Welcome to JUAS 2018 Course 2

The technology and applications of particle accelerators

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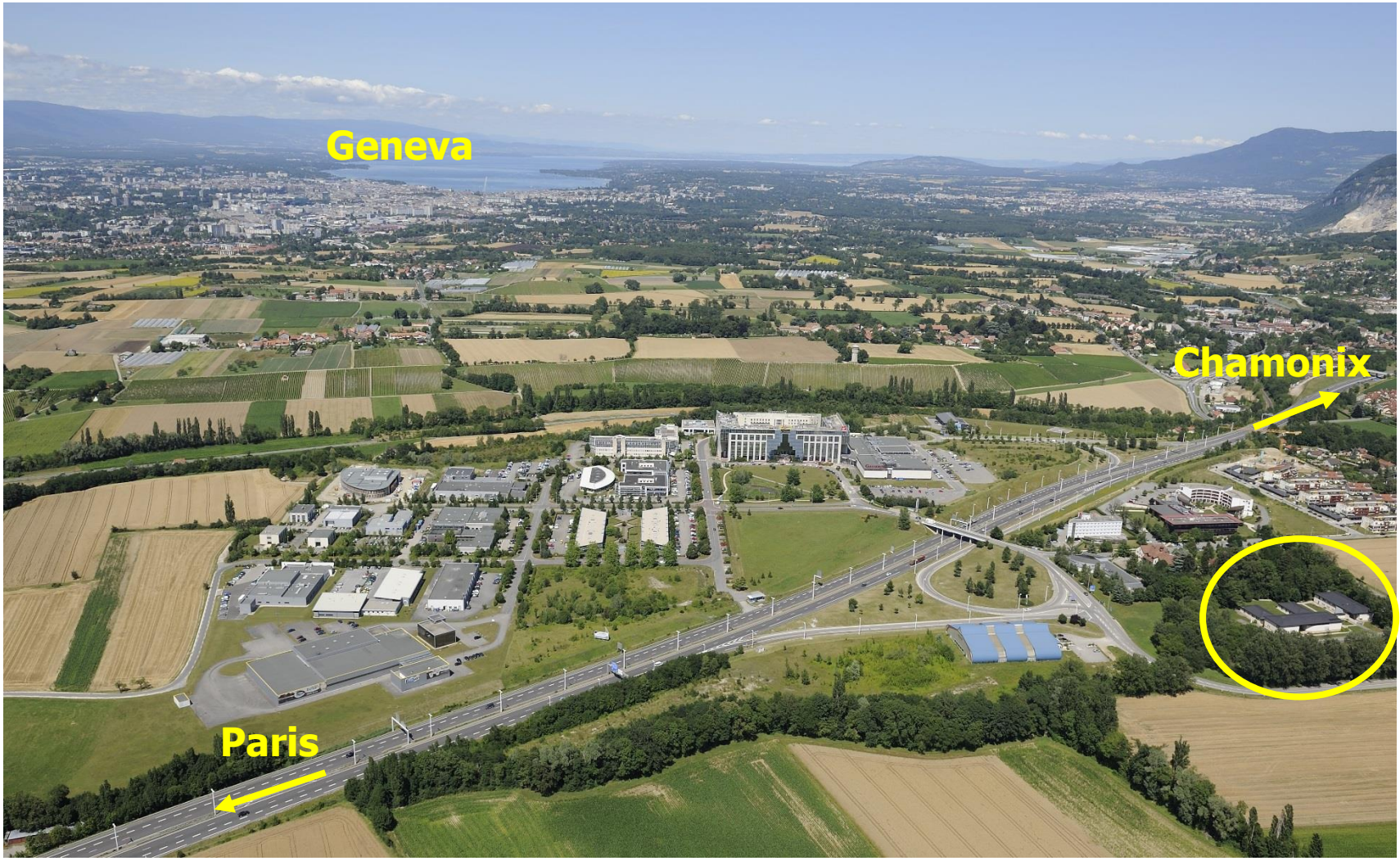
Director, JUAS

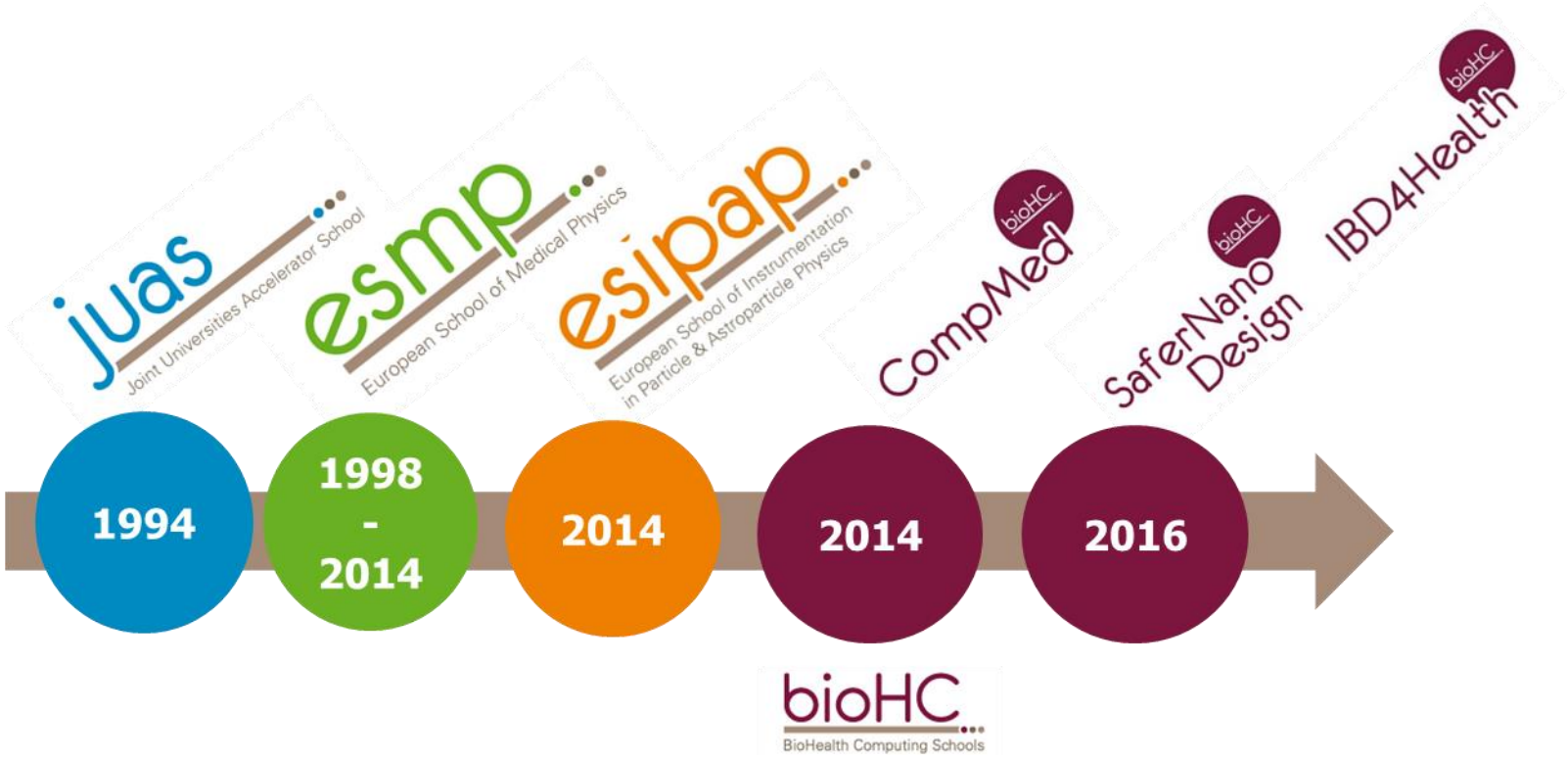
ESI Archamps Technopole

12 February 2018

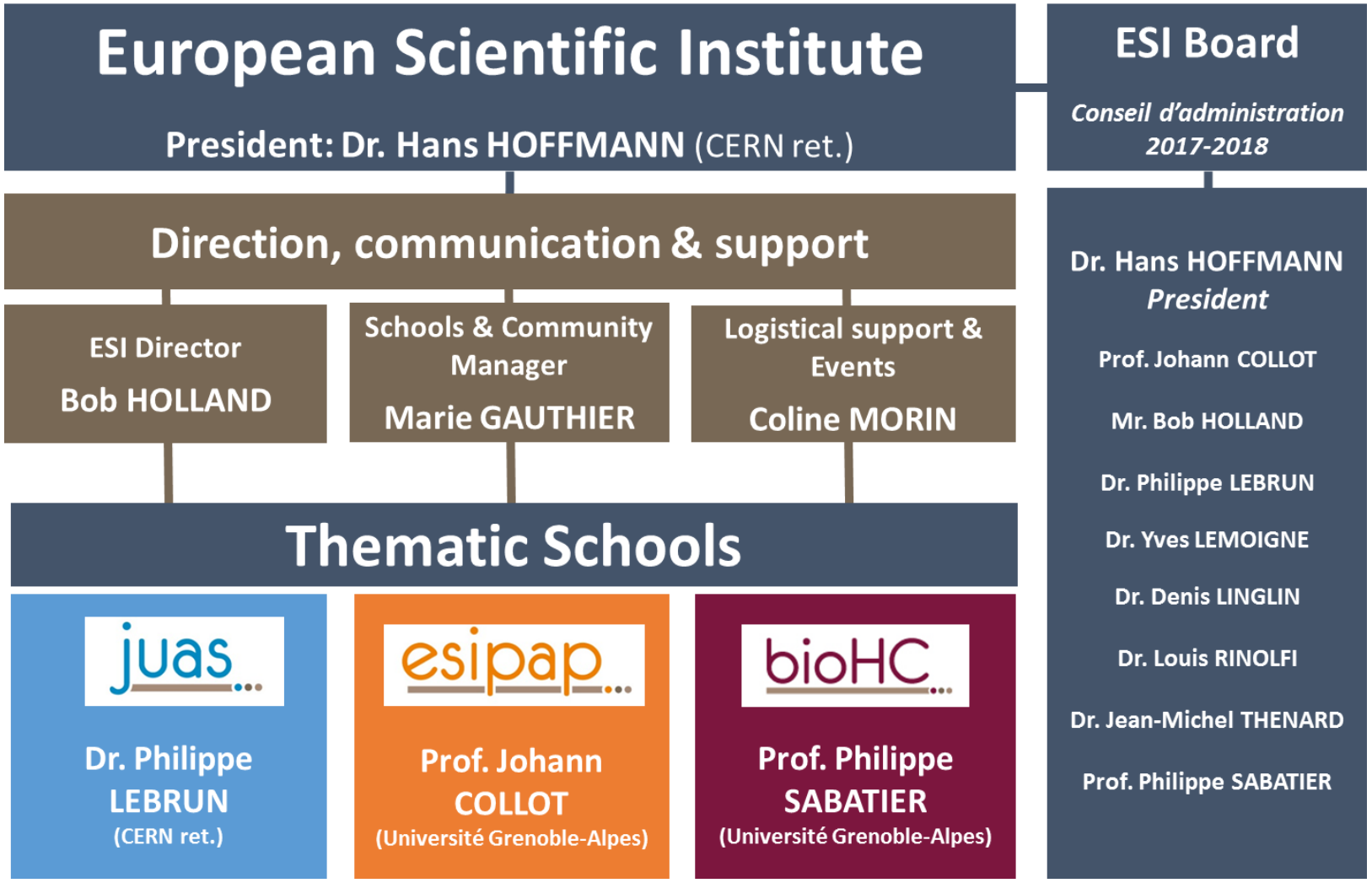
ESI Archamps Technopole, host of JUAS



ESI Scientific Schools

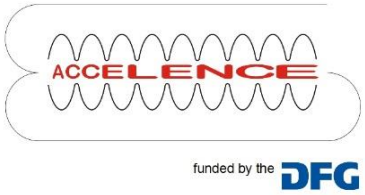


ESI Organization



16 Partner Universities

22 Sponsor institutes, industries & European programs



January-March 2018, the 25th session of JUAS

- Origins
  - Accelerator courses given by CERN staff at Université Joseph Fourier in Grenoble
  - Creation of ESI by Département de la Haute-Savoie (France)
- Previous directors
  - M. Rey-Campagnolle (founder)
  - J. Le Duff
  - F. Méot
  - L. Rinolfi
- More than 1000 students trained in 24 sessions of JUAS since 1994
- We'll celerate the 25th session on 15 February

JUAS pedagogy

- Two courses, each 4 weeks + 1 week exams
  - *The science of particle accelerators*
  - *The technology and applications of particle accelerators*
- Expert lecturers from universities, national labs and CERN
- Lectures + tutorials + seminars + workshops + practical work + lab visits
- Syllabus and appointment of lecturers submitted to Advisory Board
- Lecture notes available
  - On INDICO at beginning of course
  - On paper (color printing) for the lectures
- «Refresher» lecture and tutorial documents (E-M, Relativity, Intro to RF, Intro to Magnets) available to students before the course for personal work
- Written exams
- Oral presentations by students on design workshops and practical work

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JUAS - TIMETABLE 2018 - WEEK 6

Schedule 2018	Monday Feb 12th	Tuesday Feb 13th	Wednesday Feb 14th	Thursday Feb 15th	Friday Feb 16th
09:00					
		Introduction to RF lecture *A. Mostacci*	**Vacuum systems** lecture *V. Baglin*	**RF Engineering** lecture *F. Caspers*	**RF Engineering** lecture *F. Caspers*
10:00		**Coffee Break**	**Coffee Break**	**Coffee Break**	**RF Engineering** tutorial *F. Caspers / M. Wendt*
10:15		**Introduction to RF** lecture *A. Mostacci*	**Vacuum systems** lecture *V. Baglin*	**Vacuum systems** lecture *V. Baglin*	**Coffee Break**
11:15		**Vacuum systems** lecture *V. Baglin*	**Vacuum systems** tutorial *V. Baglin / R. Kersevan*	**Vacuum systems** tutorial *V. Baglin / R. Kersevan*	***Bus leaves at 11:30 from JUAS***
12:15	**12:00 OFFICIAL OPENING (welcome & building visit)**				***(Lunch at CERN, R2, offered by ESI)***
	13:00 WELCOME LUNCH	**BREAK**	**BREAK**	**BREAK**	
14:00	**14:00 Presentation of JUAS & Presentation of students** *P.Lebrun*	**Vacuum systems** lecture *V. Baglin*	**RF Engineering** lecture *F. Caspers*	**RF Engineering** lecture *F. Caspers*	**VISIT AT CERN**
15:00	**Introduction to CERN practical days** *Magnet,Superconductivity*	**RF Engineering** lecture *F. Caspers*	**RF Engineering** tutorial *F. Caspers / M. Wendt*	**RF Engineering** tutorial *F. Caspers / M. Wendt*	***AD / ELENA LINAC / LEIR***
16:00					
16:15	**Coffee Break**	**Coffee Break**	**Coffee Break**	**Coffee Break**	
	Introduction to CERN practical days *RF, Vacuum,CLEAR*	**RF Engineering** lecture *F. Caspers*	**Accelerator driven system** Seminar *J-L. Biarotte*	**RF Engineering** lecture *F. Caspers*	
17:45					***Bus leaves at 18:00 from CERN***
	CHECK-IN AT THE RESIDENCE & SHOPPING FOR GROCERIES				
18:15					

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JUAS - TIMETABLE 2018 - WEEK 7

Schedule 2018	Monday Feb 19th	Tuesday Feb 20th	Wednesday Feb 21st	Thursday Feb 22nd	Friday Feb 23rd
09:00					
	Beam instrumentation lecture *P. Forck*	**Beam instrumentation** lecture *P. Forck*	**Beam instrumentation** tutorial *P. Forck*	***Bus leaves at 8:00 from JUAS***	
10:00	**Coffee Break**	**Coffee Break**	**Coffee Break**	***(4 hours of travel by bus)***	
10:15	**Beam instrumentation** lecture *P. Forck*	**Beam instrumentation** lecture *P. Forck*	**Beam instrumentation** tutorial *P. Forck*	**VISIT AT PSI**	**VISIT AT PSI**
11:15	**Beam instrumentation** lecture *P. Forck*	**Beam instrumentation** lecture *P. Forck*	**Beam instrumentation** lecture *P. Forck*	***(Lunch, dinner and coffee breaks offered by PSI, night at PSI offered by ESI)***	***(Lunch and coffee breaks offered by PSI)***
12:15	**WORKING LUNCH**	**BREAK**	**BREAK**		
14:00	**Beam instrumentation** tutorial *P. Forck*	**Superconducting RF Cavities** lecture *F. Caspers*	**Superconducting RF Cavities** tutorial *F. Caspers*	**Accelerator Controls** lecture *E. Zimoch*	
15:00	**Beam instrumentation** tutorial *P. Forck*	**Superconducting RF Cavities** lecture *F. Caspers*	**Superconducting RF Cavities** tutorial *F. Caspers*		
16:00	**Coffee Break**	**Coffee Break**	**Coffee Break**		
16:15	**Beam instrumentation** tutorial *P. Forck*	**Superconducting RF Cavities** lecture *F. Caspers*	**Superconducting RF Cavities** lecture *F. Caspers*	**Accel. for hadron therapy** Seminar *M. Schippers*	***Bus leaves at 14:30 from PSI***
17:15				**Novel Accelerators** Seminar *R. Ischebeck*	***(4 hours of travel by bus)***
18:15					

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JUAS - TIMETABLE 2018 - WEEK 8

Schedule 2018	Monday Feb 26th	Tuesday Feb 27th	Wednesday Feb 28th	Thursday March 1st	Friday March 2nd
09:00				*Bus leaves at 8:00 from JUAS*	*Bus leaves at 8:00 from JUAS*
	Introduction to Magnets I lecture *A. Milanese*	**Superconducting magnets** lecture *P. Ferracin*	**Mini-workshop Normal conducting Magnets** *J. Bauche & T. Zickler*	*(Lunch at CERN, offered by ESI)*	*(Lunch at CERN, offered by ESI)*
10:00 10:15	**Introduction to Magnets II** lecture *A. Milanese*	**Coffee Break**	**Coffee Break**		
10:30	**Coffee Break**	**Superconducting magnets** lecture *P. Ferracin*	**Mini-workshop Normal conducting Magnets** *J. Bauche & T. Zickler*	**PRACTICAL DAYS AT CERN**	**PRACTICAL DAYS AT CERN**
11:15	**10:45 Normal Conducting magnets** lecture *T. Zickler*	**Superconducting magnets: cryogenics** lecture *Ph. Lebrun*	**Mini-workshop Normal conducting Magnets** *J. Bauche & T. Zickler*	RF coordinator: **F. Caspers M. Wendt**	RF coordinator: **F. Caspers**
12:15	**WORKING LUNCH**	**BREAK**	**BREAK**	VACUUM coordinator: **V. Baglin**	VACUUM coordinator: **V. Baglin**
14:00	**Normal Conducting magnets** lecture - *T. Zickler*	**Superconducting magnets** lecture *P. Ferracin*	**Mini-workshop Superconducting Magnets** *P. Ferracin & P. Lebrun*	MAGNET coordinators: **J. Bauche L. Fiscarelli**	MAGNET coordinators: **J. Bauche L. Fiscarelli**
15:00	**Normal Conducting magnets** lecture - *T. Zickler*	**Normal Conducting magnets** lecture - *T. Zickler*	**Mini-workshop Superconducting Magnets** *P. Ferracin & P. Lebrun*	SUPERCONDUCTIVITY coordinator: **J. Fleiter**	SUPERCONDUCTIVITY coordinator: **J. Fleiter**
16:00 16:15	**Coffee Break**	**Coffee Break**	**Coffee Break**	CLEAR coordinators: **R. Corsini W. Farabolini**	CLEAR coordinators: **R. Corsini W. Farabolini**
17:15	**Superconducting magnets** lecture *P. Ferracin*	**Normal Conducting magnets** lecture - *T. Zickler*	**Mini-workshop Superconducting Magnets** *P. Ferracin & P. Lebrun*	*Bus leaves at 17:30 from CERN*	*Bus leaves at 17:30 from CERN*
18:15	**Superconducting magnets** lecture *P. Ferracin*	**Normal Conducting magnets** lecture - *T. Zickler*	**Building Large Accelerators with Industry** Seminar *Ph. Lebrun*		
			AFTER WORK AT ESI		

JUAS - TIMETABLE 2018 - WEEK 9

Schedule 2018	Monday March 5th	Tuesday March 6th	Wednesday March 7th	Thursday March 8th	Friday March 9th
09:00	**Particle Sources** lecture *T. Thuillier*	**Low Energy Electron Accelerators** lecture *W. Mondelaers*	***Bus leaves at 7:30 from JUAS***	**Life-cycle and reliability of particle accelerators** lecture *S. Meyroneinc*	**High Current Proton Linacs** lecture *S. Bousson*
10:00	**Coffee Break**	**Coffee Break**		**Coffee Break**	**Coffee Break**
10:15	**Particle Sources** lecture *T. Thuillier*	**Low Energy Electron Accelerators** lecture *W. Mondelaers*	***(Lunch offered by Bergoz)***	**Life-cycle and reliability of particle accelerators** lecture *S. Meyroneinc*	**High Current Proton Linacs** lecture *S. Bousson*
11:15	**Particle Sources** lecture *T. Thuillier*	**Low Energy Electron Accelerators lecture** *W. Mondelaers*		**Life-cycle and reliability of particle accelerators** lecture *S. Meyroneinc*	**High Current Proton Linacs** lecture *S. Bousson*
12:15	**WORKING LUNCH**	**BREAK**	**VISIT AND EXPERIMENTAL WORK AT BERGOZ INSTRUMENTATION**	**SANDWICH SNACK OFFERED BY ESI**	**BREAK**
14:00	**Particle Sources** tutorial *T. Thuillier*	**Acc. for medical & industrial applications** lecture *W. Kleeven*		***Bus leaves at 13:30 from JUAS***	**Radiation safety** lecture *X. Queralt*
15:00	**Particle Sources** lecture *T. Thuillier*	**Acc. for medical & industrial applications** lecture *W. Kleeven*		**Radiation Oncology : Biology, Physics & Clinical Applications** seminar *R. Miralbell*	**Radiation safety** lecture *X. Queralt*
16:00	**Coffee Break**	**Coffee Break**		**Therapeutic Applications at Geneva Hospital**	**Coffee Break**
16:15	**From methodology of inventiveness to applications of plasma acceleration** Seminar - *Andrei Seryi*	**Acc. for medical & industrial applications** lecture *W. Kleeven*	***Bus leaves at 17:00 from BERGOZ***	***Bus leaves at 17:30 from HUG***	**Radiation safety** lecture *X. Queralt*
17:15					

JUAS - TIMETABLE 2018 - WEEK 10

Schedule 2017	Monday March 12th	Tuesday March 13th	Wednesday March 14th	Thursday March 15th	Friday March 16th
09:00					
	Presentation of reports on practical work	EXAMINATION Beam Instrumentation *Written session*	EXAMINATION RF *Written session*	EXAMINATION Magnets *Written session*	SPACE PROJECTS Joint Seminar *Isabelle Rongier & Jan Droz*
10:30	Coffee Break	Coffee Break	Coffee Break	Coffee Break	Coffee Break
11:00	Presentation of reports on practical work	EXAMINATION topic to be announced *Written session*	EXAMINATION topic to be announced *Written session*	DISCUSSION SUMMARY OF JUAS LECTURES	SPACE PROJECTS Joint Seminar *Isabelle Rongier & Jan Droz*
12:30	WORKING LUNCH	BREAK	BREAK	CLOSING RECEPTION JUAS COURSE 2	CLOSING RECEPTION ESIPAP COURSE 2
14:00	Free for preparation of examinations				SPACE PROJECTS Joint Seminar *Isabelle Rongier & Jan Droz*
15:00					Coffee Break
16:00 16:15					
17:15					

JUAS 2017 Course 2 Examination

- Written examination
  - 5 topics, each allocated one and a half hours
    - RF engineering (coefficient 12)
    - Magnets, normal-conducting (coefficient 12)
    - Beam instrumentation (coefficient 12)
    - Remaining two topics (each coefficient 6) announced in week 9 (i.e. one week before examination)
  - Permitted for exam: all written documents, pocket calculator
  - Strictly forbidden for exam: connected electronic devices
- Written report
  - SC magnet design workshop (coefficient 3)
- Oral reports
  - Practical days at CERN (coefficient 3)

Practical Days at CERN on 1 & 2 March 2018
Oral presentations on 12 March 2018

- Two full days at CERN
  - One subject per day per student
  - Students asked to rank their preferences
- Five subjects proposed (see presentations later)
  - RF
  - Vacuum
  - Magnets
  - Superconductivity
  - Beam measurements on CLEAR linear accelerator
- Students, in groups of 4 maximum, prepare oral reports on one of the two subjects they have worked on during the practical days
- Oral presentations (max 15 minutes) to be made at ESI on Monday 12 March morning and evaluated by a panel of the group coordinators and ESI/JUAS

⇒ Please indicate your preferences on the form that will be circulated, before 16 February

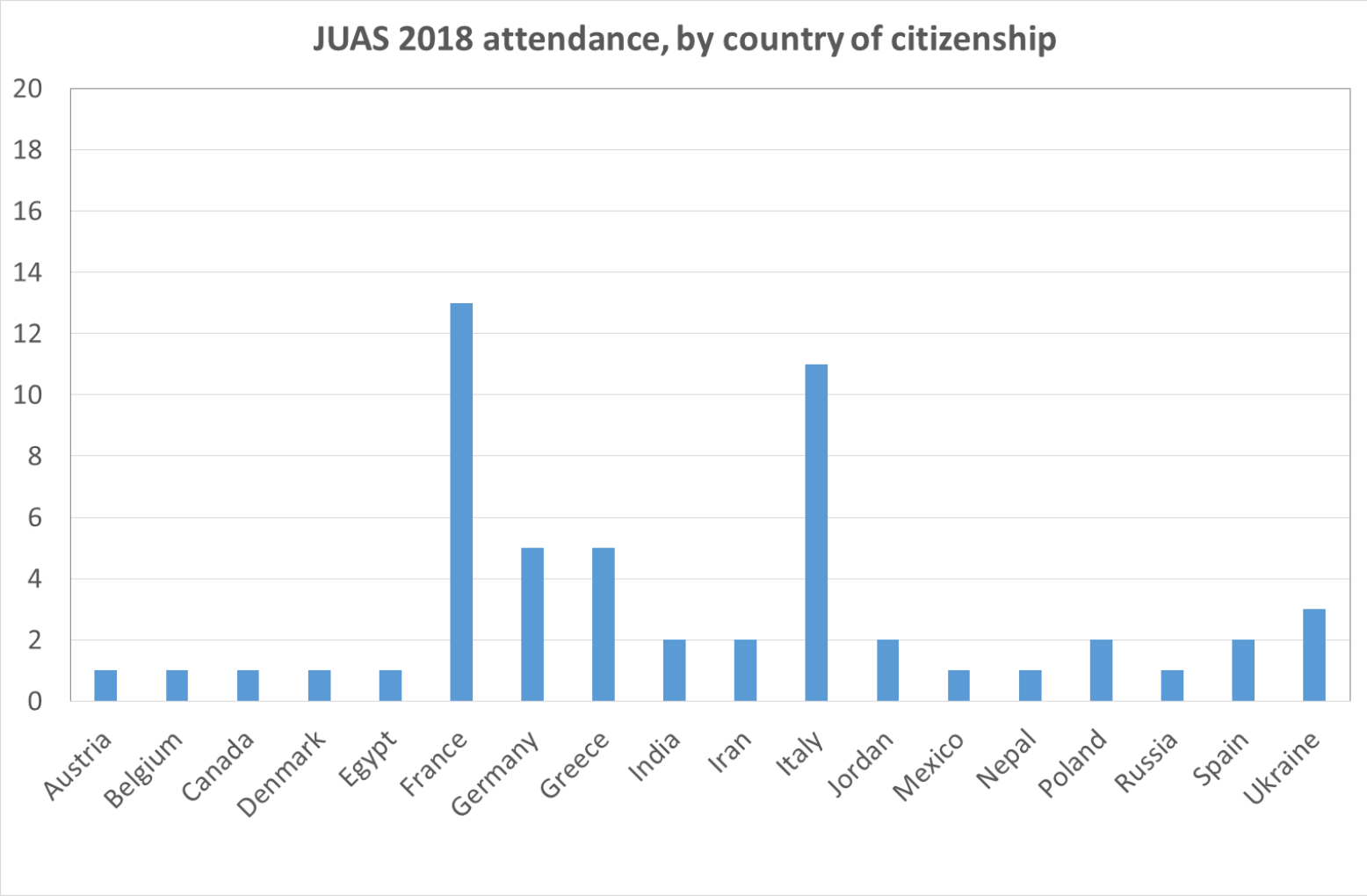
JUAS Student Certification

- JUAS and home institutions of students
  - Master Students: Partner University may give ECTS credits to their students who have passed the examination for each Course
  - Doctoral Students: credits may be given by the doctoral schools according to their own policy
  - Professionals: JUAS Course may be considered part of professional training («Formation Continue» in France)
- Certification
  - JUAS issues a Certificate for each Course containing all information
    - Subjects studied and numbers of hours
    - Exam taken or not
    - Marks obtained in relation to class averages
    - Student ranking

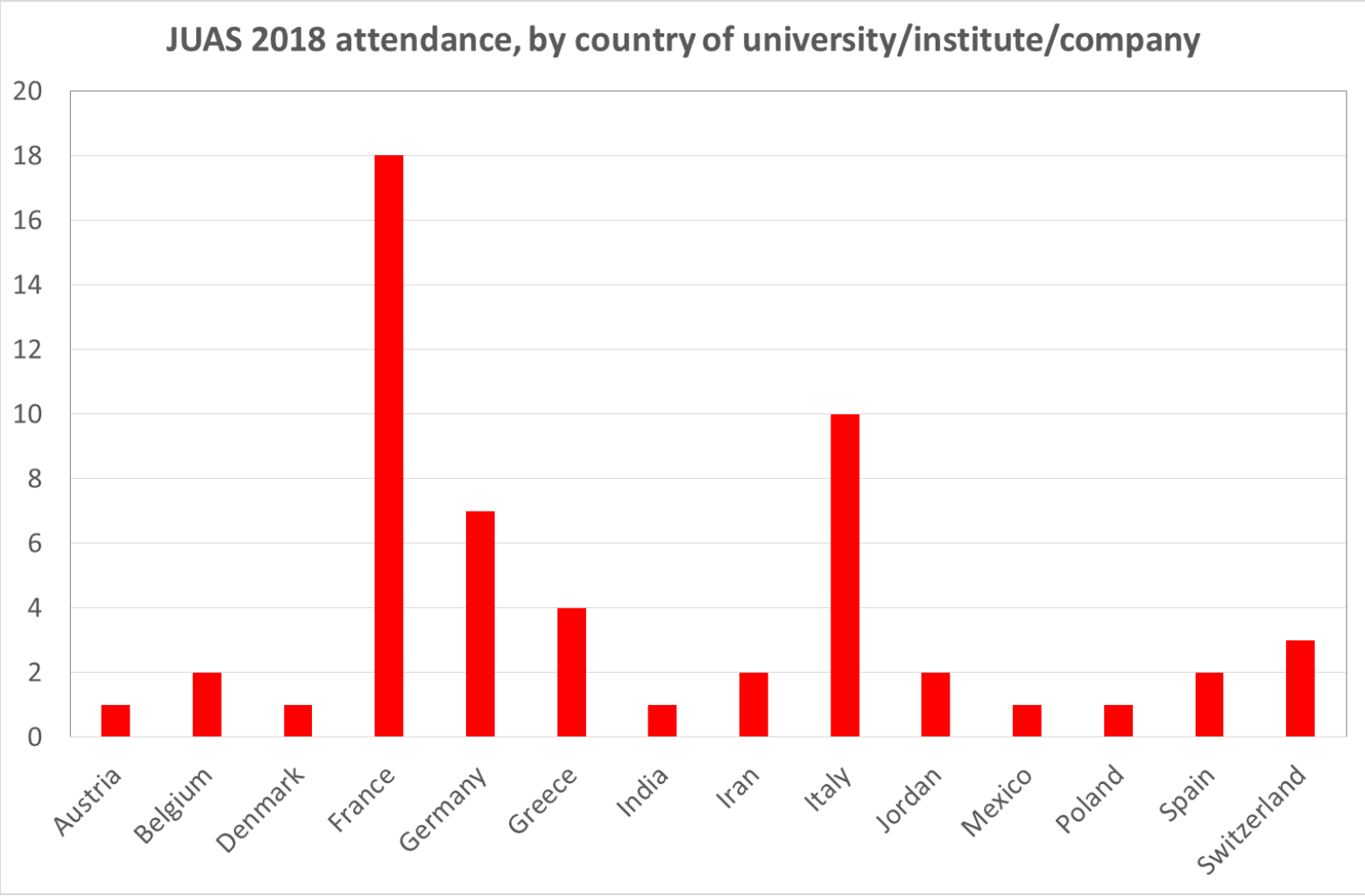
Evaluation of lectures and seminars by students

- The students are asked (anonymously) to evaluate the lectures and seminars, on the basis of several criteria:
  - Fulfilment of personal learning expectations
  - Quality of slides and written documents
  - Level of treatment of the subject
  - Quality of oral presentation
  - Guidance during lectures and tutorials
- The students are also asked for possible improvements to the course
- Evaluation is done on-line using Google Forms
- Evaluation results are communicated
  - Individually to the lecturers
  - Statistically to the JUAS Advisory Board

Origin of JUAS 2018 students



Origin of JUAS 2018 students



JUAS code of conduct

- **Mutual respect**
  - Freedom of opinion and of belief
  - Cultural diversity
  - Gender equality

  ⇒ Constitution of France, Article 1
    - *La France… assure l'égalité devant la loi sans distinction d'origine, de race ou de religion. Elle respecte toutes les croyances*
    - *France… shall ensure the equality before the law, without distinction of origin, race or religion. It shall respect all beliefs*
- **No dress code**, but

  ⇒ Loi du 11 octobre 2010 interdisant la dissimulation du visage dans l'espace public
    - *Nul ne peut, dans l'espace public, porter une tenue destinée à dissimuler son visage*
    - *Nobody may, in public space, wear a dress hiding his/her face*
- **Behaviour**
  - **Arrive on time** at the lectures
  - **Individual and collective behaviour** must not impair reputation of JUAS… but rather improve it!

Job opportunities

- Studying at JUAS is a good opportunity to find a position
  - Internship in national or international laboratory
  - Summer job
  - PhD grant
  - Post doctoral
  - …
- Do not hesitate to
  - Talk to the lecturers during coffee and lunch breaks
  - Talk to the people you will meet during laboratory visits
- Consult our updated job opportunity web site

  http://www.esi-archamps.eu/Thematic-Schools/JUAS/Job-opportunities

Developing the JUAS network

- CV Yearbook
  - We publish a CV (curriculum vitae) Yearbook
    - Introducing JUAS,
    - Containing the curriculum vitae of each JUAS 2018 student (with his/her agreement)
    - Available to the students,
    - Distributed to our partner universities and industrial sponsors

- Alumni network
  - Build up the JUAS Alumni network using social media

- More information will be communicated to you on these matters during the Course


Have a pleasant and fruitful time at JUAS!