

# ***Masterclasses Communication***

**Some general Video Conference guidelines based  
on experience from previous Masterclasses**

## **Manuals, general FAQs + brochures:**

- [Moderators Manual](#) (THE moderators bible...)
- [Moderators Twiki](#) (Manual and more...)
- [CERN Brochure](#) (FAQ on CERN, LHC etc...)
- [More Brochures](#) (Press Office collection...)

# ***Basic Communication Issues***

## **● There are two moderators running the show**

→ both moderators should talk roughly to equal amounts

- in case of a (more) senior + (more) junior moderator, the senior one should not answer all questions...

→ avoid talking too much to your co-moderator

- a looong dialog between the moderators may disconnect the students
- if you feel you've talked too much, hand over to your co-moderator, e.g. “Kate, this seems a perfect question to be answered by you...”

## **● Most of the students aren't native English speakers and don't understand and speak English very well**

→ speak slowly and clear

→ avoid using complicated and long sentences

→ use simple words (vocabulary of the students might be limited)

→ don't use acronyms, abbreviations, physics slang not common outside of our community, **avoid talking “CERNish”**

# ***Starting the Video Conference I***

## **● Introduce yourself**

→ e.g. “My name is Michael, I'm working at ..., one of the 4 large experiments at the LHC collider at CERN in Geneva Switzerland...”

## **● Explain where we are (the moderators)**

→ e.g. “Right now we are sitting at CERN. CERN is the largest centre for particle physics research in the world and a rather cool place...”

## **● Tell in a few words, what's happening in the next hour**

→ read the agenda, e.g. report of measurements and discussion of the results, questions to the moderators, quiz

## **● Display a map showing all connecting sites**

→ Masterclass organizers provide a map of the connected institutes before the Video Conference (on [Twiki](#) page)

# Starting the Video Conference II

- **Ask one short question (the “ice breaker”) to each masterclass, one by one**
  - answer should be given by a student (not the organizers or teachers), no longer than 2 minutes.
  - question could be a localized question, that you might receive from the local organizers beforehand, e.g. “Vienna, have you seen the VERA accelerator?”
    - past experience: only very few localized questions were sent by local organizers
- **Talk briefly on the LHC status**
  - at the end of a looong shutdown (~2 years)
  - restarting in May with an energy higher than ever before (8 → 13 TeV)
    - new world record...
  - higher energy gives a better chance...
    - ...to find new particles, e.g. dark matter? Where 25% of the universe is made of...
    - ...to produce more Higgses + precisely measure it’s properties (and mysteries?)...
    - ...

# General Comments on Discussion

- **Most difficult part: to encourage the students asking questions at all**
  - they are shy, don't want to expose themselves in front of their fellow students
  - it's a video conference with microphone + camera, they are not used to
  - they don't speak English well, sometimes cannot express what they want to ask, don't know the right words (e.g. in physics questions)
- **For them, we (the moderators) are considered “super-experts”**
  - they are even more shy and hesitate to ask “stupid” questions
- **Try to encourage them**
  - go through institute by institute and ask if the students have questions
    - give examples: “was the exercise difficult, what was the largest problem, how is life at CERN” etc.
  - sometimes teachers (very rarely) or local physicists are asking the questions on behalf of the students

# ***(Most) Frequently Asked Questions I***

*(and brief answers)*

→ for detailed answers see: [Moderators Manual](#)

## ● **How many people work at CERN? How many different nationalities?**

- 3000 directly employed by CERN [Fellows, Assoc., Staff], 11000 Users, 100 nationalities

## ● **How can I come to work at CERN?**

- Internships (2 weeks, school students), Summer Students (2-3 months, university stud.)

## ● **What's the salary of PhD students / CERN staff etc.?**

- don't give precise answer here, we don't get rich but have fun...

## ● **What are the costs of the LHC?**

- LHC machine: 5 BCHF (~4.7 B€) + experiments: 1.5 BCHF (~1.4 B€)

## ● **What's the power consumption of the LHC?**

- CERN total (with pre-accelerators etc.): 180 MW (= 180'000 households in Canton GE)

## ● **How much Helium is needed to cool the LHC magnets and what's their temperature?**

- 120 tons, 1.9 K = - 271.25 °C (universe: 2.7 K, cosmic microwave background radiation)

# ***(Most) Frequently Asked Questions II***

*(and brief answers)*

- **What's the speed of protons in the LHC? Are they travelling with light speed?**
  - 99.999999% (at 6.5 TeV/beam) = just 3 m/s (10.8 km/h) slower than light speed
- **Where do the protons / lead ions in the LHC originate from?**
  - Protons from an ordinary hydrogen bottle, lead ions from a 500°C hot oven
- **The Physics Nobel Prize 2013 was given to François Englert and Peter Higgs. What did they do?**
  - Invented concept, how elementary particles can get mass and become heavy: Universal Higgs field slows down particles when they move through, Higgs particle is excitation of field, discovered at CERN in 2012.
- **Why CERN / the LHC experiments didn't get the Nobel Prize?**
  - Physics Nobel Prize can go to a maximum of 3 people for their individual work, no institutions, no representatives of institutions (e.g. DG, Spokespersons). But without the discovery at CERN, the Nobel Prize would have never given to Englert and Higgs.
- **Can the LHC create black holes that destroy the earth?**
  - **NO!** cosmic rays are hitting the earth since >4 B years, energies in collisions are up to 1000x higher than at LHC, earth does still exist...