

Industry – Academia Collaboration

Sue Davies



www.quasar-group.org

Overview

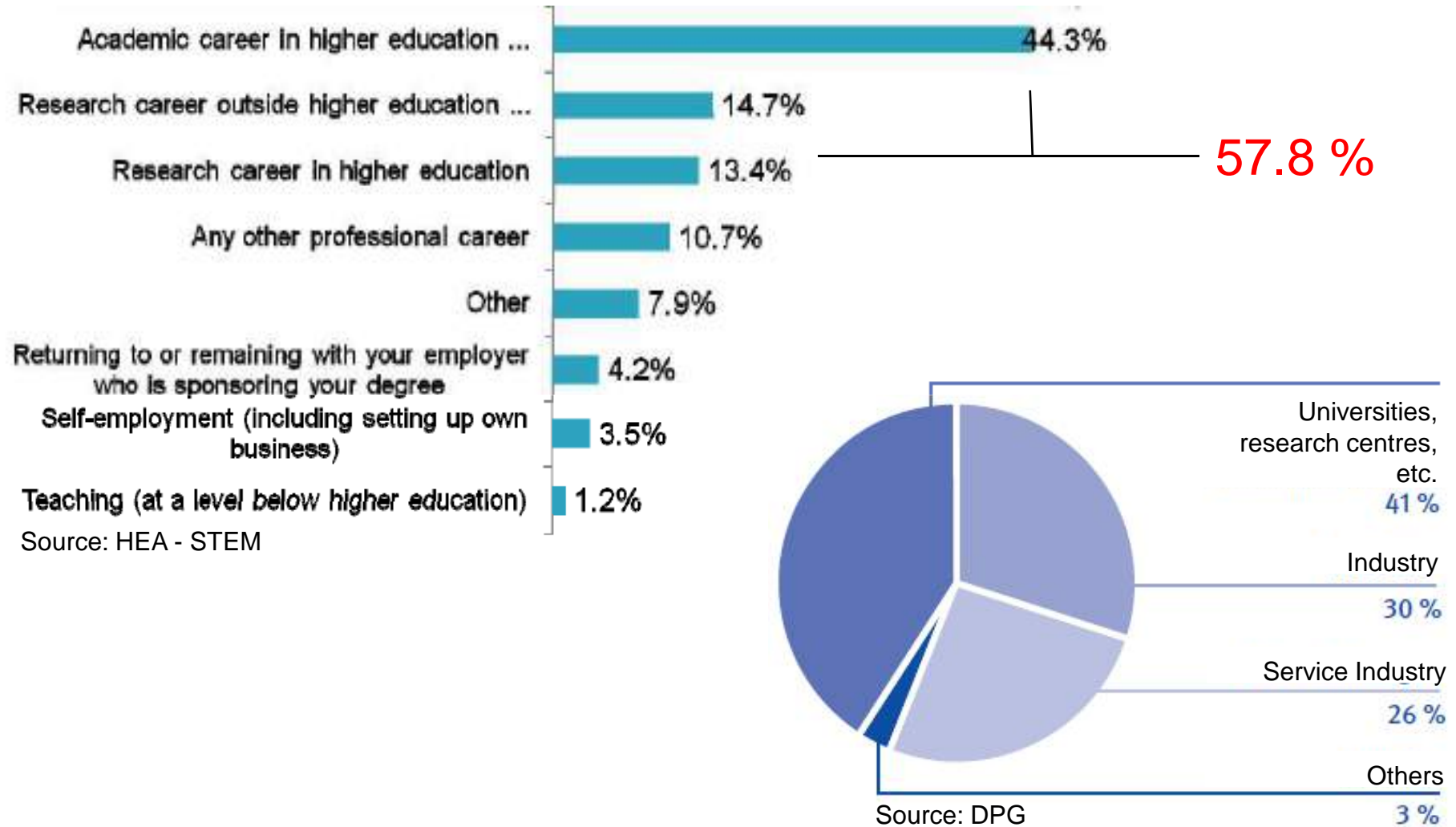
- Career perspectives for physicists;
- Classic PhD training schemes;
- DITANET
 - Training program, events, secondments
 - Industry impact
 - R&D examples
- The future: oPAC, LA³NET

Physics – an interdisciplinary field

- MSc standard;
- PhD part of training in most countries;
- Broad skills;
- Blue sky research vs. applied physics.



Career – Aspirations and Reality



Classic PhD training in Europe

- Focus on academic career path;
- Scientific papers as key quality indicator;
- Training through (often blue sky) research;
- Very little training in complementary skills – researchers often need to be (re)trained on the job;
- Students or researchers ?

Evolution: Initial training networks (ITNs)

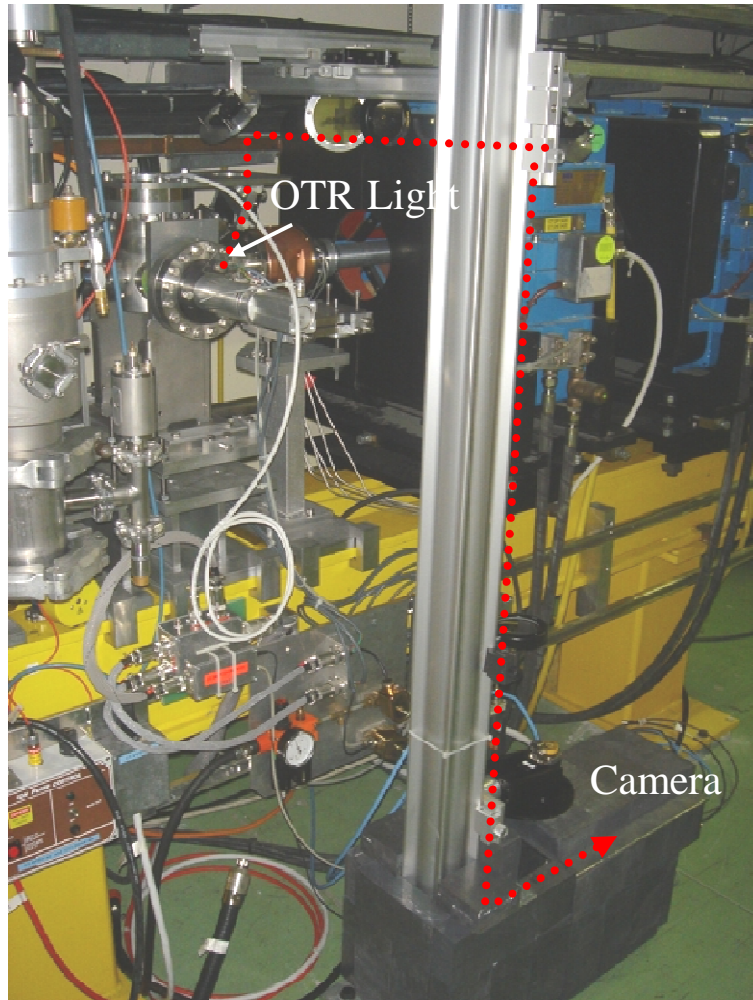
Marie Curie ITNs

- Introduced in EU Framework Program 7 – 4.8 B€ !
- 1996 – 2010: 50,000 Marie Curie researchers;
- Provides support for early career and experienced researchers (young Postdocs);

Goals

- Improve employability of researchers;
- Better training through demonstrated international mobility;
- Maintain Europe's leadership position in R&D.

A typical Accelerator Diagnostics



- Material sciences
 - Thermodynamics
 - Electro-Magnetism
 - Optics
 - Mechanics
 - Electronics
 - Nuclear Physics
 - ...
- ➔ Multi-disciplinary field !

Accelerator Beam Diagnostics

DITANET

« novel **D**iagnostics **T**echniques for future particle **A**ccelerators:
A Marie Curie Initial Training **NET**work »



SEED



What is DITANET ?

- Largest-ever EU funded training network in beam instrumentation and diagnostics (4.2 M€);
- Aim: Training of early stage researchers (18 ESRs, 3 ERs)
- Gives industry an important role;
- Presently 32 partners (*and growing...*)
- Recognised importance of beam diagnostics at European level !
(only 68 from 905 selected - with 11 in physics)

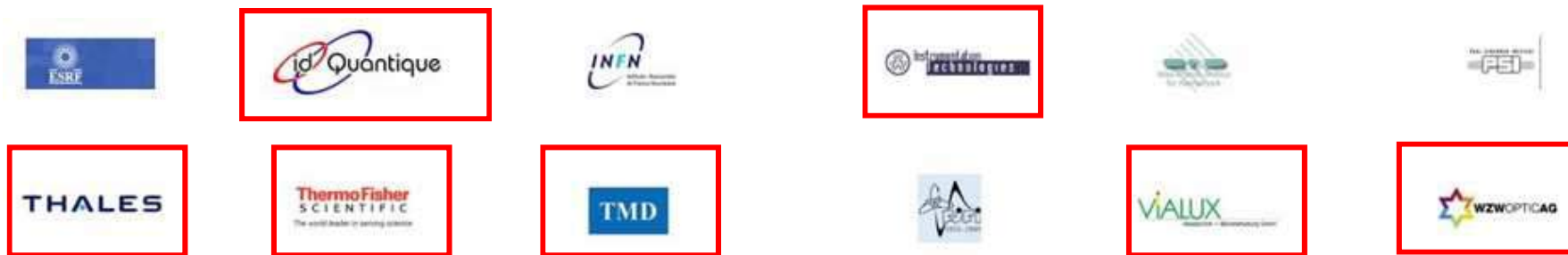
C.P. Welsch, Proc. BIW, IPAC 2011

The DITANET Consortium

Beneficiary Partners



Associated Partners



Universities:Research Centers:Industry = 1:1:1



Adjunct Partners

- Part of a long term strategy – DITANET is growing



Researcher Training Internationally



2 Diagnostics School
Stockholm, Sweden – March
Indico: 112220
> 80 participants and lecturers



8 Topical Workshops
CI, France, Slovenia, Seville, Hamburg
Indico: 145063, 145066, 145070, 135829,
154172
~ 40 participants each




Diagnostics Conference and Symposium
Seville, Spain – CNA
Indico: 135831
Proceedings + PRST-AB special edition

2nd DITANET School, March 2010

Complementary Skills

	Monday	Tuesday	Wednesday	Thursday	Friday
8:30 9:30		Project Management I Fistral: Paul Lyden	Working Within an International Network Guided Discussion	Time Management Ruth Bass	Scientific Writing ThinkWrite: Pete Moore
9:30 10:30			Building the Bridge to the Industry Sector Carsten Welsch + speakers		
11:00 12:00		Presentation Skills II Carsten Welsch	Project Management II Fistral: Paul Lyden	Problem Solving Techniques Ruth Bass	Scientific Writing ThinkWrite: Pete Moore
12:00 13:00				Self Management Ruth Bass	
14:00 15:00 15:00 16:00	Welcome/Introduction of participants Carsten Welsch	Small groups: Presentation Skills <i>Individual assessment of participants through 5 min. short talks</i>	Visit to CI / Daresbury	General Patent Issues and Intellectual Property Right Marks-Clerk: Peter Roberts	
16:30 17:30	Presentation Skills I Carsten Welsch			Work/Life Balance Ruth Bass	



DITANET
European Centres for Particle Accelerators - a European Union

- University of Liverpool, UK
- ACEA, Aachen, France
- CERN, Geneva, Switzerland
- DESY, Hamburg, Germany
- GSI, Darmstadt, Germany
- HIT Quark, Heidelberg, Germany
- IFIN-HH, Magurele, Romania
- Royal Holloway University of London, UK
- Stockholm University, Sweden
- CNA / University of Sevilla, Spain

DITANET School on Complementary Skills


Learn important topics and essential techniques of your professional career by the end of the program of this 5 day school in a friendly, relaxed atmosphere. If you are a physicist, it will provide an excellent opportunity to expand your knowledge in these subjects.

Programme is the ideal way for young people to learn the key issues on the development of their professional life. Topics are:

- Patent law
- Time and work/life management
- Individual assessment
- Problem Solving Techniques
- Self-Management
- Conclusion

For further information on the school and to apply for a place, please contact the organizers at the University of Liverpool, Liverpool, UK. Tel: +44 (0) 151 709 1000.

Contact Us:
Carsten Welsch
Department of Physics
University of Liverpool
Liverpool, L69 3GB, UK
c.welsch@liverpool.ac.uk



Supporting Cross-sector Dialogue

- Professional links across country and disciplinary borders vital for researcher careers;
- Encouraging knowledge exchange through organisation of schools, workshops and conferences;
- Important part: Industry contribution.



Key Ingredients to Success

- Dedicated Industry sessions in training schools;
- Insight into project management, robust financial planning, scientific writing skills, time and self management etc

Important to understand differences between entrepreneurial and university key success indicators



Feedback

"The workshop was not only useful but exciting!"

"...[it] covered the most important topics for a PhD student."

Secondments

- Part of every R&D projects;
- Duration: 2 weeks – several months;
- Ensures cross-sector experience;
- Helps understanding different needs and success criteria;
- Gives access to important infrastructures/tools;

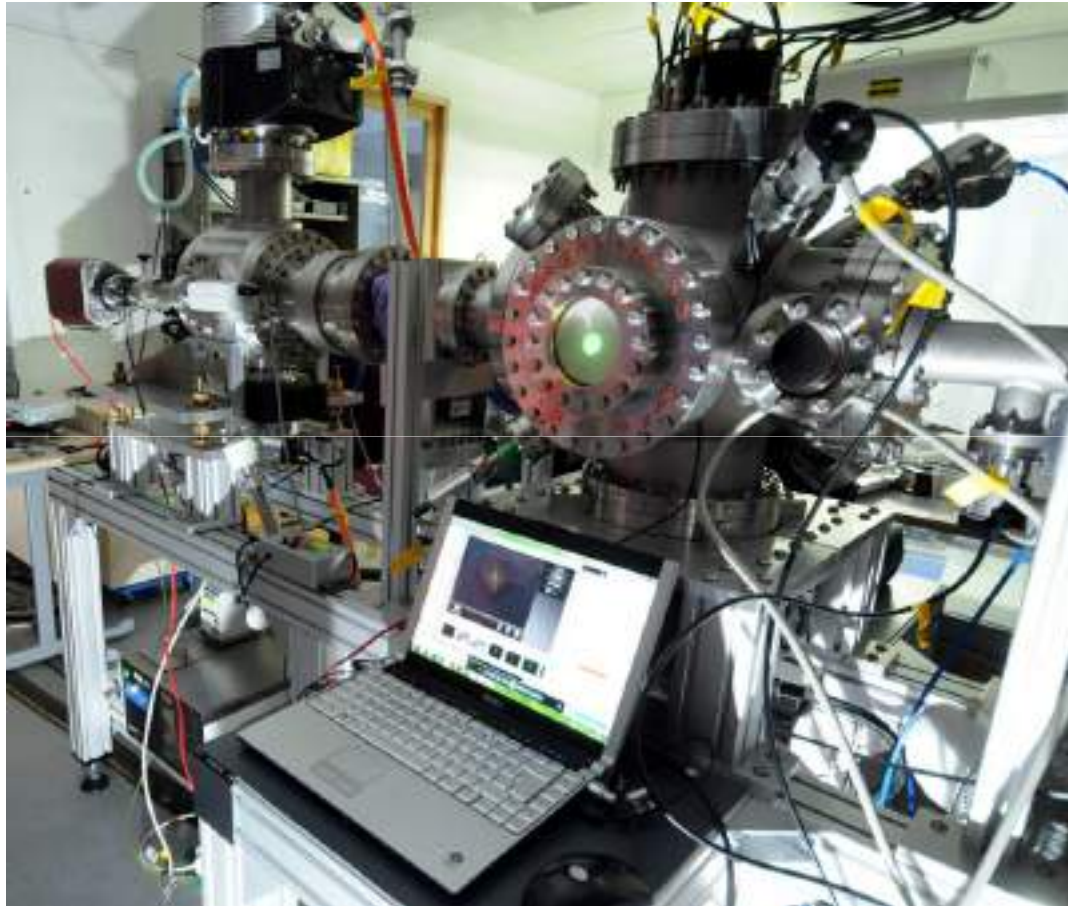
Adds value to training !



GSI: Tune measurements

- Secondments introduced Instrumentation Technologies to DITANET;
- Instrumentation Technologies became involved in DITANET Topical Workshops;
- Contributed to the network's Symposium;
- Became a beneficiary partner in oPAC

Liverpool: Gas jet beam profile monitor



- Proof-of-principle demonstrator was DITANET (PhD) project;
- Step into commercialization: RSE/STFC fellowship award / **DITACom**;
- Medical accelerators, light sources, etc.

M. Putignano, et al Hyperfine Interact. (2009)
M. Putignano, et al., Nucl. Instr. Meth. A (2011), Proc. IPAC, etc.

New initiatives – 1.10.2011



LA³NET

Open Positions with the LA³NET Project

Lasers have become increasingly important for the successful operation and continuous optimization of particle accelerators.

Free laser particle beams are well suited to driving the highest quality ion and electron beams. Free electron laser (FEL) accelerated, compressed and seeded bunches are ideal for driving the next generation of particle accelerators in the future, and without laser based beam diagnostics it would not be possible to avoid the phase errors of many complex particle beams. Within LA³NET, laser applications for particle accelerators will be developed within an international network.

The network is currently aiming to recruit a pool of leading, energetic, strongly motivated, early stage researchers with a degree in Physics, as is strongly valued here. Possibilities for working in a PhD program exist. Positions are especially encouraged in Asia.

Each researcher will benefit from a state-of-the-art training program that will take advantage of both local and network-wide activities, an effort in which network members and methods. Candidates will be offered ideal positions for their working in any of the following areas:

You will find more information about LA³NET, an excellent project and the application forms at <http://www.la3net.org>


Contact and further details:
Carmen E. Veloso
Cockcroft Institute of Accelerator Science and Technology
University of Liverpool
Department of Physics
L69 7BE, Liverpool, UK
cveloso@cockcroft.ac.uk



- **Laser Applications for Accelerators – A Marie Curie Network**
 - 17 ESRs
 - 23 Partner Institutions
 - 4.6 M€




And its sister – 1.12.2011



OPAC

**OPEN POSITIONS
WITHIN THE
OPAC PROJECT**

The optimisation of the performance of any particle accelerator inevitably depends on an in-depth understanding of the beam dynamics in the machine and the availability of simulation tools to study and continuously improve all machine components. It also requires a complete set of laser diagnostic methods to monitor all important machine and beam parameters, with high precision and a powerful control and data acquisition system.

With the OPAC project these systems will be closely linked with the aim to optimise the performance of present and future accelerators that lie at the heart of many research infrastructures.

The network is currently aiming to recruit a pool of talented, energetic, strongly motivated, early stage researchers with a degree in physics, electrical engineering or a closely related field. Possibilities to working into a PhD program exist. Women are especially encouraged to apply.

Deadline for applications:
March 31st 2012

Each researcher will benefit from a wide ranging training program that will take advantage of both local and international activities, as well as of schools, conferences, and workshops. Excellent salaries will be offered. Most positions are for starting in summer 2012.

You will find more information about OPAC, all research projects and the application details at <http://www.ck.iac.ac.uk>

Contact and further details:
Prof. Christian E. Walluck
Cockcroft Institute of Accelerator Science and Technology
University of Liverpool
Department of Physics
L69 7GB Liverpool, UK
Tel: +44 (0)151 709 7100
www.ck.iac.ac.uk

The project is funded by the European Union under contract ATN-04-2011-024487

- Optimization of Particle Accelerators
 - 22 ESRs
 - 22 Partner Institutions
 - 6 M€





Bringing the community together



Sue Davies, U Liverpool – Libera Workshop 2012



Summary

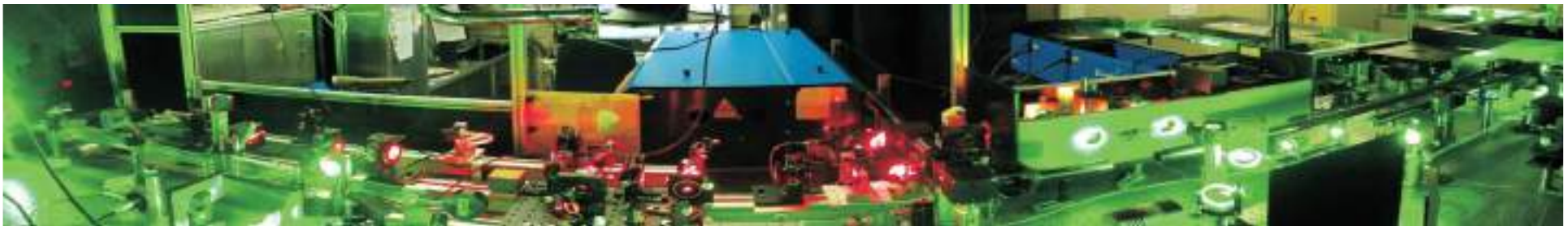
- Close collaboration between academia and industry crucial for research and training;
- DITANET, oPAC and LA³NET projects introduced new training concepts with industry partnership as key aspect;
- Event organisation (such as this workshop) as ideal way for knowledge transfer;
- Many opportunities at the horizon – join in !

Further information

Prof. Dr. Carsten P. Welsch
Associate Director
Cockcroft Institute
University of Liverpool
Warrington WA4 4AD, UK

c.p.welsch@liv.ac.uk

www.la3net.eu and www.opac-project.eu



Panorama photograph of the RILIS setup at CERN (image courtesy V. Fedosseev).