Chat transcript of answers to questions posed in Session 7 (2020-04-24) in the Bachelor's course in Mathematics and Mathematical Statistics <u>MATK11/MASK11/NUMK11</u>

Question 1:

In what way can it be relevant to talk about gender and sustainability for mathematicians?

- It is not relevant since students like me studying algebra which is a very abstract part of math do not know exactly how our knowledge can be used in real Life and sustainability. Since i am still in Bachelor level
- Maybe students on a higher level do have more knowledge that can be used. But not really in my level.
- It depends on which branch of mathematics but doing maths does not in itself require any resources or affects the world.
- It appears so disconnected from reality that pure mathematics appears to have no influence, as there are so little people who can actually understand what is written in papers and publications.
- The only thing that comes to mind would be that it could be argued to hinder further explorations, of some kinds, if so deemed by gender/sustainability -guestion.
- The only thing that comes to mind would be that it could be argued to hinder further explorations, of some kinds, if so deemed by gender/sustainability -question
- Studying mathematics does not consume much resources. Hence our responsibility against society is not that strong.
- Focusing on immediate applicability of mathematical research limits the theoretical developments one might go to, should they not prove immediately useful, despite the fact that they may very well find uses in more applicable areas in the future. Discussing sustainability as a (theoretical) mathematician could end up problematic when one's area of research is currently as far removed from 'reality' as research could possibly be, ignoring the steps it might serve to advance the subject to some sort of result which MIGHT be applicable to reality. On the other hand, not all work needs to have any consequence on society to begin with just as there can exist "art for the sake of art" (not necessarily in the cultural sense: A movie could be made solely to be enjoyed and not for the purpose of making a point), there can exist "research for the sake of research", which only serves to bring more knowledge to society as a whole, regardless of how its applications in the real world.
- Possible argument is that mathematics should be as objective as possible and gender/sust could be considered to be subjective. The research itself should not be directed toward gender/sust but the results can be applied.
- Since pure mathematics usually needs a chain of interpreters, for example first a physicist using the the maths, to develop a theory, then a engineer using what the physicist developed and then a manufacturer uses the engineers interpretation, it seems reasonable that the responsibility for the impact is not with mathematics but somewhere else in the chain of interpretation
- I think that the mathematics that we learn in our bachelor program are taught in a way that is abstract and most of the time, we do not know how to apply the math we learn in reality. In that sense, it is hard to discuss sustainability for society.
- Sustainability is largely revolved around economics and natural sciences, both of which rely on mathematics quite heavily. Due to the often unclear applications of mathematics it is particularly important to discuss the applicability of mathematics.

Question 2:

You can argue both that mathematics stand above societal issues like gender and sustainability and that it is very relevant. Think of arguments for both standpoints.

- It is known that math is used always in physics and engineering. Physics indeed is a major subject to understand things that happen in nature, environment, climate change and so on....
- I could imagine the hair ball theorem to have some implication for meteorology.
- It is relevant to the student, since the theoretical methods can be applied for better sustainability.
- Interesting point regarding gender: During my exchange in Jordan, there were almost only female students at the mathematics lectures.
- Same in Lebanon.
- It is important both talking about who is doing mathematics but also what impact does the research it self have on gender issues. I think as a citizen in a society where gender inequalities exist (everywhere to different extents) these issues should be influencing what you do, whether you are a mathematician or not.
- Mathematics could be said to be the opposite of social sciences. Gender issues are very much a social issue.
- Its relevant since if one of the genders is made less likely to study the subject due to the atmosphere or prejudice, then great thinkers might be lost. Seemingly, since pretty much all famous mathematicians from many hundreds of years ago were men, it makes statistical sense that half of the mathematicians on the level of Euler did not have a chance to florish in the subject.
- I think that the fact that more men (well mostly theorem's are named after men) have done mathematical research through history definitely has influenced what type of research, what focus etc and also theory it self is affected by gender issues
- (In direct response to the above) How can a theory, that exists "naturally" be affected by gender?
- (In direct response to the above) I think it's wrong to think that theory isn't affected by this "gender unbalance".
- (In direct response to the above) Does it exist "naturally"? At least the aim of the theory is affected, I think.
- (In direct response to the above) Well I think it exists "naturally" it's just somebody discovering.
- I think the point is that we do not know, since we did not have a lot of female mathematicians, we sort of don't have any 'data' to infer from.
- I would say that mathematics does not only consist of the theory, but also of the language to formulate it (and just read some proofs from the time before there was formula notation in place to see how different this language can be). I could imagine that the language could be very different and that would also effect the direction of new research.