

TIARA WP5 Survey Results

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WP5 participants / contacts

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Louis Rinolfi (JUAS)
- 3 CNRS:** Alex Muller, Catherine Clerc
- 4 CIEMAT:** Marisa Marco, Diego Obrador, Susanna Falcon
- 6 GSI:** Oliver Boine-Frankenheim, Sabrina Appel
- 7 INFN:** Vittorio Vaccaro, Francesca Galluccio
- 8 PSI:** Lenny Rivkin
- 9 STFC:** Philip Burrows, Max Bradbury
- 10 Nordic group:** Soren Pape Moeller + Ole Petter Nordahl
- 11 IFJ:** Piotr Malecki

Outline

- **Reminder of WP5 tasks**
- **Education and training survey:**
 - methodology**
 - results**
- **Education and training database**
- **Other WP5 news in tomorrow's talk**

WP5: outline

WP5.1 Make a **survey** of the **number of students, courses and teaching resources** in Accelerator Science and establish a **common resources database**

WP5.2 Evaluate and **develop the “market”** for **trained Accelerator Scientists** (physicists, engineers, technicians) for research, healthcare, industry and public service

WP5.3 Determine a **plan of action** for **promoting Accelerator Science and Technology** within schools, universities, research organisations, industry and society

D5.1 survey topics

- **Institutes providing training**
- **Personnel involved in delivering training**
- **Type of training**
- **Numbers and types of students**
- **Training materials and facilities**
- **Career destinations**

www-based survey

www-based questionnaire

<http://tiara.physics.ox.ac.uk/tiara-survey/>

Thanks to Max Bradbury

Philip Burrows

TIARA
Test Infrastructure and Accelerator Research Area

Home TestForm **TIARA Survey**

TIARA SURVEY

Hide/show sections by clicking their headings.
If you are not sure about a field, please leave it blank.

▶ **NAME/EMAIL**

▶ **INSTITUTION**

▼ **TRAINING**

Does your institution currently offer training in any aspect of accelerator science?

Yes
 No

In which areas do you provide training?

Particle sources
 Accelerating structures
 Magnets
 Beam dynamics
 Beam instrumentation & control

Which groups do you offer training to?

Undergraduates
 Masters-level students
 PhD students
 Post-doctoral fellows (not permanent appointments)
 Staff (permanent appointments)
 Others

▼ **UNDERGRADUATES**

How many undergraduates received training in academic year 2010/11?

How many undergraduates will receive training in academic year 2011/12?

TIARA Meeting, CIEMAT 13/6/12

Survey responses

- **Survey launched 6/9/11**
- **By April 2012 responses from 88 institutes across Europe**

**This is a fantastic response:
thanks to all who completed the survey!**

- **We have captured the vast majority of the key players**

Responding institutes by country

Denmark	1
Finland	1
France	18
Germany	11
<i>Greece</i>	3
Italy	12
<i>Netherlands</i>	1
Norway	1
Poland	5
Spain	10
Sweden	4
Switzerland	4
UK	17

Responding institutes (1)

Denmark

ISA, Aarhus University, Søren Pape Møller

Finland

Department of Physics, University of Jyväskylä, Pauli Heikkinen

France

C2RMF, Claire Pacheco

CEA/INAC/SBT, Alain Girard

CEA/DSM/IRFU/SACM, P.A. Phi Nghiem

CNRS/IN2P3/CENBG, Laurent Serani

CNRS/IN2P3/CSNSM, Cyril Bachelet

CNRS/IN2P3/IPN, Patrick Ausset

CNRS/IN2P3/IPNL, Marcel Bajard

CNRS/IN2P3/LAL, Alessandro Variola

CNRS/IN2P3/LAPP-**Université de Savoie**, Andrea Jeremie

CNRS/IN2P3/LLR, Catherine Clerc

CNRS/IN2P3/LPSC, Maud Baylac

CNRS-LPGP, Brigitte Cros

ESRF, Jean-luc Revol

GANIL/CEA/CNRS, Frederic Chautard

SOLEIL, Jean-Claude Denard

Université et Ecole des Mines de Nantes/CNRS/IN2P3/SUBATECH, Freddy Poirier

Université Paris 11, Costel Petrache

Université Paris 11/Paris 6/Paris 7/INSTN, Alessandro Variola

Responding institutes (2)

Germany

DELTA, TU Dortmund, Thomas Weis

DESY, Alexander Gamp

Goethe-Universität Frankfurt,

GSI Helmholtzzentrum für Schwerionenforschung GmbH, Oliver Kester

Hamburg University, Joerg Rossbach

Helmholtz-Zentrum Berlin, Andreas Jankowiak

Institut für Kernphysik der Johannes Gutenberg-Universität Mainz, Kurt Aulenbacher

Institut für Kernphysik, FZ Jülich, Andreas Lehrach

Institut für Kernphysik, TU Darmstadt, Ralf Eichhorn

TEMF, TU Darmstadt, Thomas Weiland

University of Wuppertal, Günter Müller

Greece

Aristotle University of Thessaloniki, Petridou Charikleia

Inst. of Nuclear Physics, National Center for Research 'Demokritos', Petros Rapidis

University of Crete, Giorgos Tsironis

Responding institutes (3)

Italy

ENEA, Luigi Picardi

Fondazione CNAO, Marco Pullia

INFN - Laboratori Nazionali del Sud, Luciano Calabretta

INFN - Laboratori Nazionali di Frascati, Andrea Ghigo, Maria Enrica Biagini, Caterina Biscari, Massimo Ferrario

INFN - Laboratori Nazionali di Legnaro, Andrea Pisent

INFN - MILANO & Università degli Studi di Milano, Paolo Pierini, Angelo Bosotti, Dario Giove, Giovanni Volpini

INFN - NAPOLI & Università degli Studi di Napoli Federico II, Maria Rosaria Masullo

INFN - PISA & Università degli Studi di Pisa, Franco Cervelli, Danilo Giulietti

Sincrotrone Trieste, Gerardo D'Auria

Università degli Studi di Torino, Mauro Gallio

Università di Bologna, Giorgio Turchetti

Università di Roma "La Sapienza", Luigi Palumbo

Netherlands

Kernfysisch Versneller Instituut, University of Groningen, Sytze Brandenburg

Norway

University of Oslo, Steinar Stapnes

Poland

Cracow University of Technology/ Faculty of Mechanical Engineering, Blazej Skoczen

Institute of Nuclear Physics, Polish Academy of Sciences, Piotr Malecki

National Centre for Nuclear Research, Slawomir Wronka

Technical University of Lodz, Department of Microelectronics and Computer Science,

Dariusz Makowski

Warsaw University of Technology, Ryszard S. Romaniuk

Responding institutes (4)

Spain

ALBA CELLS, Gaston Garcia

Centro Nacional de Aceleradores, CNA, Joquin Gomez Camacho

Centro de Investigaciones Energéticas Medioambientales y Tecnológicas, CIEMAT,
Marisa Marco

European Spallation Source of Bilbao, FJ Bermejo

Instituto de Física Corpuscular, Angeles Faus-Golfe

Technical University of Catalonia (Universitat Politecnica de Catalunya), Yuri Kubyshev

Universidad Autónoma de Barcelona, Manel Sabés

Universidad Autónoma de Madrid, Angel Munoz-Martin

Universidad de Huelva, Ismael Martel

Universidad Nacional de Educación a Distancia, UNED. (ETS Ingenieros Industriales),
Javier Sanz Gozalo

Sweden

European Spallation Source ESS AB, Håkan Danared

Lund University/MAX-lab, Sverker Werin

Stockholm University, Ansgar Simonsson

The Svedberg Laboratory, Uppsala University, Björn Gålnander

Responding institutes (5)

Switzerland

CERN, Roger Bailey

EPFL: Swiss Institute of Technology Lausanne, Lenny Rivkin

LHEP, Uni-Bern, Antonio Ereditato

Paul Scherrer Institut, Terence Garvey

United Kingdom

Brunel University, Akram Khan

Diamond Light Source, Riccardo Bartolini

Dundee University, Allan Gillespie

Glasgow University, Paul Soler

Huddersfield University, Roger Barlow

Imperial College London, Juergen Pozimski

John Adams Institute, University of Oxford, Riccardo Bartolini

John Adams Institute, Royal Holloway, University of London, Pavel Karataev

Lancaster University, Amos Dexter

Liverpool University, Andy Wolski

Manchester University, Roger Jones

Science and Technology Facilities Council, Greg Diakun

Sheffield University, Chris Booth

Strathclyde University, Alan Phelps

Surrey University, Karen Kirkby

Warwick University, Paul Harrison

University College London, Matthew Wing

Philip Burrows

Education + training survey

- **Survey data checked + validated by each country representative – bugs and inconsistencies fixed**
- **Grouped + ordered data → database**
- **Detailed analysis of results**
- **Survey report sent to SC + GB for comments**
- **www-front end available (internally)**

Survey report



Test Infrastructure and Accelerator Research Area

TIARA WP5 Deliverable 5.1 - ETR Education and Training Survey Report

2 May 2012

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Report drafted,
finalised + checked
by WP5 members,
reviewed by SC + GB

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Philip Burrows

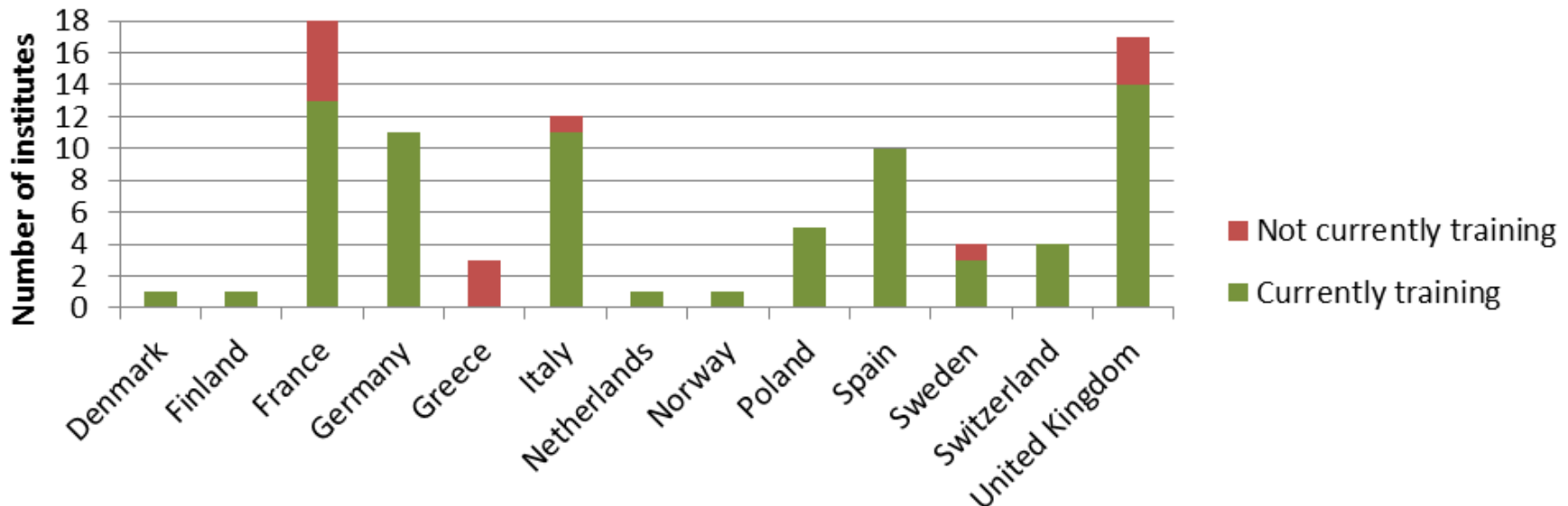
Grant agreement no 261905.

Report outline

EXECUTIVE SUMMARY	
1. INTRODUCTION	
2. INSTITUTES AND PERSONNEL	
3. INSTITUTES' PROVISION OF TRAINING.....	
4. TRAINEE NUMBERS	
5. FORMAL TRAINING TIME	
6. TRAINING SUBJECTS.....	
7. ACCELERATOR SCHOOLS AND THE CERN DOCTORAL STUDENT PROGRAMME	
8. TRAINING MATERIALS AND USE OF FACILITIES.....	
9. CAREER DESTINATIONS	
10. SUMMARY OF MAIN FINDINGS.....	
APPENDIX 1: RESPONDING INSTITUTES AND CONTACT PERSONS	
APPENDIX 2: Survey	
APPENDIX 3: country-specific analysis.....	
APPENDIX 4: CAS statistics	
APPENDIX 5: JUAS statistics	
APPENDIX 6: NATIONAL AND INTERNATIONAL FACILITIES.....	

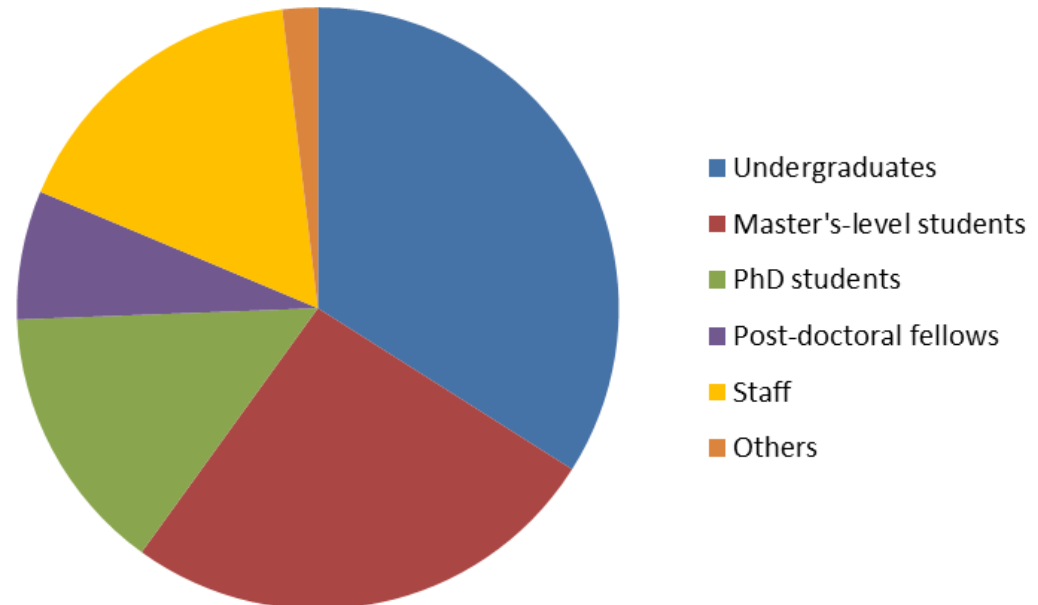
Survey highlights: institutes

- 88 responding institutes
- 3060 personnel engaged in accelerator science
- 75 institutes (85%) provide training themselves
- 12 institutes plan/desire to train in future

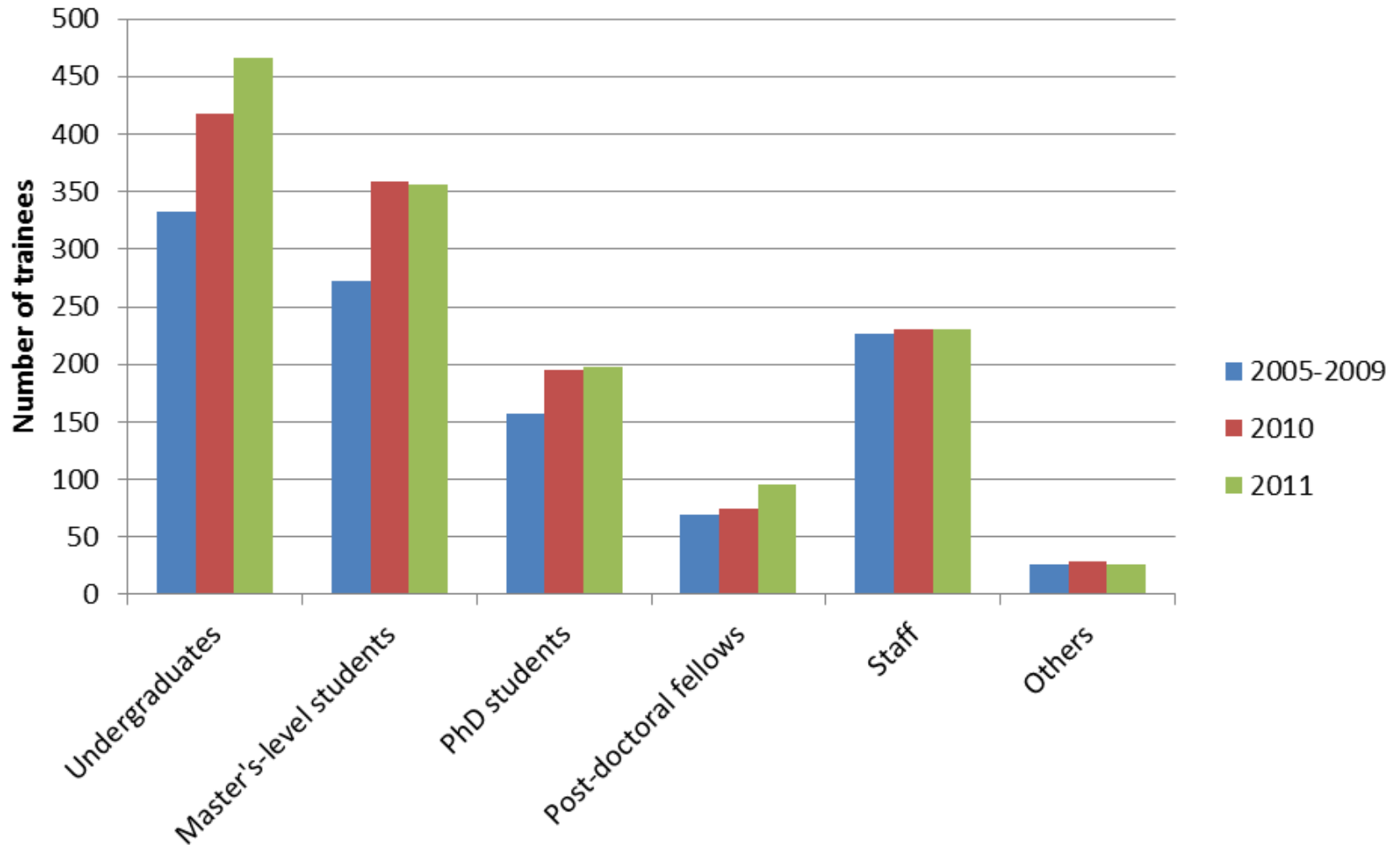


Survey highlights: trainees

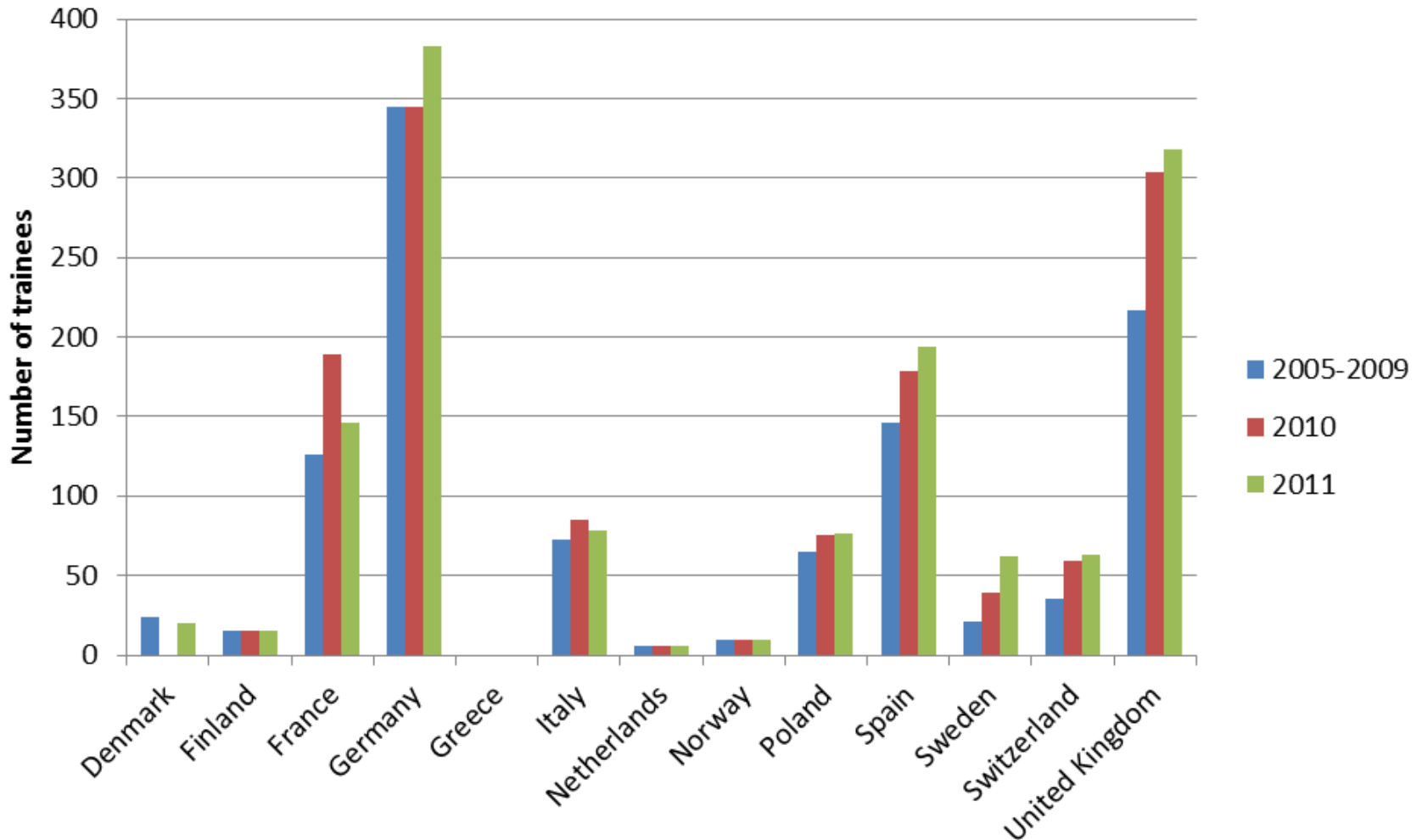
- **1371 people (2011) currently receive training:**
 - 34% undergraduates**
 - 26% masters**
 - 14% PhD**
 - 7% postdocs**
 - 17% staff**



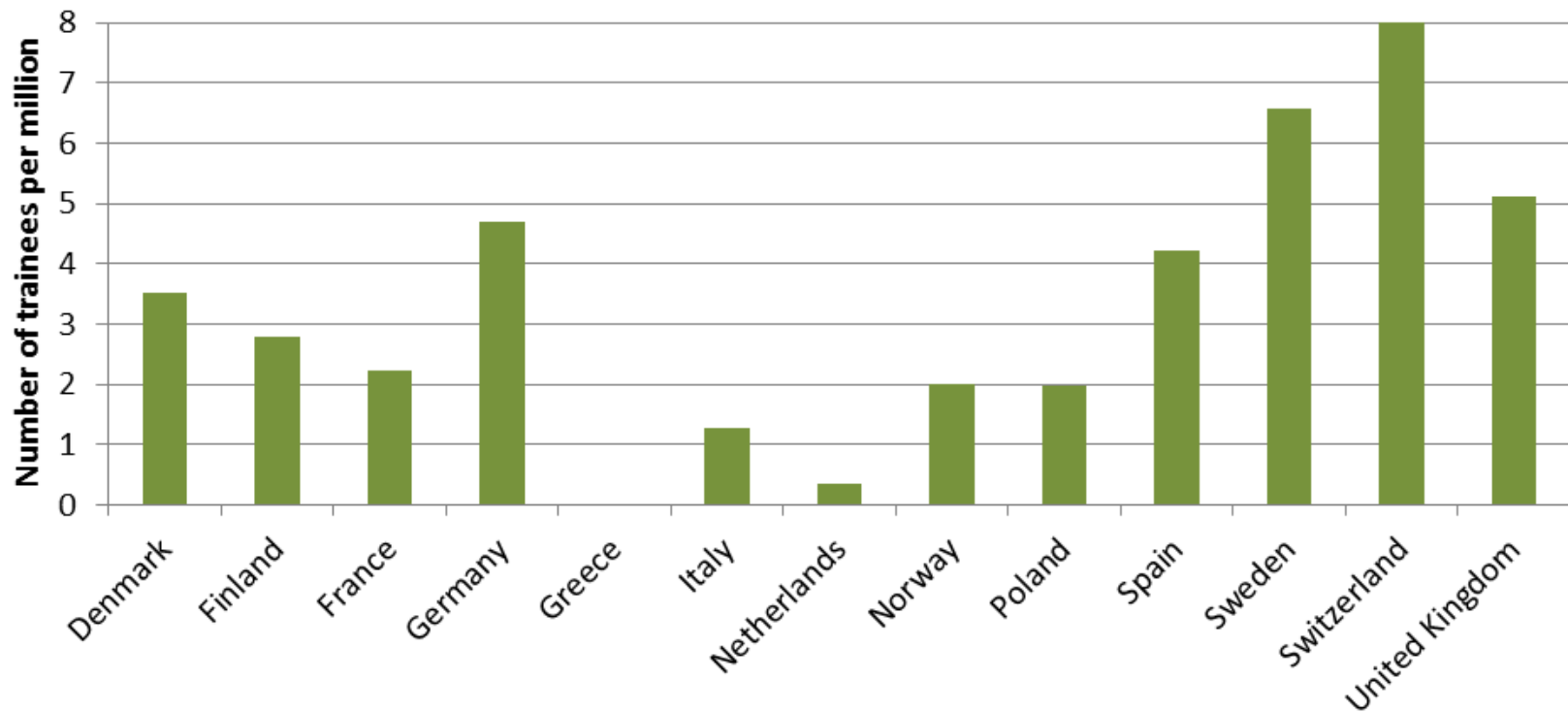
Survey highlights: trainees



Survey highlights: trainees

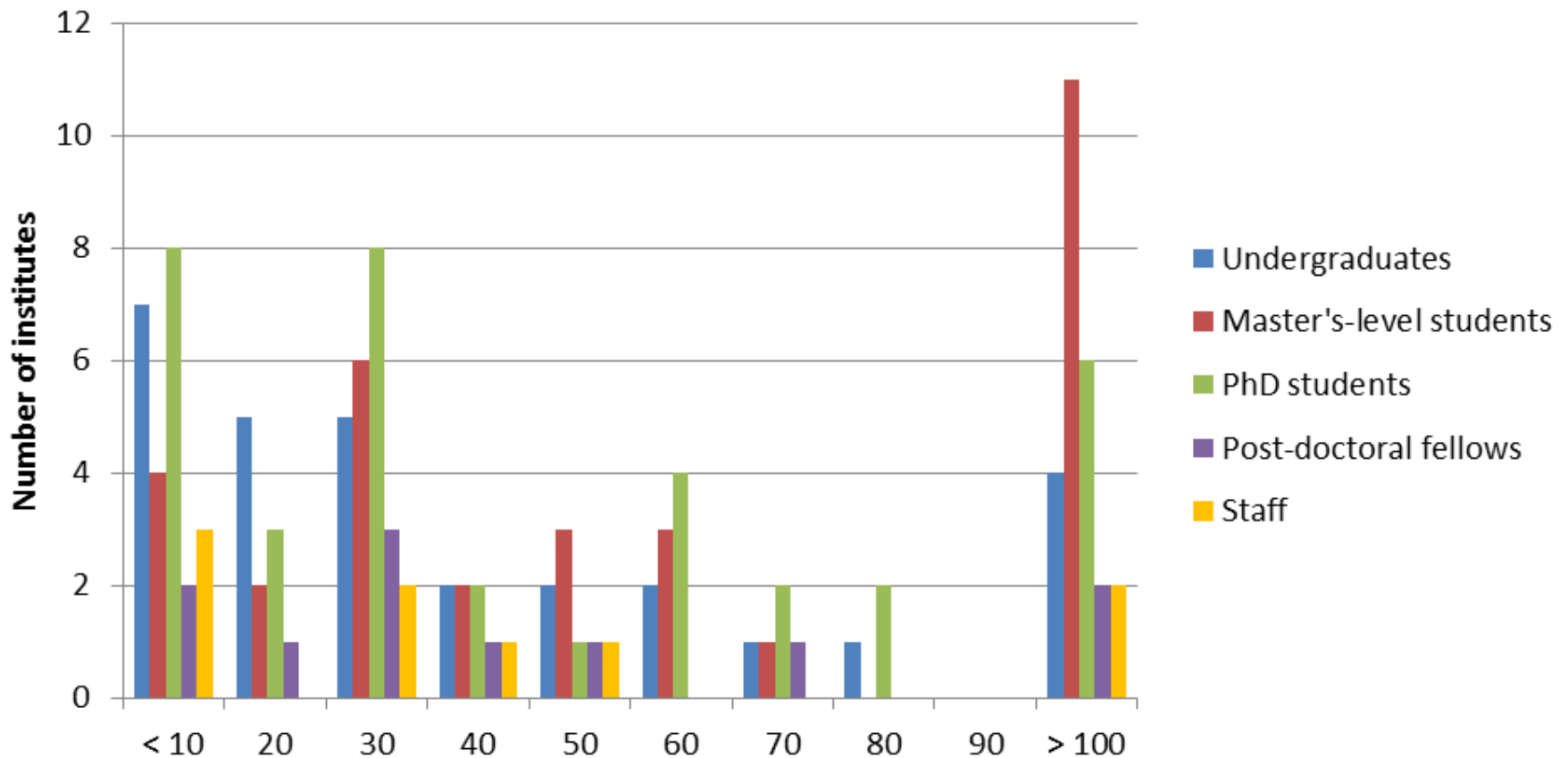


Trainees / population

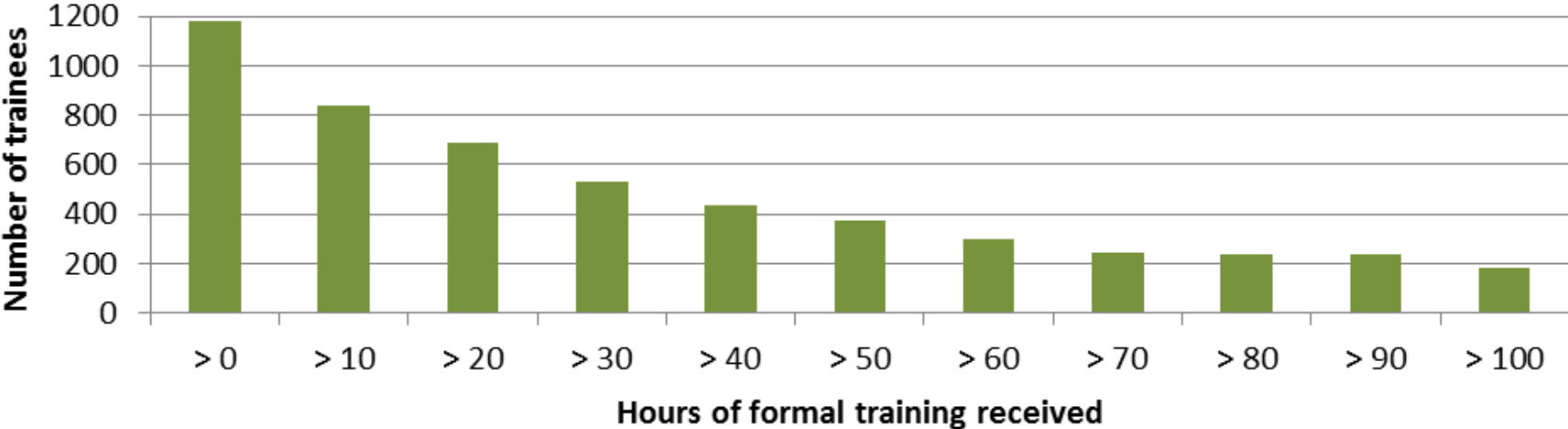


Formal training hours

- 55 / 75 institutes reported 'formal' training hours

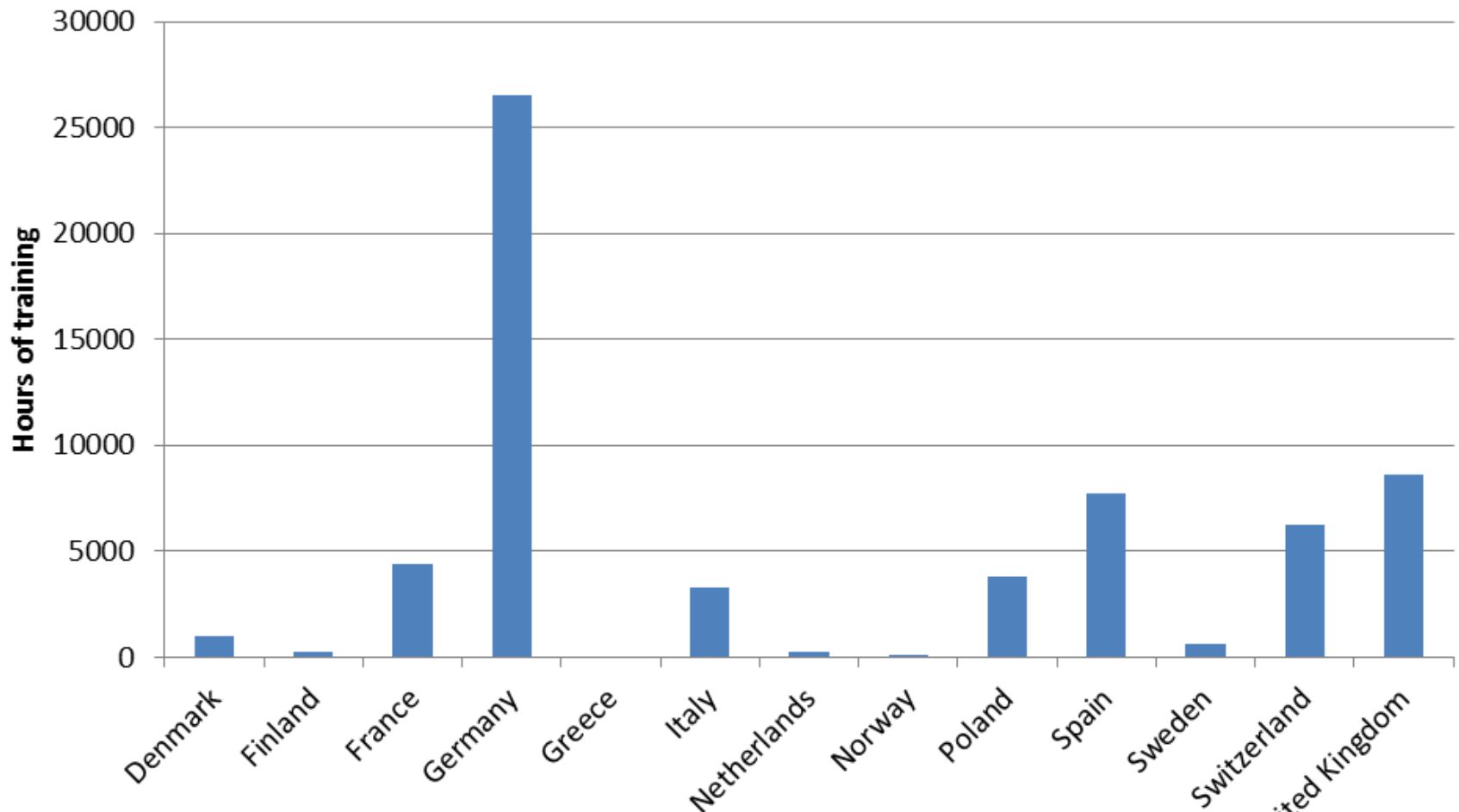


Trainees vs formal training hours

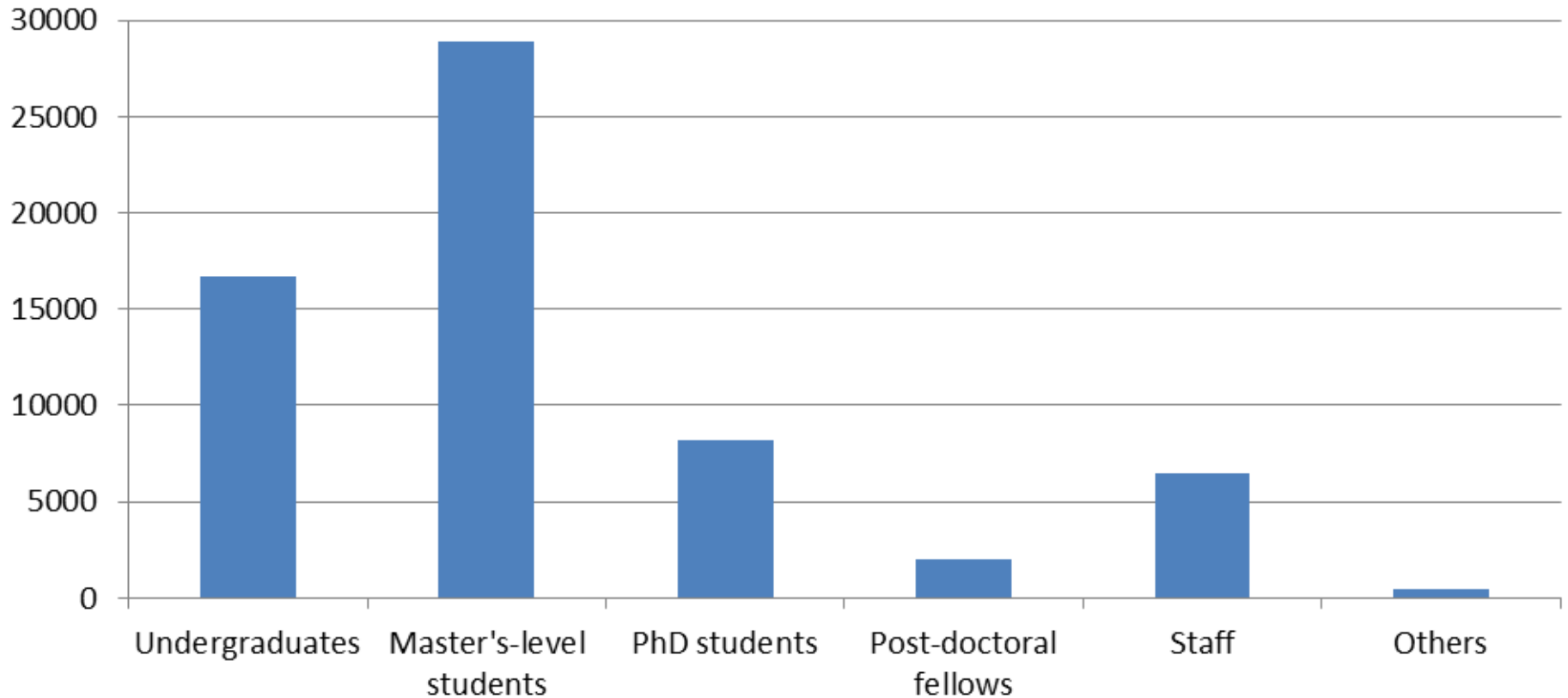


Integrated training hours

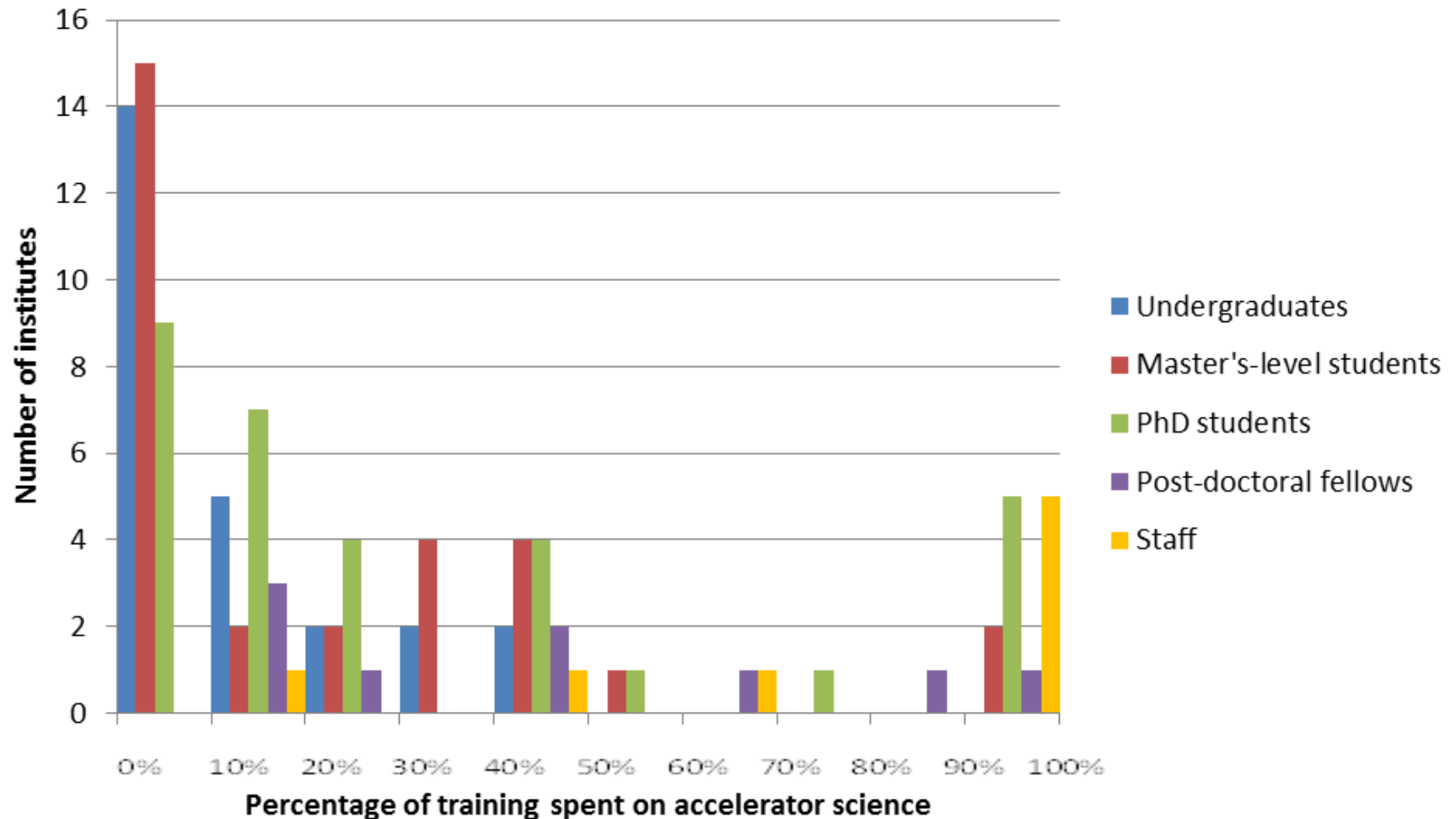
- **62777 formal training hours provided (2011)**



Integrated training hours

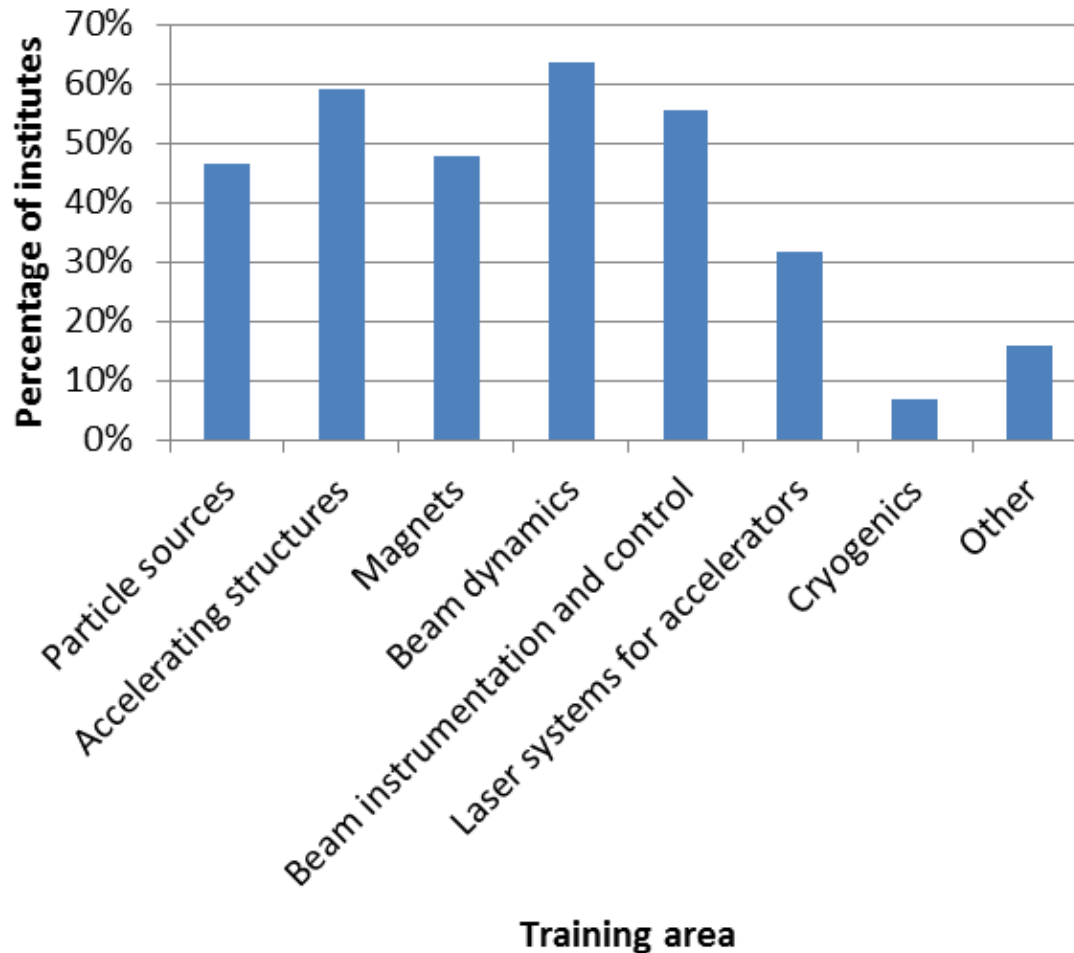


% of formal training on accel sci



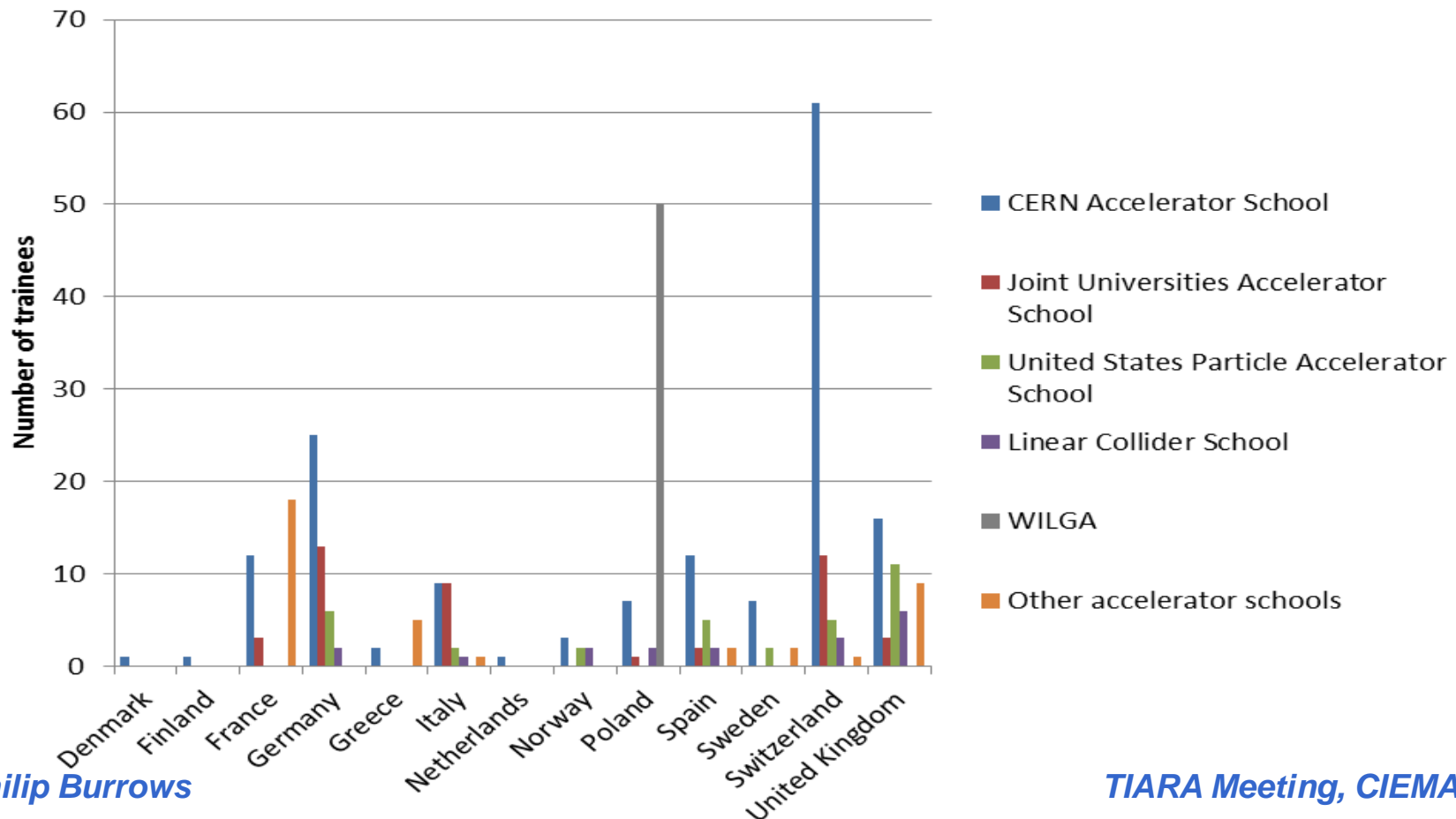
Training subjects

- 72 institutes reported on training subjects

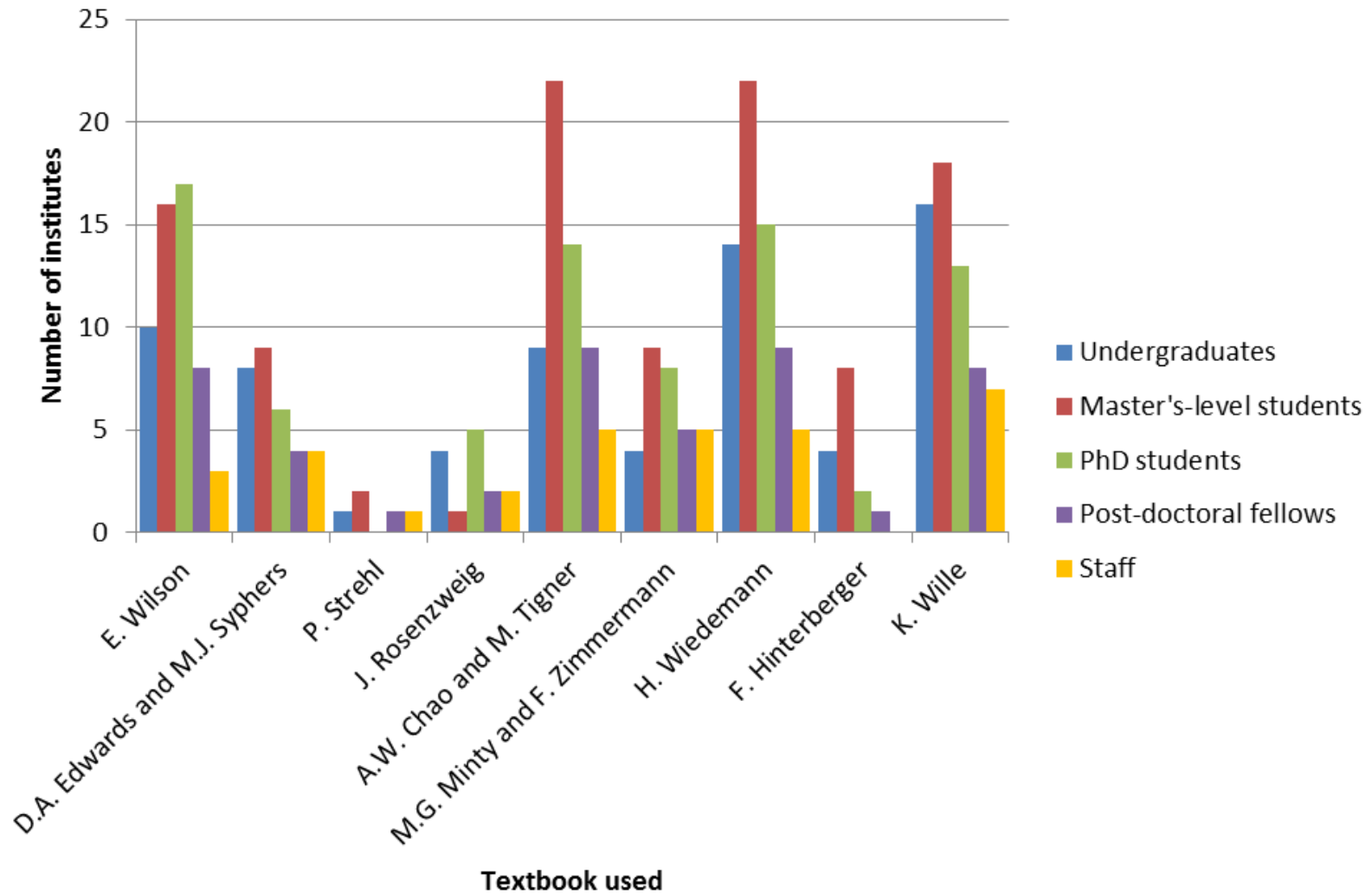


Accelerator school attendance

- 83 institutes send people to accelerator schools: 339 people (2011)

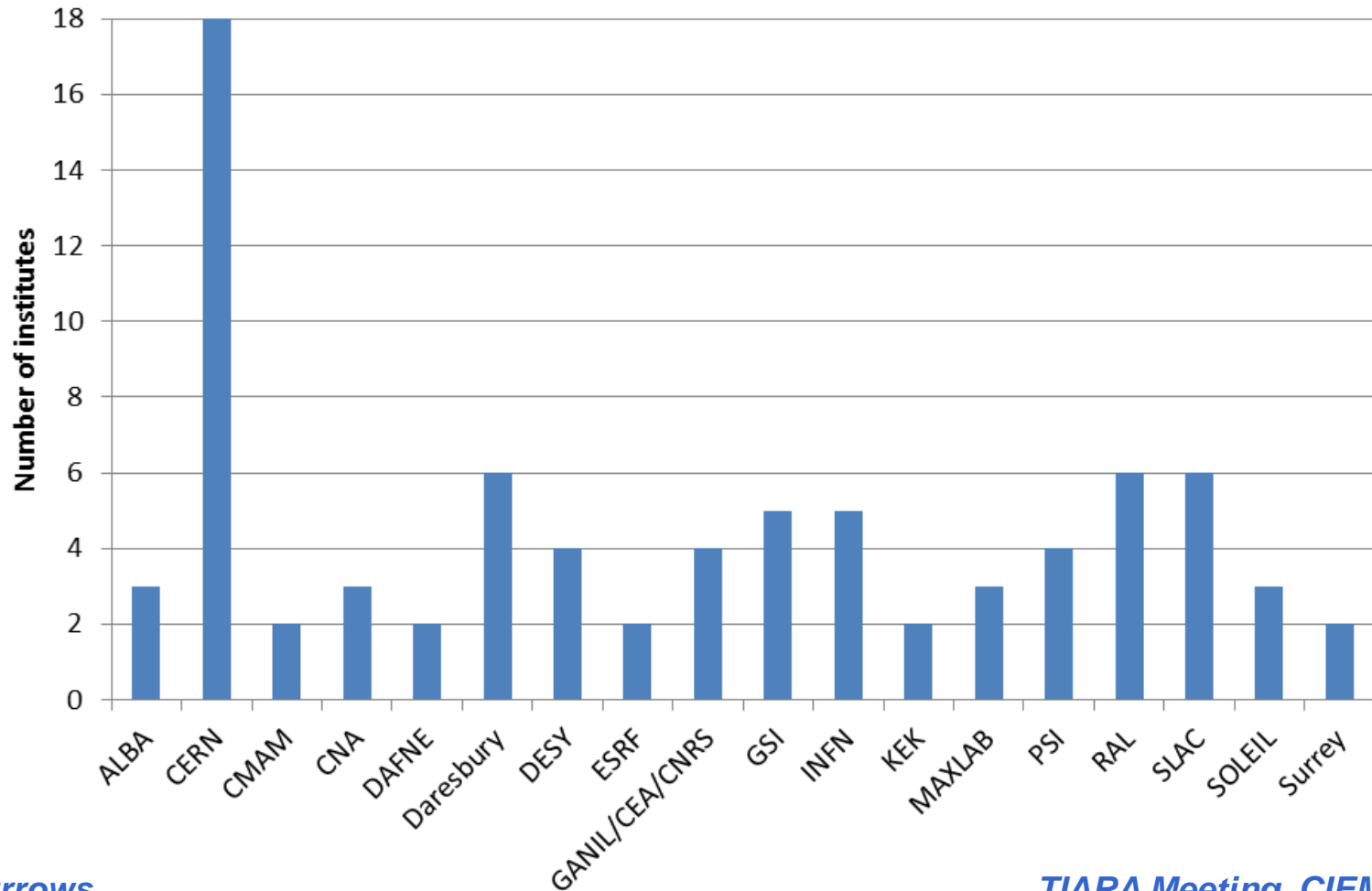


Training materials



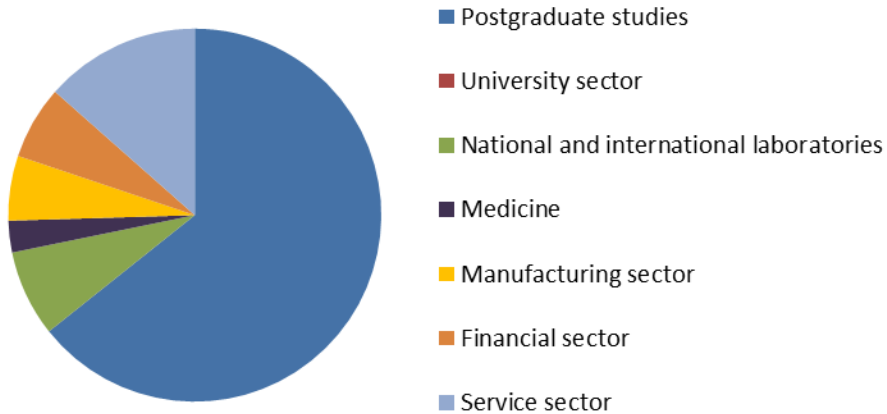
Use of facilities

- 59 institutes reported using 51 facilities

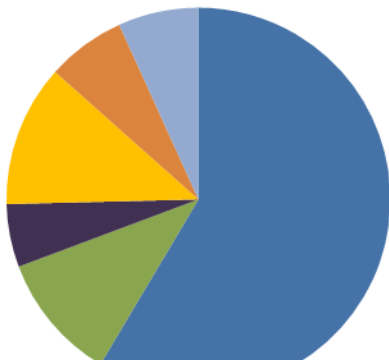


Career destinations

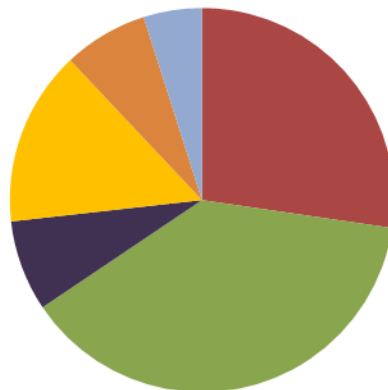
Undergraduates



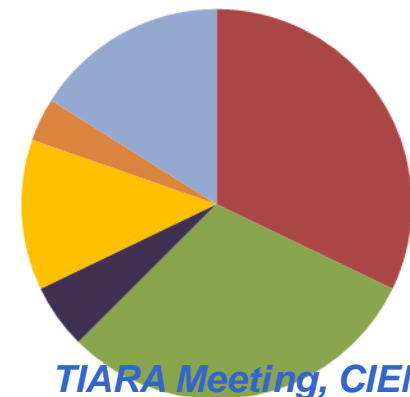
Master's-level students



PhD students



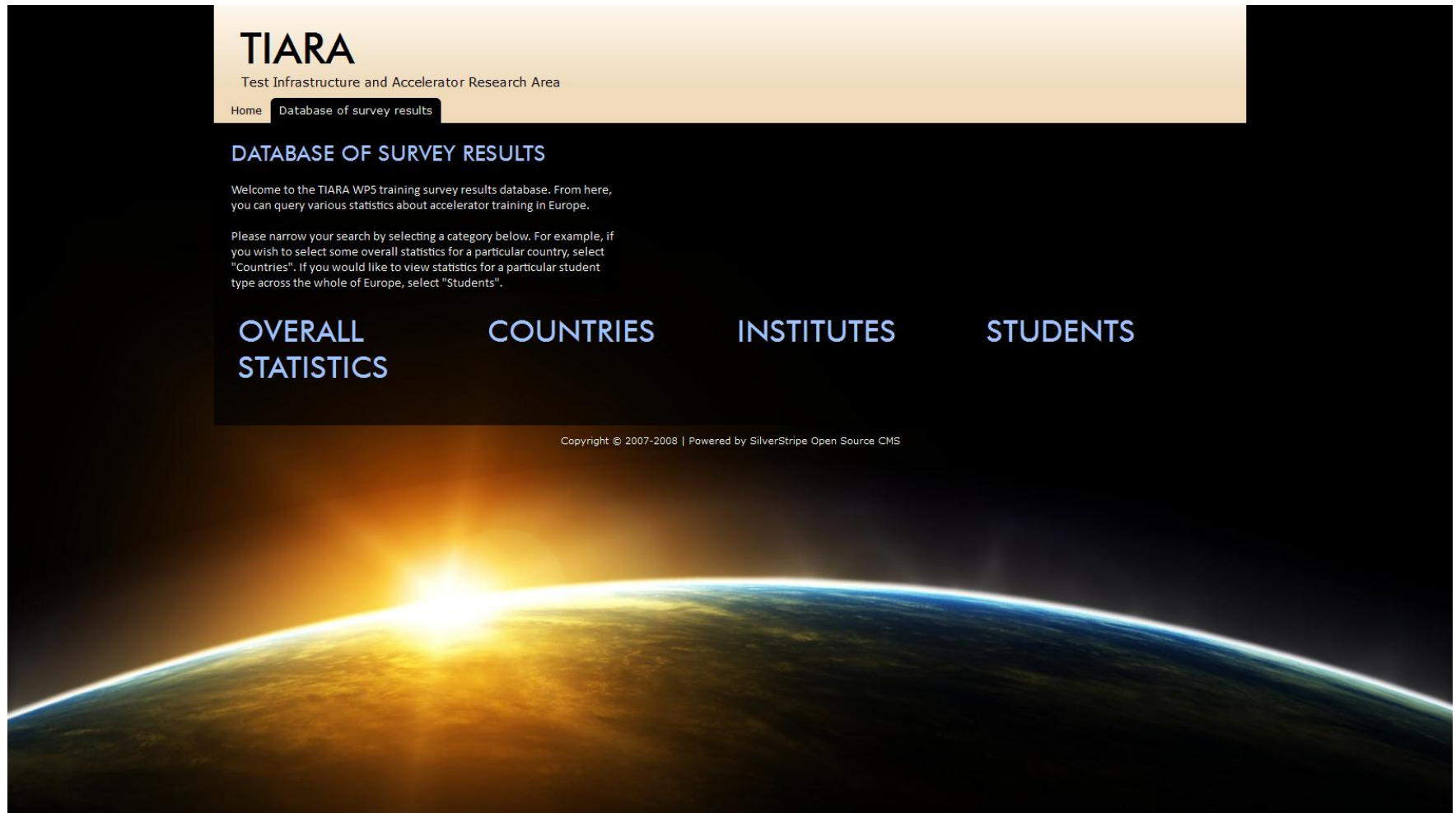
Post-doctoral fellows



Survey conclusions

- **A surprisingly large amount of training is being provided:**
- **75 institutes, 1371 people (2011),
62777 formal training hours provided (2011)**
- **However, for students, accelerator science is typically a small part of overall training,
<< 50 hours per trainee**
- **11 institutes provide > 100 hours to Master's stud**
- **83 institutes send people to accelerator schools:
339 people (2011)**
- **At each stage, about 1/3 of trainees go to industry**

www-based database front end



allow charts, tables, histograms generated by user