

# Online research conferences (and hands-on tutorials): The case of “School of Wannier90 v3.0 - Virtual Edition

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## Abstract:

*In this presentation I will discuss our experience on converting a code tutorial to a virtual online conference via Zoom videoconferencing, based on our experience with the “School of Wannier90 v3.0 - Virtual Edition”*

*(<http://www.wannier.org/events/school-2020-virtual-edition/>). I will focus on advantages with respect to standard conferences, and on issues that we have found, like management of different time zones and how to recreate the social aspect of the event. I will also discuss how we managed hands-on on various codes using the Quantum Mobile virtual machine (<http://materialscloud.org/quantum-mobile>). During the presentation, I will use some relevant results from the feedback form of the event, focusing in particular on the aspects concerning virtual events vs. events attended in person.*

## Participant’s summary

- Online tutorial, using Quantum Mobile (a VM such that all students have the same environment).
- We needed a compromise between maximising presence and prioritising speakers’ time zones.
- Most were happy with a virtual event. So much, that maybe even without travel bans, we should always do such an event virtually, rather than physically. It would also make it easy to have it each year. Only 20% definitely prefers a face-to-face event.
- Positive aspects: broader audience, more frequent events are possible.
- Negative aspects: missing the old sensation of meeting people.
- Lectures were recorded and made available later online (which also expands the audience). Gathering recordings on the website was deemed very useful if not essential.
- Questions: these were written on the chat by participants and moved to a google doc by a moderator collecting the questions. Some speakers dealt with the questions during the talk, some speakers at the end of each talk. Afterwards, offline, speakers replied with written answers to every question, and the document was put on the web together with the videos.
  - Possible danger might arise if many people are participating (larger events) and write in the chat, distracting the speaker. For the current scale (40 advanced participants) it worked very well.
  - It was very useful to have moderators/facilitators/tutors who can answer technical issues etc. without disturbing the speaker.
- Video conference was done via Zoom. Happy experience.
- VM quantum mobile: overall positive (useful, avoids setting up, installing codes, etc.)

- Very positive feedback for the self contained aspect of the VM; not only the codes, but also the documentation and tutorials in PDFs.
- Crucial is to have enough tutors to help anyway.
- Negative: VM + Zoom require lots of resources. To keep in mind for low-resource machines owners.
- Challenges: time zones; too many video events going on a single day (we should distribute better). Lack of (or reduced) networking.
- A positive aspect: less carbon (30'000kg CO<sub>2</sub> spared).
- Final note on the *OSSCAR project* (<https://www.ossscar.org>): EPFL Open Science project, working on developing jupyter tools for demos, interactive visualisations, and tutorials. Goal: making interactive visualizations very simple to use.

## Q&A

### Q: How difficult is it to create a Quantum Mobile?

A: Relatively easy. It's fully automated via [ansible](#) recipes, to recreate it from scratch. It might need a couple of days to get fully confident with the syntax and the tools. However, for small incremental changes to already-published Quantum Mobiles, one can just start it, run the modifications (install codes, remove others, add files, ...) and then recreate a new image (OVA) via a few clicks via the VirtualBox interface.

**Q: what could be kept/extracted from the video/personalized Q&A sessions (same for problem sets etc...)? In principle there is a lot of content, but it needs to be distilled. The questions will be much more appropriate for generic audiences, and more grass roots.**

A: The suggestion in our case is to tell people to \*always\* write the questions first in the chat, even before asking. In this way tutors can then answer questions offline, and publish FAQs.

Additional comment from one of the participants: the time zone issue is exactly the reason why an online course that addresses the world should be asynchronous.

**Q: Is there potential to make events quite different - e.g. “flipped” presentations - presentations recorded or short papers written before the event. Fast presentation at event - “pecha kucha” style (<https://en.wikipedia.org/wiki/PechaKucha> 20 slides, 20 second each, automatic progression) and then more time for discussion. (Could also be the basis for an asynchronous conference - <https://disqus.com/> forum with each presentation)**

A: Interesting comments. I'm not an expert of Pecha Kucha. For conferences, an asynchronous event could be very good. For a hands-on, I think there is value in real-time support and answer to questions (we anyway publish all material offline as well, but the question-answering is the added value of the actual event).

**Q: For larger events one can collect questions (many may overlap) before or after and then have a separate session after or prepare the session with questions in mind.**

A: Indeed, this is a good suggestion.

**Q: is there a tool for “joinable” thematic breakout rooms, where interested parties can join, at least to listen, if 2-3 people are discussing eg installation or something specific.**

A: I'm not aware. Also, if possible, I would minimise switching between different videoconference software too often, as this might be confusing to people. I'd be happy to know about such tools!

**Q: Has anyone any ideas on how to recreate the social aspect - e.g. having a meal together?**

A: This will be discussed in the next session.

**Q. have you thought about dockers? would it be an alternative to vm (for the low resources problems)?**

A: We did. However, docker has the disadvantage that requires a minimal level of technical expertise to run (install docker - with the added complexities if the host is not Linux, even if now things are much easier), start from the command line, understand how to connect to it, ...; moreover a VM gives a more intuitive “desktop user interface” that for some type of hands-on is better.

We tried once with docker, but the experience with the students was less smooth than with VMs.

Another thing we often do is to start VMs (with or without docker, it does not matter as long as the students don't notice) on cloud systems (we tried Amazon AWS), and give access to one person per VM. This works well for tutorials on command-line software (or software that can be run in Jupyter). The setup is limited to configuring the SSH connection (or even just connecting to Jupyter if one wants to stay in the browser - but (important) one needs to ensure that all students have a recent browser!! Jupyter does not work well on old ones). Using cloud machines worked always extremely well.

**Q: Have you considered running the workshop over a longer period. For instance, if you did the first half at the start of the month and the second half at the end of the month the students could work on a more-difficult project in the intervening time?**

A: We never tried yet, as we didn't yet “design” the events to be virtual online events. But this seems a very good suggestion!

**Q: Would your conclusions regarding a School also apply to a research conference?  
(Where adversarial combat can be an important feature!)**

A: Only some of them. Probably for conferences it might be better to pre-record videos, and have instead longer Q&A sessions?