

The CERN Accelerator School

- Established at the beginning of 1983
 - To preserve and transmit knowledge accumulated, at CERN and elsewhere, on particle accelerators and colliders of all kinds
- This provided a framework for a series of courses
 - General accelerator physics
 - [Introduction to Accelerator Physics](#)
 - [Advanced Accelerator Physics](#)
 - Specialized topic in the field
 - 50 to 70 hours teaching in **1-2 week intensive residential courses**
- About 70 courses held so far
- Occasional courses in the framework of the US-CERN-Japan-Russia Joint Accelerator School (JAS)
 - 14 schools held so far (since 1985)

Scope

Accelerator Physics

Relativity / Electro-Magnetic Theory / Transverse Beam Dynamics / Longitudinal Beam Dynamics / Linear Imperfections and Resonances / Synchrotron Radiation / Electron Beam Dynamics / Multi-Particle Effects / Non-Linear Dynamics Beam Instabilities / Landau Damping / Beam-Beam Effects

Accelerator Systems

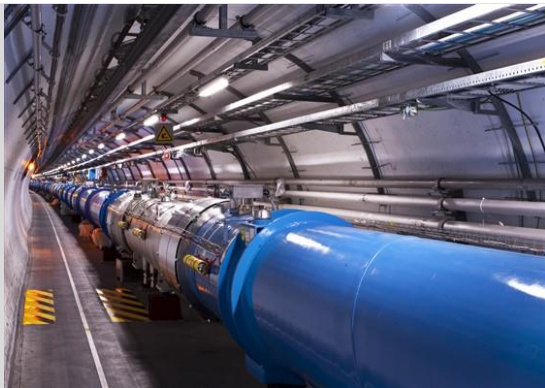
Particle Sources / RFQ / LEBT
RF Systems / Beam Measurement / Feedback Systems / Beam Injection and Extraction / Beam Transfer Power Convertors / Warm Magnets / Superconducting Magnets / Vacuum Systems Machine Protection Systems Radiation and Radioprotection

Accelerators

Linear Accelerators
Synchrotron Light Machines
FELs
FFAGs
Cyclotrons
Synchrotrons
Colliders

Applications

High Energy Physics
Nuclear Physics
Industrial Applications
Medical Applications
Cancer Therapy



The CERN Accelerator School holds courses in all of the Member States of CERN

The twenty two Member States of CERN Les vingt-deux États membres du CERN

Member States (date of accession)
États membres (date d'accession)

 Austria (1959) <i>Autriche</i>	 Italy (1953) <i>Italie</i>
 Belgium (1953) <i>Belgique</i>	 Netherlands (1953) <i>Pays-Bas</i>
 Bulgaria (1999) <i>Bulgarie</i>	 Norway (1953) <i>Norvège</i>
 Czech Republic (1993) <i>République tchèque</i>	 Poland (1991) <i>Pologne</i>
 Denmark (1953) <i>Danemark</i>	 Portugal (1986) <i>Portugal</i>
 Finland (1991) <i>Finlande</i>	 Romania (2016) <i>Roumanie</i>
 France (1953) <i>France</i>	 Slovakia (1993) <i>République slovaque</i>
 Germany (1953) <i>Allemagne</i>	 Spain (1961-1968, 1983-) <i>Espagne</i>
 Greece (1953) <i>Grèce</i>	 Sweden (1953) <i>Suède</i>
 Hungary (1992) <i>Hongrie</i>	 Switzerland (1953) <i>Suisse</i>
 Israel (2014) <i>Israël</i>	 United Kingdom (1953) <i>Royaume-Uni</i>



Have been to all except Israel (joined 2014) and Romania (joined 2016)

CAS courses - details

- “General Courses”; length 12 or 13 nights
Accelerator beam dynamics and technologies
 - on an introductory level (every year)
 - on an advanced level (every second year)
- “Topical Courses”; length 12 or 13 nights
Specialized course on a topic selected by the CAS advisory board; repetition rate of most relevant topics: 4...8 years
- “Local School”
CERN centric; 5 days, non residential, but now also open for external application
called CAS@ESI (close to CERN)

Course Program 2018 - 2021

	Period I Feb-April	Period II May-June	Period IIb End June	Period III Sept-Oct	Period IV Nov-Dec	JAS 2017: RF Japan (Hayama)
2018	Future Colliders Switzerland	Beam Instrumentation Finland	Short Introduction France (local)	General Introduction Romania	Comp. Methods Greece	
2019	Advanced Acc. Concepts Portugal (Lisbon)	General Advanced Danmark	Short Introduction France (local)	General Introduction Slovakia	JAS: Ion Colliders Russia	
2020	RF associate member state	Mechanical Engineering Holland	Short Introduction France (local)	General Introduction Ukraine earmarked	Warm magnets Austria	
2021	Digital Signal Processing tbd	General Advanced tbd	Short Introduction France (local)	General Introduction tbd	JAS: Very Advanced Beam Dynamics "In the Americas"	

* CAS@ESI
(Archamps)

What's new at CAS?

- More courses/year
 - Introductory General Course **every** year (September)
 - Advanced General Course remains every second year (June)
 - Basic (non-residential) course in the vicinity of CERN every year (also open for people from outside CERN)
- Joint Accelerator School course every second year
- Major topical courses every 4-5 years (beam instrumentation, RF, vacuum, magnets...)
- New topical courses (mechanical engineering...)

- 10 students grants for every course
- New splendid website <http://cas.web.cern.ch/>

What does it need to host a CAS?

- A local host in collaboration with the CAS team
 - choice of venue
 - planning of social programs
 - contribution to scientific program
 - (technical support for afternoon hands-on courses”)
 - office support during the school
- If possible, a financial contribution of up to 20 kCHF in order to co-finance 10 student grants at the school.
(Apart from the grants the school is meant to act cost neutral; difficult in some countries)