

International Accelerator School for Linear Colliders – Curriculum (v.9, 05/19/2006)

May 19-27, 2006, Sokendai, Hayama, Japan

Daily Schedule

Breakfast	07:30 – 09:00
Morning	09:00 – 12:30, including ½-hour break
Lunch	12:30 – 13:30
Afternoon	14:00 – 17:30, including ½-hour break
Dinner	18:00 – 19:00
Evening	19:00 – 20:30

List of Courses

	Morning	Afternoon	Evening
May 19		<i>Arrival, registration</i>	<i>Reception</i>
May 20	Introduction I & II	Sources; Bunch compressors	Tutorial & homework
May 21	Damping ring basics	Damping ring design	Tutorial & homework
May 22	ILC linac basics; ILC linac beam dynamics	<i>Field trip to Kamakura</i>	Tutorial & homework
May 23	High power RF; SRF basics	SRF cavity technology	Tutorial & homework
May 24	ILC cryomodule; Room-temperature RF	Beam delivery; Beam-beam interaction	Tutorial & homework
May 25	Instrumentation & feedback	Conventional facilities; Operations	<i>Banquet</i> ; Tutorial & homework
May 26 (*)	<i>Sokendai – KEK</i>	KEK tour	<i>Free time</i>
May 27 (*)	Detectors; Physics; ATF lecture and experiments	Detectors; Physics; ATF lecture and experiments <i>Student awards ceremony</i> ; <i>Farewell party</i>	<i>Free time</i>
May 28	<i>Departure</i>		

(*) Courses at KEK are optional. Students may choose to leave on May 26. Accommodation will be at KEK on May 26 and 27.

Program

	Saturday, May 20	Sunday, May 21	Monday, May 22	Tuesday, May 23
Morning 09:00 – 12:30	<p>Opening remarks (10)</p> <p>Lecture 1 – Introduction I (90) Fumihiko Takasaki (KEK)</p> <ul style="list-style-type: none"> • Why LC • What's ILC • Layout of ILC • Overview of issues <p>Lecture 2 – Introduction II (90) Tor Raubenheimer (SLAC)</p> <ul style="list-style-type: none"> • Parameter choices & optimization 	<p>Lecture 5 – Damping ring basics (180) Susanna Guiducci (INFN-LNF)</p> <ul style="list-style-type: none"> • Betatron motion • Synchrotron motion • Beam energy • Beam emittance • Radiation damping • Intrabeam scattering 	<p>Lecture 7 – ILC Linac basics (90) Chris Adolphsen (SLAC)</p> <ul style="list-style-type: none"> • Linac basic principles • SW linacs and structures • SRF parameter constraints • Beam loading and coupling • Lorentz force detuning <p>Lecture 8 – ILC Linac beam dynamics (90) Kiyoshi Kubo (KEK)</p> <ul style="list-style-type: none"> • Lattice layout • Beam quality preservation <ul style="list-style-type: none"> ○ RF field stability ○ Wakefield and dampers ○ HOMs ○ Alignment tolerances ○ Vibration problems ○ Beam based alignment 	<p>Lecture 9 – High power RF (60) Stefan Choroba (DESY)</p> <ul style="list-style-type: none"> • RF system overview • Modulators • Klystrons • RF distribution <p>Lecture 10 – SRF basics (120) Shuichi Noguchi (KEK)</p> <ul style="list-style-type: none"> • Superconductivity basics • SRF peculiarities • Cavity design criteria • Various constraints • ILC BCD Cavity
Afternoon 14:00 – 17:30	<p>Lecture 3 – Sources (120) Masao Kuriki (KEK)</p> <ul style="list-style-type: none"> • e- gun • e+ sources • Polarized sources <p>Lecture 4 – Bunch compressors (60) Eun-San Kim (Kyungpook Nat'l Univ.)</p> <ul style="list-style-type: none"> • Bunch compressors • Spin rotator 	<p>Lecture 6 – Damping ring design (180) Andy Wolski (Univ. of Liverpool)</p> <ul style="list-style-type: none"> • Options • Lattice • Parameter optimization • Machine acceptance • E-cloud, space charge and instability issues • Wigglers • Kickers and other technical systems 	Field trip to Kamakura	<p>Lecture 11 – SRF cavity technology (180) Peter Kneisel (Jlab)</p> <ul style="list-style-type: none"> • Material issues • Cavity fabrication and tuning • Surface preparation • Gradient limit and spread • Power Coupler • HOM Couplers • Slow and fast tuner • Path to ILC
Evening 19:00 – 20:30	Tutorial & homework	Tutorial & homework	Tutorial & homework	Tutorial & homework

Program (cont'd)

	Wednesday, May 24	Thursday, May 25	Friday, May 26	Saturday, May 27 (***)
Morning 09:00 – 12:30	<p>Lecture 12 – ILC cryomodule (60) Carlo Pagani (INFN-Milano)</p> <ul style="list-style-type: none"> • ILC cryogenics and rational • ILC cryomodule concept <p>Lecture 13 – Room-temperature RF (120) Hans Braun (CERN)</p> <ul style="list-style-type: none"> • Room temperature cavity and gradient limit • CLIC design 	<p>Lecture 16 – Instrumentation & feedback (180) Marc Ross (SLAC)</p> <ul style="list-style-type: none"> • Beam monitoring • Precision instrumentation • Feedback systems 	Bus from Sokendai to KEK	<p><i>Group A:</i> Lecture 19 – Detectors (90) Hitoshi Yamamoto (Tohoku Univ.)</p> <ul style="list-style-type: none"> • ILC detectors <p>Lecture 20 – Physics (90) Rolf-Dieter Heuer (DESY)</p> <ul style="list-style-type: none"> • ILC physics • Physics beyond 1 TeV • e-e- and γ-γ options • ILC and XFEL <p><i>Group B:</i> Special lecture – ATF (60) Junji Urakawa (KEK)</p> <p>ATF experiments (120)</p>
Afternoon 14:00 – 17:30	<p>Lecture 14 – Beam delivery (120) Andrei Seryi (SLAC)</p> <ul style="list-style-type: none"> • Beam delivery system overview • Collimation • Machine-detector interface, shielding and beam dump • Beam monitoring and control at final focus <p>Lecture 15 – Beam-beam (60) Daniel Schulte (CERN)</p> <ul style="list-style-type: none"> • Beam-beam interaction 	<p>Lecture 17 – Conventional facilities (90) Vic Kuchler (Fermilab)</p> <ul style="list-style-type: none"> • Overview • Tunneling • Site requirement <p>Lecture 18 – Operations (90) Marc Ross (SLAC)</p> <ul style="list-style-type: none"> • Reliability • Availability • Remote control and global network 	KEK tour (**)	<p><i>Group B:</i> Lecture 19 – Detectors (90) Hitoshi Yamamoto (Tohoku Univ.)</p> <p>Lecture 20 – Physics (90) Rolf-Dieter Heuer (DESY)</p> <p><i>Group A:</i> Special lecture – ATF (60) Junji Urakawa (KEK)</p> <p>ATF experiments (120)</p> <p><i>Group A & B:</i> Student awards ceremony Farewell party</p>
Evening 19:00 – 20:30	Tutorial & homework	Banquet Tutorial & homework	Free time	Free time

(**) In the afternoon of May 26, students will be divided into three groups, each with a tour guide and a bus.

(***) On May 27, students will be divided into two groups, one with lectures in the morning and ATF experiments in the afternoon, another with the order reversed, followed by student awards ceremony and a farewell party.