



JUAS ADVISORY BOARD meeting

Louis Rinolfi

23rd and 24th April 2015



THE UNIVERSITY
of LIVERPOOL

Thanks to



F. Demolis, M. Gauthier, B. Holland, H. Hoffmann, M. Romand for ESI support

M. Bozzo and E. Métral for JUAS Selection Committee

C. Welsch for the organization of this meeting

Agenda for JUAS annual meeting

23rd and 24th April 2015

Liverpool University - UK –

Thursday 23rd April:

9 h:

- 1 Welcome from Liverpool university (*C. Welsh*)
- 2 Welcome from ESI (*H. Hoffmann*)
- 3 Brief history of JUAS
- 4 JUAS 2014: 20 years anniversary celebration at LPSC - Grenoble
- 5 JUAS 2014 Minutes (Grenoble) + follow-up actions
- 6 Review of JUAS Advisory Board members
- 7 Review of professors and assistants JUAS 2015
- 8 Review of JUAS students 2015
[Coffee break](#)
- 9 Presentation of course 1: “Sciences & Physics of Particle Accelerators”
- 10 CERN and ESRF visits (course 1)
- 11 Examination results of the course 1
- 12 Presentation session 2: “Technology & Applications of Particle Accelerators”
- 13 CERN, PSI and Geneva hospital visits (course 2)
- 14 New: two practical days at CERN
- 15 Practical day at Bergoz
- 16 Examination results of the course 2
- 17 JUAS certificates (examination and attendance)
- 18 ECTS (European Credit Transfer System)
- 19 Evaluations received from students (for lecturers)

12h: Lunch together at Foresight-Center University Liverpool

Thursday 23rd April

14 h:

- 20 Review Agreement between JUAS and Universities (*all representatives*)
- 21 Status of UK universities
- 22 Status of German universities
- 23 Status of French universities
- 24 Status of Italian universities
- 25 Status of Spanish universities
[Coffee break](#)
- 26 Review and status of JUAS sponsors
- 27 JUAS budget
- 28 Computing support for JUAS
- 29 ESI logistics and communication
- 30 Report about JUAS lecturers meeting at CERN (September 2014)
- 31 JUAS in the community of Particle Accelerators
 - Conferences: IPAC, SFP
 - TIARA
 - Meeting EuCARD2 at Frankfurt
 - Nordic Particle Accelerator School and collaboration with JUAS (*C. Darve*)
 - A new facility on Archamps Technopole campus (*B. Holland, A. Seryi*)

19h: Dinner together at Alma de Cuba

Friday 24th April

9 h:

- 32 Proposal to work in the CTF3 control room with beam
- 33 Alternative dates for JUAS school
- 34 Proposals for changes in 2016
[Coffee break](#)
- 35 Place for the Advisory Board meeting in 2016 (Italian University)
- 36 Tentative date for the JUAS annual meeting 2016
- 37 A.O.B.

12h: Lunch together at Cockcroft Institute

Welcome

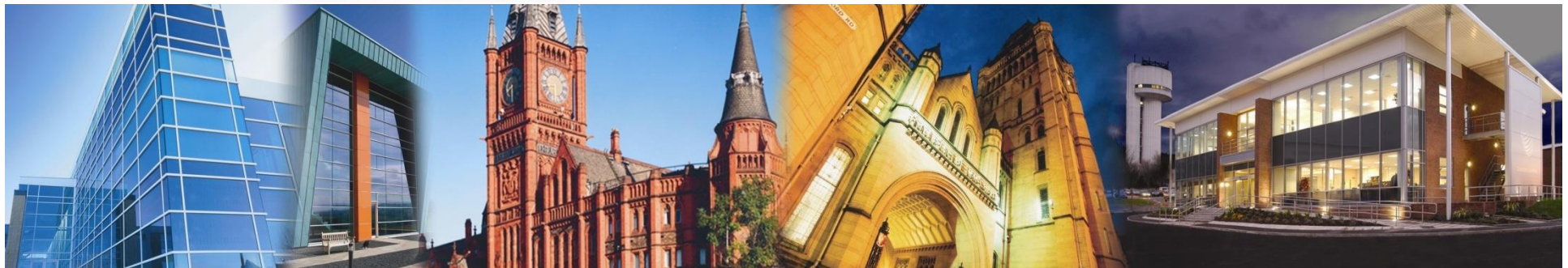
by Carsten Welsch

Welcome to Liverpool !

Prof. Carsten P. Welsch



The Cockcroft Institute



Inauguration in 2006



**The Opening of the Cockcroft Institute
by the Minister of Science, Lord Sainsbury**

*“When we talk about world-class science we
need look no further than the North West and
the Cockcroft Institute”*

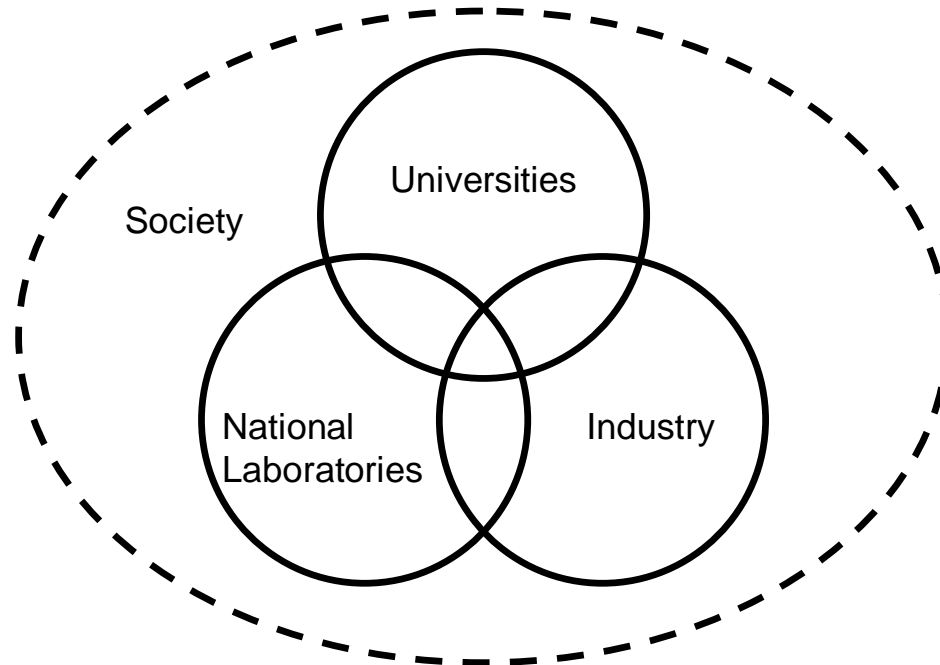
- Prime Minister, Tony Blair (2006)

The Mission

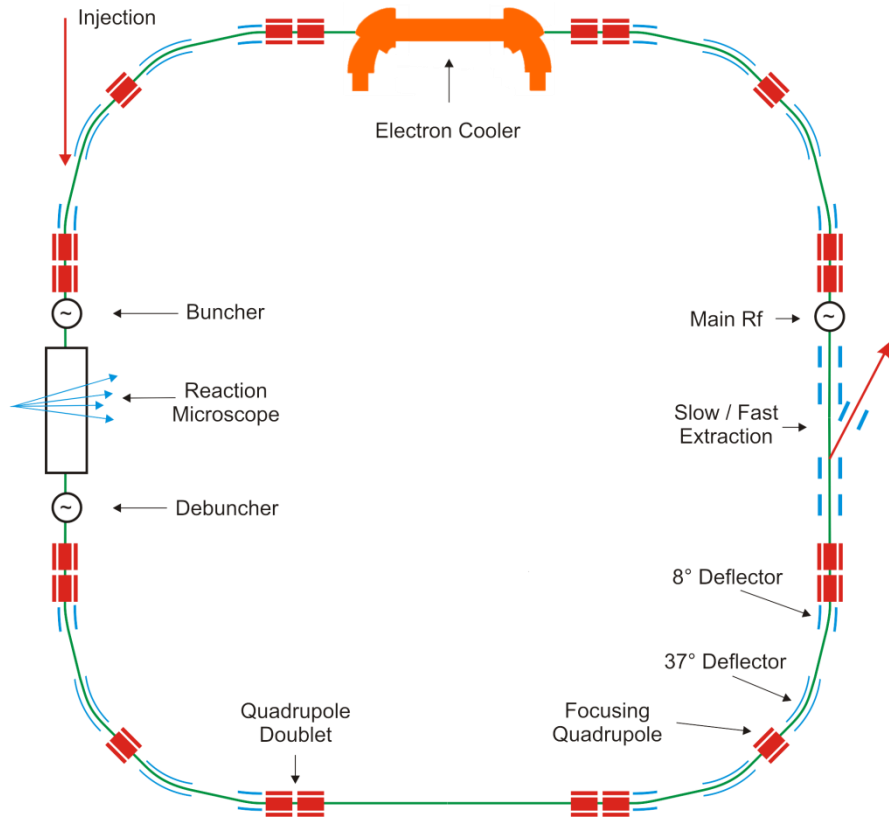
- Generic R&D at the frontier of Accelerator Science and Technology;
 - Project-specific R&D in Accelerator Science and Technology;
 - Leadership and management of national deliverables to international facilities;
 - Support in design, construction and operation of national and international facilities;
 - Technology transfer to (and Knowledge Exchange with) industry;
 - Seamless involvement of the Universities and Research Councils ;
 - Education and training to ensure a ~~flourishing next generation of scientists.~~
-

The Cockcroft Model

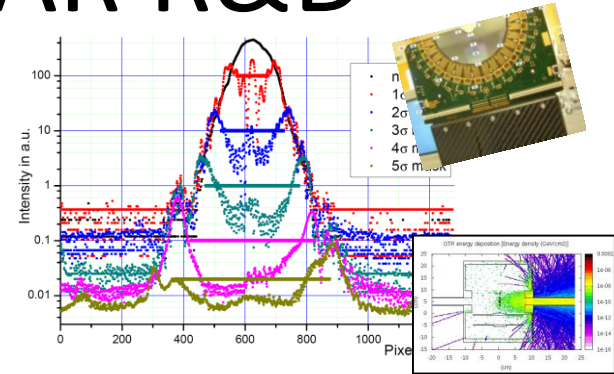
(Universities) + (STFC: ASTeC and elements at DL) + (NWDA)
+
(Integration of all the above)



Overview of QUASAR R&D



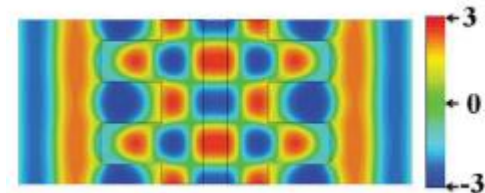
Diag



medical

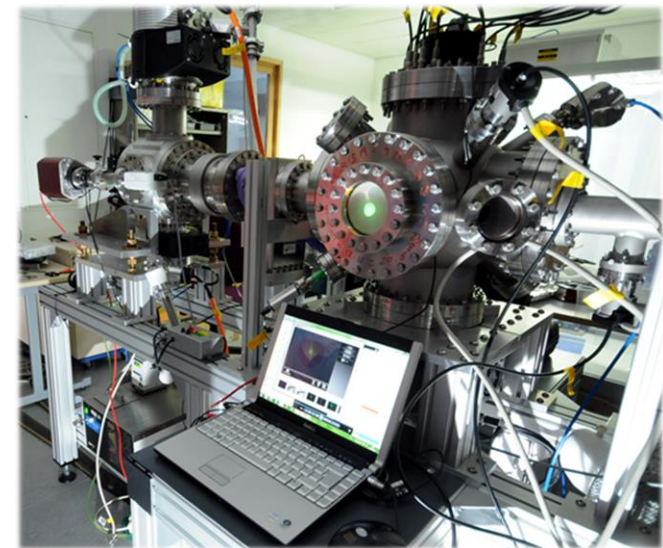


lasers

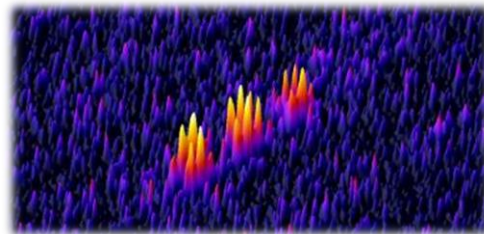
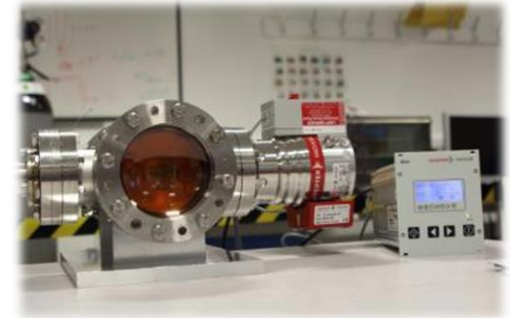
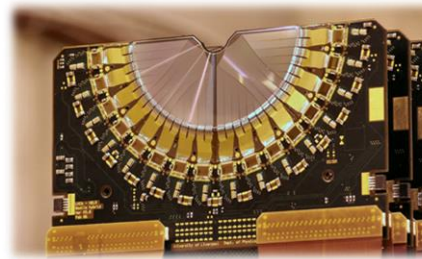
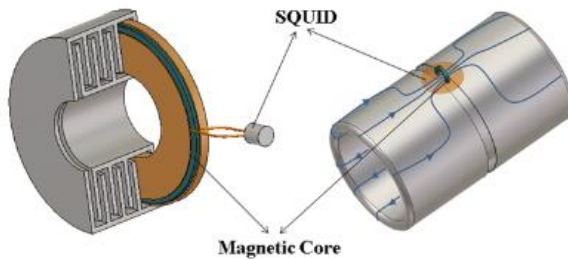
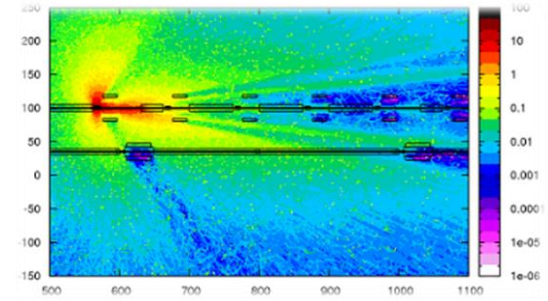
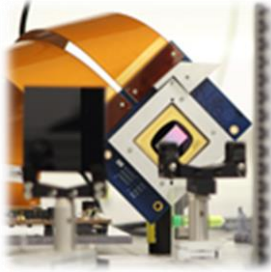


QUASAR Research

- Next generation antimatter facilities
 - Facility design and optimization
 - Beam life time studies
 - Beam stability and transmission optimization
 - Novel beam diagnostics for exotic beams
 - Commissioning and operation

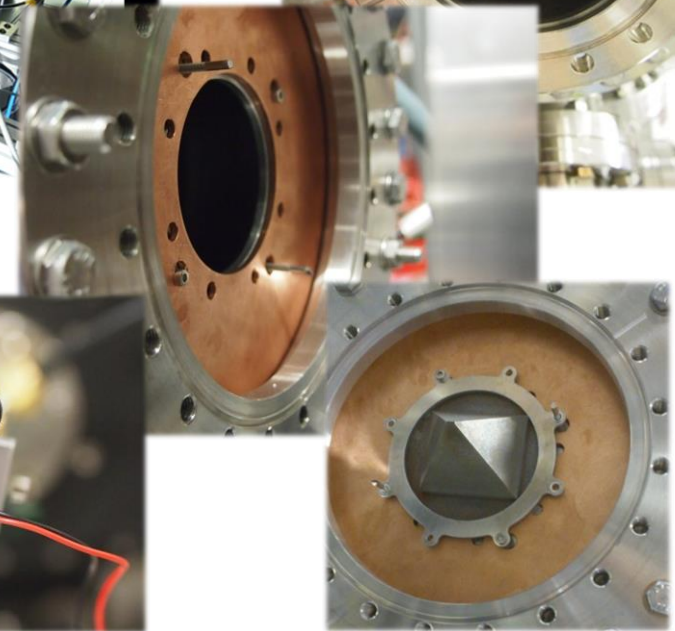
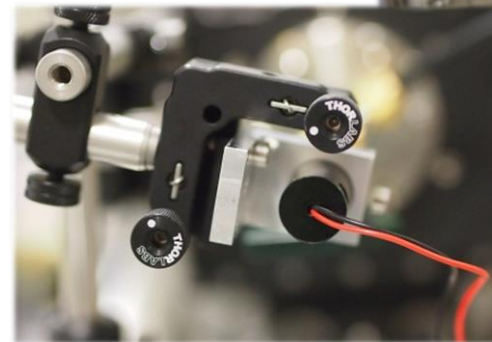
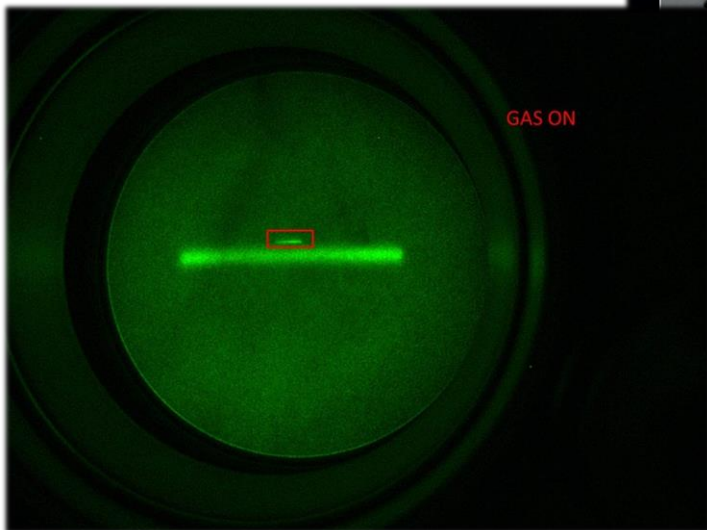
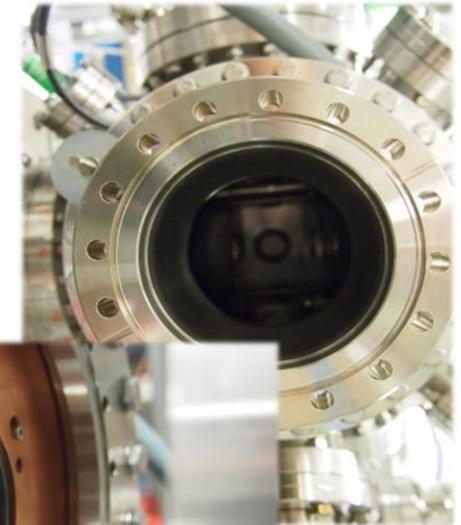
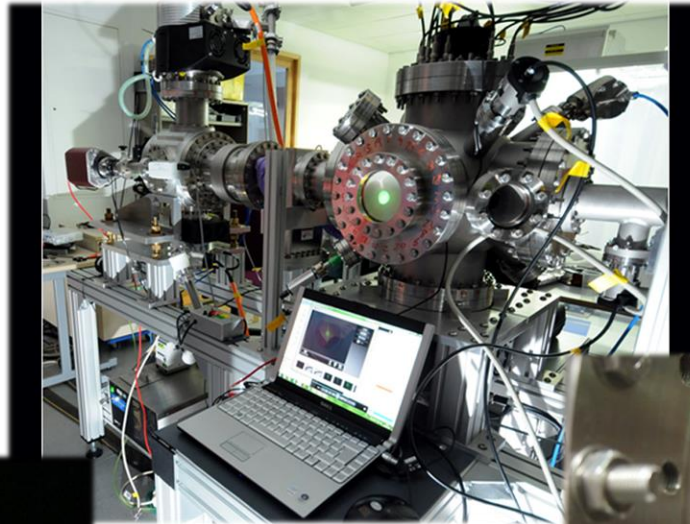
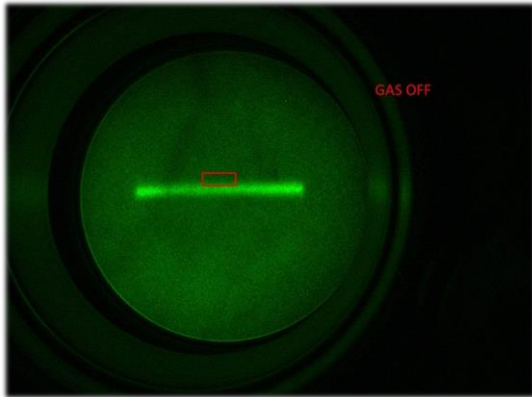


Our R&D into Diagnostics



@Cockcroft Institute and CERN
Excellent lab infrastructure

Gas Jet R&D

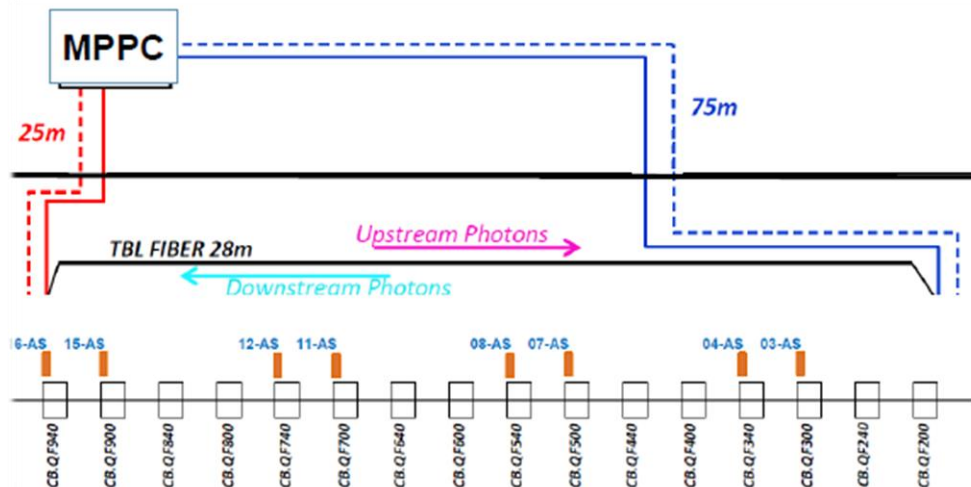


V. Tzoganis, et al.,
APL **104** 204104 (2014)



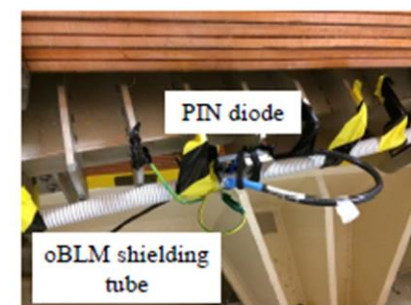
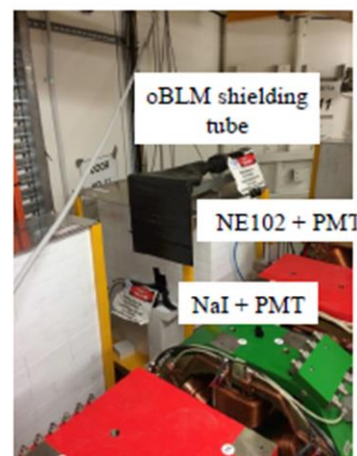
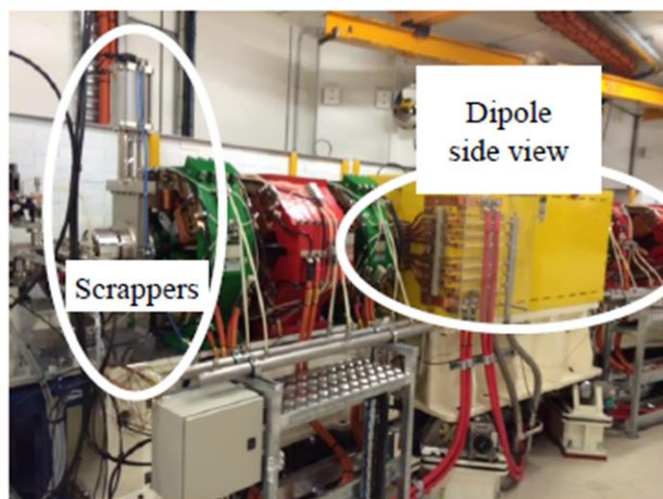
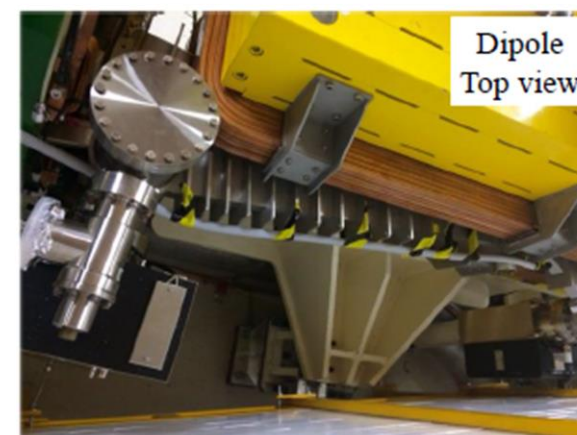
BLMs@TBL

- Pure Silica 200 μm core multimode fibre
- 25 (75) meters of read-out fibre downstream (upstream)
- 14k pixel 25 μm , 3x3 mm^2 Hamamatsu MPPCs
- Trans-impedance amplifier (opAmp THS3601 GBW 300 MHz) with $R_f = 500 \Omega$



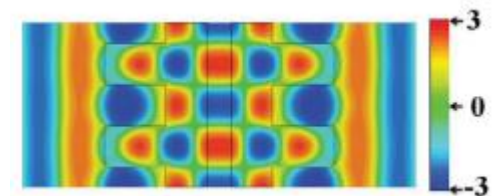
Australian Synchrotron

- Installation of several prototypes in the AS
- Two (one) 7 m (5 m) optical fibres with 365 μm (200 μm) SiO₂ core:
 - Multi Pixel Photon Counter (MPPC)
 - Photon Multiplier Tube (PMT)
 - Avalanche Photon Diode (APD)
- Pin diode, NaI and NE102 scintillators in neighbouring locations for comparison



Novel Accelerators

- Studies into relativistic and non-relativistic structures ongoing
- Multi-parameter studies yielded optimum structure parameters
- Measurements planned in close collaboration with CI partners
- Computing techniques important basis for future AWAKE work



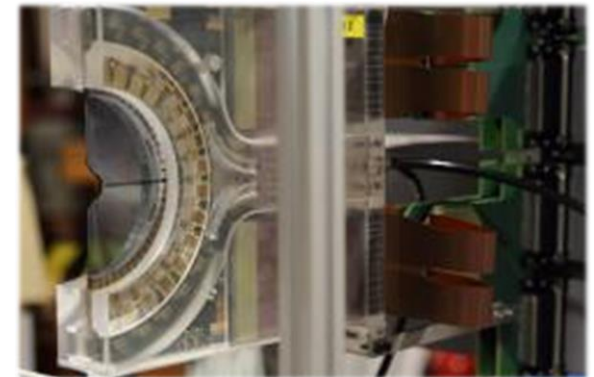
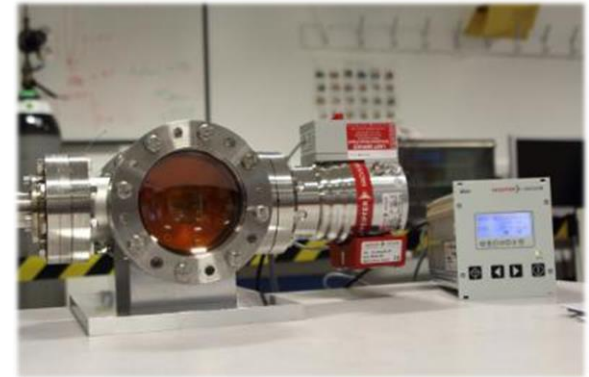
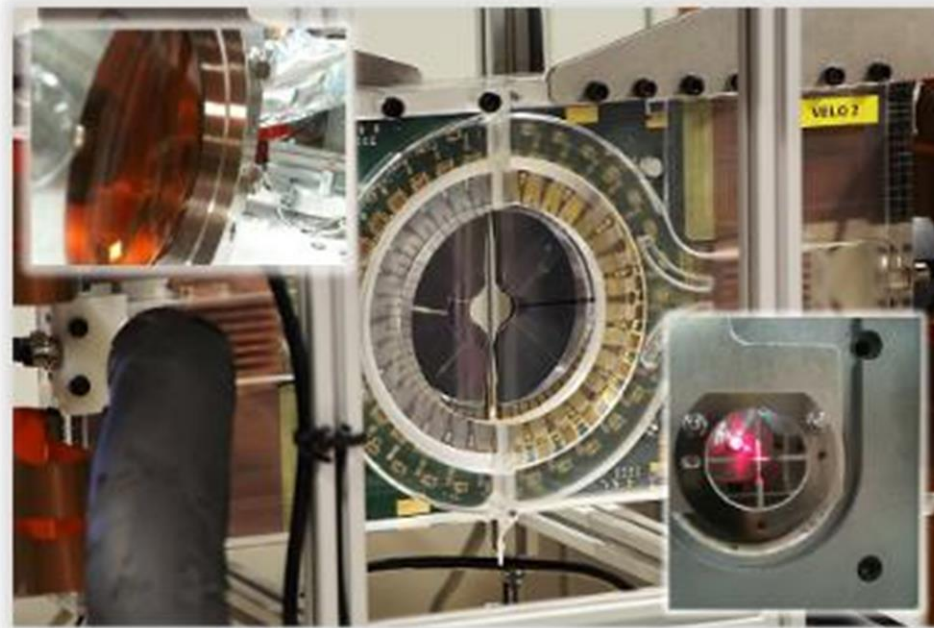
A. Aimidula, et al., Nucl Instrum Methods Phys Res A (2013)
A. Aimidula, et al., Physics of Plasmas, Vol.21, Issue 2 (2014)

Medical Applications

- Clatterbridge Cancer Centre




Clatterbridge Centre for Oncology 
NHS Foundation Trust

T. Cybulski, et al., 'A Non-Invasive Beam Monitor for Hadron Therapy Beams,
Proc. IBIC, Phys. Rev. STAB and Nucl. Instr. Meth. A, *in prep.*



Training: EU Projects

- Initiator and Coordinator of 3 Marie Curie ITNs:

-  (2008-2012...)
4.2 M€, 20 Fellows, 32 partners
-  Since 2011
4.6 M€, 17 Fellows, 35 partners
-  Since 2011
6 M€, 22 Fellows, 34 partners

 Largest Marie Curie networks in accelerator community.

„Success stories‘ (EC)

- Fellow R&D
 - Researcher skills training
 - Dissemination and Outreach
 - Project Coordination & Management
- ➡ Also recognized as ‚best practice‘ by HEA, UKRO, etc.



Many International Events



International Schools
Salamanca, London, Stockholm, etc.
Indico: 297045, etc.
~100 participants and lecturers



Topical Workshops
CI, France, Slovenia, Seville, Hamburg, etc.
Indico: 243336, 293158, etc.
70-120 participants



Conference and Symposium
Seville, Mallorca and Liverpool, UK

Events led in 2014



La

HEA Workshop

Industry Workshop



EU Project Administration



oPAC School



Beam Diagnostics

Overview of QUASAR GROUP Activities

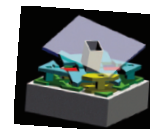


BeaPhy

OPAC

DITA-IIF

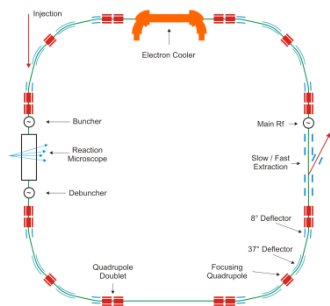
ATWAKE



ess
EUROPEAN
SPALLATION
SOURCE



LANET



EuroCirCol

- Adam – Alejandro – Alexandra (2x) – Blaine – Carsten – Eduardo – James – Javier – Hao – Lee – Maria – Miguel – Oleg – Ralph – Ricardo – Rob – Samina – Sehar – Sergey – Tomasz – Vasilis – Vinod – Yelong –

Welcome

by Hans Hoffmann

ESI in a few words . . .

ESI today

>20 years of thematic schools on scientific tools and methods and their industrial, medical and societal applications: particle accelerators, instrumentation for particle detection, bio-health computing, scientific computing.

For whom?

Master and PhD students studying sciences, mostly in European universities, and young professionals

With whom ?

CERN and CERN's network of many hundreds of university institutes, other scientific institutions, university hospitals or medical centres, industrial firms, . . .

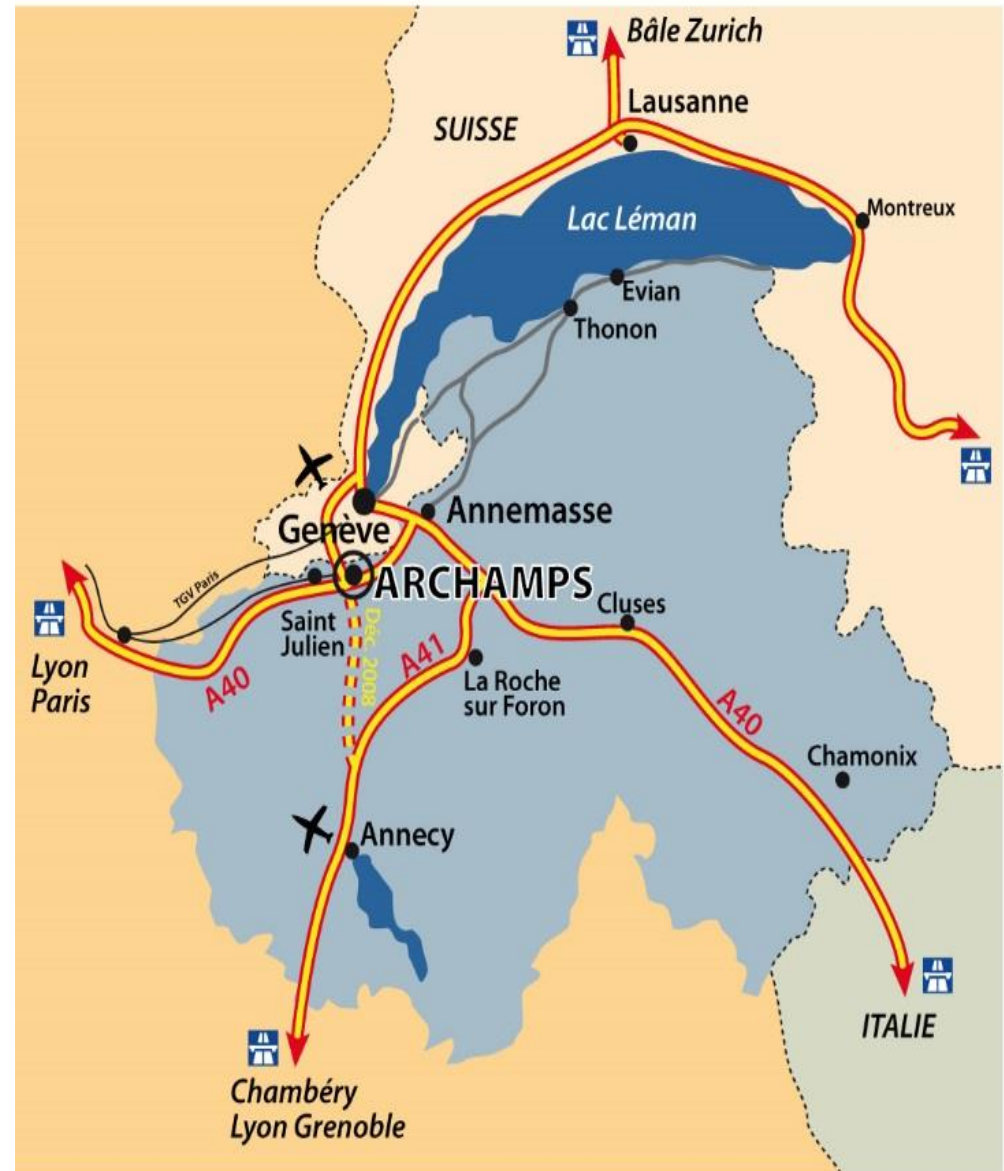
What's different to other places of formation

CERN's scientific approach (collaborative, open, innovative, international) applied to teaching and knowledge transfer

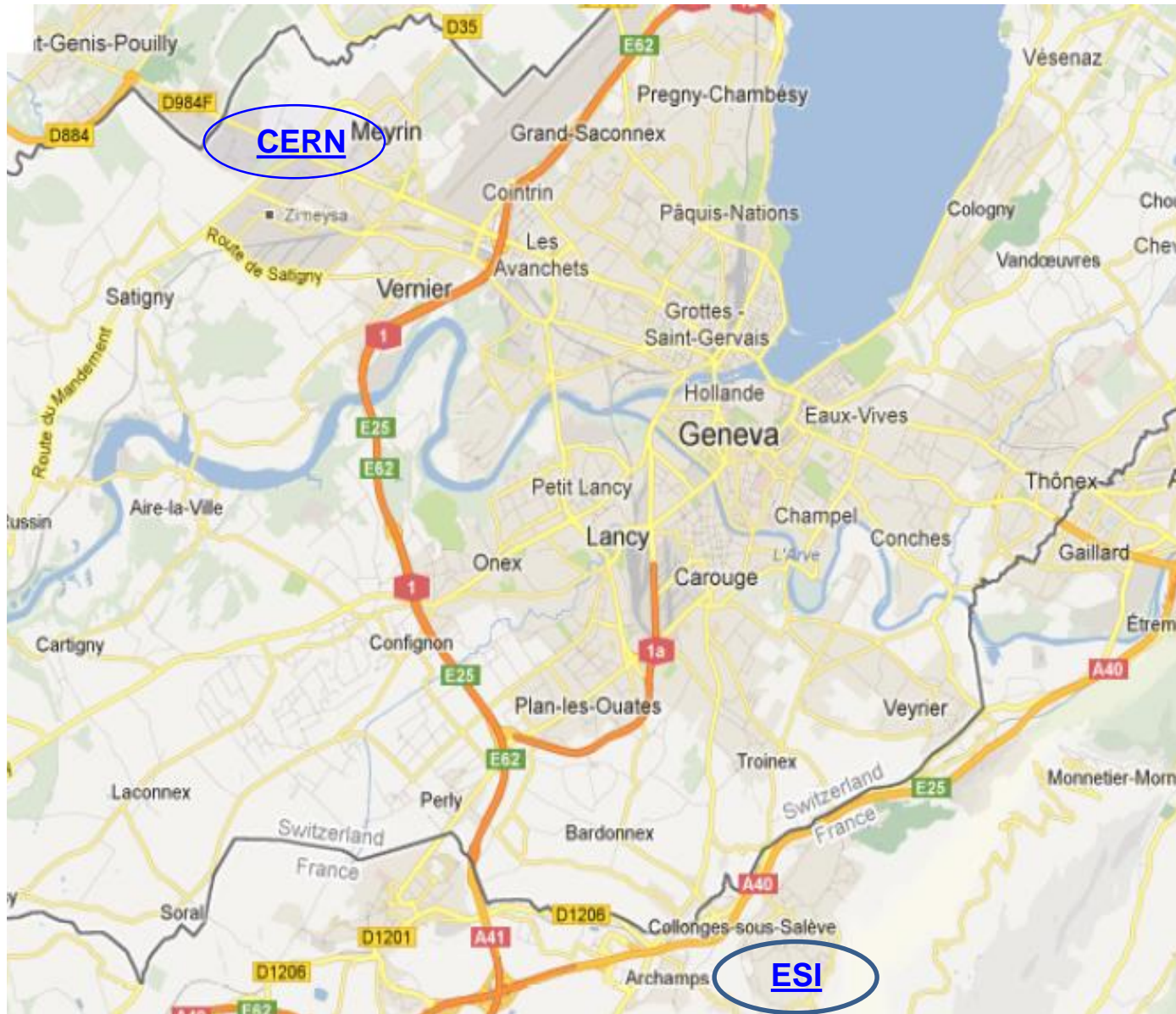
modular, intensive, state of the art courses presented by specialists

students and teachers work together in a "campus" environment

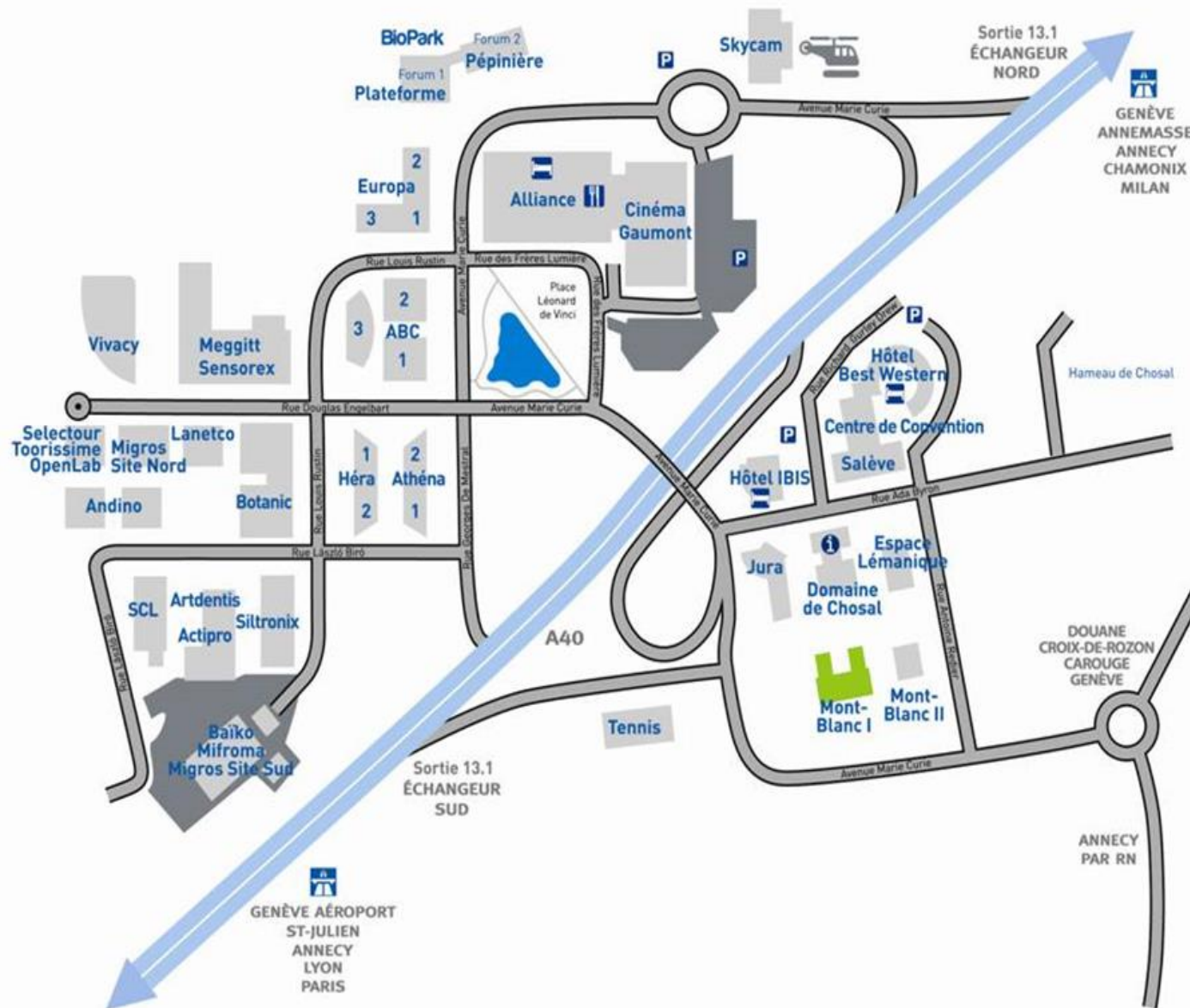
Geneva area



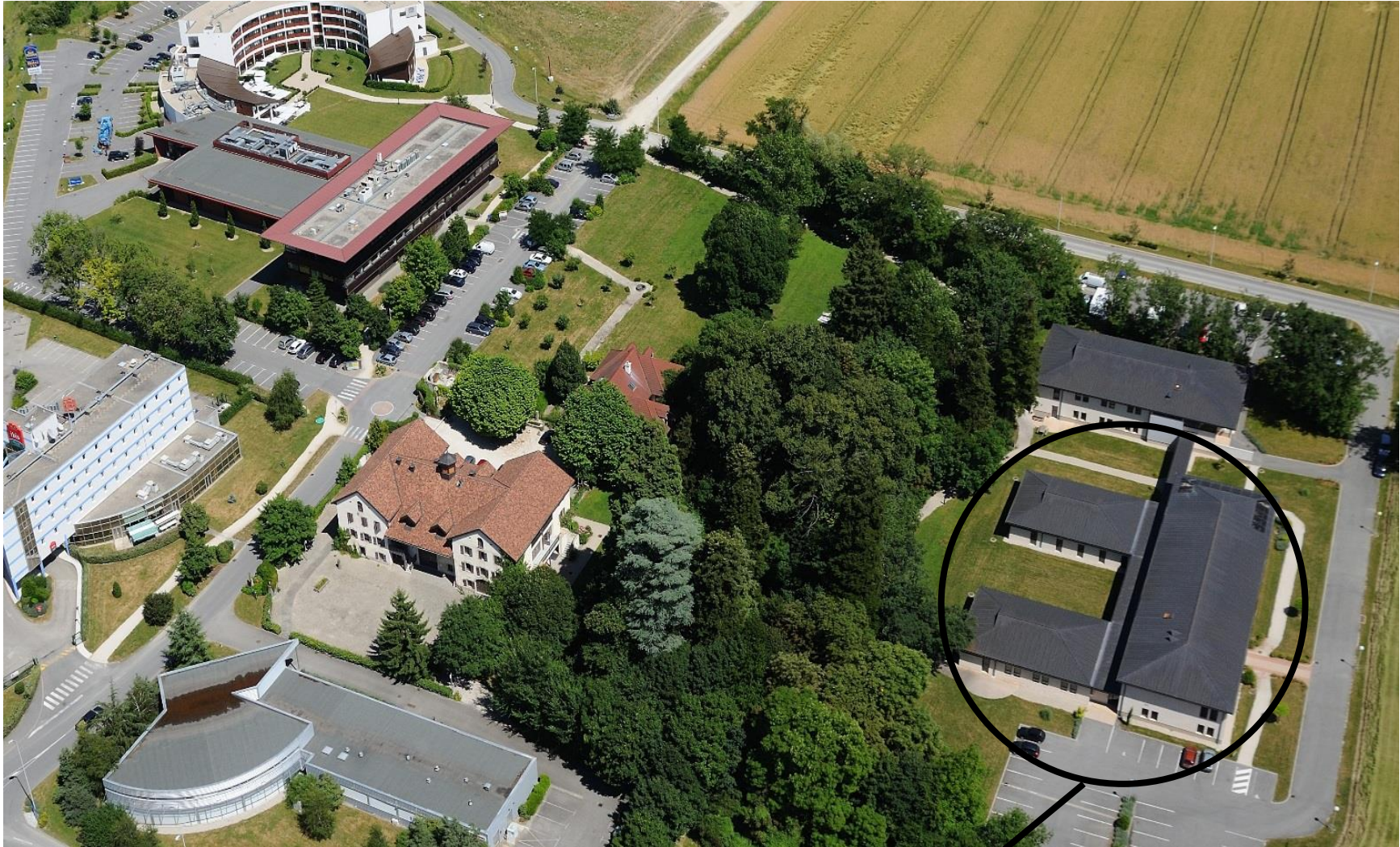
ESI is 17 km South of CERN



Archamps Technopole area



Mont Blanc 1 building



JUAS
school



Bâtiment Mont Blanc 1
61 rue Antoine Redier
Archamps Technopole
F-74166 Saint-Julien-en-Genevois Cedex

Tél: +33 4 56 44 81 40



Main sponsors of the European Scientific Institute (ESI)



The “Conseil Général de Haute Savoie” provides financial support to ESI which organizes JUAS



“Archamps Technopole” provides ESI with facilities for organization of the school including amphitheatres and computing room

Director : Dr. Louis RINOLFI (ret. CERN)

22nd edition : January - March 2015

56 students - 17 nationalities

- 16 Master
- 15 PhD
- 25 professionals

45 lecturers, inc. 20 from CERN

15 European partner universities

(France, Germany, Italy, Spain, UK)

19 Sponsors (research facilities, companies)

International Advisory Board (hosted in 2015 by University of Liverpool)

visits to CERN, PSI, Geneva University Hospital, ESRF & practical sessions at CERN, PSI and Bergoz Instrumentation.

Director : Prof. Johann COLLOT
(University of Grenoble)

2nd edition: January - March 2015

12 students - 8 nationalities

- 7 Master
- 4 PhD
- 1 Professional

42 lecturers

University partnership (Grenoble, Strasbourg ... *Uppsala-Sweden, Helsinki-Finland, Casablanca/Rabat-Morocco* ...)

Guest lecturers for special sessions open to a wider audience

Visits and practical sessions at CERN

Director : Prof. Philippe SABATIER
University of Grenoble

2nd edition of BioHC summer school, August 2015

Integrated Medicine for Chronic Diseases

- **15 students** enrolled in the Erasmus Mundus Master programme
 - (France, Spain, Italy, Romania, China, Korea and India)
 - Interdisciplinary (biology, mathematics, informatics, medicine)
- **12 lecturers** from partner universities
- **9 intensive days** including lectures and group work on complex problem solving around a case study of Chronic Obstructive Pulmonary Disease
- **New schools under development** : Big Data for Healthy Living; Predictive toxicology for Nanoparticles

2013-2014 : process of change, no school in 2014

1. Medical Computing P. Arce, CIEMAT

2. Diagnostic & Interventional Radiology K. Geleijns, Leiden University Hospital

3. Non-Ionising Radiation Imaging J. Alger, UCLA

4. Nuclear Medicine & Molecular Imaging L. Bidaut, University of Dundee

5. External Radiotherapy U. Oelfke, ICR/Royal Marsden NHS ; B. McClean, Trinity College Dublin

6. Brachtherapy A. Rijnders, Europe Hospitals Brussels ; A. Carlsson-Tedgren, Karolinska

ESI investing in the future

New ESI Website: www.esi-archamps.eu

New computer room ready for ESMP 2015

- 35 PCs – 3 year leasing contract
- Technical support
- Link to virtual machines at CERN for certain software applications
- (External-) Server for other software

Polycom Visio conferencing in meeting room

- Available from May 2015
- Increase frequency of coordinator meetings at no extra cost

ESI “promotes” a student hostel at Archamps



Dr. Louis Rinofli, JUAS Director



Dr. Elias Metral, JUAS Deputy



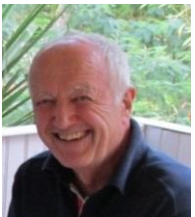
Marie Gauthier, ESI Administrator
(in charge of relations with lecturers)



Marjorie Romand, ESI Training and Events Manager
(in charge of relations with students)



Filiz Demolis, ESI Administrative Assistant
(in charge of the welcome office)



Dr. Hans Hoffmann, ESI President

JUAS 2015

JUAS 2015 opens Monday 12th January, following the day of the massive French demonstration after the terrorist attack against “Charlie Hebdo” newspaper



Benoit Simony (JUAS 2014 student) drew this picture for us

Brief history of JUAS

JUAS was founded in 1994 simultaneously with ESI at Archamps – Haute-Savoie –

JUAS Directors :

1994 – 2000 : Marcelle Rey-Campagnolle

2001 – 2005 : Joël Le Duff

2006 – 2010 : François Méot

2011 – today : Louis Rinolfi

Close to 130 lecturers have taught at the school since 1994

Close to 900 students have been trained since 1994

JUAS

Joint Universities Accelerator School

1994 - 2011

M. Rey-Campagnolle / ISN



2011 - 2014

T. Kehrer / CERN

JUAS logos

JOINT UNIVERSITIES
ACCELERATOR SCHOOL

juas

Joint Universities Accelerator School

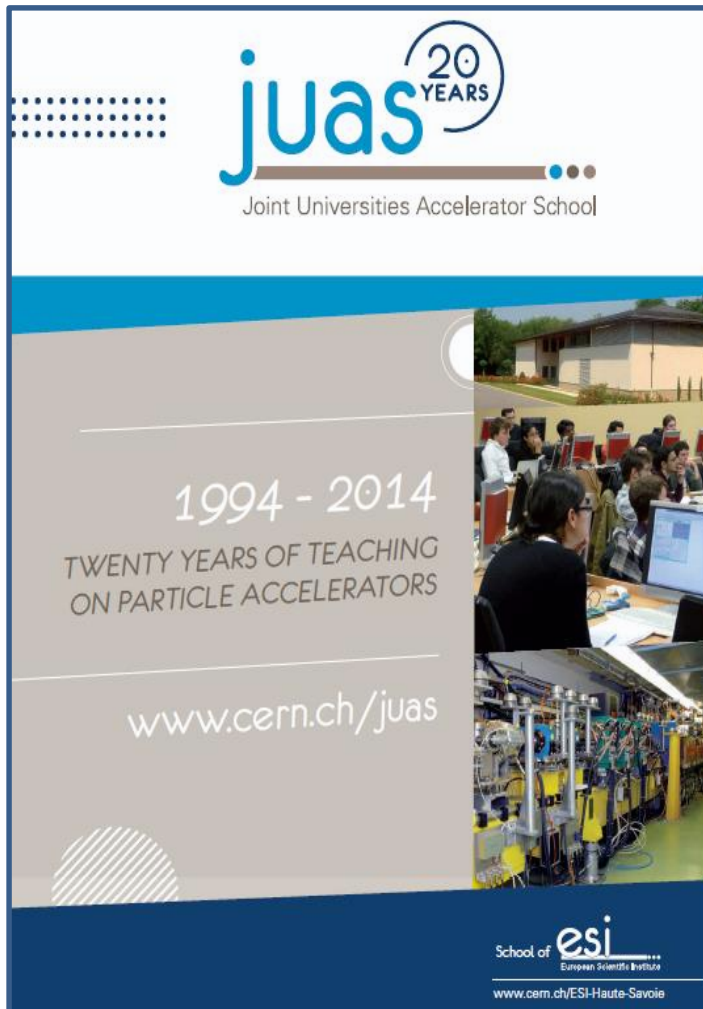
From 2014

V. Guyony / Indélébile Création

JUAS 2014

20th years anniversary

Brochure



Celebration at LPSC - University of Grenoble

LPSC = Laboratoire de Physique Subatomique et de Cosmologie

Friday 25th April 2014



July / August 2014

Article in the CERN Courier about this anniversary



Newsletter May 2014

Celebrating 20 years of JUAS

Published on 2014-05-21 12:29:00

oPAC Coordinator Prof. Carsten P. Welsch participated in the annual Joint Universities Accelerator School (JUAS) Advisory Board meeting and the special celebrations for the School's 20th anniversary. Both were held between the 23rd-25th April 2014 in Grenoble at the Laboratoire de Physique Subatomique et de Cosmologie (LPSC).

oPAC has supported JUAS during the last years and many oPAC Fellows have had the chance to profit from this first class Accelerators School. During the last year oPAC Fellow Michele Carla stood out being one of the best two students in the final exam and winning a grant to visit IPAC'14.

Next year's JUAS Advisory Board meeting will be hosted by oPAC at the University of Liverpool/Cockcroft Institute.

Celebration of the 20th Anniversary of JUAS



The celebration of the 20th Anniversary of JUAS was held on 25th April 2014 in Grenoble at the LPSC ("*Laboratoire de Physique Subatomique et de Cosmologie*").

This event brought together more than 100 scientists, lecturers, students and institutional partners... all present to share a special day dedicated to the school. It was an opportunity to look back on the past twenty years and to debate the future.



A cocktail buffet was organised in the grounds of the LPSC.

It was a delightful moment shared by all participants and an excellent opportunity to meet former colleagues, cultivate new contacts and discuss ideas on particle accelerators.

Photos of the event can be seen on the [JUAS web site](#).



The afternoon session started with a round table discussion chaired by Frédéric Bordry, CERN Director of Accelerators and Technology.

The participants included the morning's speakers joined by Philip Burrows, professor at Oxford University and chairman of the TIARA working group "*Education and training*" and by Pantaleo Raimondi, Director of the ESRF's Accelerator Department.



All presentations are available on the JUAS web site: www.cern.ch/juas

Special thanks to our partners in this event:



JUAS in the French Newspaper

10 | JEUDI 19 FÉVRIER 2015 | LE DAUPHINÉ LIBÉRÉ

LE GENEVOIS

Une formation unique au monde

Au tout début de cette année universitaire, une formation consacrée à la physique et aux technologies des accélérateurs de particules a été ouverte à la technopôle, en collaboration avec quinze universités européennes et le Cern.

Des étudiants venus du monde entier

Cette formation unique, qui s'adresse à des ingénieurs ou des étudiants en position pré-professionnelle, s'est conclue au sein de l'ESL/JUAS. Les étudiants, venus du monde entier, ont fait part de leur immense satisfaction.

Il est reconnu que ces formations placées sous l'égide du Cern permettent un transfert de savoir-faire sans aucune discrimination géographique

ou autre. Le directeur de la formation Louis Rinaffi a fait part de sa satisfaction de voir des étudiants super motivés et bien formés.

« Je suis reconnaissant aux organisateurs, professeurs, collègues, dirigeants de la Technopôle pour cette formation qui boostera ma carrière professionnelle », confie Vishal Srinivasan, ingénieure en électricité, venue d'Inde. Richard Trimaud, ingénieur au centre anticancéreux La-cassagne à Nice, a lui aussi exprimé son entière satisfaction pour ce temps passé à Archamps et a rappelé la valeur éthique de la démarche du partenariat du Cern avec l'ESL/JUAS et la Technopôle.

Il reviendra pour d'autres cycles de formation.

Luk FRANKONI



La première promotion de cette formation consacrée à la physique et aux technologies des accélérateurs de particules. Photo DR

January - March 2015

JUAS 2014 Advisory Board Grenoble University

- Photos
- Follow-up actions



During the meeting at Grenoble INP

Dinner at restaurant “Les 2 Savoies”
at Grenoble



Follow-up actions

Assuming that new seminars could be accommodated in the Timetable, members of the Advisory Board are invited to send to Louis, titles and names (of speakers) for future seminars.

⇒ **Done**

Meeting of all lecturers :

Mauro suggests that all lecturers should be invited to join the discussion of the last day during the examination week with the students.

⇒ **Done but all lecturers can not be present**

Louis decides to try to organize a meeting at CERN. Marie will send a doodle to every lecturers in order to find a possible date.

⇒ **Done**

The lectures notes remains a point not completely satisfying for the students as it is printed in black and white and 4 slides per page, but ESI will look into it in order to improve this service.

⇒ **Done, upgrade to colour materials**

Terry suggests to go to EPS (European Physical Society) with the proposal to get budget

⇒ **Done**

Follow-up actions

Louis recalls that all lecturers will receive their own marking (with the average per criteria).

=> **On going**

The question of the opportunity to organize a second JUAS

=> **Is ongoing: see Nordic PAS in Summer 2016; see request from Barcelona,....**

The members point out the importance of staying in contact with the students after JUAS (former students' network): ESI is willing to work on this task this year.

=> **Ideas to use Facebook, Lindekhin + proposal to use the IPAC repository data base**

The members advise to take off the question about written document from the Evaluation Form for the seminars, to avoid a bad mark on this criteria (as they are no written documentation given to the students for seminars).

⇒ **Not done !**

⇒ ***The members ask to obtain in the future a feedback on comments as well.***

Job opportunities : Jean-Marie suggests to contact the CNRS secretariat to make sure JUAS is on the distribution list to receive the CNRS open position.

⇒ **Not done !**

Review of Advisory Board members 2015

France



15 partner universities

Germany



TECHNISCHE
UNIVERSITÄT
DARMSTADT



Universität
Rostock



Traditio et Innovatio

Italy



SAPIENZA
UNIVERSITÀ DI ROMA



UNIVERSITÀ DEGLI STUDI
DI GENOVA



UNIVERSITÀ DEGLI STUDI DI NAPOLI
FEDERICO II

Spain

UAB

Universitat Autònoma
de Barcelona



UNIVERSITAT
DE VALÈNCIA



UNIVERSITAT POLITÈCNICA
DE CATALUNYA

United Kingdom



UNIVERSITY OF
LIVERPOOL



John Adams Institute
for Accelerator Science



UNIVERSITY OF
OXFORD

15 European Universities partners in 2015

Universities	Members of Advisory Board	Since
Université Joseph Fourier Grenoble	Jean-Marie De Conto	1994
Technische Universität Darmstadt	Joachim Enders	1994
Karlsruher Institut für Technologie	Anke-Susanne Müller	1994
Universitat Politècnica de Catalunya	Youri Koubychine	1994
Universitat Autònoma de Barcelona	Antoni Mendez	1994
Institut Polytechnique de Grenoble	Elsa Merle-Lucotte	1994
Università degli studi di Napoli "Federico II"	Vittorio Vaccaro	1994
Università degli studi di Roma "La Sapienza"	Mauro Migliorati	1994
Università degli studi di Genova	Marco Bozzo	2002
Technische Universität Berlin	Heino Henke	2002
Universitat de Valencia	Angeles Faus-Golfe	2002
University of Liverpool	Carsten Welsch	2011
Université Paris-Sud Orsay	Sophie Kazamias	2012
University of Rostock	Ursula van Rienen	2013
University of Oxford	Andrei Seryi	2014

11 representatives from Institutes in 2015

Institutes	Members of Advisory Board
ESI President	Hans Hoffmann
ESI administrator	Marie Gauthier
JUAS Director	Louis Rinolfi
JUAS Deputy Director	Elias Métral
CERN	Bernard Holzer
Oxford University	Chris Prior
ESRF (<i>European Synchrotron Radiation Facility</i>)	Jean-Luc Revol
PSI (<i>Paul Scherrer Institute</i>)	Terry Garvey
GSI (<i>GSI Helmholtzzentrum für Schwerionenforschung</i>)	Peter Forck
DESY (<i>Deutsches Elektronen-Synchrotron</i>)	Winfried Decking
BNL (<i>Brookhaven National Laboratory</i>)	François Méot

Professors and assistants 2015

Professors and assistants 2015 –Session 1

Professors / Assistants	Lecture	Home
P. Bryant	Introduction to Accelerators	Retired CERN
H. Henke	Relativity & Electromagnetism	University Berlin
J.M. De Conto	Particle optics	University J. Fourier
A. Latina / J. Resta Lopez / R. Alemany	Transverse Beam Dynamics	CERN
G. Sterbini / N. Fuster	MADX	CERN / Valencia Uni.
E. Métral / E. Benedetto	Longitudinal Beam Dynamics	CERN
J.B. Lallement / V. Dimov	Linacs	CERN
Y. Papaphilippou	Linear imperfections + Non linear effects	CERN
M. Migliorati	Space charge + Instabilities	University Roma
R. Bartolini	Synchrotron radiations	Oxford University
F. Chautard	Cyclotrons	GANIL
T. Perron	Injection / Extraction	ESRF

JUAS lecturers at the Welcome lunch



Professors and assistants 2015 – Session 2

Professors / Assistants	Lecture	Home
F. Caspers / M. Wendt	RF engineering including superconductivity	CERN
P. Chiggiato / R. Kersevan	Vacuum	CERN
Tommasini / Russenschuck	Magnets design	CERN
T. Zickler / J. Bauche	Normal conducting magnets	CERN
M. Wilson / P. Ferracin	Superconducting magnets	Retired / CERN
P. Forck	Beam instrumentation	GSI - Darmstadt
T. Thuillier	Particle sources	LPSC Grenoble
E. Zimoch	Accelerator control	PSI - Villigen
W. Mondelears	Low energy electron accelerators	Gent university
W. Kleeven	Accelerators for industrial & medical appl.	IBA - Belgium
S. Bousson	High current proton linacs	IN2P3/IPNO - Orsay
R. Miralbell	Therapeutic applications	HUG - Geneva
S. Meyroneinc	Particle therapy and accelerators	Institut Curie - Paris
X. Queralt	Radiation safety	ALBA - Barcelona

Seminars in 2015 – Session 1

Professors	Lecture	Home
U. Amaldi	History of particle accelerators as a tool for discoveries	TERA
L. Rinolfi	Future high energy colliders	CERN / JUAS
A. Seryi	Sciences and art of inventiveness	JAI / Oxford
R. Assmann	Laser plasma acceleration	DESY

Seminars in 2015 – Session 2

Professors	Lecture	Home
E. Prat	Free electron laser	PSI
M. Steck	Techniques of beam cooling	GSI

Overview of JUAS courses

Session 1 : Sciences and Physics of Particle Accelerators

Session 2 : Technology and Applications of Particle Accelerators

	Number of professors + assistants	Lectures	Tutorials	Seminars	Total
Session 1	21	68 h	40 h	4 h	112 h
Session 2	21	63 h	21 h	2 h	86 h

		Visits (CERN, ESRF, PSI, HUG)	Practical works at CERN	Practical works at BERGOZ	Grand total
Session 1	112 h	8 h	-	-	120 h
Session 2	86 h	16 h	12 h	6 h	120 h

JUAS students in 2015

MASTER STUDENTS

Nr.	Family name	Given name	C1	C2	Institution
1	AKHAVAN	Ali		x	Sharif University of Technology
2	DIJKSTAL	Philipp	x	x	TU Darmstadt
3	GAMELIN	Alexis	x	x	Université Joseph Fourier
4	GERARDIN	Delphine	x	x	Grenoble INP Phelma
5	KECKERT	Sebastian		x	University Siegen - Germany
6	KHATTAB	Yossef		x	St- petersburg polytechnical university
7	LEFEBVRE	Loic	x	x	Grenoble INP Phelma
8	OUTINI	Medhi	x	x	Grenoble INP Phelma
9	ROMANO	Annalisa	x		CERN
10	SABIO RUIZ	Daniel	x	x	Universitat Politecnica de Catalunya
11	SKOUFARIS	Kyriacos	x		University of Crete
12	SRINIVASAN	Vaishnavi	x		TU Darmstadt / GSI
13	SZALEK	Nicolas	x	x	Grenoble INP Phelma
14	VOLAT	Ludovic	x	x	Grenoble INP Phelma
15	WEIH	Simon	x	x	TU Darmstadt
16	WISSMANN	Jan	x	x	TU Darmstadt
			13	13	

Master students in 2015

C1 = Session 1

C2 = Session 2

PHD

Nr.	Family name	Given name	C1	C2	Institution
1	BENEDETTI	Stefano	x		EPFL / CERN
2	BRENTEGANI	Emanuele	x	x	University of Rostock
3	CAMPOGIANI	Giovanna	x		University La Sapienza / CERN
4	CROIA	Michele	x		University La Sapienza / LNF
5	CURCIO	Alessandro	x		University La Sapienza / LNF
6	GAROLFI	Luca	x	x	Paris-Sud University / CNRS
7	HAJDU	Csaba	x		Budapest University / CERN
8	MAIETTA	Maddalena		x	University of Naples / CERN
9	MEDINA MEDRANO	Luis Eduardo	x		Universidad de Guanajuato / CERN
10	MIRA	Francesco	x		University La Sapienza
11	MOLLARD	Antoine	x		Université Paris Sud /IRFU- CEA
12	PASSARELLI	Andrea	x		TU Darmstadt / CERN
13	STENGLER	Timo		x	University Mainz Institute Johannes Gutenberg
14	TROENG	Olof		x	Lund University
15	ZHU	Guangyu		x	Institute of modern physics Chinese academy of sciences
			11	6	

PhD students in 2015

PROFESSIONALS					
Nr.	Family name	Given name	C1	C2	Institution
1	AKROH	Abdelouahid		x	CERN
2	AL - MOHAMMAD	Hussein		x	SESAME
3	BIDAUT	Céline		x	CERN
4	CAILIAU	Philippe		x	IBA
5	CASSART	Benjamin		x	IBA
6	DALLA-COSTA	Johan	x		CERN
7	DELPRAT	Simon		x	IBA
8	DI GIOVANNI	Gian Piero		x	CERN
9	ESPERANTE PEREIRA	Daniel		x	CERN /IFIC
10	FADAKIS	Eleftherios		x	CERN
11	GOFFE	Joel		x	IBA
12	HAN	Yanliang	x		CERN
13	KITTEL	Christoph	x		CERN
14	MAILLET	Rodolphe	x		CERN
15	MAINTROT	Marc	x	x	CERN
16	MISKI-OGLU	Maksym	x	x	GSI
17	MOSCATELLI	Andrea	x		CERN
18	PEREZ	Diego	x		CERN
19	QUENEUTTE	Nicolas	x		CERN
20	SARASOLA MARTIN	Xabier		x	Columbia University / CERN
21	SHPAKOV	Vladimir	x		INFN Frascati
22	TECKER	Irina	x		CERN
23	TRIMAUD	Richard	x	x	Centre Antoine Lacassagne
24	VAN DEN HOVE	Eric		x	IBA
25	WU	Yu		x	CERN
			12	16	

Professionals students in 2015

Overview of students status

2015	Masters	PhD	Professionals	Total	Presented exam
Course 1	13	11	12	36	24
Course 2	13	6	16	35	18

2014	Masters	PhD	Professionals	Total	Presented exam
Course 1	12	19	3	34	30
Course 2	16	10	5	31	25

2013	Masters	PhD	Professionals	Total	Presented exam
Course 1	13	20	12	45	30
Course 2	12	9	18	39	19

2012	Masters	PhD	Professionals	Total	Presented exam
Course 1	20	4	13	37	25
Course 2	21	8	11	40	28

JUAS students 2015 by countries

	Countries	Students
1	Belgium	5
2	China	3
3	Cyprus	1
4	France	14
5	Germany	6
6	Greece	1
7	Hungary	1
8	India	1
9	Iran	1
10	Italy	12
11	Jordan	1
12	Mexico	1
13	Russia	2
14	Syria	1
15	Spain	4
16	Sweden	1
17	Ukraine	1
	17	56

2012

Countries	Sudents
Armenia	1
Belgium	1
Benin	1
Canada	1
Denmark	2
France	5
Germany	7
Greece	1
Hungary	1
Iran	2
Israel	1
Italy	15
Japan	1
Macedonia	1
Pakistan	1
Romania	2
Slovenia	1
Spain	4
Switzerland	3
Turkey	2
United Kingdom	2
Venezuela	1
22	56

2013

Countries	Sudents
Argentina	1
Austria	1
Belgium	1
China	3
Denmark	4
France	12
Germany	7
Greece	1
India	2
Iran	2
Italy	13
Japan	1
Morocco	1
Mexico	1
Montenegro	1
Pakistan	1
Poland	2
Portugal	1
Spain	5
Tunisia	2
United Kingdom	1
Ukraine	1
22	64

2014

Countries	Students
Armenia	1
Austria	1
Belgium	1
Colombia	1
France	7
Germany	4
Greece	1
India	2
Iran	1
Italy	13
Lebanon	1
Poland	2
Romania	4
Russia	2
Spain	2
Sweden	2
Turkey	1
Ukraine	2
18	48

Presentation Session 1

Sciences & Physics of Particle Accelerators

esi
European Scientific Institute

juas
Joint Universities Accelerator School
www.wpcrt.ch/juas
TWENTY YEARS OF TEACHING
ON PARTICLE ACCELERATORS
esi

**Students JUAS 2015 – Session 1
Sciences & Physics of Particle Accelerator**



WEEK 1

	Monday Jan 12 th	Tuesday Jan 13 th	Wednesday Jan 14 th	Thursday Jan 15 th	Friday Jan 16 th	
09:15						09:15
	Registration and coffee at Juas Office	Relativity lecture	Electro-magnetism lecture	Particle optics lecture	Intro. to Accelerators lecture	
10:15	Presentation of ESI H. Hoffmann	<i>H. Henke</i>	<i>H. Henke</i>	<i>J.M. De Conto</i>	<i>Ph. Bryant</i>	
		Coffee Break	Coffee Break	Coffee Break (group photo)	Coffee Break	10:15
10:45	Presentation of Archamps Technopole <i>Bob Holland</i>	Relativity tutorial	Electro-magnetism tutorial	Particle optics lecture	Introduction to the Mini-Workshop lecture	10:30
11:00	Presentation of JUAS & Presentation of students 2015 <i>L. Rinolfi</i>	<i>H. Henke</i>	<i>H. Henke</i>	<i>J.M. De Conto</i>	<i>Ph. Bryant</i>	11:30
		Electro-magnetism lecture	Electro-magnetism lecture	Particle optics tutorial	Introduction to the Mini-Workshop lecture	
12:00		<i>H. Henke</i>	<i>H. Henke</i>	<i>J.M. De Conto</i>	<i>Ph. Bryant</i>	12:30
12:30		LUNCH	LUNCH	LUNCH	Bus leaves at 12:30 from JUAS	
14:00	WELCOME COCKTAIL	Intro. to Accelerators lecture	Particle optics lecture	Intro. to Accelerators lecture	(Lunch at CERN) VISIT	14:00
		<i>Ph. Bryant</i>	<i>J.M. De Conto</i>	<i>Ph. Bryant</i>	AT	
15:00	Relativity lecture	Intro. to Accelerators lecture	Particle optics lecture	Intro. to Accelerators lecture	CERN	15:00
	<i>H. Henke</i>	<i>Ph. Bryant</i>	<i>J.M. De Conto</i>	<i>Ph. Bryant</i>	(Presentation of CERN and visit of CMS)	16:00
16:00	Coffee Break	Coffee Break	Coffee Break	Coffee Break		16:15
16:15	Relativity lecture	Intro. to Accelerators lecture	Particle optics tutorial	Intro. to Accelerators lecture		
	<i>H. Henke</i>	<i>Ph. Bryant</i>	<i>J.M. De Conto</i>	<i>Ph. Bryant</i>	Return scheduled at 18:30	17:15
17:15						

WEEK 2

		Monday Jan 19 th	Tuesday Jan 20 th	Wednesday Jan 21 st	Thursday Jan 22 nd	Friday Jan 23 rd		
09:15	Transverse Dynamics lecture <i>A. Latina</i>	Longitudinal Dynamics lecture <i>E. Métral</i>	Transverse Dynamics lecture <i>A. Latina</i>	Transverse Dynamics lecture <i>A. Latina</i>	Longitudinal Dynamics lecture <i>E. Métral</i>	09:15		
10:15	Coffee Break	Coffee Break	Coffee Break	Coffee Break	Coffee Break	10:15		
10:30	Transverse Dynamics lecture <i>A. Latina</i>	Longitudinal Dynamics tutorial <i>E. Métral / E. Benedetto</i>	Longitudinal Dynamics lecture <i>E. Métral</i>	Longitudinal Dynamics lecture <i>E. Métral</i>	Longitudinal Dynamics lecture <i>E. Métral</i>	10:30		
11:30	Transverse Dynamics tutorial <i>A. Latina</i>	Transverse Dynamics lecture <i>A. Latina</i>	Longitudinal Dynamics tutorial <i>E. Métral / E. Benedetto</i>	Longitudinal Dynamics lecture <i>E. Métral</i>	Longitudinal Dynamics tutorial <i>E. Métral / E. Benedetto</i>	11:30		
12:30	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH	12:30		
14:00	Bus leaves at 13:30 from JUAS VISIT AT CERN <i>(Visit of CTF3 and Synchrocyclotron)</i> Return scheduled at 18:00	Exercises in computer room		Exercises in computer room		14:00		
15:00		Transverse Dynamics tutorial <i>A. Latina / J. Resta Lopez</i>	Longitudinal Dynamics lecture <i>E. Métral</i>	Transverse Dynamics tutorial <i>A. Latina / J. Resta Lopez</i>	Longitudinal Dynamics tutorial <i>E. Métral / E. Benedetto</i>	15:00		
16:00		Longitudinal Dynamics lecture <i>E. Métral</i>	Transverse Dynamics lecture <i>A. Latina</i>	Transverse Dynamics tutorial <i>A. Latina / J. Resta Lopez</i>	Transverse Dynamics lecture <i>A. Latina</i>	16:00		
16:15		Coffee Break	Coffee Break	Coffee Break	Coffee Break	16:15		
17:15		Intro. to MADX <i>G. Sterbini</i>	MADX <i>G. Sterbini/ A. Latina /J. Resta Lopez / N. Fuster</i>	MADX <i>G. Sterbini/ A. Latina /J. Resta Lopez / N. Fuster</i>	MADX <i>G. Sterbini/ A. Latina /J. Resta Lopez / N. Fuster</i>	MADX <i>G. Sterbini/ A. Latina /J. Resta Lopez / N. Fuster</i>	17:15	
18:15	MADX <i>G. Sterbini/ A. Latina /J. Resta Lopez / N. Fuster</i>	MADX <i>G. Sterbini/ A. Latina /J. Resta Lopez / N. Fuster</i>						

WEEK 3

	Monday Jan 26 th	Tuesday Jan 27 th	Wednesday Jan 28 th	Thursday Jan 29 th	Friday Jan 30 th	
09:00				Seminar History of particle accelerators <i>Ugo Amaldi</i>		
09:15	Beam Dynamics lecture on LHC <i>R. Alemany</i>	Linear imperfections lecture <i>Y. Papaphilippou</i>	Linear imperfections lecture <i>Y. Papaphilippou</i>		Instabilities lecture <i>M. Migliorati</i>	09:15
10:15	Coffee Break	Coffee Break	Coffee Break	Coffee Break	Coffee Break	10:15
10:30	Linear imperfections lecture <i>Y. Papaphilippou</i>	Linear imperfections tutorial <i>Y. Papaphilippou</i>	Linear imperfections tutorial <i>Y. Papaphilippou</i>	Space charge lecture <i>M. Migliorati</i>	Instabilities lecture <i>M. Migliorati</i>	10:30
11:30	Linear imperfections lecture <i>Y. Papaphilippou</i>	Linear imperfections lecture <i>Y. Papaphilippou</i>	Non-linear effects lecture <i>Y. Papaphilippou</i>	Space charge lecture <i>M. Migliorati</i>	Instabilities tutorial <i>M. Migliorati</i>	11:30
12:30	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH	12:30
14:00	Exercises in computer room			Exercises in computer room		14:00
15:00	Linacs lecture <i>J-B. Lallement</i>	Injection / extraction lecture <i>T. Perron</i>	Linacs lecture <i>J-B. Lallement</i>	Space charge tutorial <i>M. Migliorati</i>	Non-linear effects lecture <i>Y. Papaphilippou</i>	15:00
16:00	Linacs lecture <i>J-B. Lallement</i>	Injection / extraction lecture <i>T. Perron</i>	Linacs tutorial <i>J-B. Lallement / V. Dimov</i>	Space charge lecture <i>M. Migliorati</i>	Non-linear effects lecture <i>Y. Papaphilippou</i>	16:00
16:15	Coffee Break	Coffee Break	Coffee Break	Coffee Break	Coffee Break	16:15
17:15	Linacs tutorial <i>J-B. Lallement / V. Dimov</i>	Linacs lecture <i>J-B. Lallement</i>	Linacs tutorial <i>J-B. Lallement / V. Dimov</i>	Space charge lecture <i>M. Migliorati</i>	Non-linear effects tutorial <i>Y. Papaphilippou</i>	17:15

WEEK 4

	Monday Feb 2nd	Tuesday Feb 3rd	Wednesday Feb 4th	Thursday Feb 5th	Friday Feb 6th	
09:15	Synchrotron Radiation lecture <i>R. Bartolini</i>	Machine Design tutorial <i>Ph. Bryant</i>	Machine Design tutorial <i>R. Bartolini</i>	Cyclotrons lecture <i>F. Chautard</i>	Synchrotron Radiation lecture <i>R. Bartolini</i>	09:15
10:15	Coffee Break	Coffee Break	Coffee Break	Coffee Break	Coffee Break	10:15
10:30	Synchrotron Radiation lecture <i>R. Bartolini</i>	Machine Design tutorial <i>Ph. Bryant</i>	Machine Design tutorial <i>R. Bartolini</i>	Cyclotrons lecture <i>F. Chautard</i>	Synchrotron Radiation tutorial <i>R. Bartolini</i>	10:30
11:30	Synchrotron Radiation tutorial <i>R. Bartolini</i>	Machine Design tutorial <i>Ph. Bryant</i>	Machine Design tutorial <i>R. Bartolini</i>	Cyclotrons tutorial <i>F. Chautard</i>	Synchrotron Radiation tutorial <i>R. Bartolini</i>	11:30
12:30	LUNCH	LUNCH	LUNCH	LUNCH	LUNCH	12:30
14:00	Exercises in computer room			Exercises in computer room		14:00
15:00	Synchrotron Radiation lecture <i>R. Bartolini</i>	Synchrotron Radiation lecture <i>R. Bartolini</i>	Cyclotrons lecture <i>F. Chautard</i>	Seminar Sciences and Art of Inventiveness <i>A. Seryi</i>	Presentation of Accelerator Design <i>Students + Ph. Bryant</i>	15:00
16:00	Synchrotron Radiation lecture <i>R. Bartolini</i>	Synchrotron Radiation lecture <i>R. Bartolini</i>	Cyclotrons tutorial <i>F. Chautard</i>	Synchrotron Radiation lecture <i>R. Bartolini</i>	Presentation of Ligth Source Design <i>Students + R. Bartolini</i>	16:00
16:15	Coffee Break	Coffee Break	Coffee Break	Coffee Break	Coffee Break	16:15
17:15	Seminar High Energy future Colliders <i>L. Rinolfi</i>	Synchrotron Radiation tutorial <i>R. Bartolini</i>	Cyclotrons lecture <i>F. Chautard</i>	Seminar Laser Plasma Acceleration <i>R. Assmann</i>	Conclusion of mini- workshop <i>R. Bartolini + Ph. Bryant</i>	17:15

WEEK 5

	Monday Feb 9 th	Tuesday Feb 10 th	Wednesday Feb 11 th	Thursday Feb 12 th	Friday Feb 13 th	
09:15		EXAMINATION Synchrotron radiation <i>Written session</i>	EXAMINATION Longitudinal beam dynamics <i>Written session</i>	EXAMINATION Transverse beam dynamics <i>Written session</i>		09:15
10:45						10:45
11:00		Coffee Break	Coffee Break	Coffee Break		11:00
		EXAMINATION Particle optics <i>Written session</i>	EXAMINATION Linear imperfections <i>Written session</i>	DISCUSSION SUMMARY of JUAS lectures		
12:30						12:30
				BUFFET END OF 1 ST JUAS SESSION		
14:00						14:00
15:00						15:00
16:00 16:15						16:00 16:15
17:15						17:15

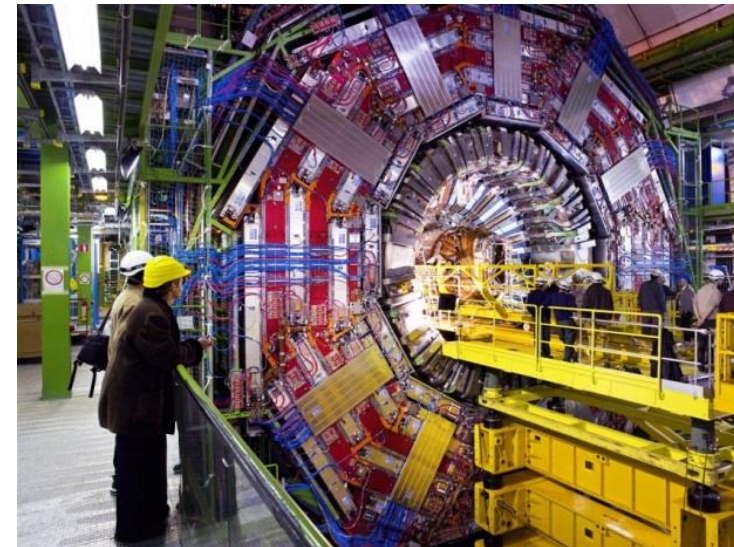
Visit at CERN

Friday 16th January 2015



Programme:

- 13:00 Lunch at CERN
- 13:30 Bookshop (if you want)
- 14:00 Presentation of CERN (L. Rinolfi)
- 14:45 Film
- 15:00 Bus start for CMS detector (Point 5 in Cessy)
- 15:30 Start CMS visit (4 groups)
- 17:30 End of CMS visit



CLIC Test Facility (CTF3) at CERN

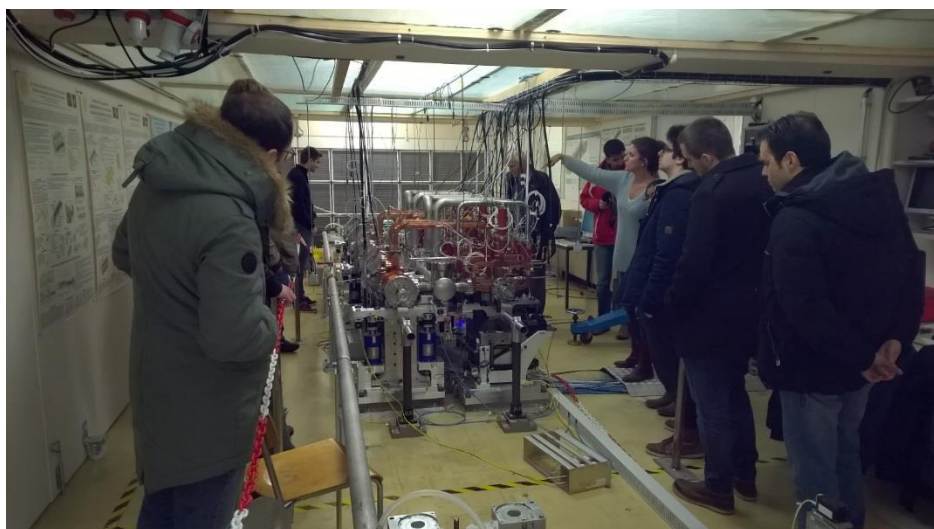
W. Farabolini as a guide



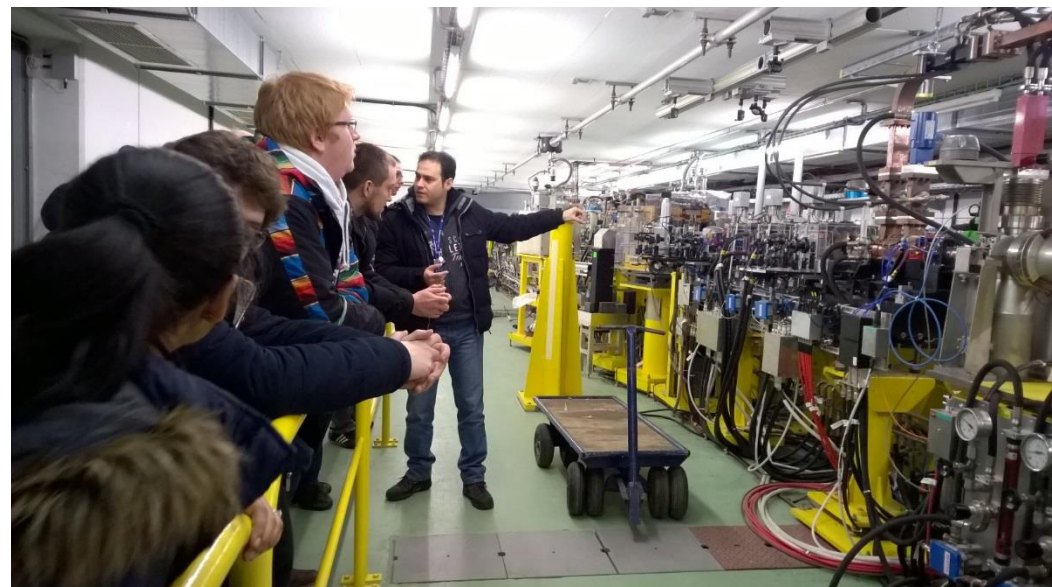
Inside the CLIC Show Room



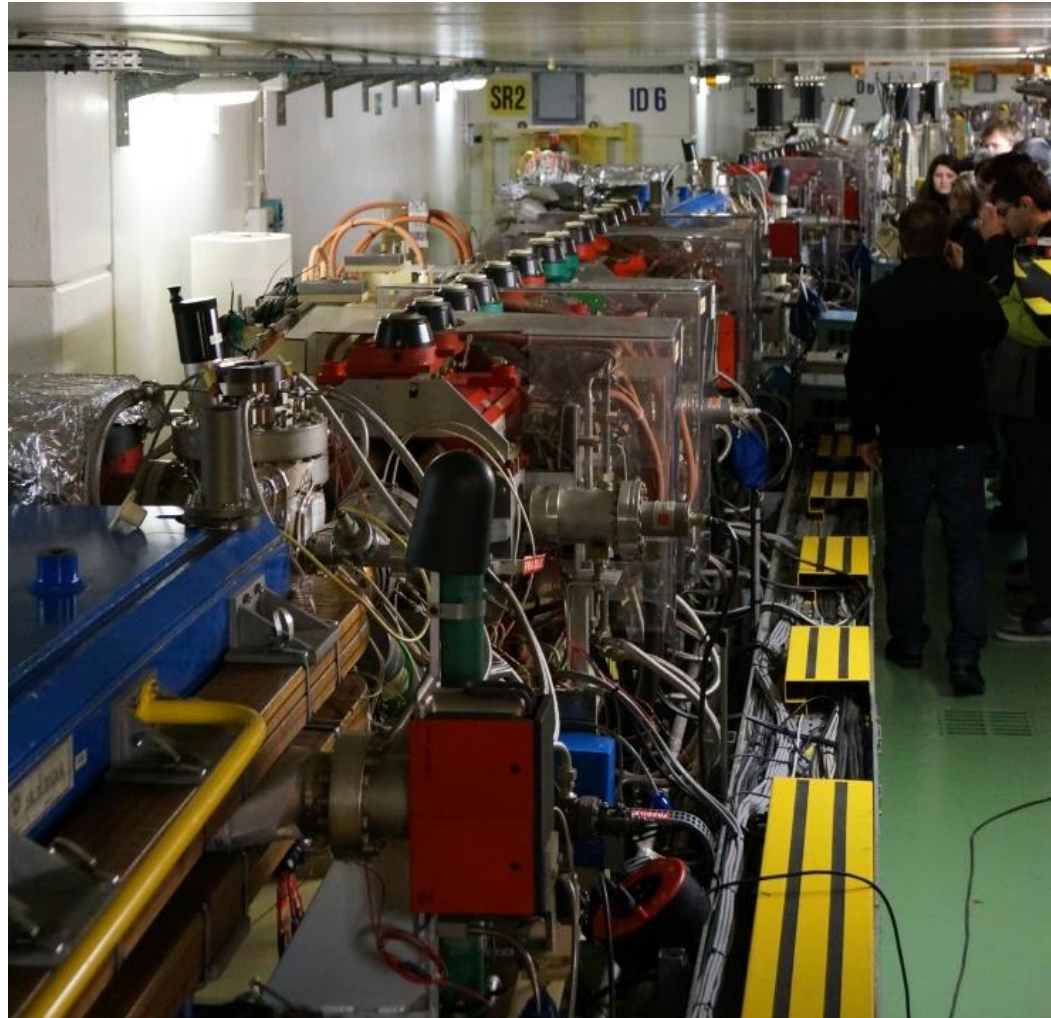
The 12 GHz accelerating structures



The 120 MeV Linac for the Probe Beam



Unfortunately, in 2015, ESRF closed rather early and it was impossible to visit it



EXAMINATION

Each student who gets an **average mark of 10/ 20** (or above) can receive **ECTS** credits recognized by the partner Universities.

There are 5 topics, each of them lasts 1.5 hour:

Session 1:

- * Transverse Beam Dynamics
- * Longitudinal Beam Dynamics
- * Synchrotron Radiations

Session 2:

- * RF
- * Magnets
- * Beam Instrumentation

The remaining 2 exams are announced the week 4 and 9 (weeks before the exams)

For each examination, all **written documents are permitted** and a pocket calculator.

It is strictly forbidden to have an electronic device (iPhone, Portable, etc...) during the exam

Students 2015 during the exam



Presentation Session 2 Technology & Applications of Particle Accelerators



**Students JUAS 2015 – Session 2
Technology & Applications of Particle Accelerator**

WEEK 6

	Monday Feb 16 th	Tuesday Feb 17 th	Wednesday Feb 18 th	Thursday Feb 19 th	Friday Feb 20 th
09:15	Registration and coffee at Juas Office	RF Engineering lecture <i>F. Caspers</i>	Vacuum systems lecture <i>P. Chiggiato</i>	RF Engineering lecture <i>F. Caspers</i>	RF Engineering lecture <i>F. Caspers</i>
10:00	Presentation of JUAS 2015 <i>L. Rinolfi</i>	Coffee Break	Coffee Break	Coffee Break	RF Engineering tutorial <i>F. Caspers / M. Wendt</i>
11:00	Presentation EUCARD 2 <i>Maurizio Vretenar</i>	RF Engineering tutorial <i>F. Caspers / M. Wendt</i>	Vacuum systems lecture <i>P. Chiggiato</i>	Vacuum systems lecture <i>P. Chiggiato</i>	Coffee Break
11:30	Introduction to CERN practical day <i>Magnet, Superconductivity</i>	RF Engineering lecture <i>F. Caspers</i>	Vacuum systems tutorial <i>P. Chiggiato / R. Kersevan</i>	Vacuum systems tutorial <i>P. Chiggiato / R. Kersevan</i>	Bus leaves at 11h30 from JUAS (Lunch at CERN)
12:30	WELCOME COCKTAIL	LUNCH	LUNCH	LUNCH	
14:00	Introduction to CERN practical day <i>RF, Vacuum</i>	RF Engineering lecture <i>F. Caspers</i>	Vacuum systems lecture <i>P. Chiggiato</i>	RF Engineering lecture <i>F. Caspers</i>	
15:00	RF Engineering lecture <i>F. Caspers</i>	RF Engineering tutorial <i>F. Caspers / M. Wendt</i>	Vacuum systems tutorial <i>P. Chiggiato / R. Kersevan</i>	RF Engineering tutorial <i>F. Caspers / M. Wendt</i>	VISIT AT CERN (LINACS Visit, AD Visit, RF Measurements)
16:00	Coffee Break	Coffee Break	Coffee Break	Coffee Break	
16:15	RF Engineering lecture <i>F. Caspers</i>	RF Engineering lecture <i>F. Caspers</i>	Seminar Free Electron Laser <i>E. Prat</i>	RF Engineering lecture <i>F. Caspers</i>	
17:15					Return scheduled at 19h00

09:15

10:15
10:30

11:30

12:30

14:00

15:00

16:00
16:15

17:15

WEEK 7

	Monday Feb 23 rd	Tuesday Feb 24 th	Wednesday Feb 25 th	Thursday Feb 26 th	Friday Feb 27 th	
08:45	Introduction to Magnets lecture <i>D. Tommasini</i>	Superconducting magnets lecture - <i>M. Wilson</i>	Mini-workshop Normal conducting Magnets	<i>Bus leaves at 8:00 from JUAS</i> <i>(lunch at CERN)</i> PRACTICAL WORKS AT CERN RF coordinator: F. Caspers VACUUM coordinator: P. Chiggiato MAGNETS coordinator: J. Bauché SUPERCONDUCTIVITY coordinator: A. Ballarino <i>Return scheduled at 19:00</i>	<i>Bus leaves at 8:00 from JUAS</i> <i>(lunch at CERN)</i> PRACTICAL WORKS AT CERN RF coordinator: F. Caspers VACUUM coordinator: P. Chiggiato MAGNETS coordinator: J. Bauché SUPERCONDUCTIVITY coordinator: A. Ballarino <i>Return scheduled at 19:00</i>	08:45
09:45	Coffee Break	Coffee Break	Coffee Break			09:45
10:00	Electromagnetism lecture <i>S. Russenschuck</i>	Superconducting magnets lecture - <i>M. Wilson</i>	<i>P. Ferracin</i> <i>S. Russenschuck</i> <i>D. Tommasini</i> <i>M. Wilson</i> <i>T. Zickler</i>			10:00
11:00	Electromagnetism lecture <i>S. Russenschuck</i>	Superconducting magnets lecture - <i>M. Wilson</i>				11:00
12:00	LUNCH	LUNCH	LUNCH			12:00
13:00	Electromagnetism lecture <i>S. Russenschuck</i>	Superconducting magnets lecture - <i>M. Wilson</i>	Mini-workshop Superconducting Magnets <i>P. Ferracin</i> <i>S. Russenschuck</i> <i>D. Tommasini</i>	13:00		
14:00	Normal Conducting magnets lecture <i>T. Zickler</i>	Superconducting magnets lecture - <i>M. Wilson</i>		14:00		
15:00	Normal Conducting magnets lecture <i>T. Zickler</i>	Normal Conducting magnets lecture - <i>T. Zickler</i>		15:00		
16:00	Coffee Break	Coffee Break	Coffee Break	16:00		
16:15	Normal Conducting magnets lecture - <i>T. Zickler</i>	Normal Conducting magnets lecture - <i>T. Zickler</i>	<i>M. Wilson</i> <i>T. Zickler</i>	16:15		
17:15	Numerical techniques lecture <i>S. Russenschuck</i>	Normal Conducting magnets lecture - <i>T. Zickler</i>		17:15		
18:15				18:15		

WEEK 8

	Monday March 2 nd	Tuesday March 3 rd	Wednesday March 4 th	Thursday March 5 th	Friday March 6 th	
09:15	Beam instrumentation lecture <i>P. Forck</i>	Beam instrumentation lecture <i>P. Forck</i>	Beam instrumentation tutorial <i>P. Forck</i>	Bus leaves at 8:00 from JUAS Travel to Villigen (Lunch at PSI) VISIT PSI (Lunch at PSI) VISIT PSI Accelerators Controls lecture <i>E. Zimoch</i>	VISIT PSI (Lunch at PSI) VISIT PSI	09:15
10:15	Coffee Break	Coffee Break	Coffee Break			10:15
10:30	Beam instrumentation lecture <i>P. Forck</i>	Beam instrumentation lecture <i>P. Forck</i>	Beam instrumentation tutorial <i>P. Forck</i>			10:30
11:30	Beam instrumentation lecture <i>P. Forck</i>	Beam instrumentation lecture <i>P. Forck</i>	Beam instrumentation lecture <i>P. Forck</i>			11:30
12:30	LUNCH	LUNCH	LUNCH			12:30
14:00	Exercise in computer room		Exercise in computer room			14:00
15:00	Beam instrumentation tutorial <i>P. Forck</i>	Superconducting RF Cavities lecture <i>F. Caspers</i>	Superconducting RF Cavities tutorial <i>F. Caspers</i>			15:00
16:00	Beam instrumentation tutorial <i>P. Forck</i>	Superconducting RF Cavities lecture <i>F. Caspers</i>	Superconducting RF Cavities tutorial <i>F. Caspers</i>			16:00
16:15	Coffee Break	Coffee Break	Coffee Break			16:15
17:15	Beam instrumentation lecture <i>P. Forck</i>	Superconducting RF Cavities lecture <i>F. Caspers</i>	Superconducting RF Cavities lecture <i>F. Caspers</i>			17:15
18:00				(Dinner at PSI)	18:00	

Return scheduled at 21:00

WEEK 9

	Monday March 9th	Tuesday March 10th	Wednesday March 11th	Thursday March 12th	Friday March 13th	
09:15	Particle Sources lecture <i>T. Thuillier</i>	Low Energy Electron Accelerators lecture <i>W. Mondelaers</i>	Bus leaves at 8:00 VISIT AND EXPERIMENTAL WORK AT BERGOZ INSTRUMENTATION <i>(Lunch at Bergoz)</i> Return scheduled at 19:00	Particle therapy and accelerators lecture <i>S. Meyroneinc</i>	High Current Proton Linacs lecture <i>S. Bousson</i>	09:15
10:15	Coffee Break	Coffee Break		Coffee Break	Coffee Break	10:15
10:30	Particle Sources lecture <i>T. Thuillier</i>	Low Energy Electron Accelerators lecture <i>W. Mondelaers</i>		Particle therapy and accelerators lecture <i>S. Meyroneinc</i>	High Current Proton Linacs lecture <i>S. Bousson</i>	10:30
11:30	Particle Sources lecture <i>T. Thuillier</i>	Low Energy Electron Accelerators lecture <i>W. Mondelaers</i>		Particle therapy and accelerators lecture <i>S. Meyroneinc</i>	High Current Proton Linacs lecture <i>S. Bousson</i>	11:30
12:30	LUNCH	LUNCH		LUNCH	LUNCH	12:30
14:00	Particle Sources tutorial <i>T. Thuillier</i>	Acc. for indust. & medical applications lecture <i>W. Kleeven</i>		Radiation Oncology Biology & physics Clinical application lecture <i>R. Miralbell</i>	Radiation safety lecture <i>X. Queralt</i>	14:00
15:00	Particle Sources lecture <i>T. Thuillier</i>	Acc. for indust. & medical applications lecture <i>W. Kleeven</i>		Radiation safety lecture <i>X. Queralt</i>	Coffee Break	15:00
16:00	Coffee Break	Coffee Break		Therapeutic Applications at Geneva Hospital	Radiation safety lecture <i>X. Queralt</i>	16:00
16:15	Seminar Techniques of Beam Cooling <i>M. Steck</i>	Acc. for indust. & medical applications lecture <i>W. Kleeven</i>		Return scheduled at 18:00		16:15
17:15						17:15

WEEK 10

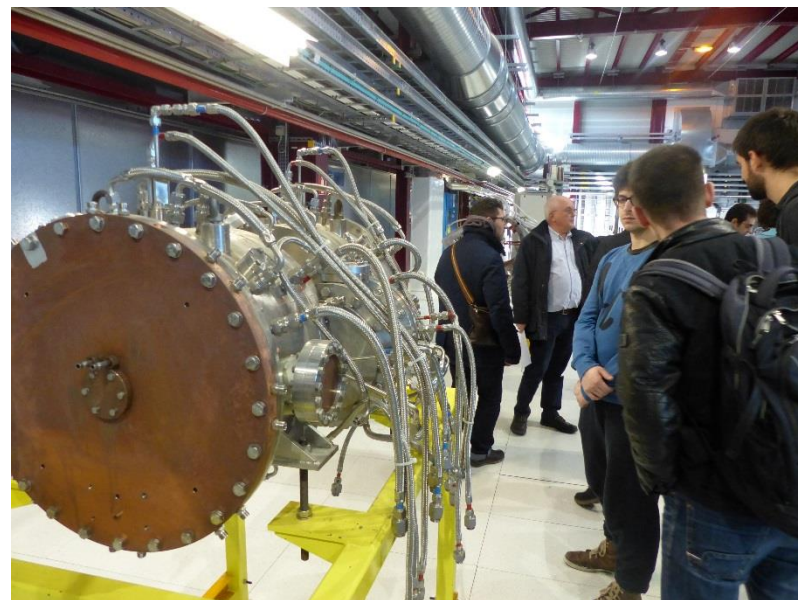
	Monday March 16 th	Tuesday March 17 th	Wednesday March 18 th	Thursday March 19 th	Friday March 20 th	
09:15		EXAMINATION Beam Instrumentation <i>Written session</i>	EXAMINATION Magnets <i>Written session</i>	EXAMINATION RF <i>Written session</i>		09:15
10:45						10:45
11:00		Coffee Break	Coffee Break	DISCUSSION SUMMARY of JUAS lectures		11:00
		EXAMINATION Radiation safety <i>Written session</i>	EXAMINATION Particle sources <i>Written session</i>			
12:30				BUFFET END OF 2 nd JUAS SESSION - END OF THE SCHOOL 2015		12:30
13:00						13:00
14:00						14:00
15:00						15:00
16:00						16:00
16:15						16:15
17:15						17:15

CERN visits

In front of LHC magnet



Inside the Linac 4



Inside the Linac 3 (Ions)



LEIR



PSI visit



HUG visit



Lecture by Prof. Miralbell

Inside the radiotherapy room



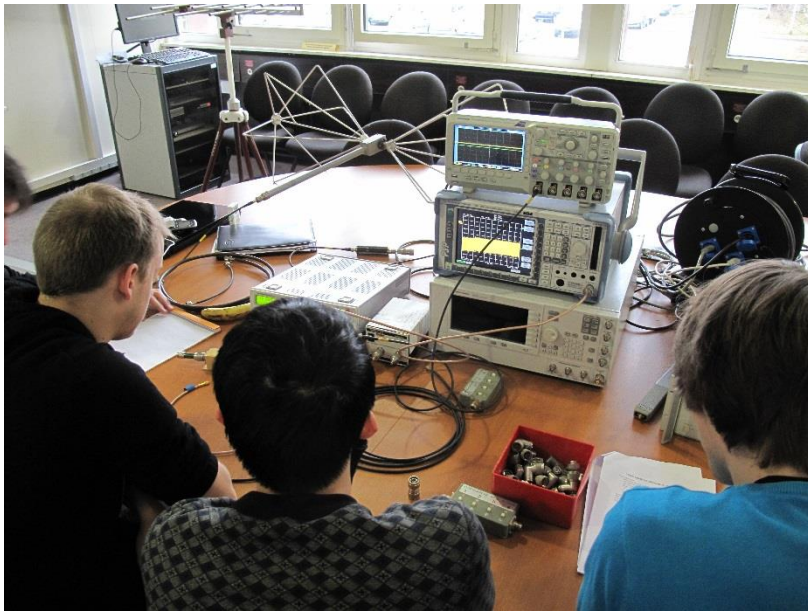
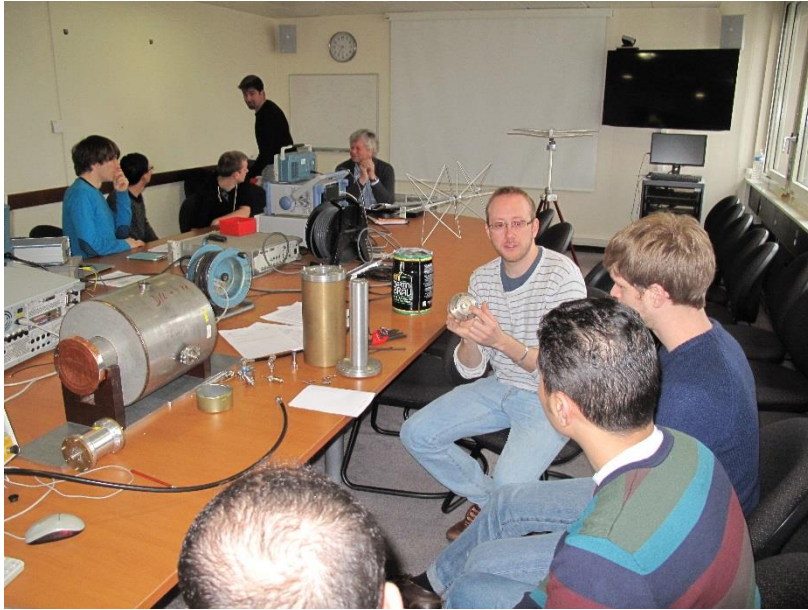
New in 2015:

Two practical days at CERN

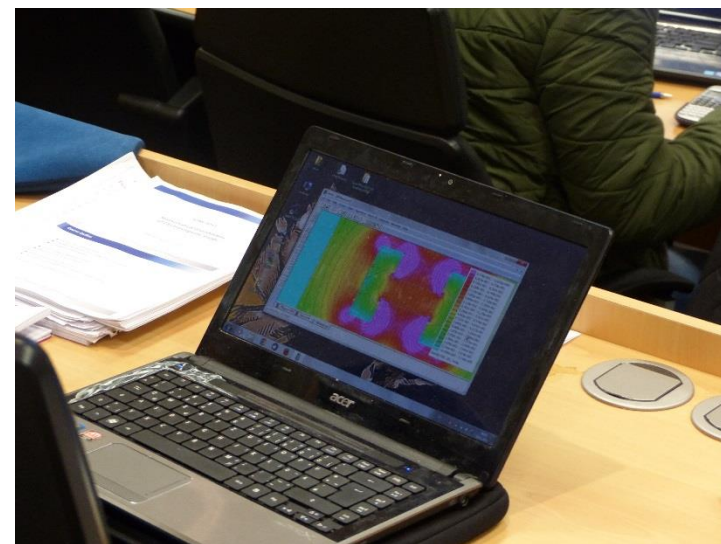
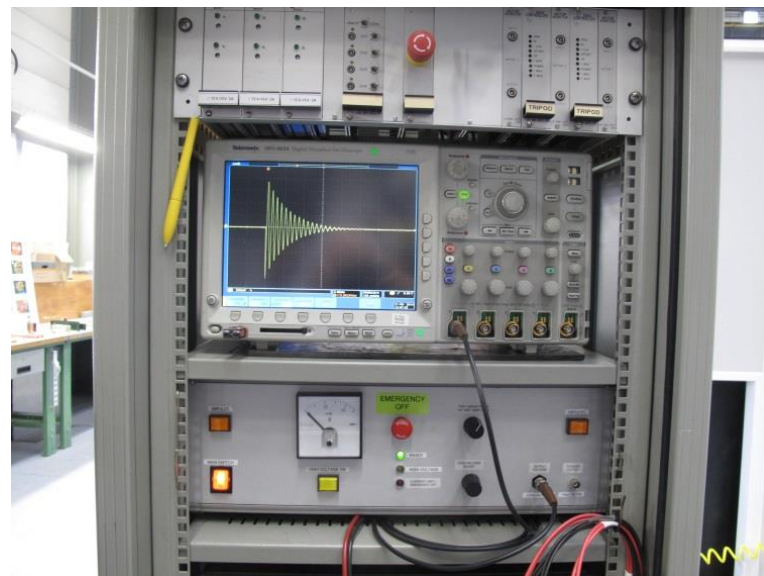
Thursday 26th February and Friday 27th February

**Each student was able to work on 2 different topics to be chosen between:
RF, Magnets, Vacuum, Superconductivity**

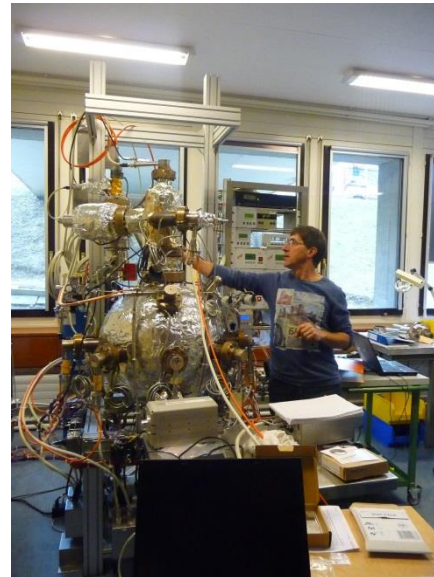
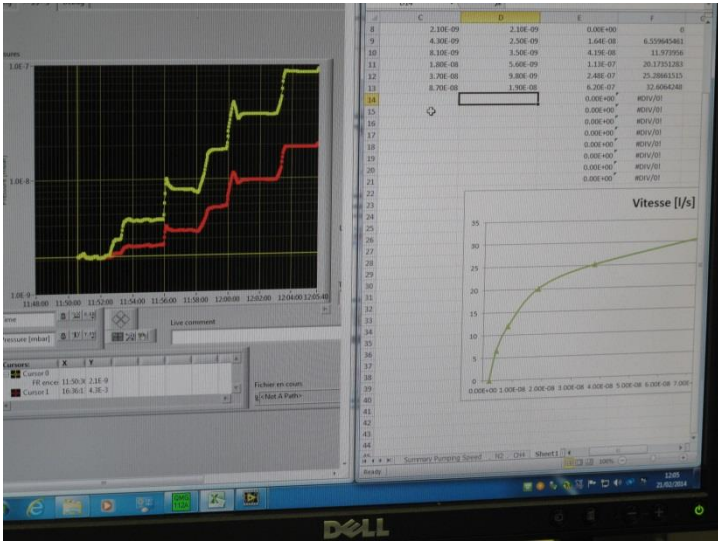
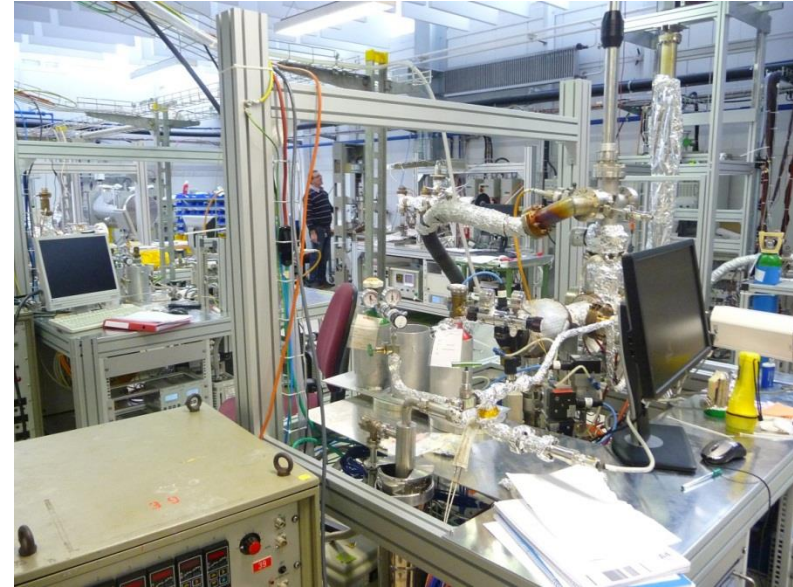
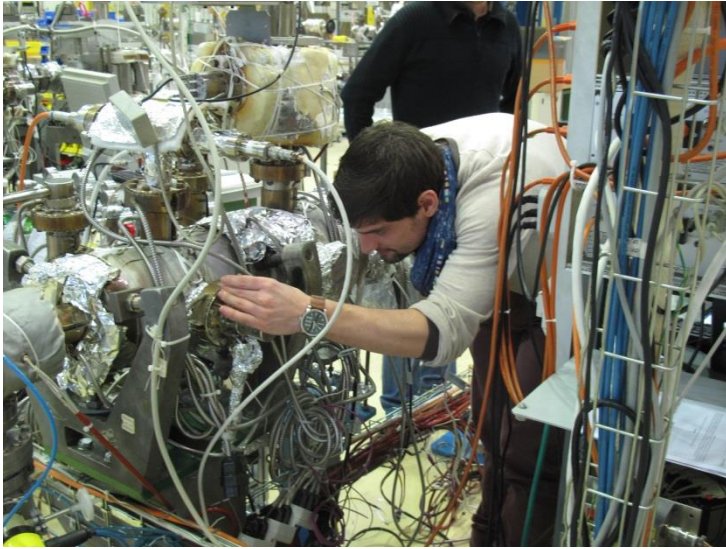
Practical days at CERN: RF group



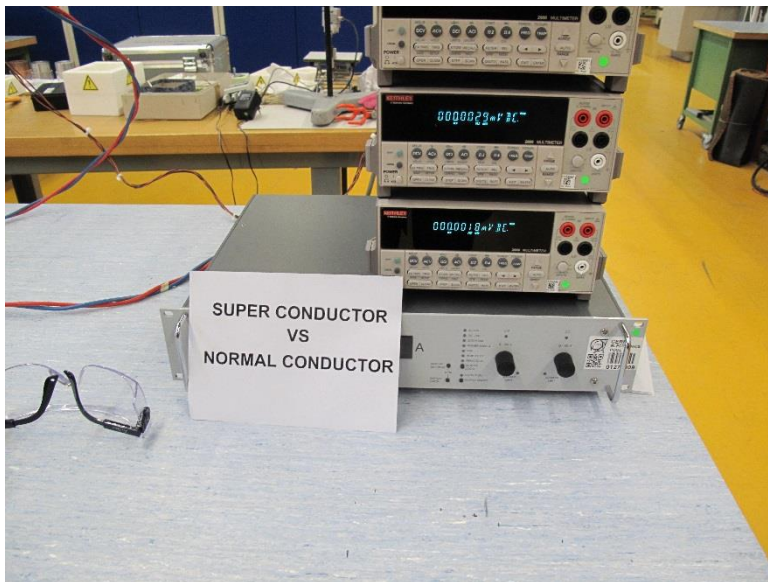
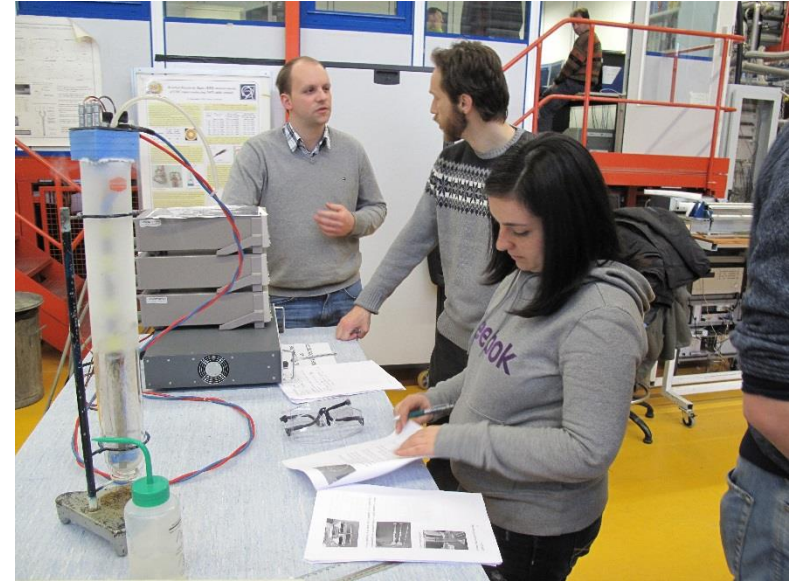
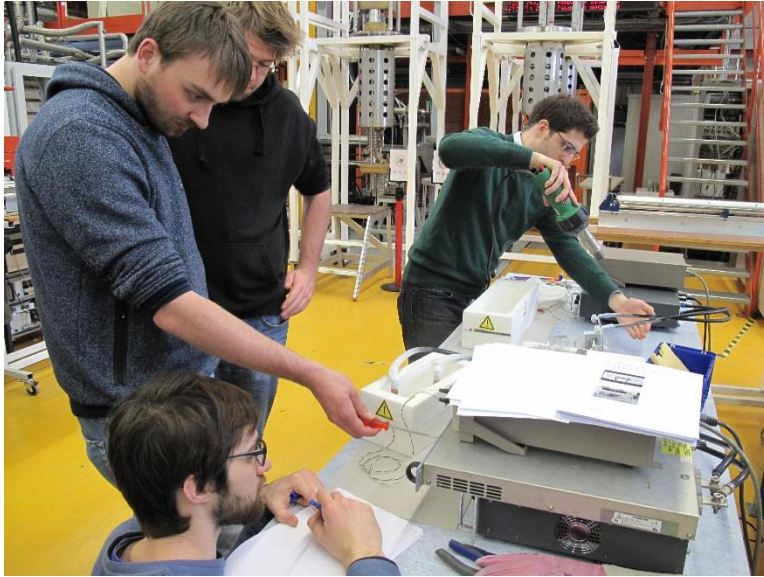
Practical days at CERN: Magnets group



Practical days at CERN: Vacuum group



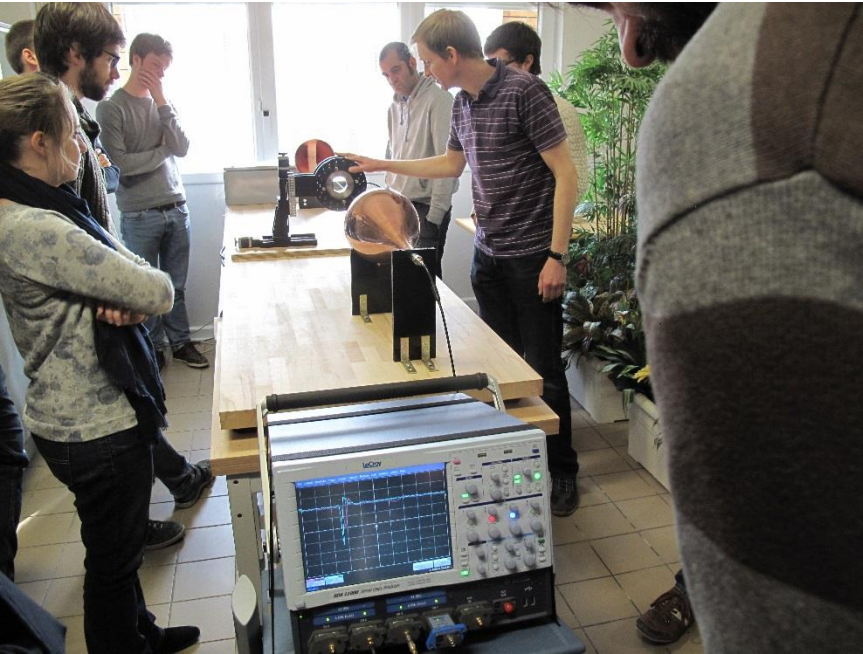
Practical days at CERN: Superconductivity group



Practical day Bergoz

Wednesday 11th March 2015

Practical day at Bergoz



Goubau Line



Soldering printed
circuits for a Wi-Fi
meter



Reports from students

Visit at Bergoz Instrumentation

Philipp Dijkstal

March 13, 2015



Contents

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2.1	Presentation and tour	2
2.2	Current transformer test stand	2
2.3	Temperature wire scanner	3
3	Practical work: WiFi Meter assembly & testing	5
4	Summary	6

JUAS 2015

CERN Practical Days Report

By:

Hussein AL-MOHAMMAD

Abstract

This report shows what I learned in CERN during 2 days training, what I achieved, how this training develop my skills in RF and magnets how to improve and deal with them.

Feb. 26th and 27th 2015

CERN

JUAS certificates

Archamps, March 4th 2015

JUAS CERTIFICATE 2015

Course 1
SCIENCES & PHYSICS OF PARTICLE ACCELERATORS
(4 weeks of lectures, tutorials, seminars, visits and 1 week of exams)

DIJKSTAL Philipp

participated in the examination week and passed successfully the exams.

His performance merited the award of credits under the European Credit Transfer System (ECTS), acknowledged by JUAS partner Universities.

Average score : 18,4 /20

Rank : 1 /24

Average score of class : 13.9 /20

Louis RINOLFI

JUAS Director



Marie GAUTHIER

ESI Administrator



Universitat Politècnica de Catalunya

Universitat Autònoma de Barcelona

Technische Universität Darmstadt

Université Joseph Fourier Grenoble

Institut Polytechnique de Grenoble

Karlsruher Institut für Technologie

Università degli Studi di Napoli „Federico II“

Università degli Studi di Roma „La Sapienza“

Technische Universität Berlin

Università degli Studi di Genova

Universitat de València

Universität Heidelberg

University of Liverpool

Université Paris Sud - Orsay

Oxford University

EFET 427 430 433 00012 - AFE 3340

Joint Universities Accelerator School 2015

Archamps, 4th March 2015

CERTIFICATE OF ATTENDANCE

We, undersigned, certify that,

DIJKSTAL Philipp

has registered as student for JUAS 2015 and
has followed 4 weeks of JUAS courses (lectures, tutorials, seminars and visits),

Sciences and Physics of Particle Accelerators

(Course 1)

(from January 12th to February 13th in Archamps -France)

This course consists of Relativity, Electro Magnetism, Introduction to Accelerators, Particle Optics, Transverse Beam Dynamics, Longitudinal Beam Dynamics, MADX, Linacs, Linear Imperfections, Injection/Extraction, Non-linear Effects, Space Charge, Instabilities, Synchrotron Radiation, Machine Design and Cyclotrons.

Organized by the European Scientific Institute (E.S.I.) in partnership with 15 European Universities.*

Louis RINOLFI

JUAS Director



Marie GAUTHIER

ESI Administrator



JUAS certificate of attendance for session 1

*Each student who followed more than
90% of the course received such
certificate*

European Credit Transfer System (ECTS)

Students passing the exam of:

- Session 1 (“Physics of Accelerators”)
- Session 2 (“Technology of Accelerators”)

can receive **ECTS** credits from their universities