

Researcher training within international networks

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oPAC Project Manager

Overview

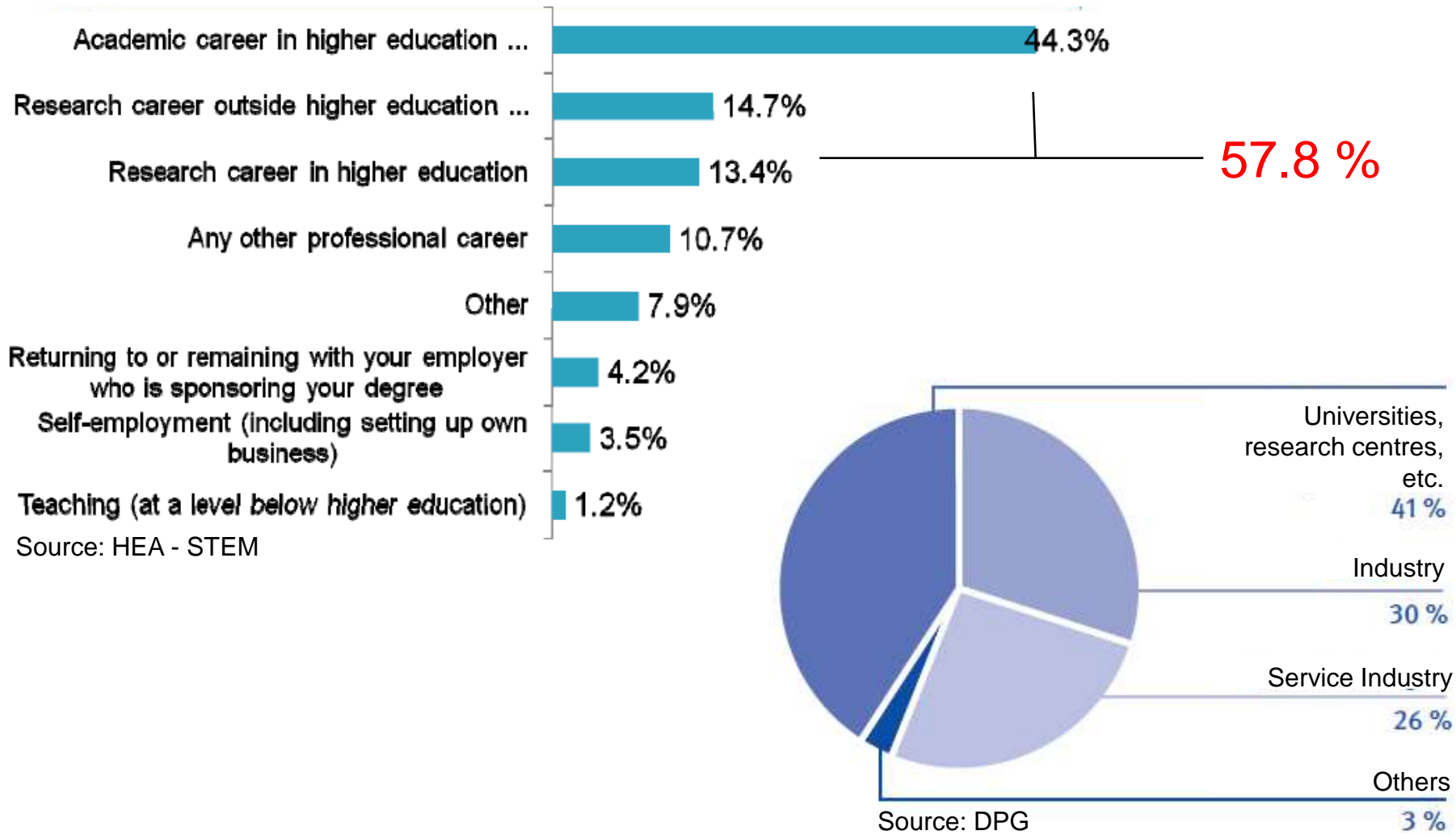
- Researcher Training in Europe
- DITANET – European Network on Accelerator Diagnostics
- oPAC – European Network on Particle Accelerators
- Other Initiatives and future aim: LA³NET

European Researchers

- 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)

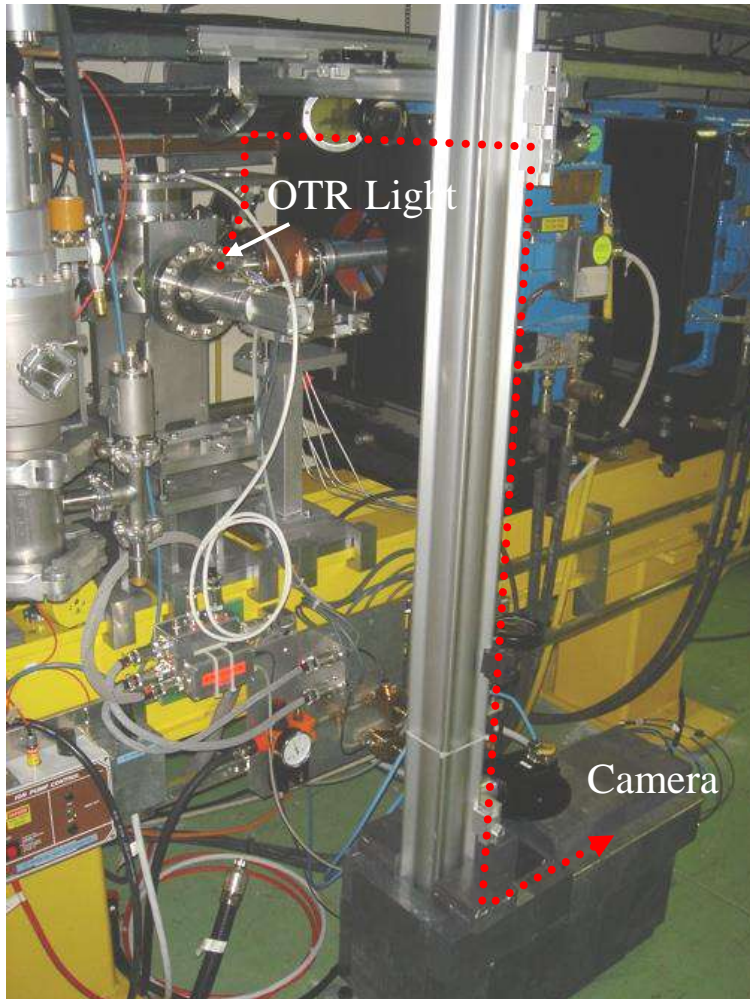
Marie Curie ITNs

- 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



« novel Diagnostic Techniques for future particle Accelerators:
A Marie Curie Initial Training NETwork »

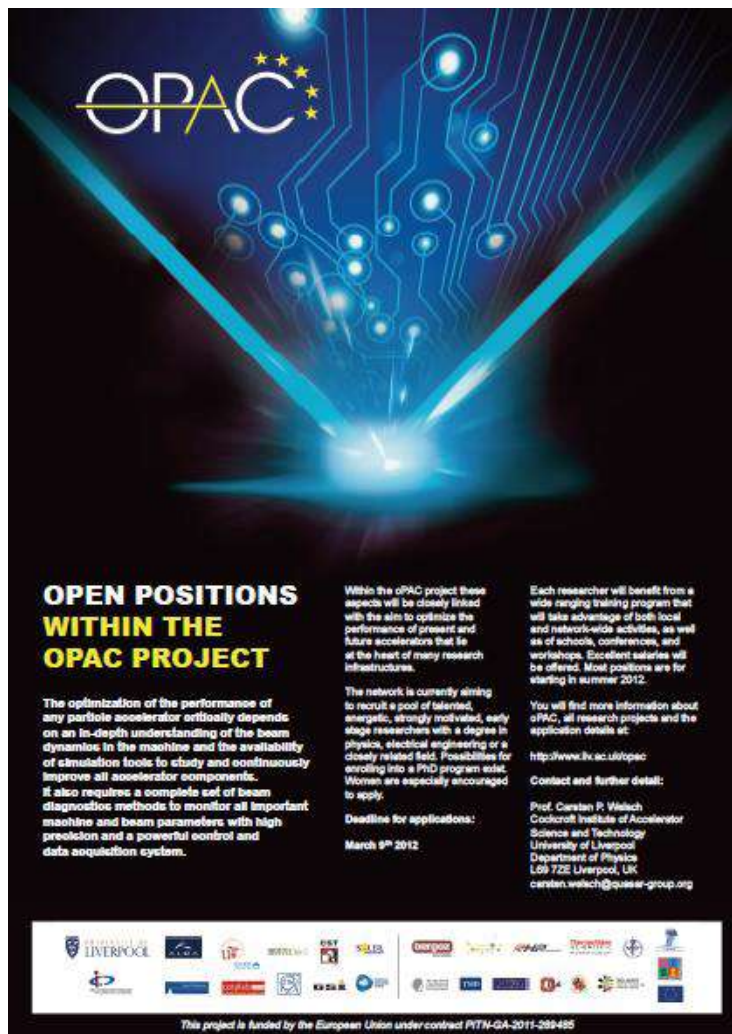
www.liv.ac.uk/ditanet



What is DITANET ?

- Aim: Training of early stage researchers (*18 ESRs, 3 ERs*)
- Gives industry an important role;
- 32 partners
- Recognized importance of beam diagnostics at European level !
(only 68 from 905 selected - with 11 in physics)

What is oPAC?



OPAC

**OPEN POSITIONS
WITHIN THE
OPAC PROJECT**

The optimization of the performance of any particle accelerator critically 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 accelerator components. It also requires a complete set of beam diagnostic methods to monitor all important machine and beam parameters with high precision and a powerful control and data acquisition system.

Within the oPAC project these aspects will be closely linked with the aim to optimize 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 for enrolling into a PhD program exist. Women are especially encouraged to apply.

Deadline for applications:
March 9th 2012

Each researcher will benefit from a wide ranging training program that will take advantage of both local and network-wide 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.liv.ac.uk/opac>

Contact and further detail:
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carsten.welsch@quasar-group.org

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■ Optimization of Particle Accelerators

- 22 ESRs
- 22 Partner Institutions (*and growing...*)
- 6 M€



www.opac-project.eu

Overview of Consortium

■ Beneficiary partners



■ Associated partners



Adjunct Partners

- Part of the long term strategy – oPAC is growing



ALMA MATER STUDIORUM
UNIVERSITA DI BOLOGNA



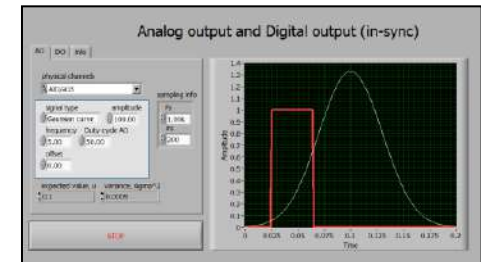
UPPSALA
UNIVERSITET



Accelerator Optimization

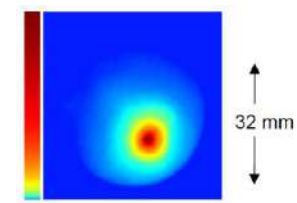
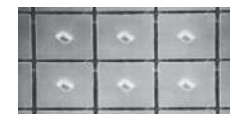
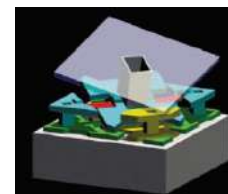
- Adaptation of existing open-source control systems from compact accelerators to large scale facilities

P. Maslov, Cosylab



- Beam Halo R&D

B. Lomberg, University of Liverpool



C.P. Welsch, et al., Meas. Sci. Technol. **17** (2006)
Phys. Rev. ST-AB (2012).

Accelerator Optimization

- Design and development of common applications for different particle accelerators

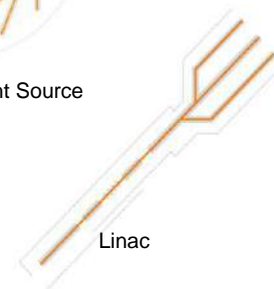
Manuel Cargnelutti, Instrumentation Technologies



Synchrotron Light Source



Hadron Collider



Linac

- Development of a versatile beam loss monitor

Pavel Kavargin, CIVIDEC



Researcher Training Internationally

	Main training events & conferences	WP	Lead Institution	Project month
1	1 st oPAC School	6/7	CERN	9
2	Workshop Beam Physics	6/7	ALBA	12
3	Beam Instrumentation	6/7	Bergoz	15
4	Simulation Tools	6/7	CST	18
5	Complementary Skills School	6	ULIV	21
6	Workshop on Diagnostics	6/7	CIVIDEC	27
7	Libera Workshop	6/7	i-tech	30
8	2 nd oPAC School	6/7	RHUL	33
9	Workshop “Technology Transfer”	6/7	ULIV <i>with industry partners</i>	36
10	Employability Improvement Workshop	6/7	ULIV with industry partners	39
	Final conference	6/7	US/CNA	42



Training

- Local training by host;
- Network-wide schools on accelerator techniques;
- Intra-network exchange of researchers;
- Secondments to other network partners (cross sector);
- Training in complementary skills.

➡ Motivation: *Ideal* Training.

Complementary Skills School

Time	Monday	Tuesday	Wednesday	Thursday	Friday
8.30 – 9.30	Introduction <i>Paired Introductions: Participants generate flip chart poster of interview partner then present them to whole group.</i>	Career Prospects in Industry & Academia	Presentation skills <i>Introduction</i> <i>Participants will give 5 minute presentation in small groups about their PhD projects</i> <i>All presentations will be video recorded</i> <i>Feedback by:</i> (1) presenter, (2) (2) fellow students, (3) Tutor	Advanced Project Management	Introduction to Peer Review The Presentation <i>(Followed by Questions)</i> Peer Review preparation Peer Review <i>Teams present assessment and feedback</i> Forward Planning
9.30 – 10.30		Independent Teamwork Dreamer, Realist, Critic <i>Teams to come up with a response to the challenge</i> <i>Teams choose their project topic and plan the team-working process.</i>		Independent Team Work <i>Teams work on the project according to their plan</i>	
10.30 - Break		Presentation skills <i>Basics of research presentations – an introduction to the Do's and Don'ts of conference presentation</i>		Chairs meeting <i>Present summary of report structure</i> <i>Teams review project following feedback</i>	
11.00 – 12.30					
12.30 – 13.30	Lunch				
13.30 – 15.00	Introduction to Project Management <i>Theoretical Background</i> <i>Action: Plan PhD project</i> <i>Update description</i> <i>Stakeholder analysis</i> <i>Milestones</i> <i>Deliverables</i>	Scientific Writing <i>Focus on writing research papers.</i> <ul style="list-style-type: none"><i>The writing process and structure</i><i>Thinking about the audience</i><i>Target journals</i><i>Tips</i> <i>Writing for the general public.</i>	Visit to Cockcroft Institute <i>Introduction</i> <i>Tour of facilities</i>	Network diagrams <i>(Understanding dependencies)</i>	
15.00 – Break					
15.30 – 16.30				Independent Team Work <i>Teams continue collaborating on project.</i> <ul style="list-style-type: none"><i>Produce report</i><i>Create presentation</i>	
16.30 – 17.30				Assessing Risks	

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 !

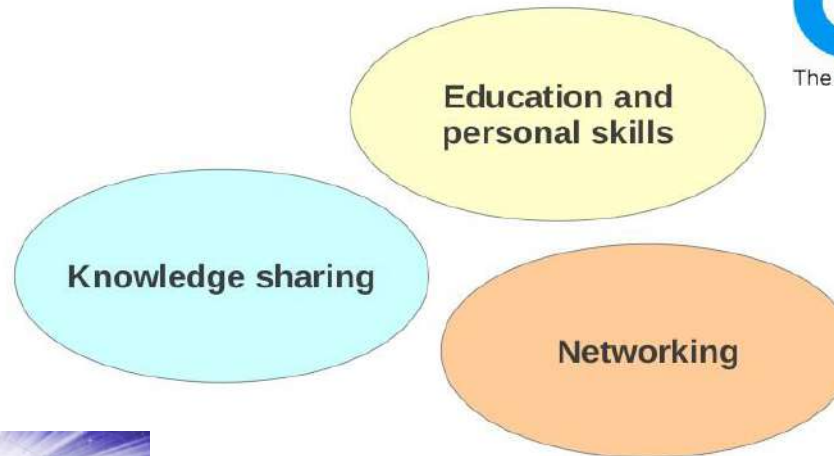


Instrumentation Technologies

- 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

Training – at each Network Node

- Example:
Manuel Cargnelutti, Instrumentation Technologies,
Slovenia





Topical Workshops

Project partners

Secondments

Dissemination: oPAC Website

oPAC

About us

Network Structure

Projects

Vacancies

News

Events

Dissemination

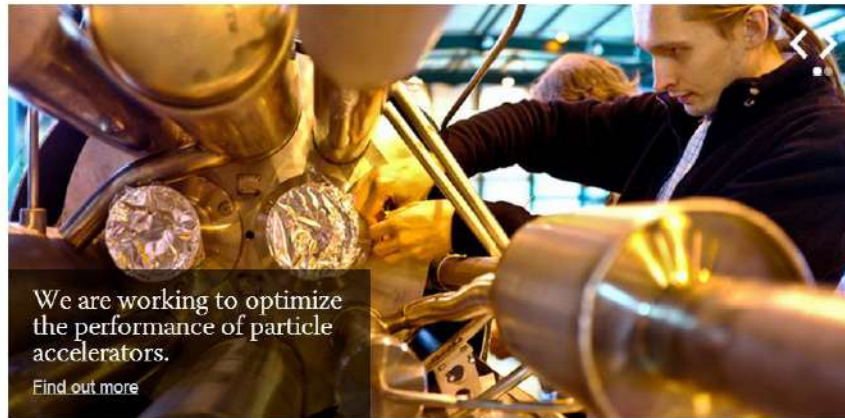
Press

Downloads

Links


EU Project T.E.A.M.

Contact





We are working to optimize the performance of particle accelerators.


[Find out more](#)



Welcome to oPAC

The optimization of the performance of any Particle ACcelerator (oPAC) is the goal of this new network within the FP7 Marie Curie Initial Training Network (ITN) scheme.



Our Network

We work with the leading research centres, universities and industry partners.

[Find out more](#)

News

oPAC Fellows at EIC14

The Big Bang National Event - It all started with the Big Bang!!

www.liv.ac.uk/opac

Quarterly Newsletter

- Part of the dissemination strategy
- Contribution from all network partners
- Announcement and review of activities
- > 500 recipients, growing
 - All available via home page.




Follow us on Facebook

Other initiatives

■ Laser Applications for Accelerators – A Marie Curie Network

- 17 ESRs
- 23 Partner Institutions
- 4.6 M€



LA³NET

Open Positions with the LA³NET Project

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

Lasers have become increasingly important for the successful operation and continuous optimization of particle accelerators. Laser-based particle sources are well suited for delivering the highest quality ion and electron beams. Laser acceleration has demonstrated unprecedented accelerating gradients and might be an alternative for conventional particle accelerators in the future, and without laser-based beam diagnostics it would not be possible to unravel the characteristics 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 talented, energetic, strongly motivated, early stage researchers with a degree in physics or a closely related field. Possibilities for enrolling into a PhD program exist. Women are especially encouraged to apply.

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

You will find more information about LA³NET, all research projects and the application details at: <http://www.liv.ac.uk/la3net>

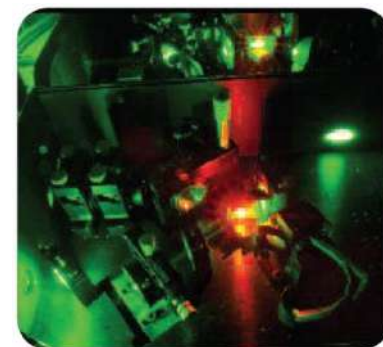
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LA³NET

www.la3net.eu

LAser Applications at Accelerators a european NETwork

- More than 30,000 accelerators in the world;
- Lasers are becoming increasingly important
 - Beam generation;
 - Acceleration;
 - Characterization.
- Few experts trained in both fields;
- Large scale facilities: International collaboration is key !



➡ Multi-disciplinary field !

Bringing the community together



Summary and outlook

- Close collaboration between academia and industry crucial for research and training;
- Defined improved training standards.
- New initiatives based on this experience offer exciting opportunities.
- Cross sector training; secondments
- In constant dialogue with the research community – many events.

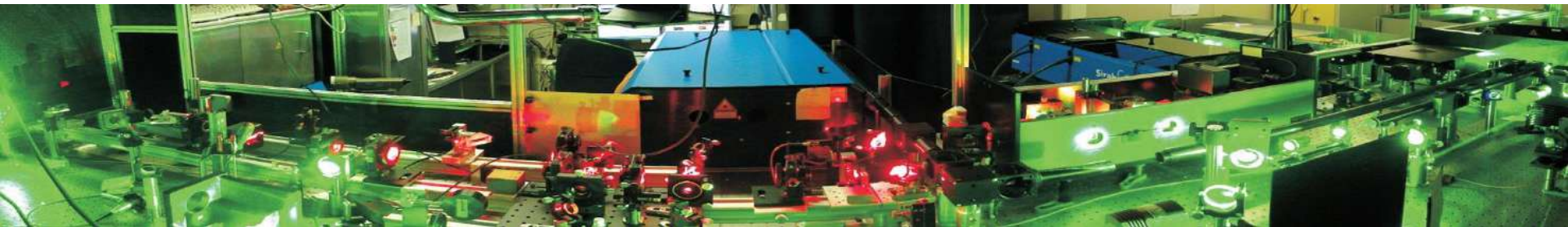


Further information

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



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