CAS Programme Committee Meeting

Vacuum Technology in Accelerators

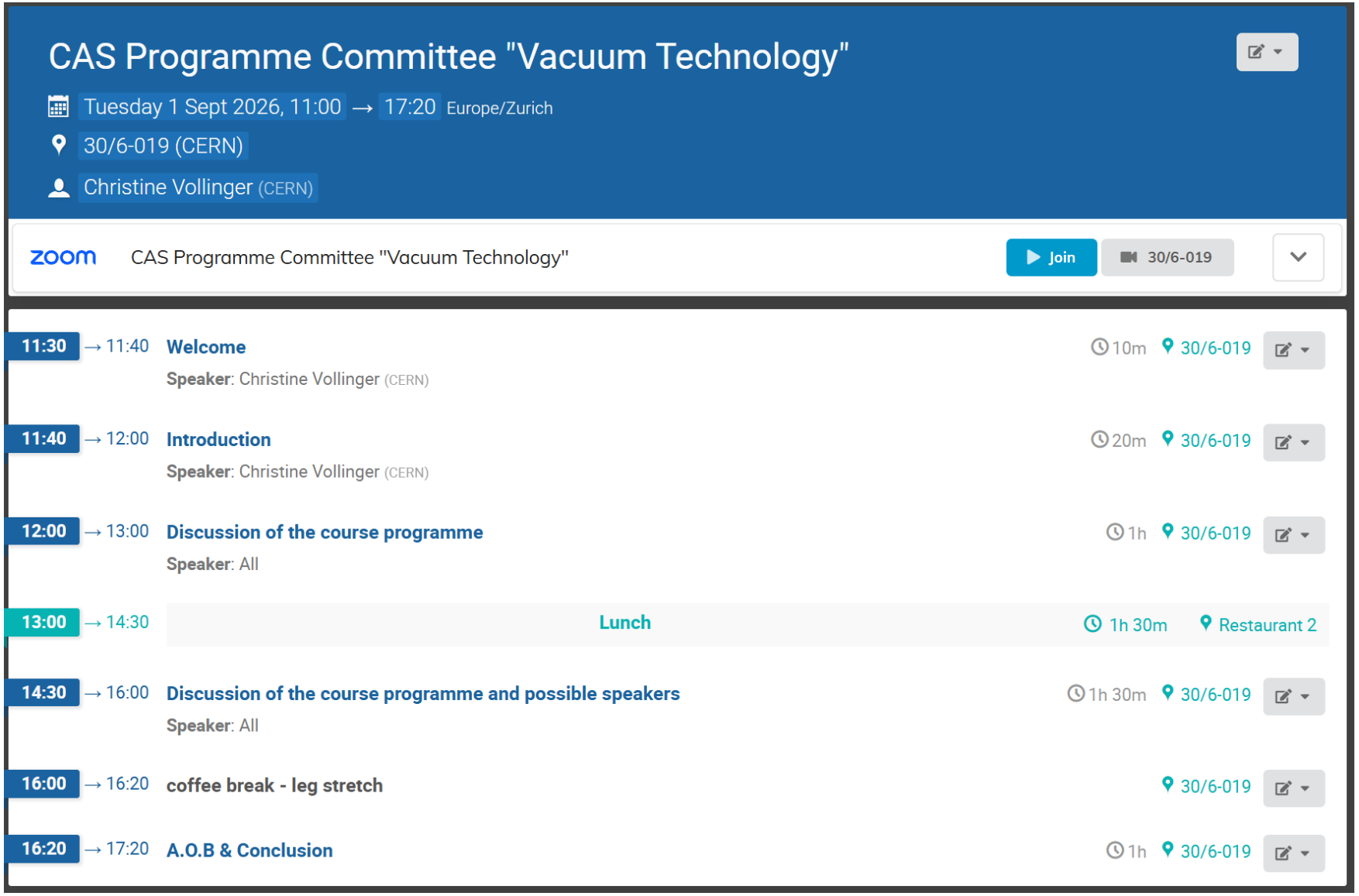
September, 1st 2026

The CERN Accelerator School

Programme Committee Meeting - Schedule

Thank you so much for participating as Programme Committee Member!

Common lunch today (R2 Glassbox)



CAS Programme Committee "Vacuum Technology"

Tuesday 1 Sept 2026, 11:00 → 17:20 Europe/Zurich

30/6-019 (CERN)

Christine Vollinger (CERN)

zoom CAS Programme Committee "Vacuum Technology" Join 30/6-019

11:30	→ 11:40	**Welcome** **Speaker**: Christine Vollinger (CERN)	10m	30/6-019
11:40	→ 12:00	**Introduction** **Speaker**: Christine Vollinger (CERN)	20m	30/6-019
12:00	→ 13:00	**Discussion of the course programme** **Speaker**: All	1h	30/6-019
13:00	→ 14:30	**Lunch**	1h 30m	Restaurant 2
14:30	→ 16:00	**Discussion of the course programme and possible speakers** **Speaker**: All	1h 30m	30/6-019
16:00	→ 16:20	**coffee break - leg stretch**		30/6-019
16:20	→ 17:20	**A.O.B & Conclusion**	1h	30/6-019

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Programme Committee Members

Andreas Kraemer	GSI - Germany
Artur Gevorgyan	ESS - Sweden
Christine Vollinger	CAS, CERN - Switzerland
Cristina Bellachioma	GSI - Germany
Eshraq Al Dmour	MAX IV - Sweden
Fred Dylla	American Institute of Physics - USA
Giulia Lanza	SLAC - USA
Giuseppe Bregliozzi	CERN - Switzerland
Jose Antonio Ferreira Somoza	CERN - Switzerland
Natalia Kirchgeorg	PSI - Switzerland
Paolo Chiggiato	CERN - Switzerland
Patrick Werneke	Nikhef - Netherlands
Vincent Baglin	CERN - Switzerland
Yasunori Tanimoto	KEK - Japan

Many thanks!
We count on your active participation
☺

The CAS Team

Noemi Caraban Gonzalez

CASopedia, Filming, Social media

Christine Völlinger

Deputy Director/
CAS Director as of 2027

Maria Filippova

Administrative Assistant, Proceedings

Frank Tecker

Current CAS Director

Delphine Rivoiron

Administrative Manager

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Some words about *CAS*

The CERN Accelerator School - *CAS*

- Established at the beginning of 1983 → now 43 years!
  - 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 60 hours teaching in ~2 week intensive residential courses
- More than **100 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)

CAS Course Schedule as of 2027…

Remind you that we have fixed slots for the ***BASIC***, the ***General Introduction***, and the ***Advanced General CAS***.
Core topics (BI, RF, Magnets, Vacuum, Mechanical Engineering, …) shall be repeated every 5-7 years.

	Period I Feb-April	Period II May-June	Period IIb July	Period III Sept-Oct	Period IV Nov-Dec
2026	**Basic** local	**Medical Accelerators** Latvia		**General Introduction** UK	**Circular e+/e- colliders and light sources** Czech Republic
2027	**Basic** local	**Advanced General** **Sweden**	**IAS?** Europe? Australia?	**General Introduction** **Spain**	**Vaccum Technologies** **Germany**
2028	**Basic** local	**Power Converters?** **Latvia**		**General Introduction** **Spain**	**Control Systems?** **Slovenia**
2029	**Basic** local	**RF in Accelerators** **Bulgaria**		**General Introduction** **Spain**	**Advanced General** **Croatia**
2030	**Basic** local	**Topical** **(LLRF?)**		**General Introduction**	**Topical** **(Injection/Extraction & Transfer Lines?)**
2031	**Basic** local	**Topical** **(Mechanical Engineering & Materials?)**		**General Introduction**	**Advanced General**

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CAS Backbone - Residential CAS Courses

- **Introduction to Accelerator Physics** (yearly – in September)
  - 20 Sep – 3 Oct 2026 (in Edinburgh, UK)
  - General introduction to accelerator physics and technology
  - Hands-on exercises in transverse and longitudinal beam dynamics
- **Advanced Accelerator Physics** (every two years)
  - 13 -25 June 2027 (in Helsingborg, Sweden)
  - Hands-on exercises in RF, Beam Instrumentation and Beam Dynamics
- **Special Topical Courses**
  - 2023: Radiofrequency, Normal- and Superconducting Magnets
  - 2024: Mechanical and Material Engineering
  - 2025: Intensity Limitations in Hadron Beams, Beam Instrumentation
  - 2026: Medical Accelerators, Circular e+ / e- colliders and light sources

- High-level expert lecturers from CERN and many other institutes
- Networking is an essential part of each CAS course!

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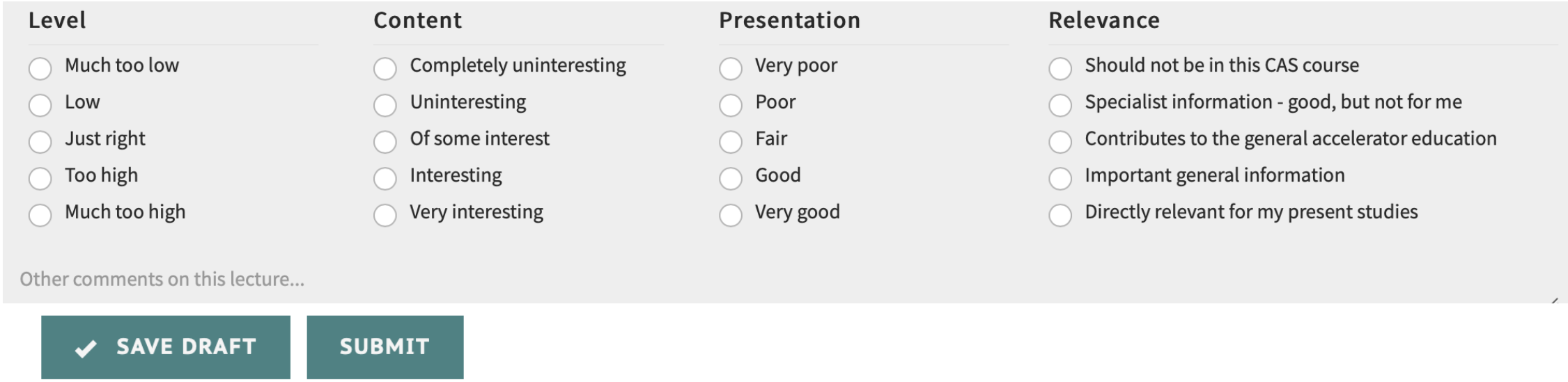
Networking at CAS
More Than Just Connections – a Career Accelerator!

- **Networking is integral to CAS: Many collaborations and career opportunities begin here**

- **Bonds from CAS** often last for the whole professional career
- strong **participants and lecturers** interactions by **built-in social activities**:
  - Coffee breaks, meals taken together
  - people socialising (working and leisure) up to late in the evenings
  - “1 slide – 1 minute” as icebreaker
  - Poster session
  - Cinema evening, CASaoke
  - Excursion

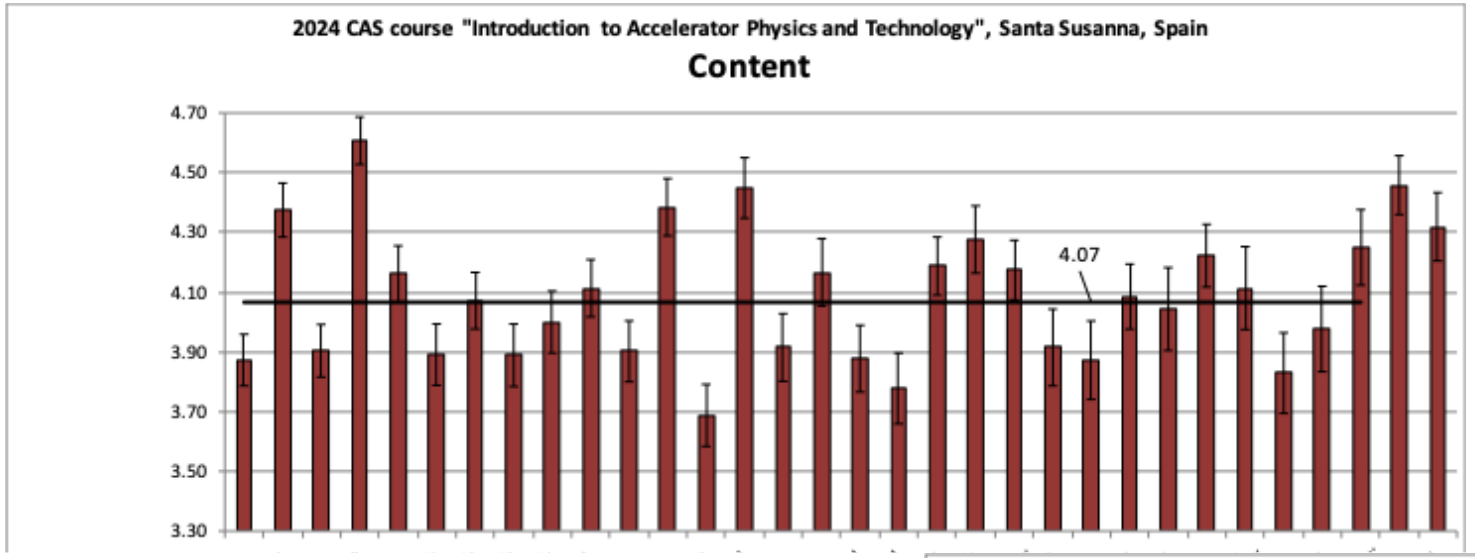
- **Digital networking support:**
  - WhatsApp group for the courses + WhatsApp community (information exchange)
  - LinkedIn CAS community https://www.linkedin.com/in/cern-cas/ (over 11k followers!)

CAS - Online Evaluation Form

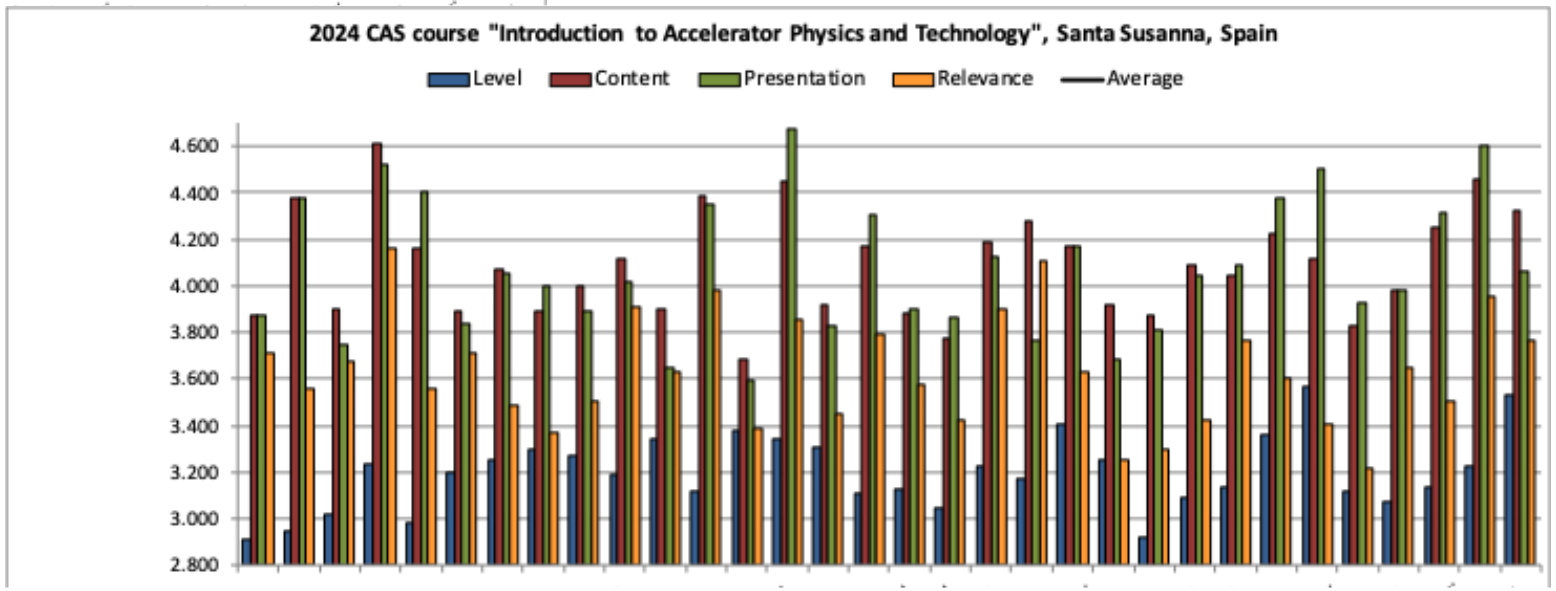


- Multiple Log-in options: with CERN account or many other ways (Google, LinkedIn, …)
- Participants can save it during the CAS course and come back to it later at any time
- To be completed after the course
- typically **2/3** of participants **complete evaluation – good statistics and significant input**
- Important to **maintain / improve the high quality** of CAS teaching
- Helps refine course content, teaching methods, and hands-on activities

CAS – Example of Online Evaluation Results

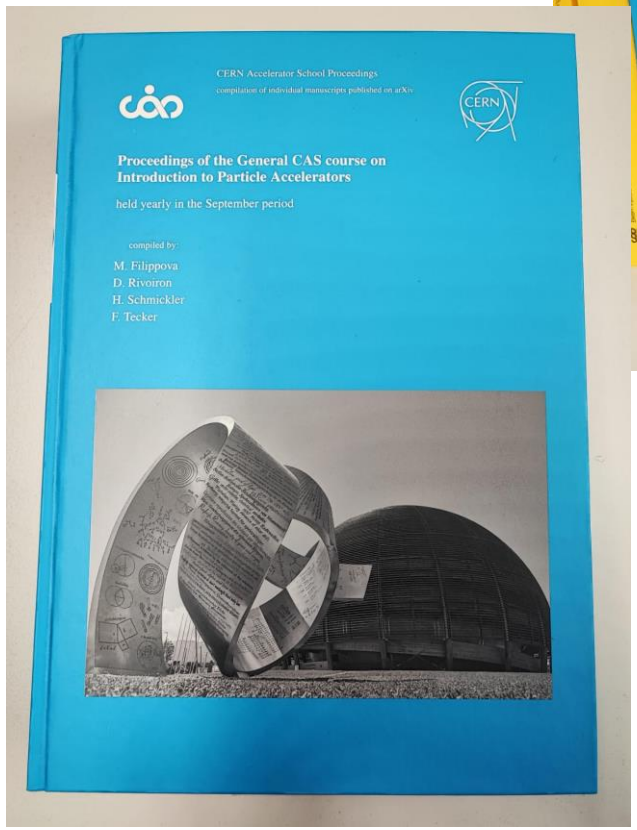


Every speaker will receive his/her evaluation results after the course!



Recent CAS Proceedings

- Contributions in LaTeX or Word
- Edited by CAS team (streamlining, format editing)
- Contributions published in ArXiv by CAS team
- Author can claim ownership
- Completed and (eventually) printed:
  - Vacuum
  - Beam Instrumentation
  - Numerical Methods
  - Wakefield Acceleration
  - Introduction (missing 3 contributions)
  - Introduction (2nd edition – 1 missing contr.)



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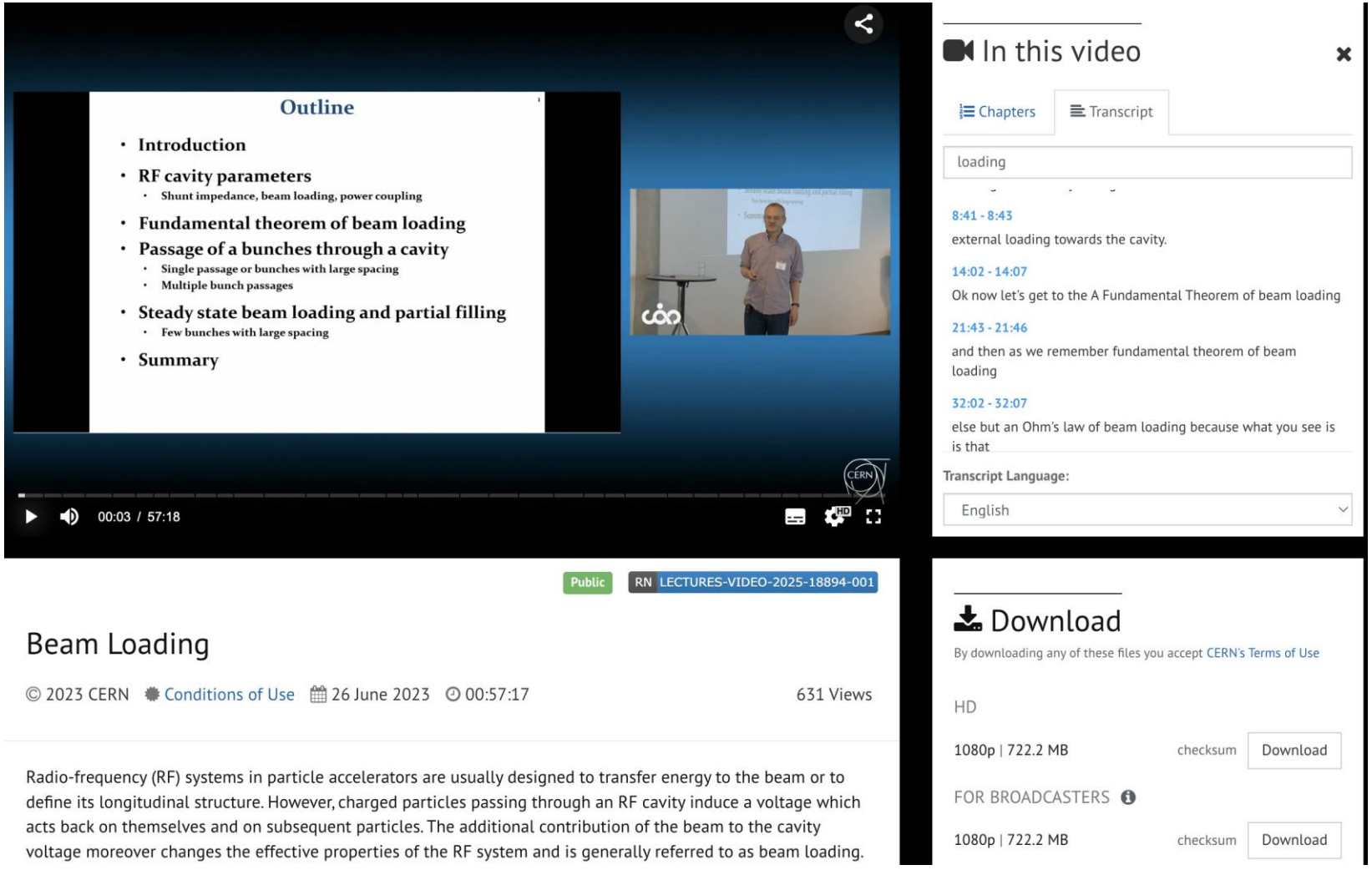
CASopedia

- **Goal:** List of keywords that point to relevant sections of CAS videos
  - Searchable keyword index based on lecturer-provided keywords points to videos (entire video first, sequence later)
  - Keyword search in transcripts of the videos

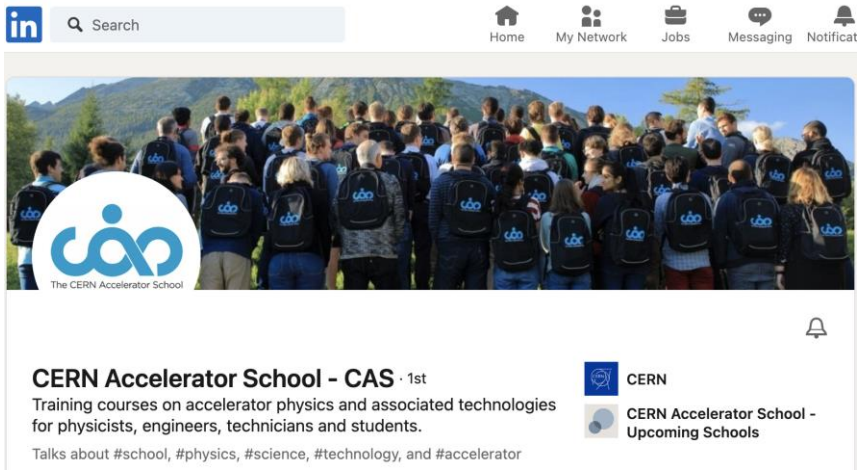
- Videos filmed with 3 cams + slide stream with virtual laser pointer
- Noemi collects metadata: abstracts and keywords from lecturers
- transcripts of the videos produced
- CDS Webservice publishes video through Indico
- Available on Indico from CAS courses and CDS (CERN Document Server)
- Recent courses published and publicly available

CASopedia – Example Video

- https://cds.cern.ch/record/2882185



Social Media / Digital Presence



- Expand CAS networking with digital tools
- Developed and significantly extended by Noemi
- LinkedIn
  - CAS profile: https://www.linkedin.com/in/cern-cas/ (over 10k followers!)
  - Creating a community of accelerator scientists for general accelerator news, jobs, etc.
- CERN general social media (Facebook, Instagram, X (Twitter), …)
- Accelerating News - https://acceleratingnews.eu/
- CERN Bulletin

Bulletin for the CERN Community

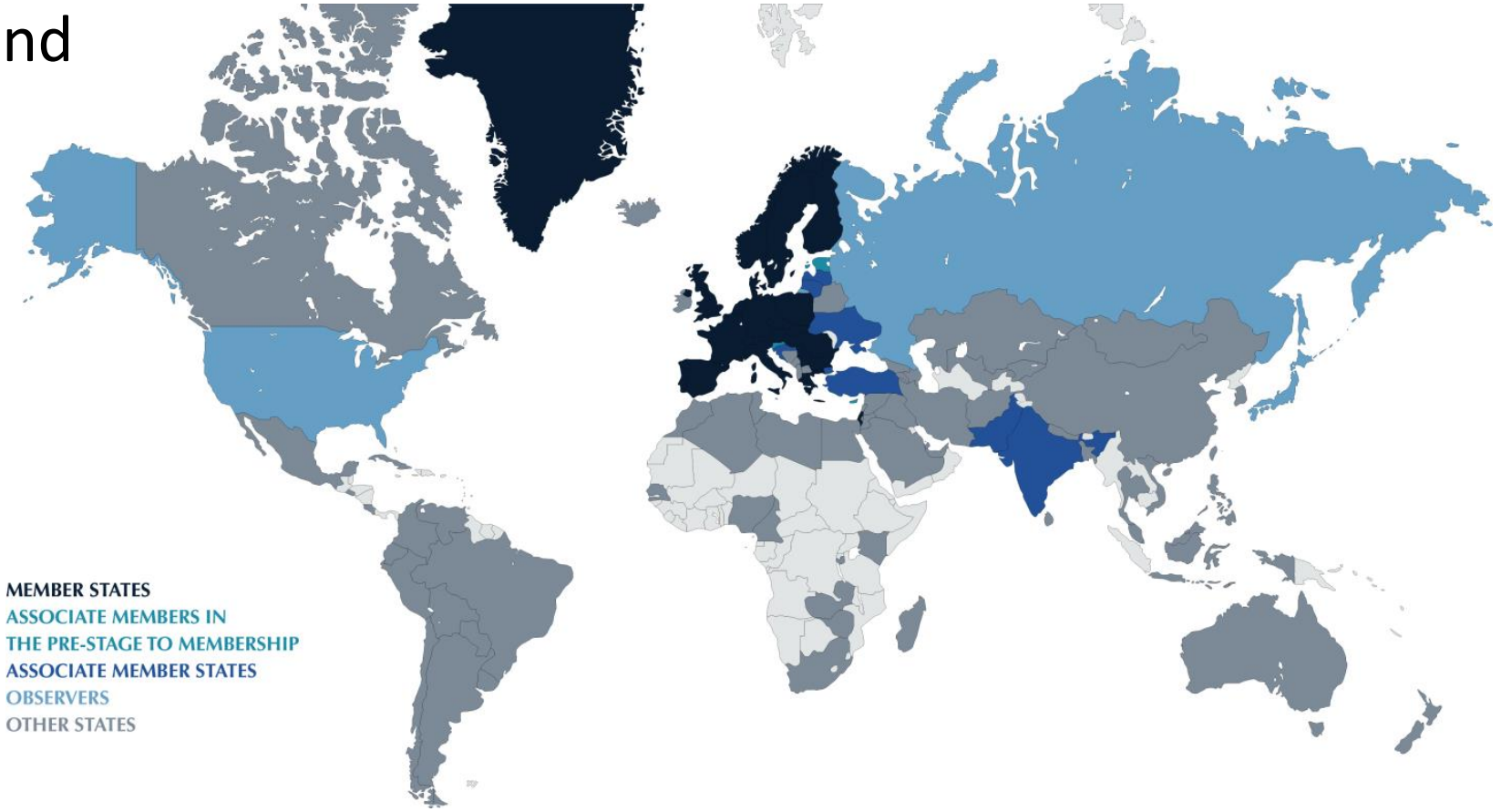
Accelerating NEWS

- CERN Courier (Feature article in 2024 Jan/Feb issue)

CERNCOURIER

CAS Locations

- CERN is financed by 25 member states and 10 associated member states
- **CAS visits** all **CERN member states and associated member states in turn** as return to countries and to foster contacts
- Courses organised in collaboration with local organiser from institute in the country
- Support for
  - hotel selection, local organization, lab visit,…



Country priority

- Multiple facts to consider:
  - time since last CAS
  - CERN return of investment
  - member / assoc. member states
  - current geopolitical situation
  - ease of shipping material for hands-on training
  - local accelerator infrastructure
    - Contacts with institutes
    - general course in countries with less developed accelerator infrastructure

- not yet visited
  - Brazil
  - Cyprus
  - Estonia
  - India
  - Ireland
  - Israel
  - Latvia
  - Pakistan
  - Serbia
  - Slovenia
  - Türkiye
  - Ukraine

associated member

member state

Country	Last CAS	# of CAS (1993)
Norway	2013	2
Czech	2014	2
Poland	2015	2
Hungary	2016	2
Sweden	2017	2
UK	2017	4
Italy	2017	7
Finland	2018	1
Romania	2018	1
Greece	2018	4
Slovakia	2019	2
Denmark	2019	3
Portugal	2019	3
Switzerland	2021	4
Lithuania	2022	1
France	2022	4
Germany	2023	6
Austria	2023	4
Netherlands	2024	2
Belgium	2024	3
Bulgaria	2025	1
Spain	2025	6
Croatia	2025	1

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Now about the Vacuum Technology CAS!

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Today, we have a programme to fill!

- 9-10 lecture days
- 46-52 (50) hours
- Exercises?
- Tutorial work?

- Suggestion:
  - 1st iteration: topics
  - 2nd step: lecturers + backup
- Lecturers: try to give >=2 lectures if possible (travel cost reduction)

Program for the 2027 CAS - Vacuum Technology for Particle Accelerators

	Mon 15/11	Tue 16/11	Wed 17/11	Thu 18/11	Fri 19/11	Sat 20/11	Sun 21/11	Mon 22/11	Tue 23/11	Wed 24/11	Thu 25/11	Fri 26/11
08:30	Arrival day and registration	Opening / Local presentation Christine VOLLINGER					Excursion			Free		Departure day
09:30												
09:40												
10:40		Coffee						Coffee				
11:10												
12:15		Lunch						Lunch				
13:45				Visit to GSI								
14:45												
14:55												
16:00		Coffee			Coffee			Coffee				
16:30											Closing Christine VOLLINGER et	
17:30												
17:45		1 slide 1 minute	Poster session									
18:45		Welcome reception						Seminar				
20:00	Dinner at Hotel											
21:00									Cinema event			

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Topic Suggestions

Aim of the School:

Provide participants with a deep understanding of the challenges and opportunities of Vacuum Technology in Accelerators.

Equip them with the knowledge and skills needed to contribute to the development.

Programme:

Theoretical lectures that are supported by Hands-on tutorials.

Hands-on tutorials shall be carried out on different vacuum set-ups, computational work, and instrumentation that will be brought to the CAS course.

Open Questions:

Exhibition areas for companies? Is this wanted?

Hopefully, we can have a visit to the installations of GSI!

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Today, we have a programme to fill!

We will start from the Vacuum CAS of 2017,
and work through the topics.

Many thanks! Your input is precious.

Program for the 2027 (former 2017) CAS - Vacuum Technology for Particle Accelerators

	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri
	15/11	16/11	17/11	18/11	19/11	20/11	21/11	22/11	23/11	24/11	25/11	26/11
08:30	Arrival day and registration	Opening / Local presentation Christine VOLLINGER et al.	Materials & Properties III: Mechanical Behaviour Cedric GARION (CERN)	Ion Pump Technology for Particle Accelerators Cristian MACCARRONE (Ag	Industrial Vacuum Applications Andrew CHEW (Edwards	Thin-Film Coating Pedro COSTA PINTO (CERN)	Excursion	Surface Characterisation Reza VALIZADEH (STFC	Radiation Damage and its Consequence Markus BRUGGER (CERN)	Free	Manufacturing & Assembly for Vacuum Technology Serge MATHOT (CERN)	Departure day
09:30												
09:40		Introduction to Machine Parameters Pedro TAVARES (MAX IV	Materials & Properties IV: Outgassing Paolo CHIGGIATO (CERN)	Introduction to Cryogenics Serge CLAUDET (CERN)	Beam Induced Desorption Oleg MALYSHEV (STFC	Controlling Particles/Dust in Vacuum Systems Lutz LILJE (Deutsches		Interactions between Beams and Vacuum System Walls Roberto CIMINO (LNF-INFN)	Control & Diagnostic Andre ROCHA (CERN), Gregor		The Real Life of Operation Vincent BAGLIN (CERN)	
10:40		Coffee						Coffee				
11:10		Fundamentals of Vacuum Technology Eshraq AL DMOUR (MAX IV	Vacuum Gauges I & II Karl JOUSTEN (Physikalisch-	Cryopumping Vincent BAGLIN (CERN)	Beam-Gas Interaction Massimiliano FERRO-	Beam Induced Radioactivity & Radiation Hardness Francesco CERUTTI (CERN)		Surface Cleaning & Finishing Mauro TABORELLI (CERN)	Vacuum Acceptance Tests for Particle Accelerator Equipment Giuseppe BREGLIOZZI (CERN)		Challenges for Vacuum Technology of Future Accelerators Jose Miguel JIMENEZ (CERN)	
12:15		Lunch						Lunch				
13:45		Impedance & Instabilities WANZENBERG (Deutsches	Mechanical Vacuum Pumps Heinz BARFUSS (Pfeiffer	Visit to GSI	Tutorial Tutor group	Tutorial Tutor group		Tutorial Tutor group	Tutorial Tutor group	Tutorial Tutor group	Tutorial Work Close-Out	
14:45												
14:55		Materials & Properties I: Introduction Stefano SGOBBA (CERN)	Computation for Vacuum System of Accelerators Roberto KERSEVAN (CERN)		Tutorial Tutor group	Tutorial Tutor group		Tutorial Tutor group	Tutorial Tutor group	Tutorial Tutor group	Tutorial Work Close-Out	
16:00		Coffee			Coffee			Coffee				
16:30		Materials & Properties II: Thermal & Electrical Characteristics Sergio CALATRONI (CERN)	Getter Pumps Paolo MANINI (SAES)		Tutorial Work	Tutorial Work		Tutorial Work	Tutorial Work	Tutorial Work	Closing Christine VOLLINGER et al.	
17:30												
17:45		1 slide 1 minute	Poster session									
18:45		Welcome reception						Seminar				
20:00		Dinner at Hotel									Banquet	
21:00									Cinema event			

Greetings from 2024 Mechanical and Materials Engineering

Noemí Carabán González

A typical CAS:

The agenda is packed,

but it will be a pleasure, nevertheless!

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The CERN Accelerator School and
Max IV Laboratory are organizing a course on

Vacuum for Particle Accelerators

6 to 16 June, 2017

Hotel Örenäs Slott, Glumslöv, Sweden

This course will mainly be of interest to staff in accelerator laboratories, university departments and companies manufacturing vacuum equipment.

Following introductory lectures on accelerator parameters and vacuum fundamentals, the different processes contributing to vacuum quality will be discussed. The various components and techniques currently available for a modern vacuum system will then be treated in some detail, as will beam-vacuum phenomena.

Most afternoons will be devoted to a series of tutorials, where the participants will have the opportunity to work in small groups on a variety of practical techniques.

A full day visit incorporating both Max IV and ESS, both in Lund, will provide a current insight into the field.

Agilent Technologies · HIDEN ANALYTICAL · saes group · PFEIFFER VACUUM · VAT · Leybold

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