



UNIVERSITY OF EDINBURGH  
Business School

# Building Science-Business Partnership Workshop

*Enterprising Scientists!*

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MARIE CURIE ALUMNI ASSOCIATION  
ANNUAL CONFERENCE

# *Enterprising Scientists!*

## Summary

- Who I am and what I do in my day job.
- ***Being Enterprising***.....making things happen!
- Some insights from the European project - **HEKATE**
- ***Impacts of collaborative doctoral students*** - Working collaboratively between science and business – some research findings
- ***Mobility and Enterprising Scientists in Europe and beyond***

# Some contexts we are in.....

- Across Europe one in ten doctoral graduates go on to become 'self-employed' (Auriol, 2010).
- almost 15% of all employed people in the UK are 'self-employed' (2014)
- Lord Young (2014) "enterprising attitude is important amongst all people"
- "Small Business Charter" – linking Business Schools and SMEs
- 60-70% of doctoral graduates work outside the academia (UK Vitae figure)

# Being Enterprising... making things happen

## *Enterprising Scientists*

### ***Academic entrepreneur –***

building enterprising  
academic career at the  
University e.g. University  
spin-offs; industry  
collaborations

### ***Scientific/Tech***

### ***entrepreneur –***

starting-up firms; working  
in industry, sometime  
between the university  
and industry

### ***Intrapreneur –***

working in R&D/innovation  
within corporate  
organisations  
Corporate spin-outs

# Being Enterprising... making things happen

- Choose your mission
- Make sure you understand:
  - the opportunity
  - the route to market/business
  - what success should look like
- Decide what resources, expertise and help you need to succeed
- Balance boldness/caution
- Identify when the job is done – move on?

# HEKATE project (2013-2015)

[hekate.tutech.eu/project/](http://hekate.tutech.eu/project/)

## *Enterprising Scientists*

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# HEKATE workshops

- Our target was **PhD and Early career Post-doctoral researchers** in STEM subjects
- Our aim was to inspire and excite the workshop participants to be “**enterprising scientists**” in their careers, be that in a university, a global multi-national enterprise (MNE), small and medium enterprise (SME), or as the founder of a start-up/spin-out.
- Collaborating with a variety of external industry organisations (university start-ups, EIRMA members, venture capital...) and internal academics, who provided “**role models**”



## Day 1

### The Enterprising Scientist

- Experiences from academia, a large corporation and a high-tech SME
- The Entrepreneurial Commercialisation of Knowledge
- Views from practitioners

## Day 2

### Enterprise in Career, Contexts and Practice

- **Special Panel Session: The Enterprising Scientist** – making a career with enterprise
- **From Idea to Reality – industrial case studies** (EIRMA contribution); **Idea pitch**
- Stakeholder Management



HEKATE



Lifelong  
Learning  
Programme





# *HEKATE workshops*

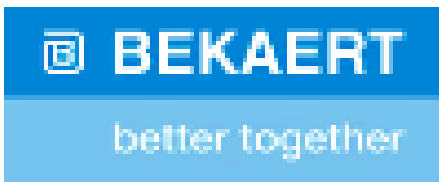
## *EIRMA session contributors*



**Thierry Piret** - Head of Solvay Ventures

- *Corporate venturing - case studies/group exercise*

October 2014



**Kevin De Caluwé** – Global Innovation manager, Bekaert

- *Innovation portfolio management – idea development/group exercise*

March 2015

# The Enterprising Scientist – Making a career with enterprise in Manchester



- **Dr Farid Khan** – Med tech entrepreneur; Chief Scientific Officer, Protein Technologies



- **Dr Curtis Dobson** - Academic entrepreneur; University of Manchester/Founder, Ai2



- **Dr Veronica Sanchez Romaguera** – Enterprise lecturer; formerly senior researcher at Omic; Nanoco technologies.

# HEKATE outcomes.... Connections and Mentoring between universities and industry



The screenshot shows a web browser window with the address bar displaying "www.eirma.org/hekate-project". The website header features the EIRMA logo and the text "european industrial research management association FACING THE INNOVATION CHALLENGE". A navigation bar includes links for HOME, EIRMA, EIRMA MEMBERSHIP, ACTIVITIES, NEWS AND VIDEOS, and COLLABORATION CENTER. A login section is visible on the right. The main content area is titled "HEKATE PROJECT" and features the HEKATE logo. The text describes the project as a framework for training entrepreneurs, funded by the European Commission. It mentions the formation of "Knowledge Alliances" and the role of EIRMA in fostering entrepreneurship. A sidebar on the left lists various EIRMA initiatives, and a "Membership Benefits" section is on the right. The Windows taskbar at the bottom shows the date as 01/03/2016 and the time as 17:31.

HEKATE Project | EIRMA

www.eirma.org/hekate-project

eirma european industrial research management association FACING THE INNOVATION CHALLENGE

HOME EIRMA EIRMA MEMBERSHIP ACTIVITIES NEWS AND VIDEOS COLLABORATION CENTER

COLLABORATION CENTER

CTO AWARD

EIRMA TASK FORCE ON RESPONSIBLE INNOVATION

EUROPEAN PROJECTS

- ERC-Science\*
- HEKATE
- RECREATE

HEKATE PROJECT

HEKATE (Higher Education and Enterprises: knowledge alliances for the training of entrepreneurs) a project funded by the European Commission within the framework of the University-Business Cooperation initiative.

The initiative aims to provide a framework for the formation of the so called "Knowledge Alliances" to encourage structured, result-driven cooperation ventures between universities and companies, bridging the gap between the two sectors and addressing how to involve the latter in higher education.

HEKATE fosters entrepreneurship by encouraging senior R&D managers in research intensive industries to become more pro-actively engaged with universities.

To this end a specific platform has been created on the EIRMA website. This platform allows interested EIRMA members to post f.i. their specialisation, the topics in which they are interested, eventually case studies. [More info...](#)

Experienced R&D directors span both the world of research and business: individually and corporately they can be inspirational for students and researchers to engage in business creation.

HEKATE seeks to explore how this can be developed.

Under the HEKATE partnership, EIRMA, together with Solvay and TechBridgeOne has been teamed up with two Higher Education Institutes to translate this collaborative relationship into entrepreneurship training activities for early career researchers and PhD students.

Read the short summary on [Concept, Outcomes and Lessons Learnt](#) during the workshops, [click here](#)

The HEKATE Final Conference - Building bridges between the industry and its future innovation managers took place at the Norway House in Brussels on 22 September 2015, [click here](#)

More info: <http://hekate-project.eu/catecon/news/>

Membership Benefits

Share best practices of industrial R&D and innovation and enjoy the experience of networking with your peers across different industrial sectors all over Europe!

- All your benefits...
- How to become a Member
- Eirma's channel on YouTube
- The Practitioner's Guide to Industrial Innovation

Search

EIRMA Events... Ok

# Nurturing *Enterprising Culture* is important

- Enterprising aspirations among scientists differ due to variations in salient “informal institutions” (Erikson et al., 2015)
- the relationships between scientific excellence and enterprising activities (Larsen, 2011; Wigren-Kristoferson et al 2011)
- prior (non-academic) experience is important for enterprising endeavours in academia – but, complex implications for recruitment, reward/recognition and promotion.

# University-industry collaboration and human mobility

As Perkmann and Walsh argue (2007, p.263):

- *Relationships will often occur in conjunction with **human mobility**: for example, when companies sponsor Ph.D. studentships. In fact, in many cases, mobility can be intrinsic to relationships if it occurs within the context of specific collaborative projects.*

It is also acknowledged that understanding on the **educational impact of university-business collaboration** is limited (Healey et al., 2014).

# Collaborative doctoral students - Embedded Knowledge Exchange Mobility

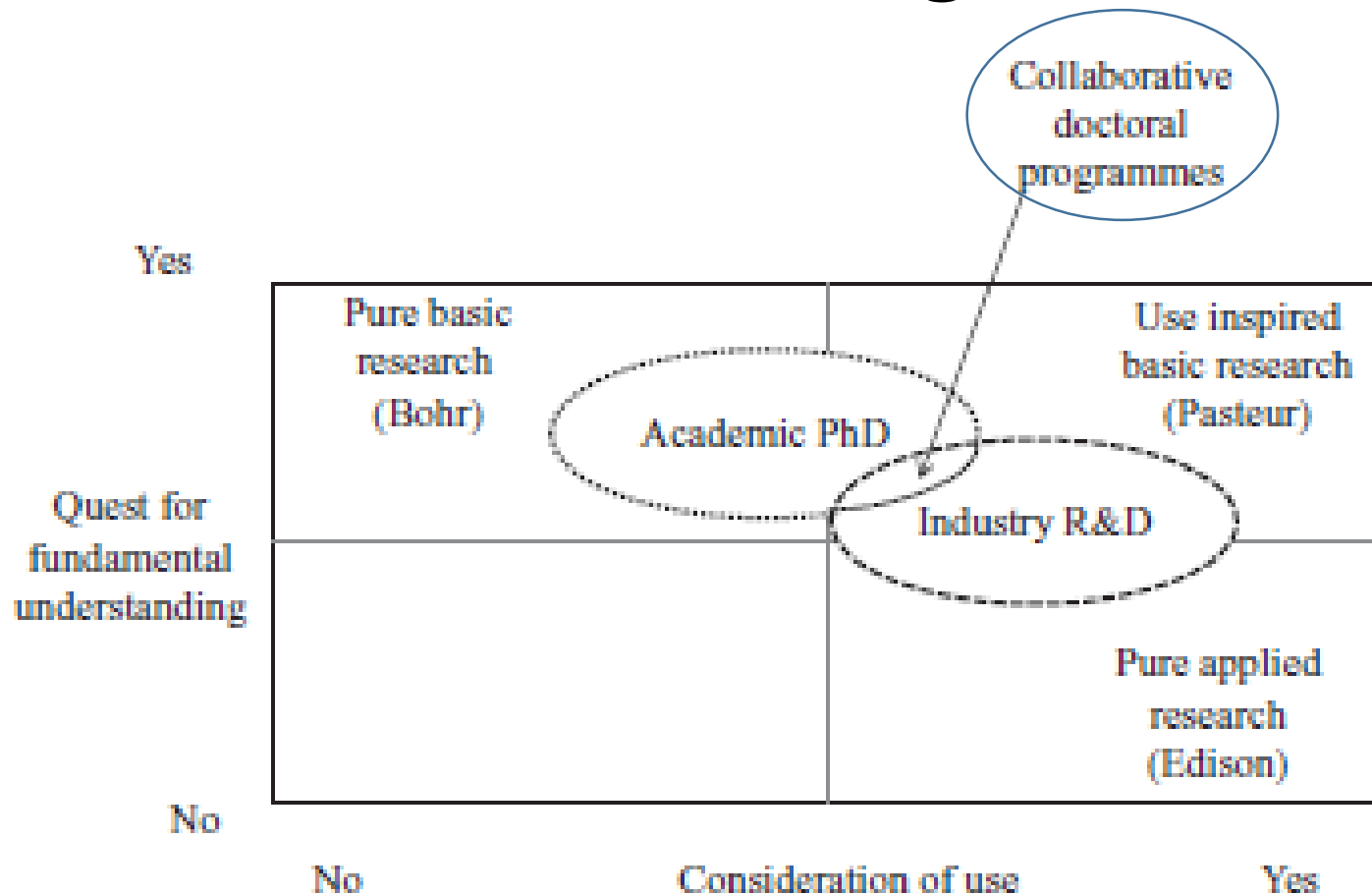


Figure 1 Positioning collaborative doctoral programmes in Stokes' (1997) quadrant

# Four routes to impacts of Doctoral students working with industry

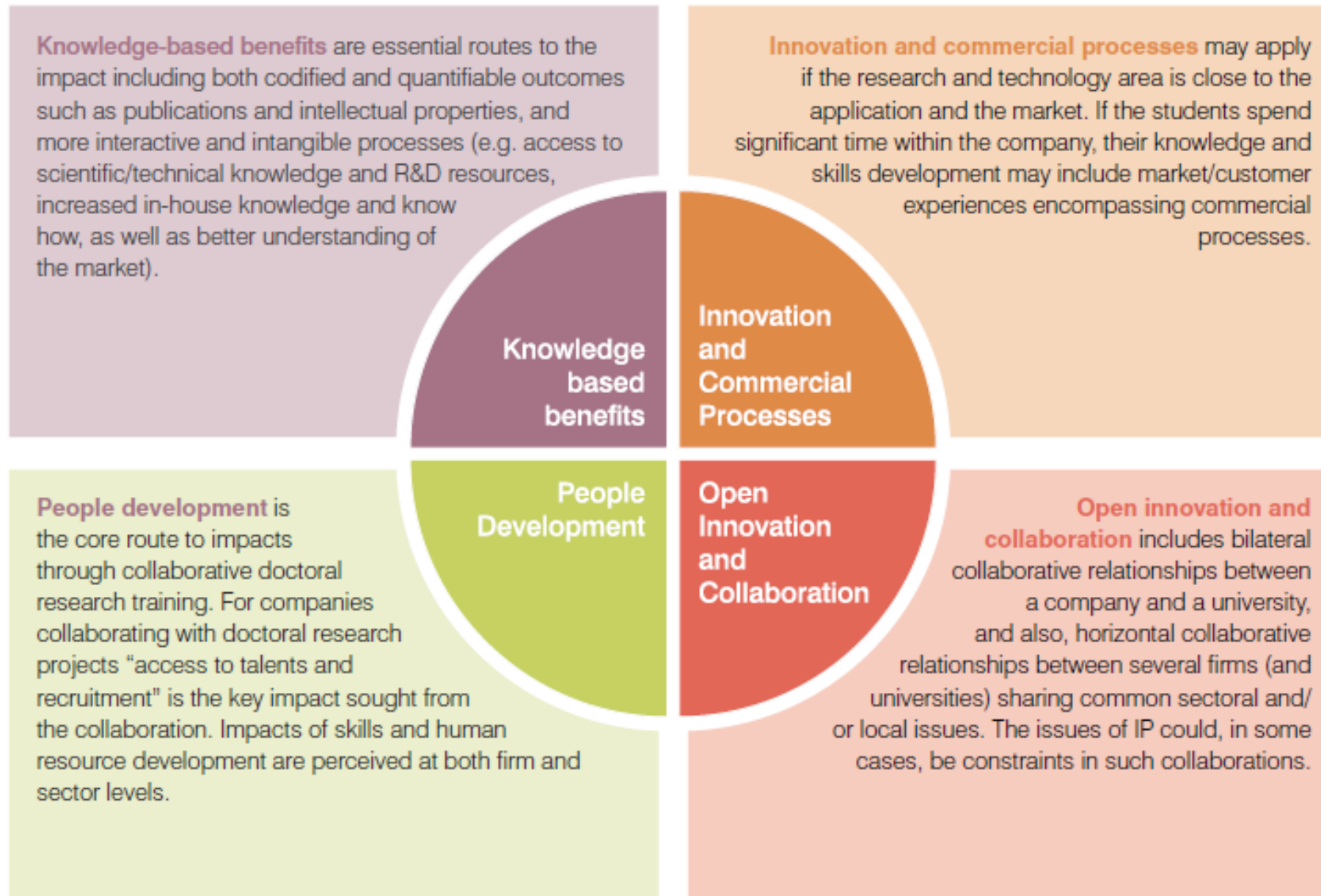
<http://www.business-school.ed.ac.uk/research-report/four-routes-to-impacts>

Asked sponsoring companies about EngD/IDC impact in relation to CASE PhD, KTP etc

- Most of the collaborative doctoral research training would have “**Knowledge-based benefits**” and “**People development**”.
- “**Open innovation and collaboration**” - Sector specificity plus centre strategies
- “**Innovation and commercial processes**” – close contact to the market – IDC uniqueness

Most of the companies collaborating with doctoral research projects state that “**Access to talents and recruitment**” is the key impact sought from the collaboration.

# What industry says - Four Routes to Impacts





## Knowledge based benefits



### Access to scientific/technical knowledge and R&D resources

- Access to expertise (e.g. university professors; researchers)
- Access to and use of university research infrastructures
- Access to cutting-edge R&D activities at the university
- Deeper understanding of strategic research areas

### Increased In-house knowledge, know-how and R&D resources

- New data, techniques, technology, methods, and process
- Development of new devices and equipment as a result of collaboration

### Knowledge returning back to academia from Industry collaboration

- Improvement of teaching methods and curricula
- Increased knowledge on commercialisation opportunities and skills

### Codified knowledge

- Publications
- *No. of scientific papers and conference papers by the doctoral students*
- *No. of co-authored scientific papers and conference papers*
- Patents, licenses
- *No. of patents filed*
- Doctoral theses defended
- *No. of theses defended*

### Better understanding of the market and customers

- Identification and understanding of new markets
- Identification of customers
- *No. of training courses in business, accounting and finance, or marketing attended*

## Innovation and Commercial Processes



### Innovation

#### Technological Innovation

- *No. of new or improved technologies*
- *Increase in Technology Readiness Levels (TRL)*

#### Exploitation of Intellectual properties

- *No. of patents granted*
- *No. of licence deals*
- *No. of spin-outs/new ventures created*

#### Product Innovation

- *No. of prototypes*
- *No. of new or improved products launched*
- Service innovation
- *No. of new or improved services launched*

#### Business Innovation

##### Process Innovation

- *No. of new or improved processes developed*
- Organisational/management innovation
- *No. of new units and systems developed*

##### Production Innovation

- *No. of new or improved production systems developed*

##### Marketing Innovation

- *New sales approach and financial arrangements*
- New business model

### Business Impact

- *Cost saving*
- *Time saving*
- Reduced time to the market
- *Return on Investment (ROI)*
- Increased competitiveness in the industry

### Market Impact

- *Growth of market share*
- Access to existing and new markets (national and international)
- *No. of new customers*
- *Increase in sales*
- *Increase in turnover*
- Creation of new markets

## People Development



### Access to talents/recruitment

- Reach bright students
- Potential future employees
- *No. of doctoral graduate recruitments after the programme at the sponsoring company*

### Access to business training both by doctoral students and existing staff

- *No. of technical training courses attended*
- *No. of training courses in business, accounting and finance, or marketing attended*
- *No. of CPDs for employers' staff*

### Work-based training and learning (for company employees)

- Experiences of supervising R&D projects for the industry supervisor
- Development and retention of existing employees enrolled on doctoral programmes
- *No. of staff promoted to R&D manager*
- *No. of staff on professional development courses and their retention*

### Subsidised R&D workforce and cost saving

- Extra capability with reduced cost, depth of core technology area and short term delivery ability
- Reduced cost of training/recruitment
- R&D personnel development with market/customer experiences

### Sector level human resources and future leadership

- Talented people/future leaders attracted to the sector, especially in the competitive labour market
- *No. of post-programme doctoral graduate recruitments in the sector*
- *Routes to the Chartered status developed through doctoral training*
- Networks/social capital developed among doctoral students trained on the same programme

## Open Innovation and Collaboration



### Enhanced collaboration with academia

- Relationships with academic supervisors developed throughout the doctoral project
- Further utilisation of academic expertise beyond the doctoral project
- *No. of co-authored scientific papers and conference papers*
- Use of the university equipment and facilities beyond the doctoral project
- New relationships developed with other units in the university (e.g. TTO and other research groups)
- Organisational changes implemented to better adapt to collaborative research
- *Contact person appointed for academic collaboration*

### Research networks, R&D capabilities and collaborations

- Networks developed with academic communities through doctoral projects/doctoral centres
- *No. of new collaborative projects with academia*
- *No. of new collaborative projects including those involving students (MSc, PhD, EngD, KTP etc) and post-doc researchers*
- *No. of applications to new research grants*
- *R&D investment generated*
- *Expectation at the outset of the collaboration*
- *Current and future positions*

### Collaboration and networks in the sector(s)/technology areas

- Networks with other firms developed through doctoral projects/doctoral centres
- *Contacts and networks with other businesses*
- *No. of events and conferences attended*
- *Co-funding of R&D projects between industry partners*
- Supply chain innovation
- Demonstrating and developing clusters of companies for R&D collaboration
- Technology platforms

### Local and regional development

- Collaborative relationships developed with a local university/ research organisations
- Collaborative R&D relationships developed with firms in the local area
- *No. of local cluster memberships, and links to local SMEs/ intermediaries*
- Local supply chain development/ local technology platform

### Standard, Visions

- Strategic visions for the sector developed (e.g. skills gap, technology roadmap)
- Influencing stakeholders with new knowledge, standards, and regulations

# *Mobility and **Enterprising Scientists** in Europe and beyond*

- the **mobility** of scientific researchers at various stages of their careers
  - Geographical mobility; cross-sectoral (Science-Business) mobility
  - Implications for recruitment, reward and promotion.
- How do we capture **long term impacts of mobility**? (e.g. career trajectories, scientific excellence and enterprising/innovation activities)
- How can Science-Business partnership **build capacity** for the future?
  - Mentoring, role models, use of social media.....?

# Thanks for listening!

Additional information -

- <http://www.aengd.org.uk/news/news-releases/engineering-doctorate-benefits-uk-plc-identified/>
- <http://www.business-school.ed.ac.uk/research-report/four-routes-to-impacts>

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