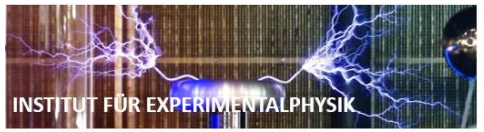

Universität Hamburg
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CLUSTER OF EXCELLENCE
QUANTUM UNIVERSE

The ESSvSB Workshop

(Towards a participation of the German physics community in a long-baseline neutrino project in Europe)

Tamer Tolba

Universität Hamburg
October 8 – 9, 2020

Workshop Webpage:
https://www.conferences.uni-hamburg.de/event/129/overview

Workshop Objective

- The observation of massive neutrinos was one of the crucial scientific findings that opened a new era for the physics beyond the SM.
- The recent T2K experiment claim on the CP-violating phase in neutrino oscillation, where they disfavored almost half of its possible values at the 99.7% (3σ) confidence,
  - ➔ paved the way for the next generation neutrino experiments where the exploration of all related parameters at the highest precision scales became their fundamental goal, especially the long-baseline accelerator-based projects.
- Germany plays a significant role in the fields of particle and astroparticle physics, especially neutrino physics.
- German particle/astroparticle physics activities*

➢ cover wide range of fundamental high-energy, particle and astroparticle physics disciplines e.g. LHC-HEP, rare decays, DM, neutrino, heavy ions, anti-matter, cosmic rays, …,

➢ hosts/participate-in world class experiments in the field of neutrino physics e.g. KATRIN, ICECube, HESS, CTA, MAGIC, GERDA, Double Chooz, JUNO, T2K, XENON, …

➢ However, … **NOT** involved in any of the next-generation long baseline experiments!

The objective of this workshop is…

➔ Establish communication between the German particle physics community and the scientists of the ESSνSB project

➔ Discuss new and world-leading programme of intensity Frontier Particle Physics

* sources:
https://indico.cern.ch/event/489996/contributions/2299386/attachments/1343195/2023670/Zeitnitz.pdf
https://www.desy.de/~schleper/talks/RECFA_KET_Schleper.pdf

Workshop Agenda

Day 1 (Thu. 8 Oct 2020, 10:00)

➔ **Morning session:**

- Introduction to the workshop.
- Theoretical insight to the *ν*-oscillation phenomenology.
- Introduction to the ESS facility.
- Introduction to the ESS*ν*SB project.

➔ **Two afternoon sessions:**

- Introduction to and updates on the role and activities of the ESS*ν*SB work groups.
- Short summary of the first day.

Welcome and the objective of the workshop	*Tamer Tolba*	10:00 - 10:15
Neutrino oscillation phenomenology	*Prof. Silvia Pascoli*	10:15 - 10:45
European Spallation Source (ESS) facility	*Prof. Mats Lindroos*	10:45 - 11:15
The ESS neutrino Super Beam	*Prof. Marcos Dracos*	11:15 - 11:45
Break (Lunch)		11:45 - 13:30
ESS linac for ESSnuSB	*Dr Mamad Eshraqi*	13:30 - 13:50
The ESSnuSB accumulator design	*Dr Ye Zou*	13:50 - 14:10
The ESSnuSB Target Station	*Dr Eric Baussan*	14:10 - 14:30
Break		14:30 - 15:00
ESSnuSB near and far detector technology/strategy	*Dr Budimir Kliček*	15:00 - 15:30
ESSnuSB physics reach	*Dr Salvador Rosauro*	15:30 - 16:00
Short summary of the first day	*Tamer Tolba*	16:00 - 16:15

Workshop Agenda…

Day 2 (Fri. 9 Oct 2020, 09:30)

➔ **Two morning session:**

- Introduction to and updates on the German involvements in neutrino projects that are related and/or of a technological interest to the ESS*ν*SB project.

➔ **Afternoon session #1:**

- The future opportunities with ESS that are related to the ESS*ν*SB experiment.

➔ **Afternoon session #2:**

- Summary on the status of the ESS*ν*SB project.
- Open discussion. (Please suggest discussion topics/questions and send them to me directly before the 2nd afternoon session)

Introduction to the second day	*Tamer Tolba*	09:30 - 09:45
First results of KATRIN on the neutrino mass and the search for light sterile neutrinos	*Dr Thierry Lasserre*	09:45 - 10:15
The T2K experiment	*Prof. Stefan Roth*	10:15 - 10:45
Break		10:45 - 11:00
The Deep Underground Neutrino Experiment DUNE - Overview & Prospects in Germany	*Prof. Frank Simon*	11:00 - 11:30
THEIA: An advanced hybrid neutrino detector	*Prof. Michael Wurm*	11:30 - 12:00
Break (Lunch)		12:00 - 13:30
Muon Collider	*Prof. Carlo Rubbia*	13:30 - 13:50
Neutrino coherent scattering experiment at the ESS	*Prof. Juan José Gómez Cadenas*	13:50 - 14:10
nuSTORM	*Prof. Jaroslaw Pasternak*	14:10 - 14:30
Decay at rest	*Prof. Janet Conrad*	14:30 - 14:50
Break		14:50 - 15:10
The High Intensity Frontier Initiative based on ESSnuSB	*Prof. Tord Ekelöf*	15:10 - 15:30
Open discussion	*Ali*	15:30 - 16:30
Summary of the workshop and closing session	*Tamer Tolba*	16:30 - 16:45

Some zoom meeting regulations

- All audience, please mute your microphones and cameras during the talks, unless you are speaking.

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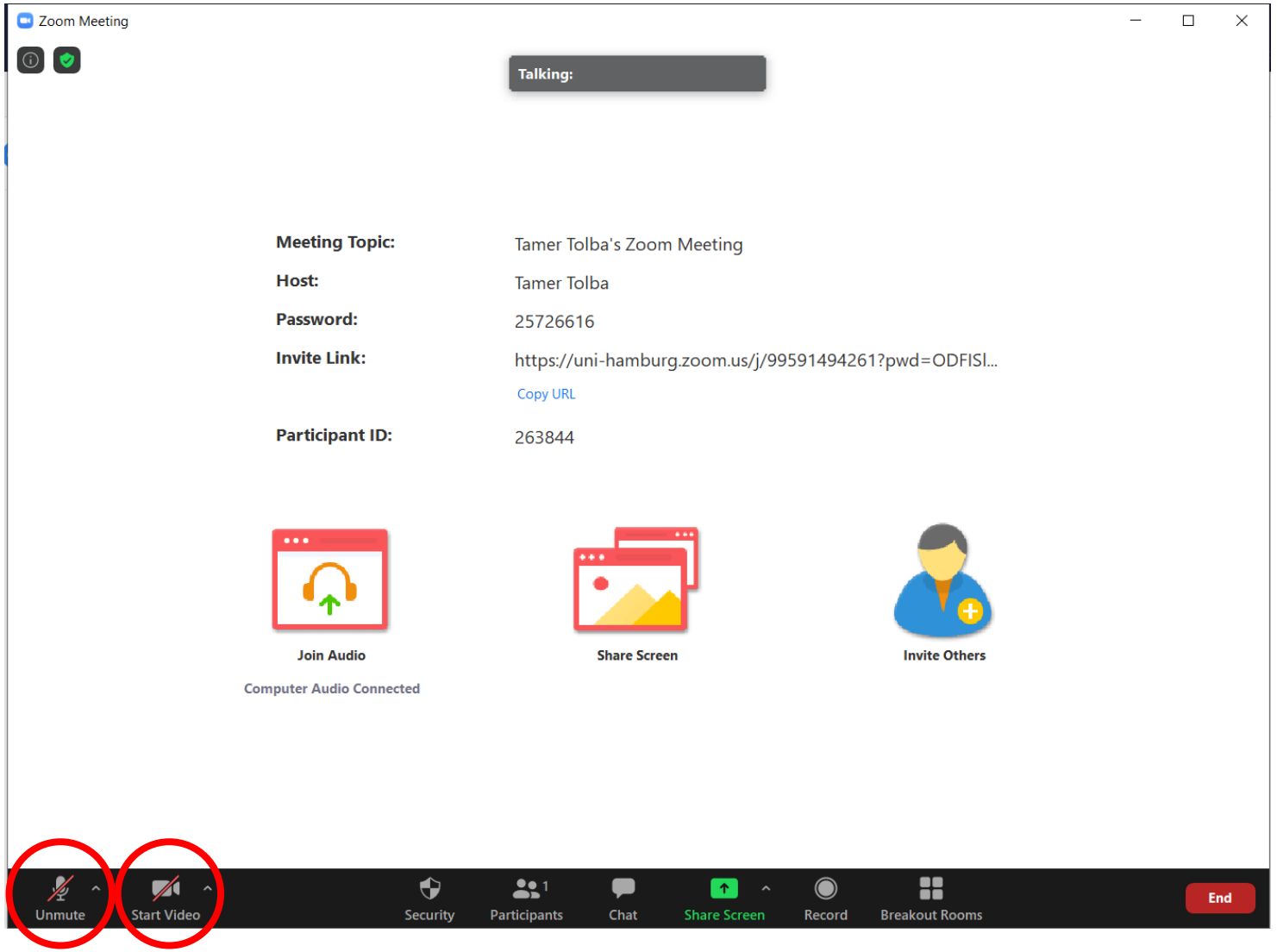

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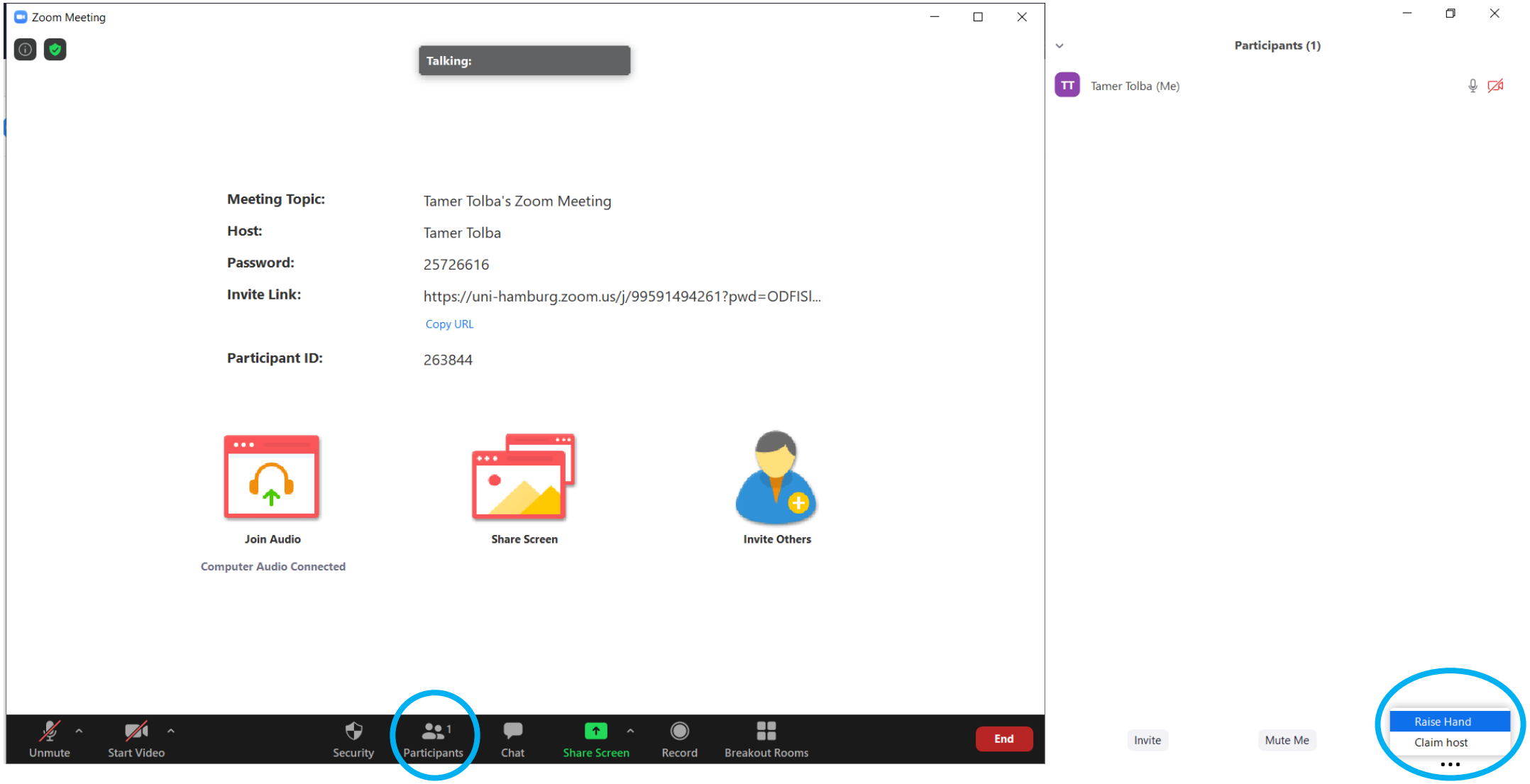

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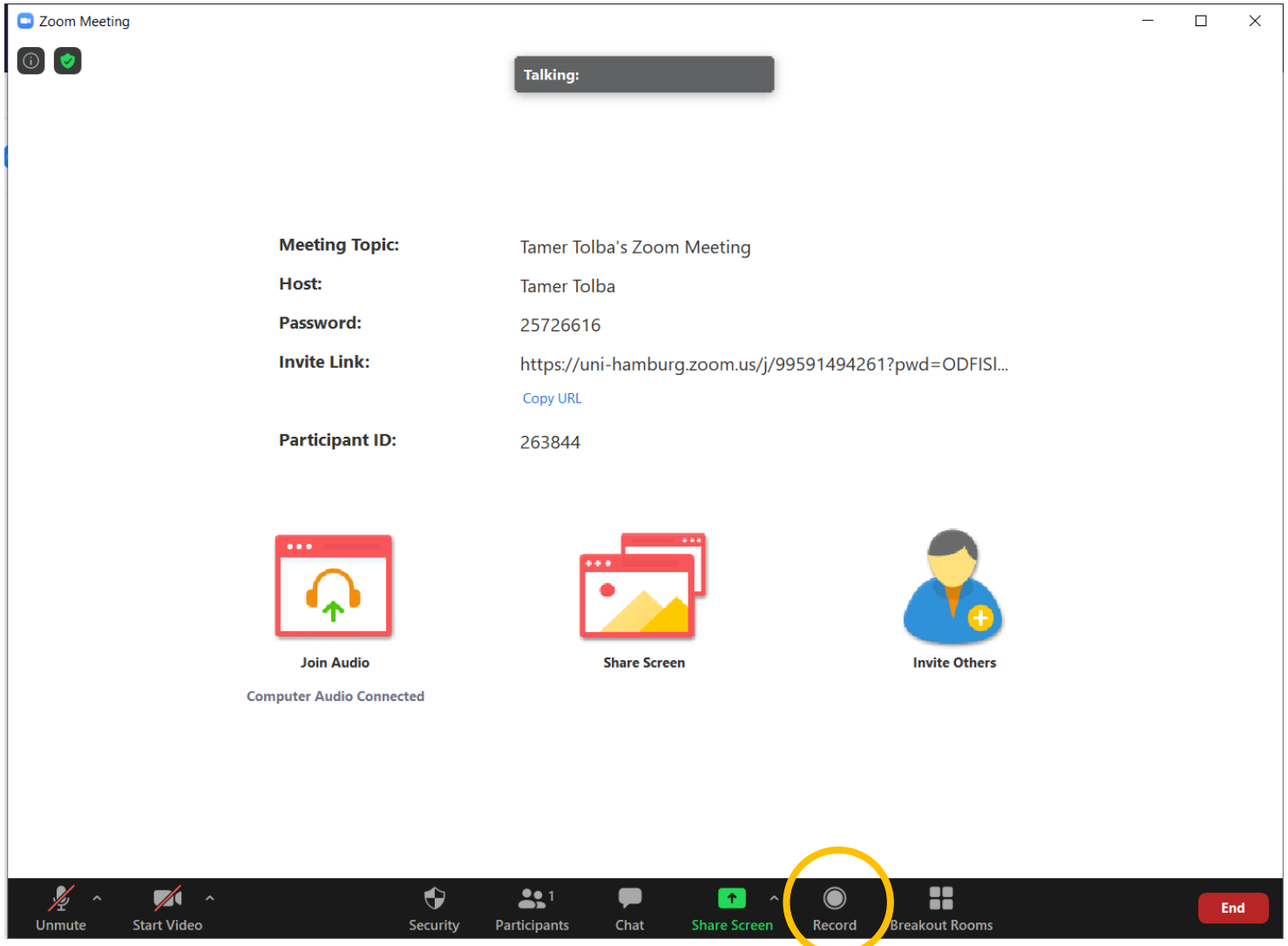

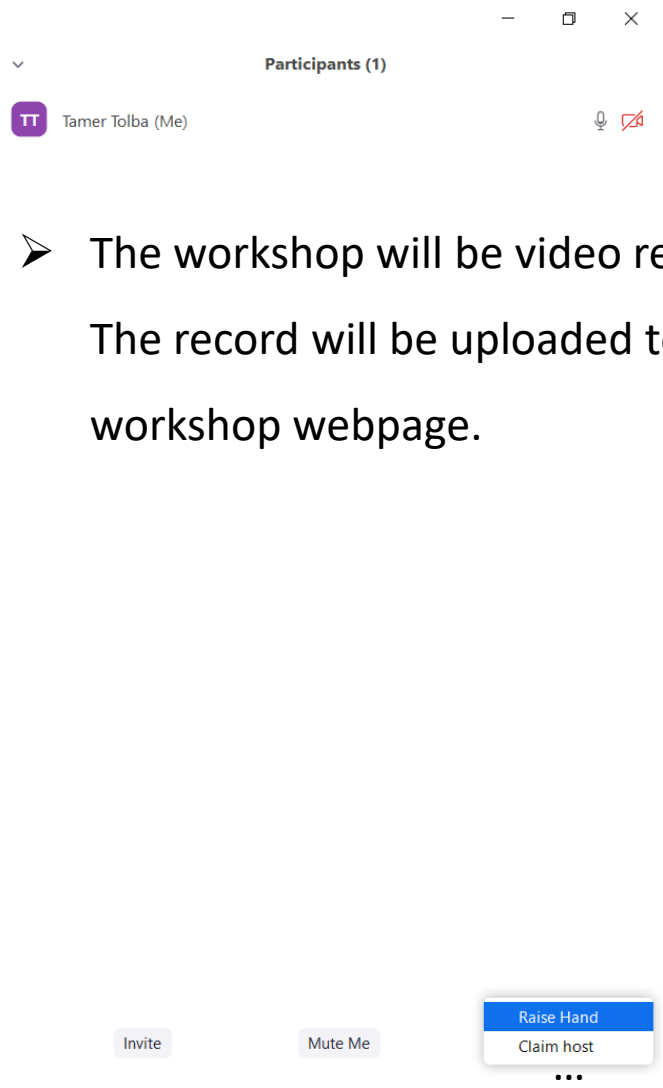

- The workshop will be video recorded. The record will be uploaded to the workshop webpage.