

Eighth International Accelerator School for Linear Colliders – Curriculum (v.4, 12/03/2013)

December 4 – 15, 2013, Rixos Hotel, Antalya, Turkey

Hosted by the Institute of Accelerator Technologies (IAT) of Ankara University

Daily Schedule

Breakfast	07:30 – 09:00
Morning	09:00 – 12:30, including ½-hour break
Lunch	12:30 – 14:00
Afternoon	14:00 – 17:30, including ½-hour break
Tutorial & homework	17:30 – 18:30
Dinner	19:00 – 20:00
Tutorial & homework	20:00 – 22:00

List of Courses (black: required, red and blue: elective)

	Morning	Afternoon	Evening
December 4		<i>Arrival, registration</i>	<i>Reception</i>
December 5	Introduction to physics & future accelerators	ILC	Tutorial & homework
December 6	CLIC	Joint lecture: Linac basics	Tutorial & homework
December 7	Joint lecture: Instrumentation basics	Course A: Accelerator physics Course B: Accelerator technology	Tutorial & homework
December 8	Course A: Accelerator physics Course B: Accelerator technology	<i>Excursion</i>	Tutorial & homework
December 9	Course A: Accelerator physics Course B: Accelerator technology		Tutorial & homework
December 10	Course A: Accelerator physics Course B: Accelerator technology		Tutorial & homework
December 11	Course A: Accelerator physics Course B: Accelerator technology	<i>Excursion</i>	Tutorial & homework
December 12	Course A: Accelerator physics Course B: Accelerator technology		Tutorial & homework
December 13	Course A: Accelerator physics Course B: Accelerator technology		Tutorial & homework
December 14	Course A: Accelerator physics Course B: Accelerator technology	<i>Study time</i>	Study time
December 15	Final exam	<i>Free time</i>	<i>Banquet; Student Award Ceremony</i>
December 16	<i>Departure</i>		

Program

	Thursday, December 5	Friday, December 6	Saturday, December 7	Sunday, December 8
Morning 09:00 – 12:30	Inauguration Welcome – <i>O Yavas (IAT)</i> Introduction – <i>W Chou (Fermilab)</i> Lecture I1 – Introduction (3 hrs) <i>Masao Kuriki (Hiroshima Univ.)</i> <ul style="list-style-type: none"> • Tera scale physics • Overview of future accelerators for Tera scale physics (ILC, CLIC, muon collider, $\gamma\gamma$ collider, LHeC, TLEP, new acceleration technologies) 	Lecture I3 – CLIC (3 hrs) <i>Frank Tecker (CERN)</i> <ul style="list-style-type: none"> • Klystron vs. beam driven acceleration • CLIC layout • Parameter choices & optimization • Driver beam stability • Comparison of the CLIC and ILC • Technical challenges 	Joint lecture AB2 – Instrumentation basics (3 hrs) <i>Hermann Schmickler (CERN)</i>	Course A: Accelerator physics Lecture A1 – Linac (cont'd) <i>Daniel Schulte (CERN)</i> Course B: Accelerator technology Lecture B1 – Room temperature RF (cont'd) <i>Walter Wuensch (CERN)</i>
Afternoon 14:00 – 17:30	Lecture I2 – ILC (3 hrs) <i>Masao Kuriki (Hiroshima Univ.)</i> <ul style="list-style-type: none"> • e- and e+ sources • Bunch compressors and spin rotators • Damping rings • Main linac • Beam delivery system • Civil construction issues 	Joint lecture AB1 – Linac basics (3 hrs) <i>Daniel Schulte (CERN)</i>	Course A: Accelerator physics Lecture A1 – Linac (9 hrs) <i>Daniel Schulte (CERN)</i> Course B: Accelerator technology Lecture B1 – Room temperature RF (12 hrs) <i>Walter Wuensch (CERN)</i>	Excursion
Evening 19:00 – 22:00	Tutorial & homework	Tutorial & homework	Tutorial & homework	Tutorial & homework

Program (cont...)

	Monday, December 9	Tuesday, December 10	Wednesday, December 11	Thursday, December 12
Morning 09:00 – 12:30	<p>Course A: Accelerator physics Lecture A1 – Linac (cont'd) <i>Daniel Schulte (CERN)</i></p> <p>Course B: Accelerator technology Lecture B1 – Room temperature RF (cont'd) <i>Walter Wuensch (CERN)</i></p>	<p>Course A: Accelerator physics Lecture A3a – Damping rings (12 hrs) <i>Yannis Papaphillipou (CERN)</i></p> <p>Course B: Accelerator technology Lecture B1 – Room temperature RF (cont'd) <i>Walter Wuensch (CERN)</i></p>	<p>Course A: Accelerator physics Lecture A3a – Damping rings (cont'd) <i>Yannis Papaphillipou (CERN)</i></p> <p>Course B: Accelerator technology Lecture B2 – Superconducting RF (cont'd) <i>Takayuki Saeki (KEK)</i></p>	<p>Course A: Accelerator physics Lecture A3a – Damping rings (cont'd) <i>Yannis Papaphillipou (CERN)</i></p> <p>Course B: Accelerator technology Lecture B2 – Superconducting RF (cont'd) <i>Takayuki Saeki (KEK)</i></p>
Afternoon 14:00 – 17:30	<p>Course A: Accelerator physics Lecture A2 – Sources (6 hrs) <i>Masao Kuriki (Hiroshima Univ.)</i></p> <p>Course B: Accelerator technology Lecture B2 – Superconducting RF (12 hrs) <i>Takayuki Saeki (KEK)</i></p>	<p>Course A: Accelerator physics Lecture A2 – Sources (cont'd) <i>Masao Kuriki (Hiroshima Univ.)</i></p> <p>Course B: Accelerator technology Lecture B2 – Superconducting RF (cont'd) <i>Takayuki Saeki (KEK)</i></p>	Excursion	<p>Course A: Accelerator physics Lecture A3a – Damping rings (cont'd) <i>Yannis Papaphillipou (CERN)</i></p> <p>Course B: Accelerator technology Lecture B3 – Instrumentation (3 hrs) <i>Hermann Schmickler (CERN)</i></p>
Evening 19:00 – 22:00	Tutorial & homework	Tutorial & homework	Tutorial & homework	Tutorial & homework

	Friday, December 13	Saturday, December 14	Sunday, December 15	Monday, December 16
Morning 09:00 – 12:30	<p>Course A: Accelerator physics Lecture A3b – Ring colliders (3 hrs) <i>Yannis Papaphillipou (CERN)</i></p> <p>Course B: Accelerator technology Lecture B4 – LLRF & high power RF (9 hrs) <i>Stefan Simrock (ITER)</i> <i>Zheqiao Geng (PSI)</i></p>	<p>Course A: Accelerator physics Lecture A4 – Beam delivery system and beam-beam (cont'd) <i>Andrei Seryi (John Adams Inst.)</i></p> <p>Course B: Accelerator technology Lecture B4 – LLRF & high power RF (cont'd) <i>Stefan Simrock (ITER)</i> <i>Zheqiao Geng (PSI)</i></p>	08:00 – 12:30 Final exam (4.5 hrs)	Departure
Afternoon 14:00 – 17:30	<p>Course A: Accelerator physics Lecture A4 – Beam delivery system and beam-beam (6 hrs) <i>Andrei Seryi (John Adams Inst.)</i></p> <p>Course B: Accelerator technology Lecture B4 – LLRF & high power RF (cont'd) <i>Stefan Simrock (ITER)</i> <i>Zheqiao Geng (PSI)</i></p>	Study time	<i>Free time</i>	
Evening 19:00 – 22:00	Tutorial & homework	Study time	Banquet at 19:00; Student Award Ceremony	

Lecturers of the 2013 LC Accelerator School (v5)

Topic	Lecture	Lecturer
Introduction	I1	Masao Kuriki (Hiroshima U.)
ILC	I2	Masao Kuriki (Hiroshima U.)
CLIC	I3	Frank Tecker (CERN)
Linac basics	AB1	Daniel Schulte (CERN)
Instrumentation basics	AB2	Hermann Schmickler (CERN)
Linac	A1	Daniel Schulte (CERN)
Sources	A2	Masao Kuriki (Hiroshima U.)
Damping rings	A3a	Yannis Papaphillipou (CERN)
Ring colliders	A3b	Yannis Papaphillipou (CERN)
Beam delivery & beam-beam	A4	Andrei Seryi (John Adams Inst.)
Room temperature RF	B1	Walter Wuensch (CERN)
Superconducting RF	B2	Takayuki Saeki (KEK)
Instrumentation	B3	Hermann Schmickler (CERN)
LLRF & high power RF	B4	Stefan Simrock (ITER) Zheqiao Geng (PSI)

Total teaching and training 82.5 hours:

- Classroom lectures – 51 hours
 - Common lectures – 15 hours (I1-I3 and AB1-AB2)
 - Elective lectures – 36 hours (A1-A4 or B1-B4)
- Tutorial/homework: 27 hours
- Final exam – 4.5 hours

Lectures, Homework and Exam

- All lectures are in seminar style, no text books.
- All lectures are available on the web. Hard copies will be handed out every day.
- Each lecture has homework assignments. But they will not be graded.
- Teachers will be available in the evening of their lecture day during the tutorial and homework time.
- All students are required to attend the evening session.
- There will be a final exam on December 15. Some of the exam problems are similar to those in the homework, some are new.
- Based on the exam grade, the school will select top ~10 students and have an award ceremony in the evening of December 15.

Two Requirements for All Students

- Learn as much as you can.
- Make as many friends as you can.
 - This is a rare opportunity for most of you to meet with a group of young and talented people from many different countries all over the world. And you share similar research interest in your career.
 - You will live together, eat together, study together and play together for 12 days.
 - Some of the friendship nurtured at the school may last for a life time.
 - To help you make friends, we will divide students to **seven study groups** in the evening. But this assignment is not mandatory. You may switch group freely if you wish.

Important Notes

- The school or your institution will cover the hotel costs for 12 nights. Some students who came early or will leave late need to pay for the extra nights.
- The hotel costs include room and meals, but do not include incidentals (mini-bar, telephone, laundry, etc.). You will be responsible for using these services.
- All personal costs should be paid to Ms. Bahar Kul before you leave.