



International Masterclasses

Recommendations for

Online Masterclasses

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Introductory Remarks

International Masterclasses is a worldwide program, running in 60 countries on all continents. The 2022 edition of the program will again be affected by the COVID-19 pandemic. We expect that many Masterclasses cannot be held onsite at the universities and research labs, especially if visitors will not be allowed on campus. In that case, physicists might visit classrooms to deliver the Masterclass there.

Remote Masterclasses are a proven alternative, either with high school students at home or with students in their schools. This document contains a collection of recommendations for such remote Masterclasses.

Lectures

- Use Zoom videoservice
 - Use webinar style for large groups
 - Protect against Zoom-bombing! Do not post Zoom meeting IDs on any public website unless you set a password to protect the meeting/event. Of course, do not post the password on any public website, either.
- Provide preparatory material for students, e.g. videos, online courses
 - Some links for those who want to learn more about Particle Physics are collected at <https://physicsmasterclasses.org/index.php?cat=country>
- Start the day with a short community-building game or a round of introductions
- Include many interactive parts, e.g. Zoom polls, kahoot quizzes
- Include enough breaks
- Consider splitting the whole Masterclass content over 2 or more (half) days

Hands-on Measurement

- Create break-out rooms for pairs of students
 - difficult to manage for large groups
 - additional tutors may be needed to manage
 - if available, teachers who are proficient with masterclasses can help
- Distribute download links beforehand
- Point students and teachers to screencasts for ATLAS Z, CMS, and MINERvA Masterclasses at <http://tiny.cc/imc-vid> (how to install the software etc.).
- Ensure that students have the software ready
- Switch to online tools where practical
- Use simplified measurements, especially where there is less support

Videoconference

We expect to have a mix of groups and individual students in each of the sessions. Also, moderators will not be able to sit together. Therefore we have to adjust the

videoconferencing structure. If many students connect individually from their home, the Zoom webinar style will be chosen, as in 2021.