Basics of Accelerator Physics and Technology

9-13 May 2022

Appart'City, Ferney Voltaire, France

WELCOME!

The CERN Accelerator School - CAS

- 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 topics in the field (RF, BI, magnets, vacuum, colliders, beam dynamics, plasma,…)
  - 50 to 70 hours teaching in ~2 week intensive residential courses
- About 90 courses held so far
- Occasional courses in the framework of the US-CERN-Japan-Russia Joint Accelerator School (JAS), from 2022: IAS (International Accelerator School)
  - 14 schools held so far (since 1985), Superconductivity course upcoming in July 2022

Upcoming Residential CAS Courses

- Networking is an essential part of each CAS course!

- Introduction to Accelerator Physics (yearly – in September)
  - 16 Sep – 1 Oct 2022 (venue to be decided)
  - Hands-on in transverse and longitudinal beam dynamics

- Advanced Accelerator Physics
  - 6 – 18 Nov 2022 in Sévrier (near Annecy), France
  - Hands-on in RF, Beam Instrumentation and Beam Dynamics

- 2023+: Radiofrequency, Magnets, Mechanical and Material Engineering, …

Basics of Accelerator Physics and Technology

- Course established in 2013
- **Introductory level training in General Accelerator Physics**
  - reviews the **core topics of accelerator physics**
  - special **emphasis on CERN** machines
- mainly for engineers and technical engineers, who have not yet attended one of the regular CERN Accelerator School Introductory courses
- slightly **easier level** than the Introductory Course
  - subset of topics (five days only)
  - no hands-on exercises
- Originally this course was for CERN participation only, but since 2018 it is also available for anyone not working for CERN

This course

- 80 participants (65 CERN, 15 ext.)
- Lectures 45-50 minutes + discussion
- Discussion sessions with lecturers

- Lunch and coffee breaks on the other side of reception (left from coming in)
- use them for networking
- Welcome drink tonight!

Program for the CAS@Ferney - Basics of Accelerator Physics and Technology, 9-13 May 2022

	Mon 09	Tue 10	Wed 11	Thu 12	Fri 13
08:30	Welcome	Coffee			
08:45	Accelerators for Beginners and the CERN Complex *Steerenberg*	Transverse Beam Dynamics I *Holzer*	Transverse Beam Dynamics III *Holzer*	Injection and Extraction *Dutheil*	Collective effects *Buffat*
09:45	Pause				
09:55	Basic Mathematics and Units *Steerenberg*	Normal Conducting & Permanent Magnets *Zickler*	Longitudinal Beam Dynamics II *Tecker*	Cryogenics *Koettig*	Plasma Wakefield Acceleration + AWAKE *Gschwendtner*
10:55	Coffee				
11:25	Electromagnetic Theory *Skowronski*	Longitudinal Beam Dynamics I *Tecker*	Beam Instrumentation *Lefevre*	Linear Imperfections *Wenninger*	HL-LHC *Zerlauth*
12:25	Lunch				
13:50	Relativity for Accelerators *Shreyber*	Transverse Beam Dynamics II *Holzer*	RF Systems *Damerau*	Discussion	Future Linear Colliders *Stapnes*
14:50	Pause				
15:00	Particle Sources *Küchler*	Discussion	Discussion	Controls *Deghaye*	Future Circular Colliders *Buffat*
16:00	Coffee				
16:30	Standard Model and Beyond *Sphicas*	Linacs *Lombardi*	Superconducting Magnets *Todesco*	Vacuum Systems *Baglin*	Discussion
17:30	Welcome drink				

The CAS Team

Anastasiya Safronava

Web pages

Noemi Caraban Gonzales

CASopedia

Christine Völlinger

Deputy Director

Michela Lancellotti

Social media

Hermann Schmickler

previous Director

Frank Tecker

Director

Delphine Rivoiron

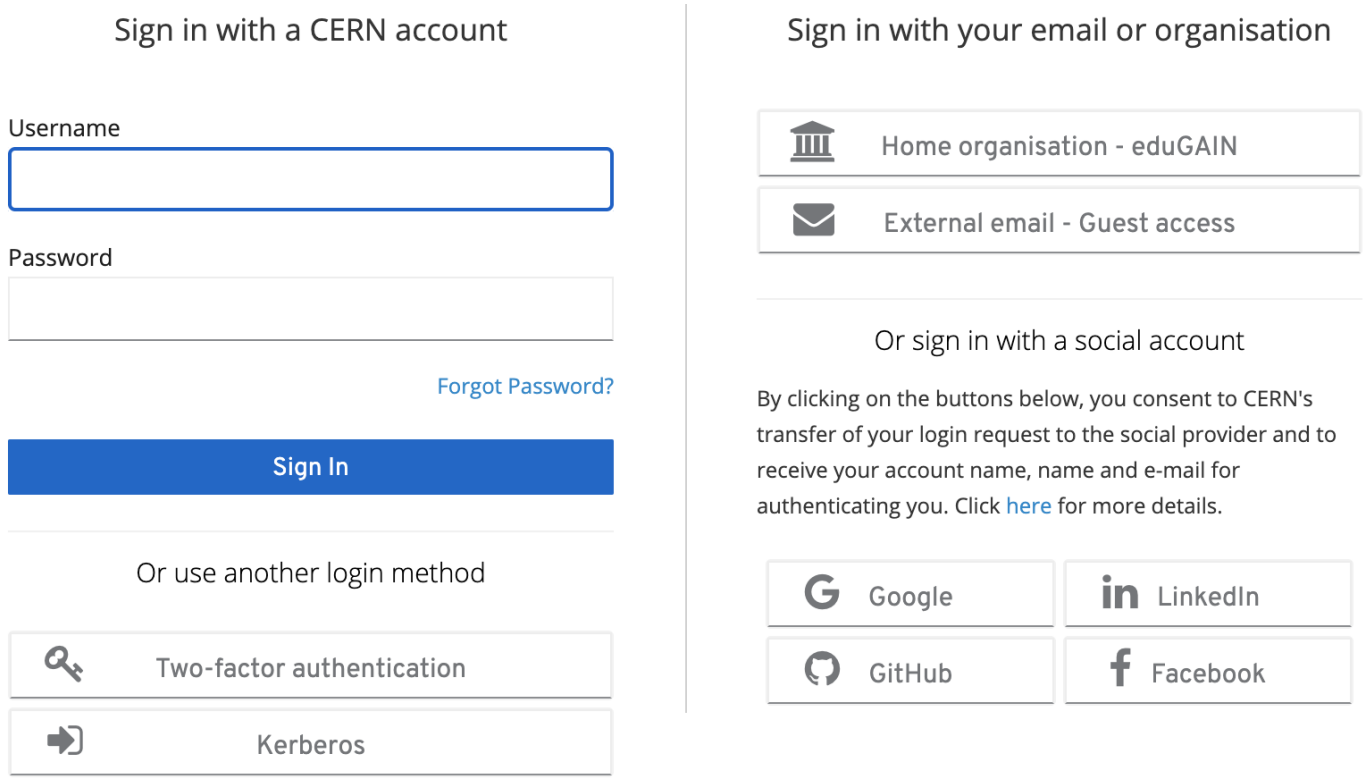
Administrative Manager

Ron Suykerbuyk

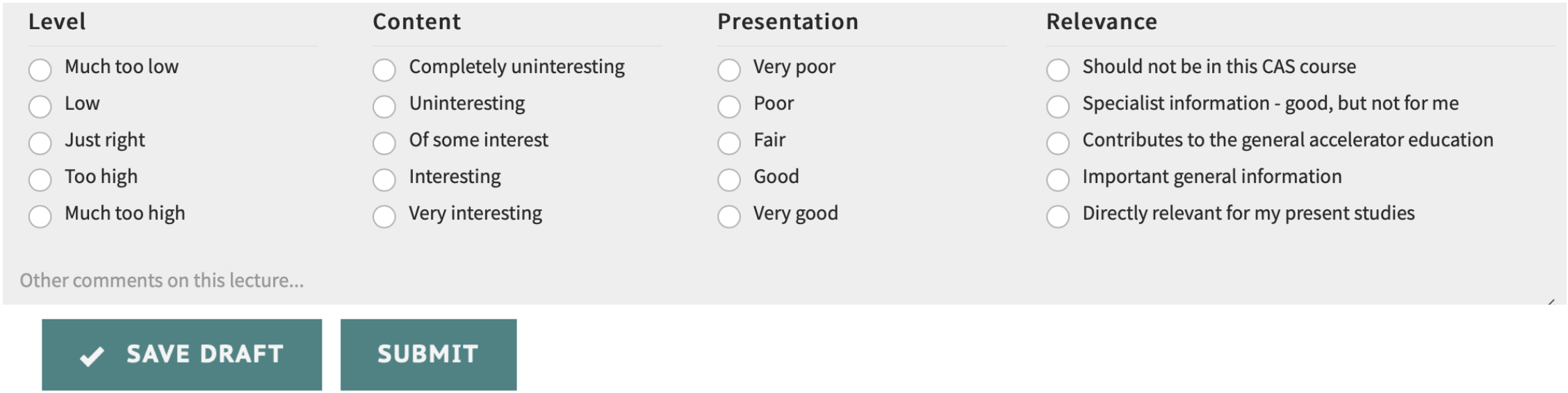
Filming

Online Evaluation Form

- Important to maintain / improve the high quality of teaching
- https://cas.web.cern.ch/evaluation/ferney-voltaire-2022
- Log in with CERN account or many other ways (Google, LinkedIn, …)



Online Evaluation Form



- Please **fill it in** ideally **daily** during the course, when your memory is fresh
- You can **save it** and come back to it later at any time
- Just **DON'T submit it until** you have completed your evaluation at **the end**

Basics of Accelerator Physics and Technology

Enjoy the course!