time PhD in this subject!

### **What was your first experience of HPC? Did that change the course of your career?**

When the university contract ended, I returned to industry, but missed the academic environment. So I applied for a job at EPCC at the University of Edinburgh. I had no HPC experience, but EPCC developed Grid middleware software, OGSA-DAI, which related loosely to the CORBA middleware technologies I had worked on at IONA.

At EPCC I worked mainly on Grid-related projects. My first explicit experience of HPC came during a six-month secondment to ICHEC, working on a CUDA weather code. CUDA was quite novel at the

time so I was thrilled to get this opportunity. With this under my belt, when I returned to EPCC I worked on another CUDA project and an HPC micro-benchmark project. I really enjoyed the work and environment at EPCC, but during my secondment I had decided to relocate back to Dublin permanently, and managed to get a job at ICHEC.

### **What are the exciting aspects of working in an HPC-related career?**

The significance of the work that we facilitate is what excites me; working on groundbreaking science and technologies which will influence the world in the future gives me a strong purpose.

### **Project management is tough - how do you find it in relation to the HPC environment?**

My background in science and computer science helps me to understand the technical side of HPC. Years of experience and training, plus strong organisation and communication skills, help me to ensure we all work towards the client's or user's vision. It's very important to know what you don't know and spend extra energy there, to identify risks. Reducing the risk of a project dramatically reduces its likelihood of failure. Fostering an open environment where critique is well received and given is also invaluable. The most important thing I can do is create an environment where everyone understands the purpose of the work and has enough autonomy to take ownership and responsibility for achieving the objectives, and also to ensure that we are always challenged and improving, in technical aspects and, just as importantly, in soft skills such as teamwork.

### **Are there any challenging aspects?**

Plenty of good challenges! It's a very fast-paced, highly technical environment, and a competitive environment with little room for error. All of the people I work with are highly intelligent. These challenges enable me to push myself to new heights, which is something I value in my career.

### **Where do you see your career leading next?**

Well, I will continue working on my PhD – it is part-time so it's going to take a while. I am excited to see how the HPC industry evolves and so at the moment I am very happy in aligning my research with my skills, abilities, and experience. I also find the new Women in HPC initiative ([www.womeninhpc.org](http://www.womeninhpc.org)) very inspiring and I'm keen to get more involved.