Snapshot story of EBSN2021

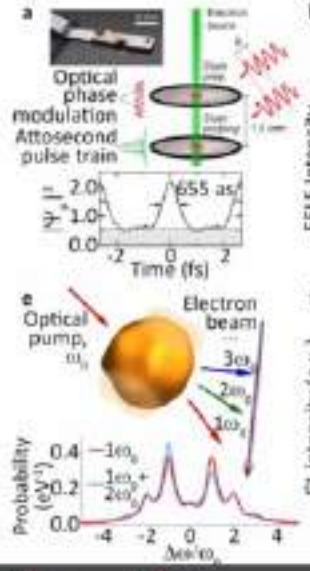
- Few zoom moments picked up randomly…

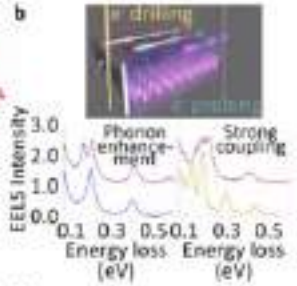
Nahid Talebi’s introduction

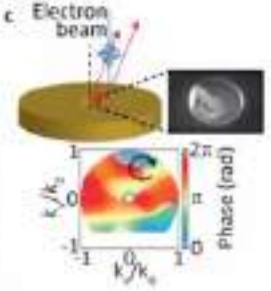

LIVE
sur Personnaliser le service de rediffusion en direct
Affichage
Electron Beam Spectroscopy 1
Nano-Optics · 14th - 15th June, 20
Mathieu Kociak
CNRS, FR
Nahid Talebi
Kiel University, DE
Mathieu Kociak
Neus Pons_Fundació Scito
Albert Polman
Peter Hommelhoff
Nahid Talebi
Scito
Activer
Démarrer vidéo
Participants
Converser
Partager l'écran
Enregistrer
Lever la main
Quitter

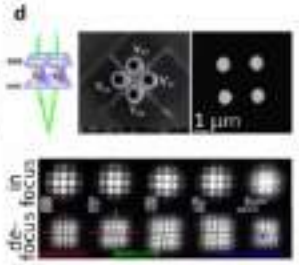
eBEAM Consortium and Aims

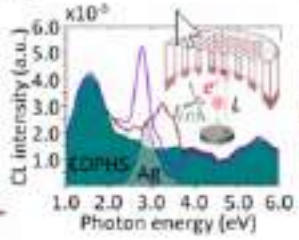
https://www.e-beam.eu/





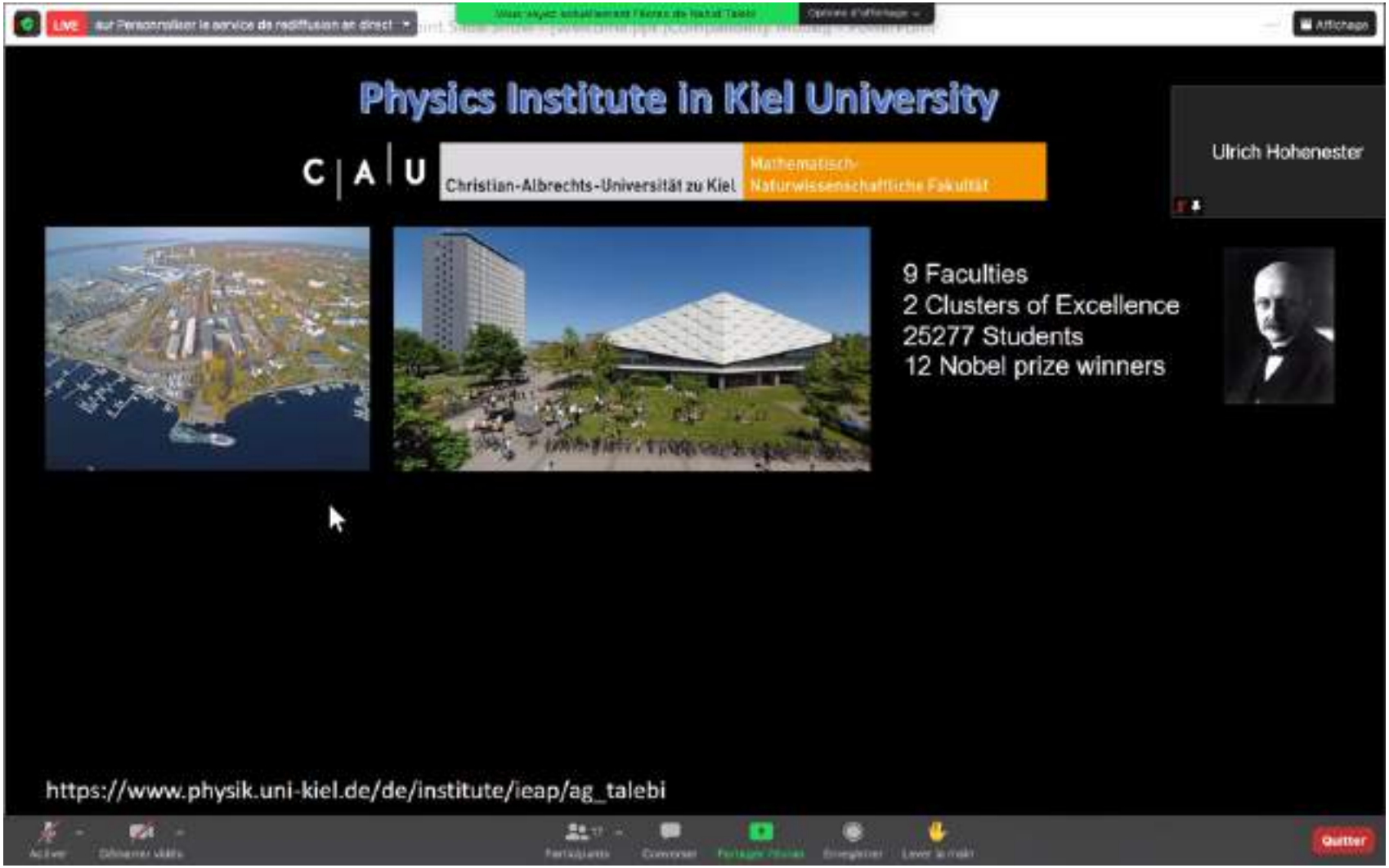






The **eBEAM** project will:

1. Extend the range of spatially and temporally resolved spectral electron microscopy
2. Demonstrate application potential in renewable energy, semiconductor metrology, materials science, and life sciences
3. Develop prototype hardware components that will lead to commercial products to be retrofitted in commercial EMs



In real life, it should have been in Kiel… too bad!

Our Booming Field!

Enjoy the Conference!

La parole est à : Nahid Talebi

EELS

CL

PINEM

Several EU programs
eBEAM, ONEM,
SMART-electron,
QSORT

Quantum technology

Atomic-scale spectroscopy

Electron-beam shaping

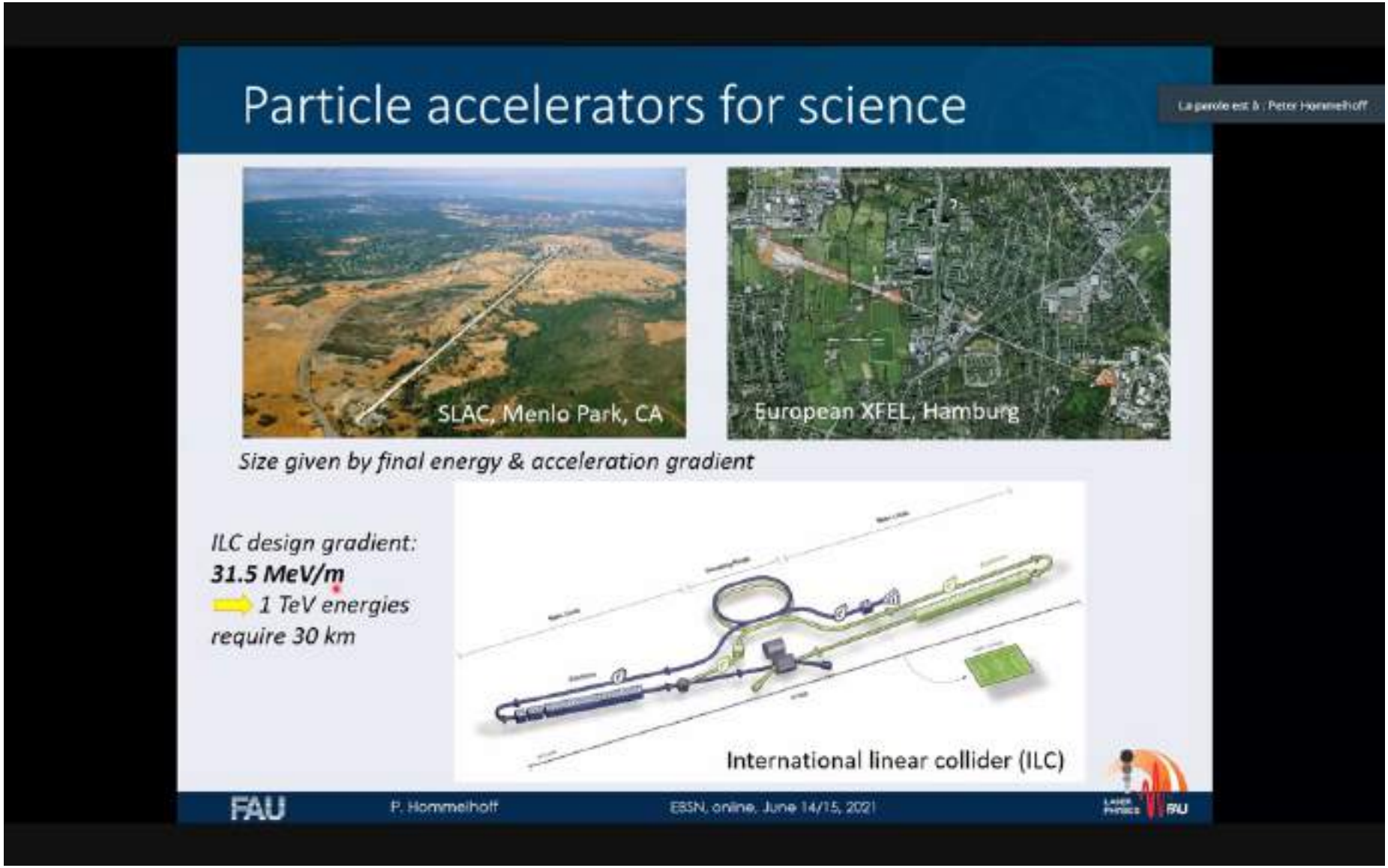
Ultrafast dynamics

Mon Jun 14 2021		
13:00 - 13:10		Introduction
	Session 1A - Swift electron-light interactions	
	Chair: Albert Polman	
13:10 - 13:35 Interactions-I1	Hommelhoff, Peter	Electron phase space control on a nanophotonic chip
13:35 - 13:40		Discussion
13:40 - 14:05 Interactions-I2	Konečná, Andrea ICFO-Institut de Ciencies Fotoniques, The Barcelona Institute of Science and Technology	Electron beam aberration correction and shaping using optical fields
14:05 - 14:10		Discussion
14:10 - 14:20 Interactions-O1	Feist, Armin University of Göttingen	Continuous-Wave Optical Phase Modulation of Electron Beams Using Chip-based High-Q Microresonators
	Feist, Armin University of Göttingen, DE	
14:20 - 14:25		Discussion
14:25 - 14:35 Interactions-O2	Dahan, Raphael	Imprinting the quantum statistics of photons on free electrons
14:35 - 14:40		Discussion
14:40 - 15:00		Break
15:00 - 16:20		ePoster Session

Peter Hommeloff

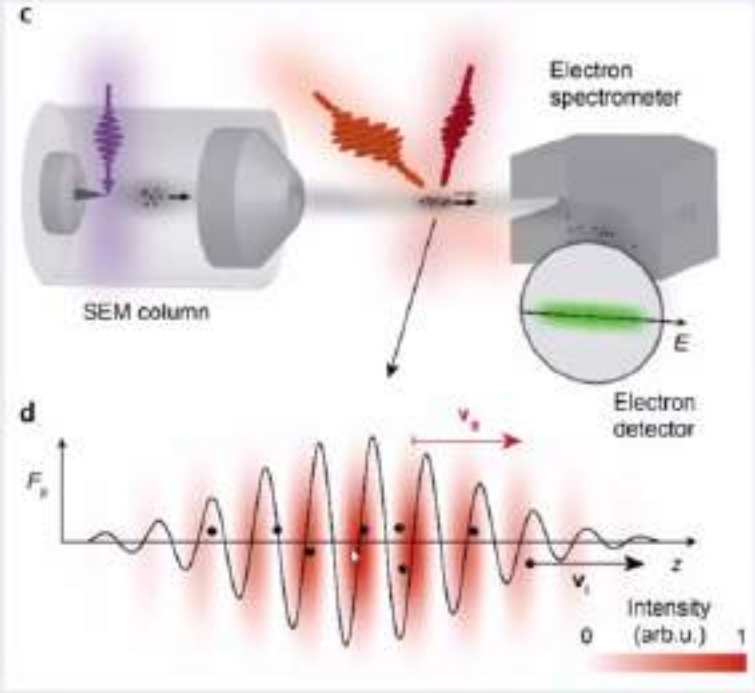
- (Albert Polman chairing the first session)

Peter ’s microscope: maybe too big for our labs? ;)



Inelastic ponderomotive electron scattering

La parole est à : Peter Hommelhoff



λ_1 = 1356 nm (0.91 eV)
λ_2 = 1958 nm (0.63 eV)
α = 41°
β = 107°

- Forward (longitudinal) momentum change only
- Gradient up to 2.2 GeV/m
- Strong energy modulation imprinted

$$\lambda_g = 2\pi c/(\omega_1 \cos\alpha - \omega_2 \cos\beta) = 1.41\ \mu\text{m}$$

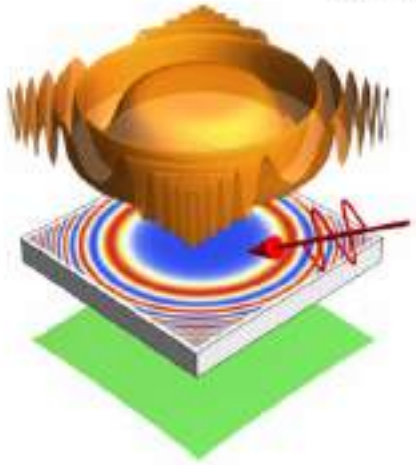
Femtosecond SEM: M. Kozák et al., J. Appl. Phys. 124, 023104 (2018)

Andrea Konecna

ICFO
The Institute of Photonic Sciences

nanophotonics

Electron Beam Aberration Correction and Shaping Using Optical Fields



Andrea Konečná & F. Javier García de Abajo

EBSN virtual conference

14 June 2021

Interaction of fast electrons and light

$$\psi(\mathbf{r}, t) = \psi_i(\mathbf{r}, t)\exp\left[\frac{-\mathrm{i}}{\hbar}\int_{-\infty}^{t} \mathrm{d}t' \hat{\mathcal{H}}_1(\mathbf{r} - \mathbf{v}t + \mathbf{v}t', t')\right]$$

Final electron wavefunction

Initial electron wavefunction

Light-electron interaction Hamiltonian

1. With a scatterer

$$\hat{\mathcal{H}}_1 = \frac{ev}{c}A_z + \frac{e^2}{2m_e c^2 \gamma}\left(A_x^2 + A_y^2 + \frac{1}{\gamma^2}A_z^2\right)$$

2. Without a scatterer (light in free space)

$$\hat{\mathcal{H}}_1 = \frac{ev}{c}A_z + \frac{e^2}{2m_e c^2 \gamma}\left(A_x^2 + A_y^2 + \frac{1}{\gamma^2}A_z^2\right)$$

For details, see:
García de Abajo & Konečná, PRL 126 (2021)
García de Abajo & Di Giulio, ACS Photonics 8 (2021)

Apparently, Andrea wants to make things more complicated ;)

Armin Feist

Armin should teach us how to get embedded …

Raphael Dahan

zoom.us Réunion Voir Modifier Fenêtre Aide — Lun. 14 juin à 14:22

Webinaire Zoom

LIVE sur Personnaliser le service de rediffusion en direct

AdMQuanta

TECHNION Israel Institute of Technology

FAU

UNIVERSITY OF CAMBRIDGE

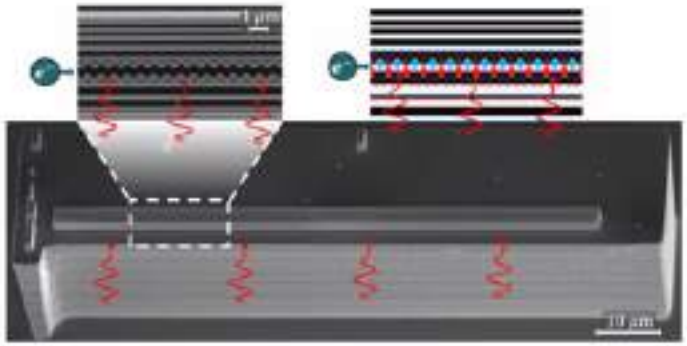
Imprinting the quantum statistics of photons on free electrons

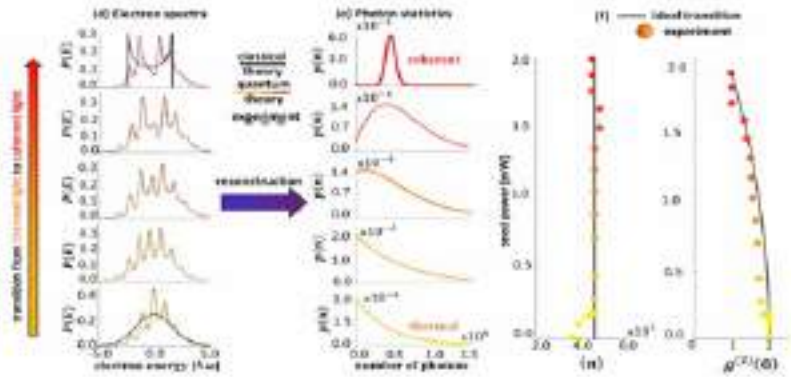
EBSN 2021

Raphael Dahan†, Alexey Gorlach†, Urs Haeusler†, Aviv Karnieli†, Ori Eyal, Peyman Yousefi, Mordechai Segev, Ady Arie, Gadi Eisenstein, Peter Hommelhoff, and Ido Kaminer*

TEL AVIV UNIVERSITY

Fraunhofer ICTS





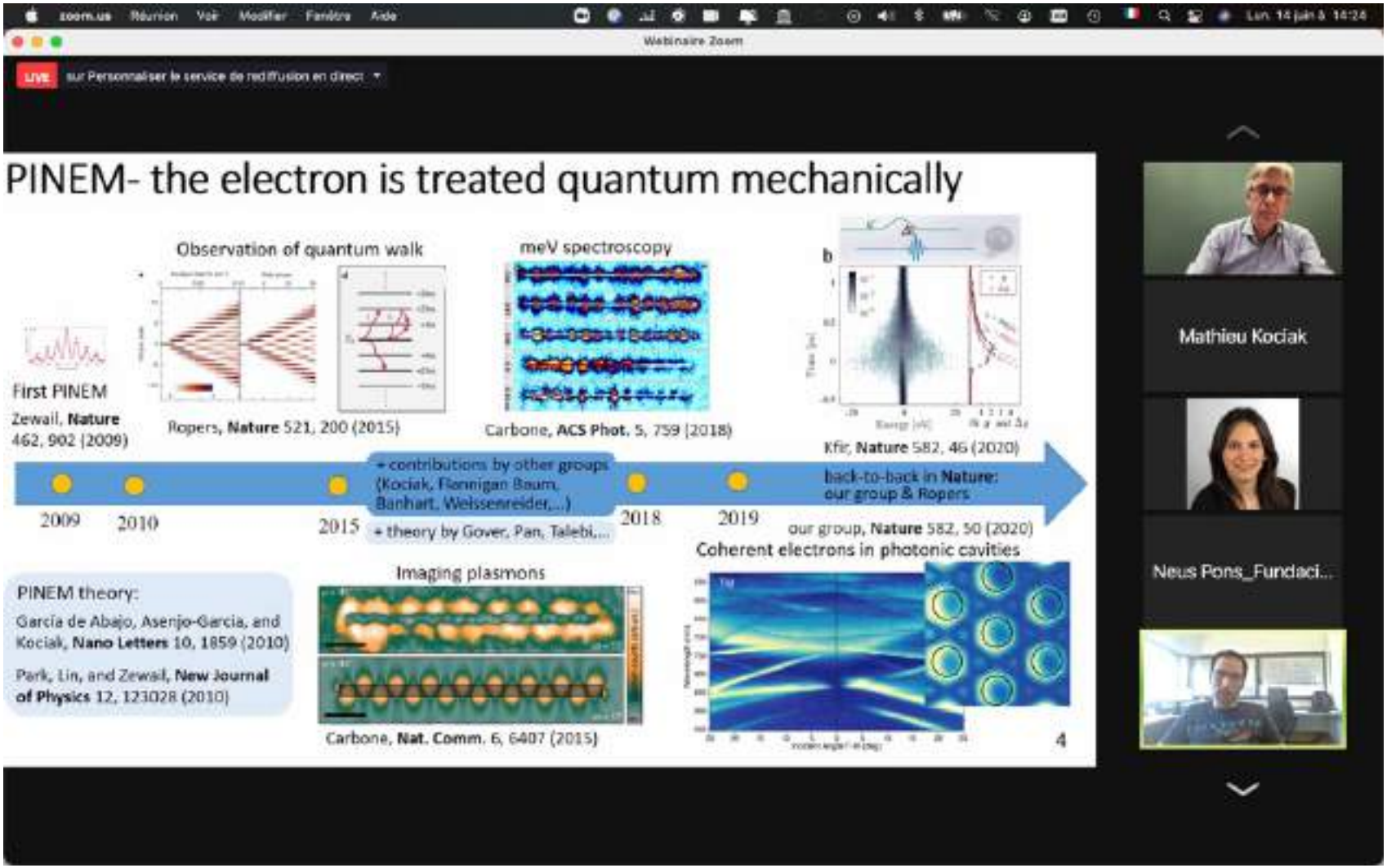
arXiv:2105.03105

Mathieu Kociak

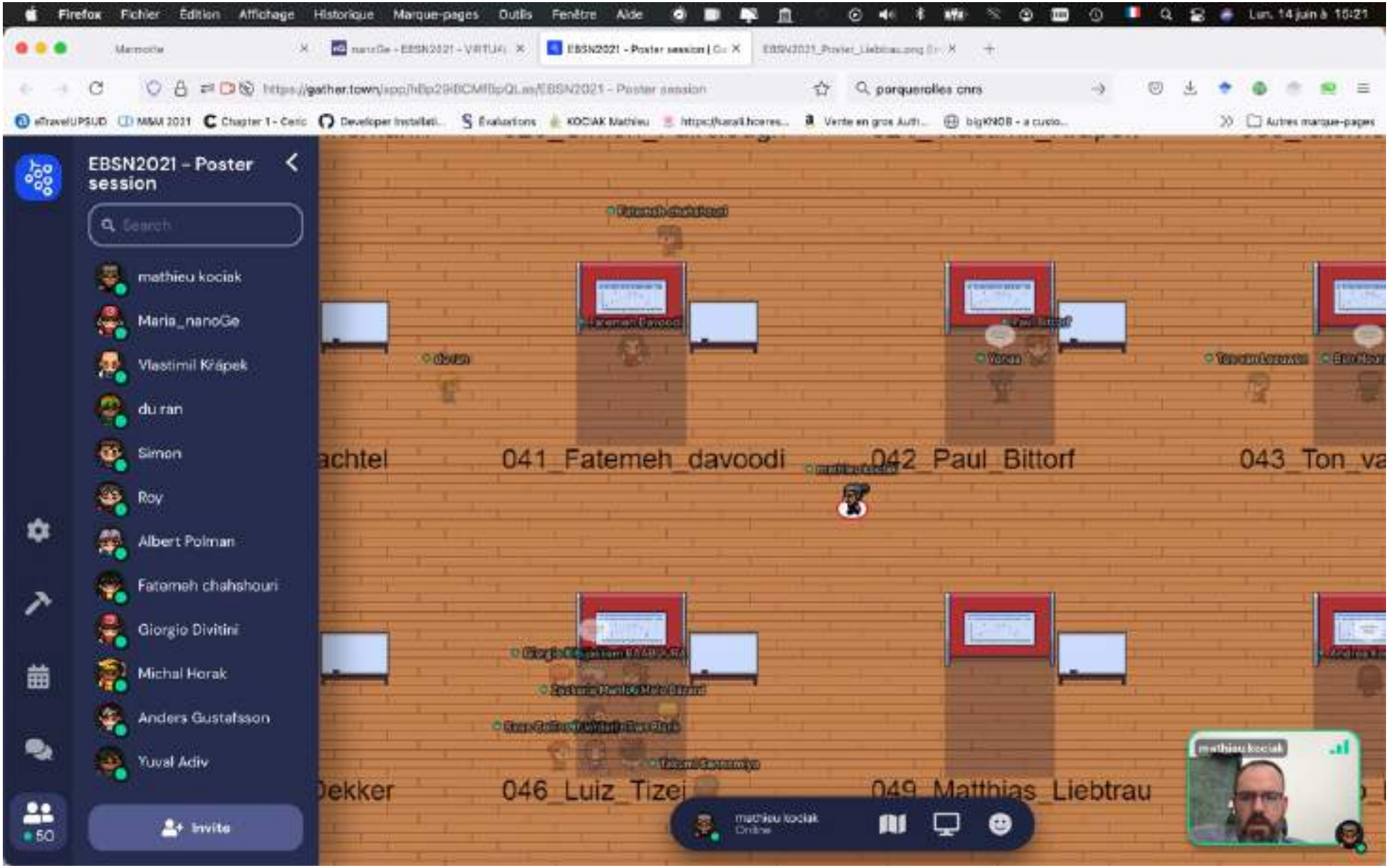
Neus Pons_Fundaci...

Raphael Dahan

A story of PINEM and EEGS …



Poster session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EBSN2021 - Poster session
Search
mathieu kociak
Maria_nanoGe
Vlastimil Křápek
du ran
Simon
Roy
Albert Polman
Fatemeh chahshouri
Giorgio Divitini
Michal Horak
Anders Gustafsson
Yuval Adiv
50
Invite
041_Fatemeh_davoodi
042_Paul_Bittorf
043_Ton_va
046_Luiz_Tizei
049_Matthias_Liebtrau
mathieu kociak
Online

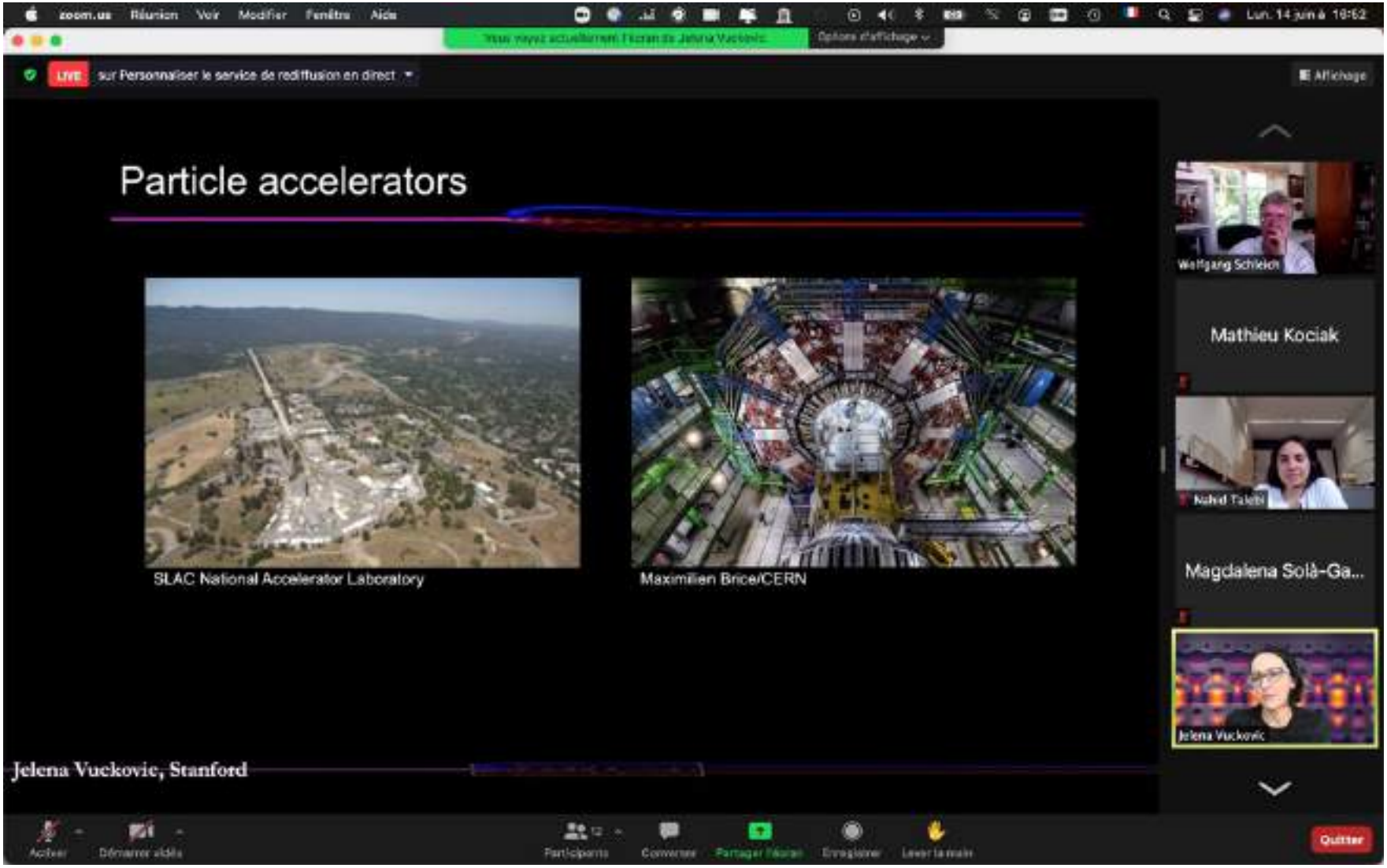
Wolfgang Schleich

- (Nahid Talebi chairing)

Pure quantum optics ahead – electrons guys need to learn …

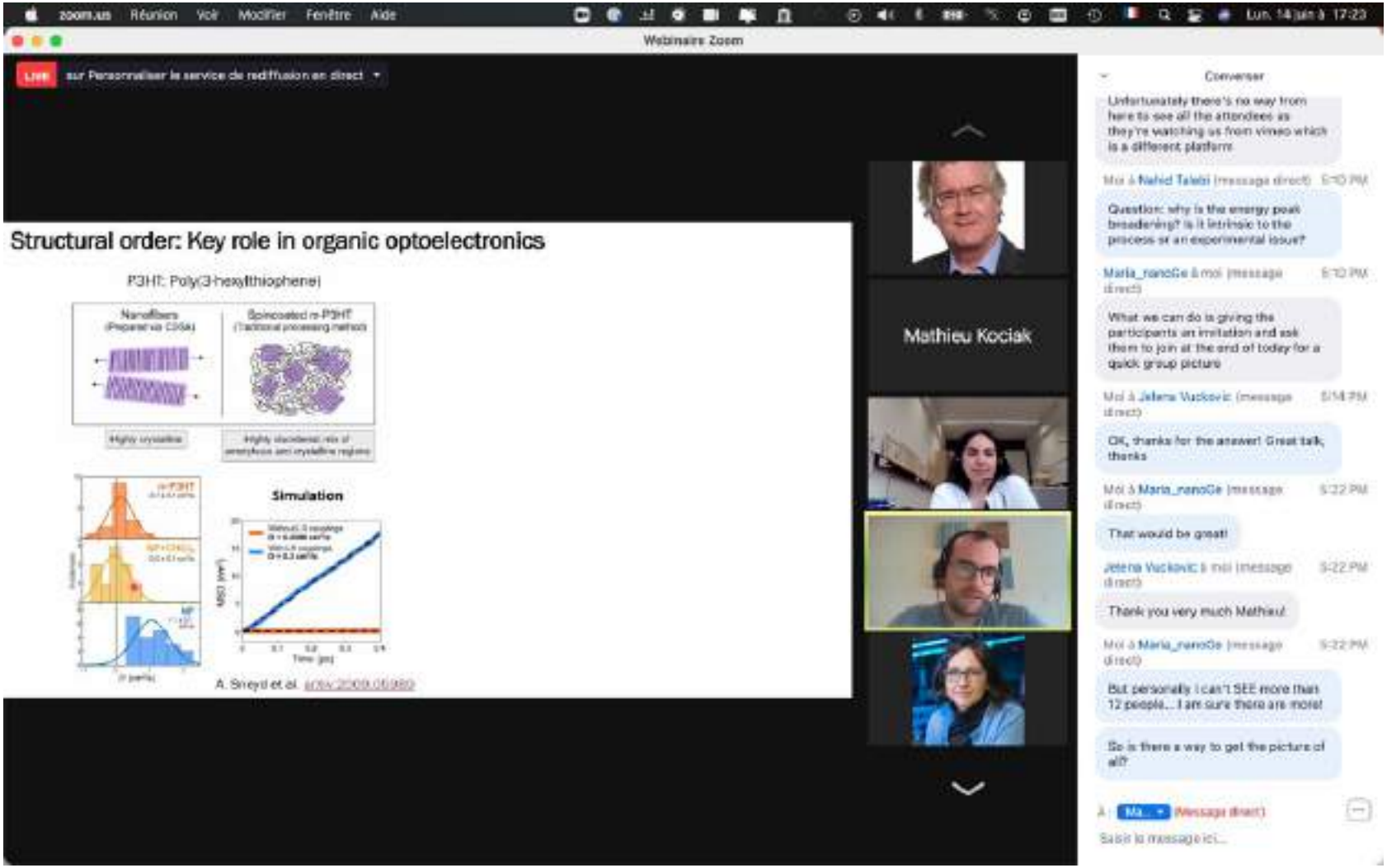
Jelena Vuckovic

Another frightening electron microscope?



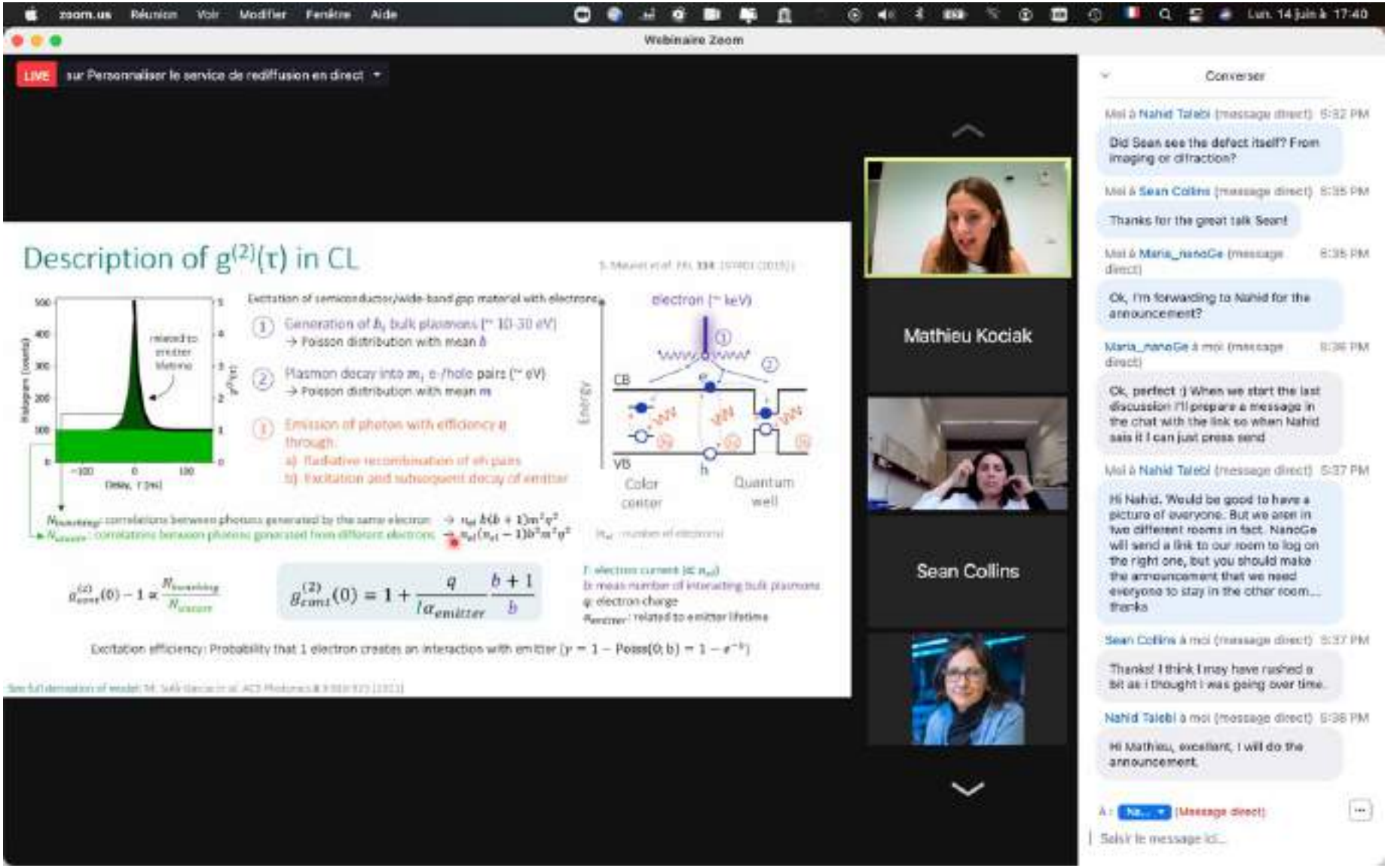
Sean Collins

Sean Collins switches to radically different topics: first material talk!



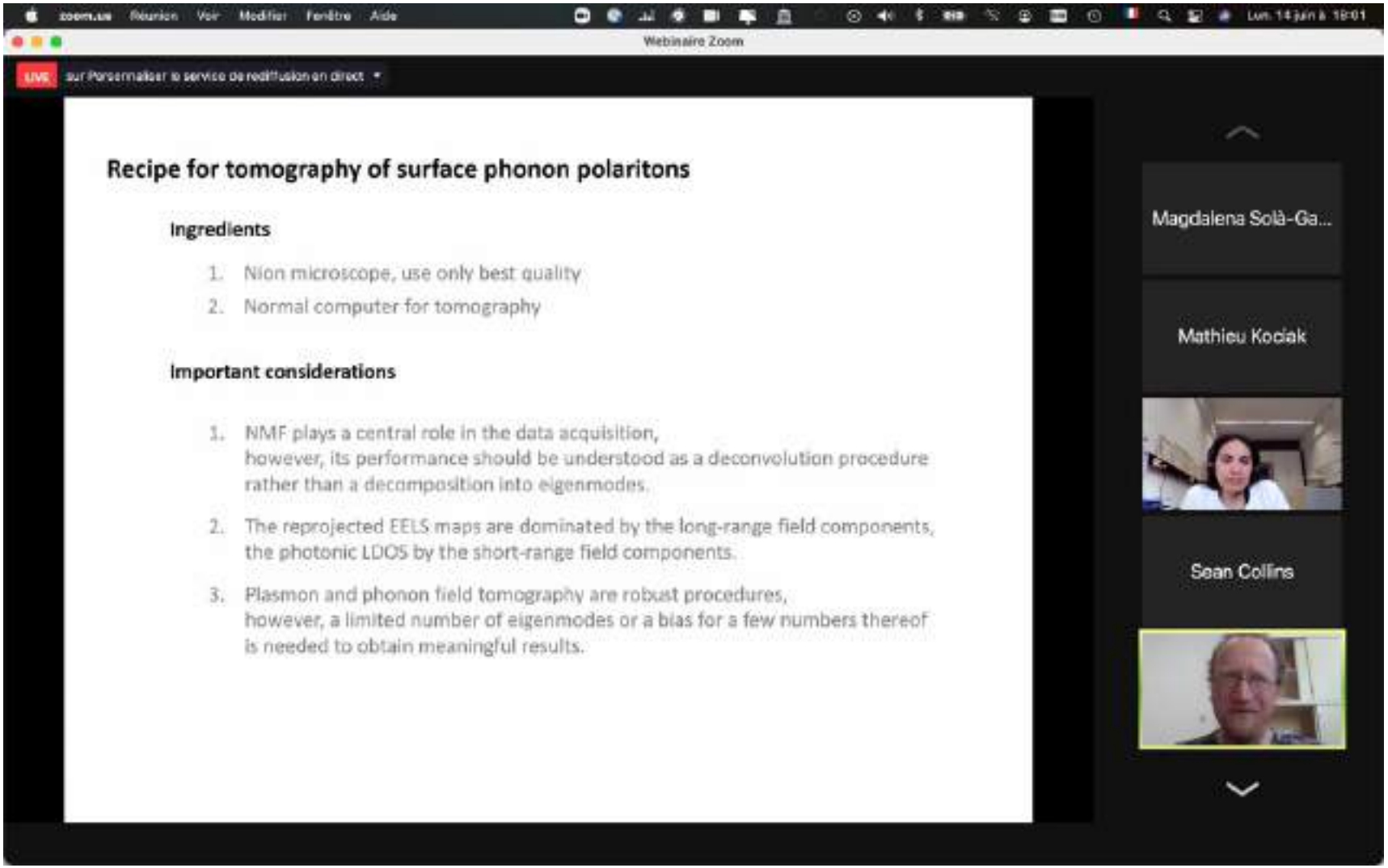
Magdalena Solà-Garci

Complexity made simple …



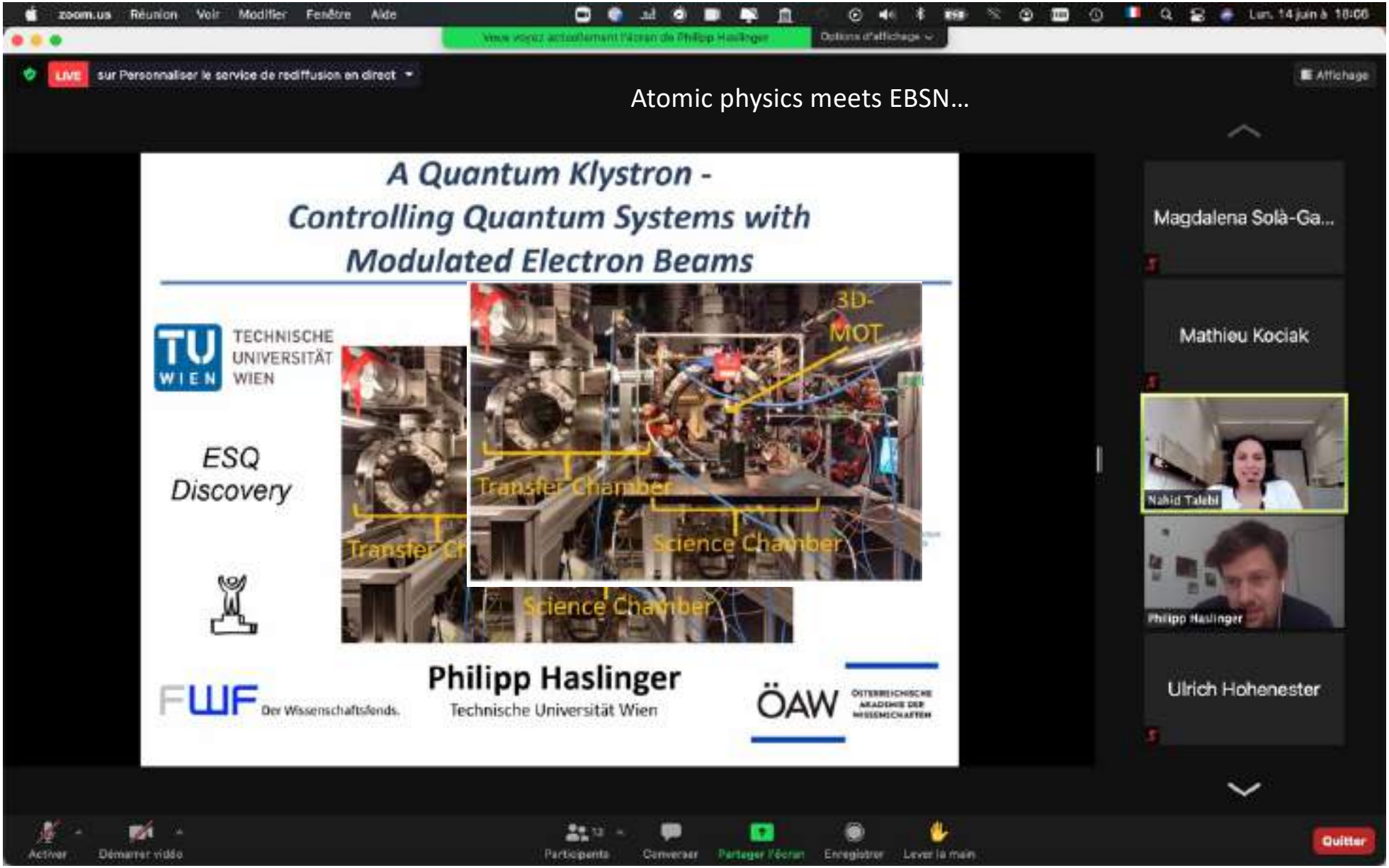
Ulrich Hohenester

Typical Austrian recipe: first, get quality ingredients, then, mix them in a simple and straightforward way to get the best flavors …



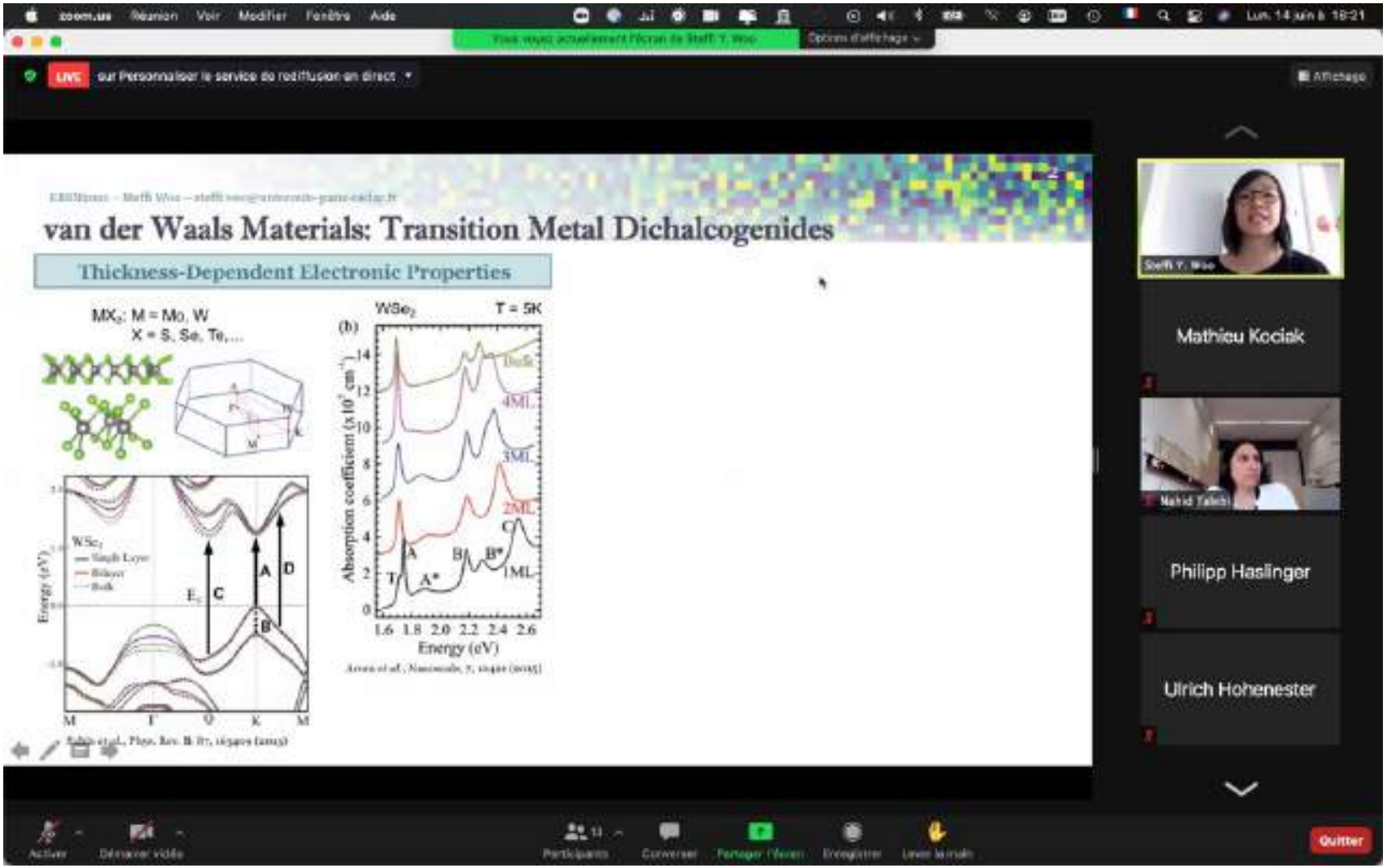
Philipp Haslinger

Atomic physics meets EBSN…



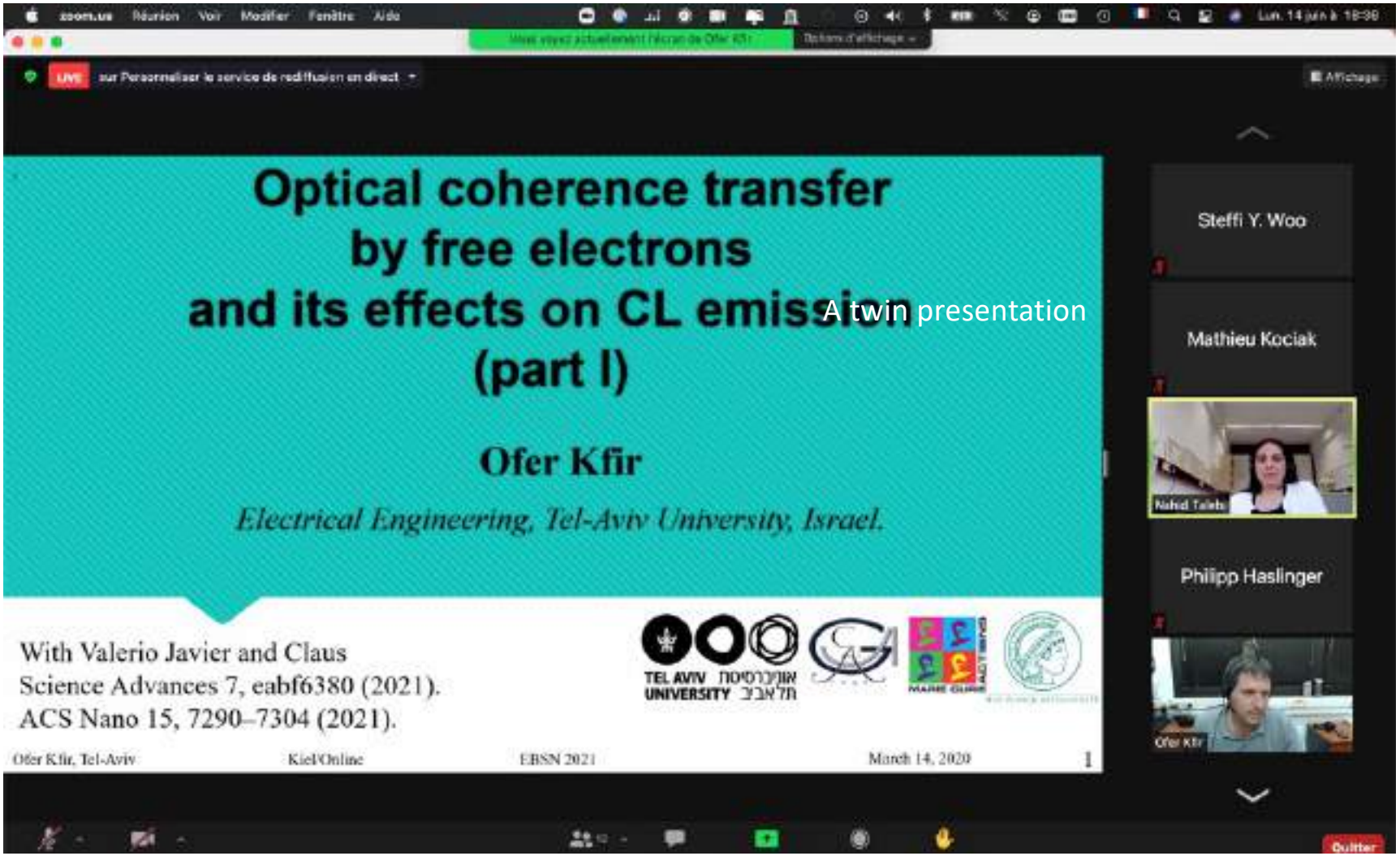
Steffi Woo

First band structure of the conference!



Ofer Kfir/ Valerio di Guilio

Coherence is back, and will last until tomorrow…



A twin presentation

zoom.us Réunion Voir Modifier Fenêtre Aide — Lun. 14 juin à 10:46

Webinaire Zoom

LIVE sur Personnaliser le service de rediffusion en direct

Optical coherence transfer by free electrons and its effects on CL emission (part II)

Valerio Di Giulio[1], Ofer Kfir[2,3], Claus Ropers[3,4] and F. Javier García de Abajo[1,5]

1 – ICFO - The Institute of Photonic Sciences, (Spain)
2 – Tel Aviv University, School of Electrical engineering, Tel Aviv 69978, (Israel)
3 – MPIBPC - Max Planck Institute for Biophysical Chemistry (Germany)
4 – University of Göttingen, IV. Physical Institute (Germany)
5 – ICREA - Institució Catalana de Recerca i Estudis Avançats, (Spain)

Electron Beam Spectroscopy for Nano-Optics · 14th - 15th June, 2021

Science Advances 7, 18, eabf6380, (2021)
ACS Nano 2021, 15, 4, (2021)

ICFO nanophotonics.es ICREA

Email: valerio.digiulio@icfo.eu

Steffi Y. Woo

Mathieu Kociak

Cheers!

- Unfortunately, not everyone could connect…

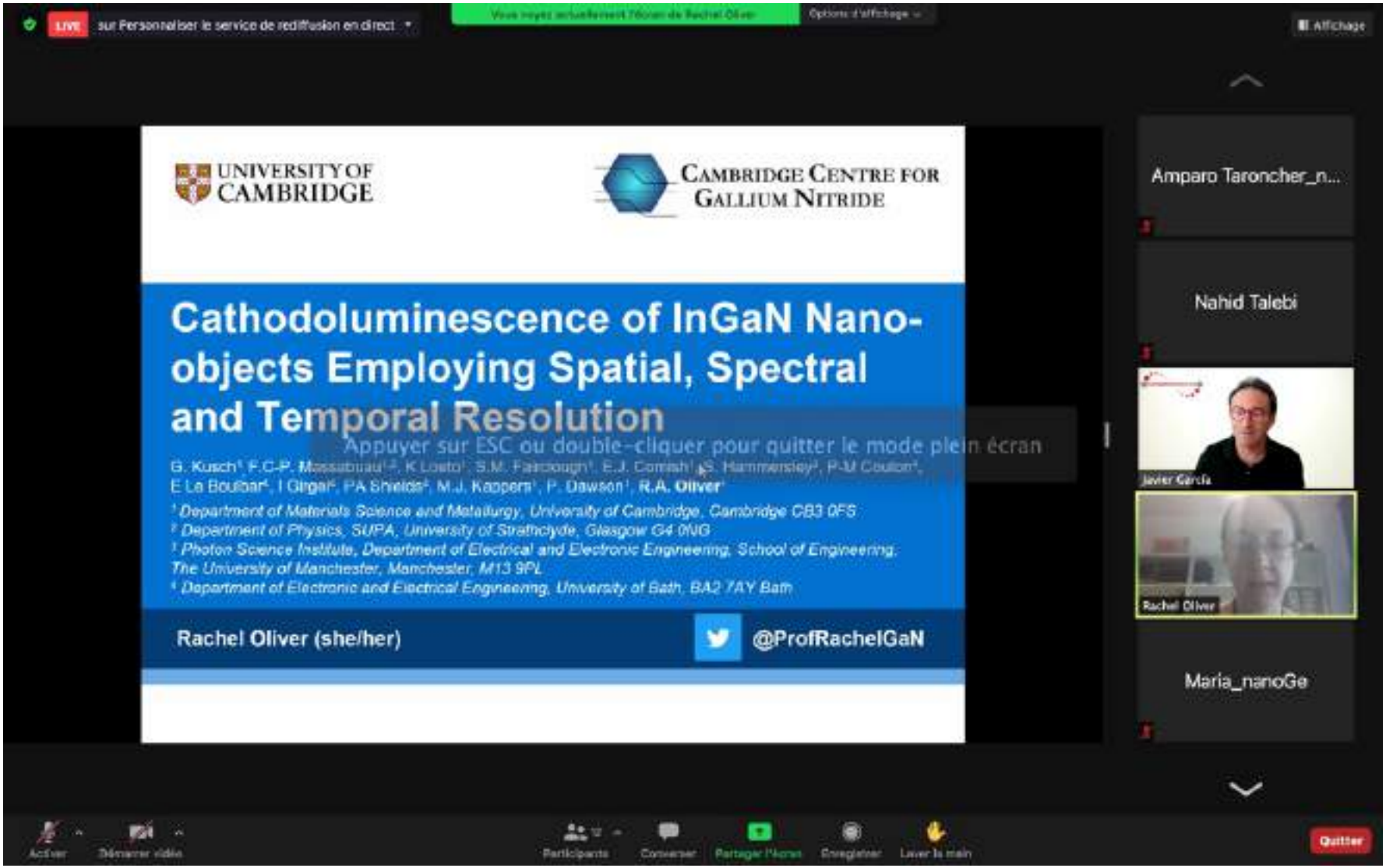

zoom.us Réunion Voir Modifier Fenêtre Aide
Lun. 14 juin à 19:05
Webinaire Zoom
LIVE sur Personnaliser le service de rediffusion en direct
Maria_nanoGe
1/2
1/2


zoom.us Réunion Voir Modifier Fenêtre Aide
Lun. 14 juin à 19:06
Webinaire Zoom
LIVE sur Personnaliser le service de rediffusion en direct
Affichage
Maria_nanoGe
Armin Feist
Ofer Ehr
Ben Hourahine
Anders Gustafsson
Fatemeh Davoodi
Andrea Konečná
Hugo Lourenco Martins
Maximilian Black
Luiz Tizei
Juan-Carlos Idrobo
Jonas Lähnemann
Sean Collins
Michal Horák
Paul Bittorf
S Vadivel
Magdalena Solà-Garci
Matthias Liebtrau
Vincenzo Grillo
Masoud Taleb
Zackaria
Daphne Deisker
Maïo Bézard
fatemeh chahshouri
Dolev Roitman
2/2
2/2
Muet
Arrêter vidéo
Participants
Converser
Partager l'écran
Enregistrer
Lever la main
Quitter

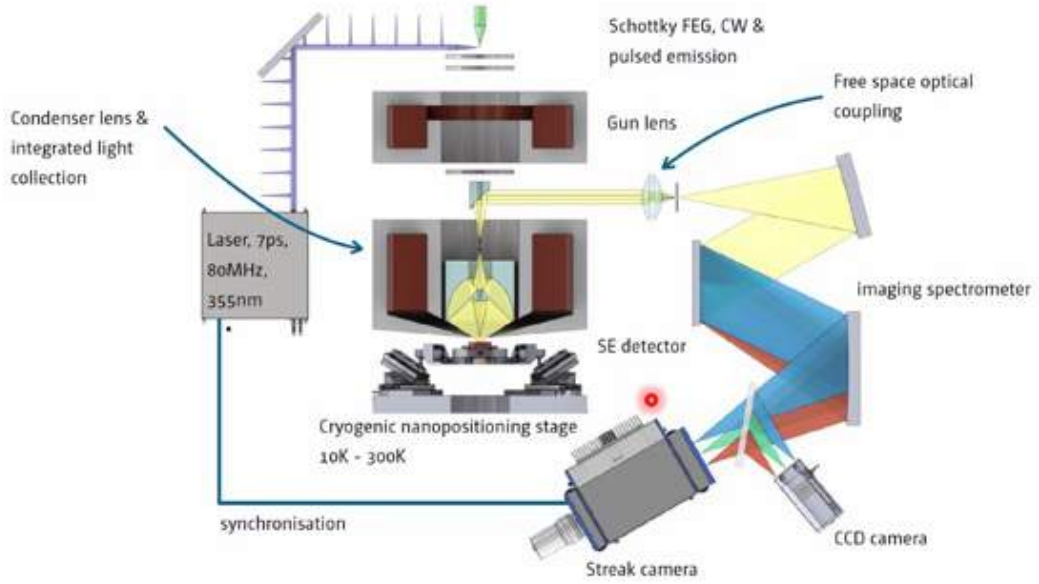
Rachel Oliver

- (Javier Garcia de Abajo Chairing)

III-N physics at its best!



Time-resolved cathodoluminescence system



UNIVERSITY OF CAMBRIDGE

CAMBRIDGE CENTRE FOR GALLIUM NITRIDE

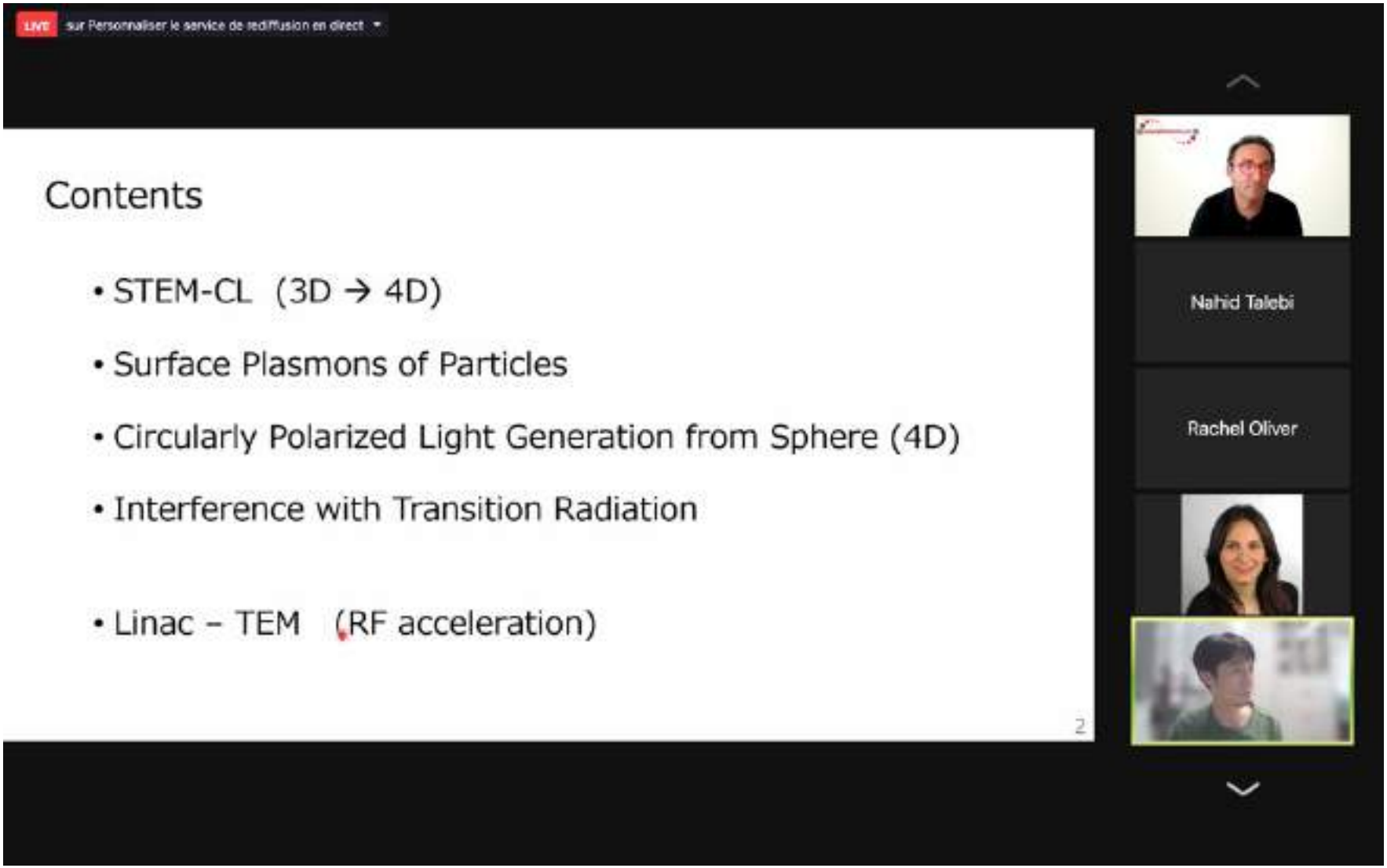
Amparo Taroncher_n...

Nahid Talebi

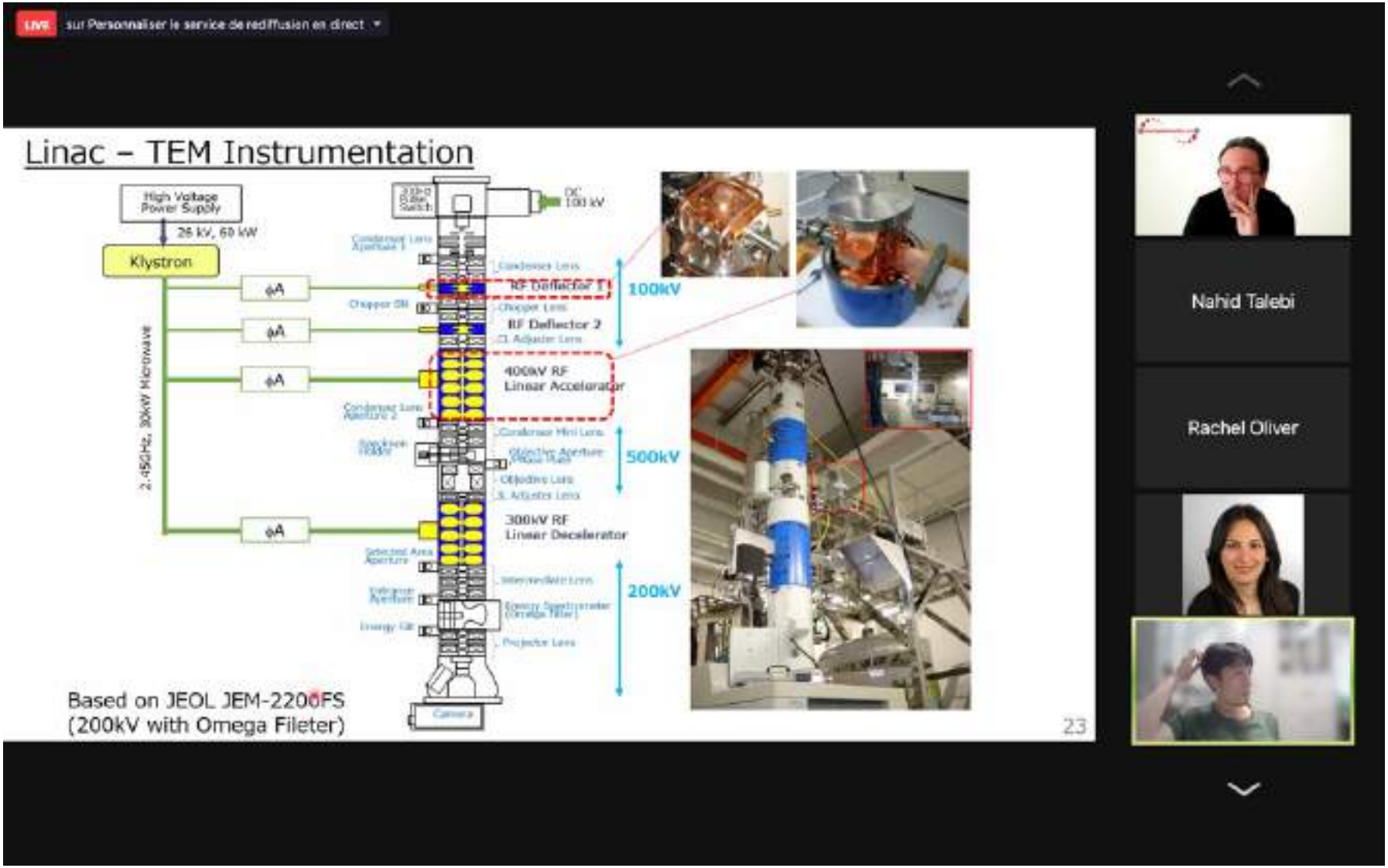
Fabrizio Carbone

Takumi Sannomyia

Coherence is back (now classical) …

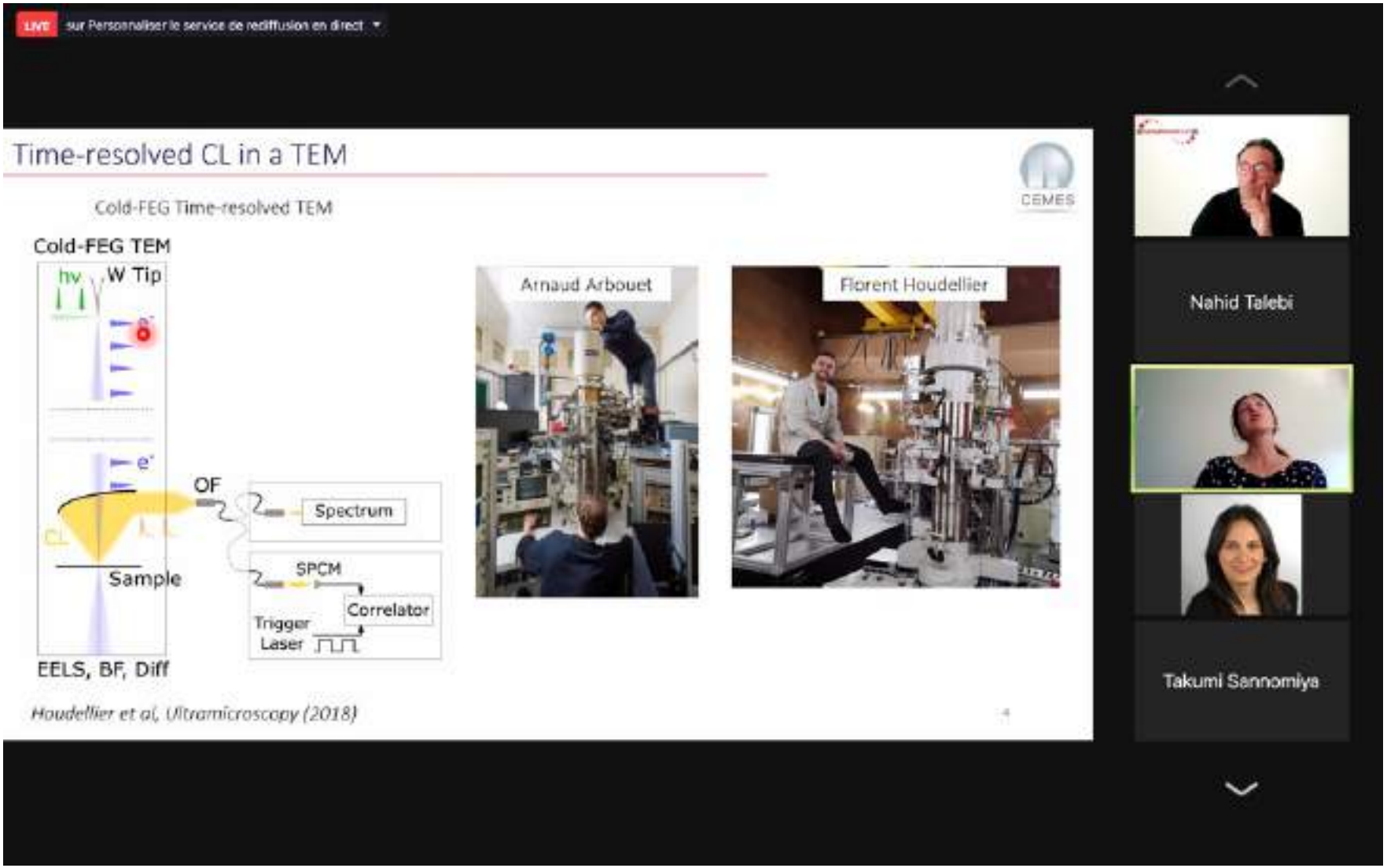


… and Klystron, too!



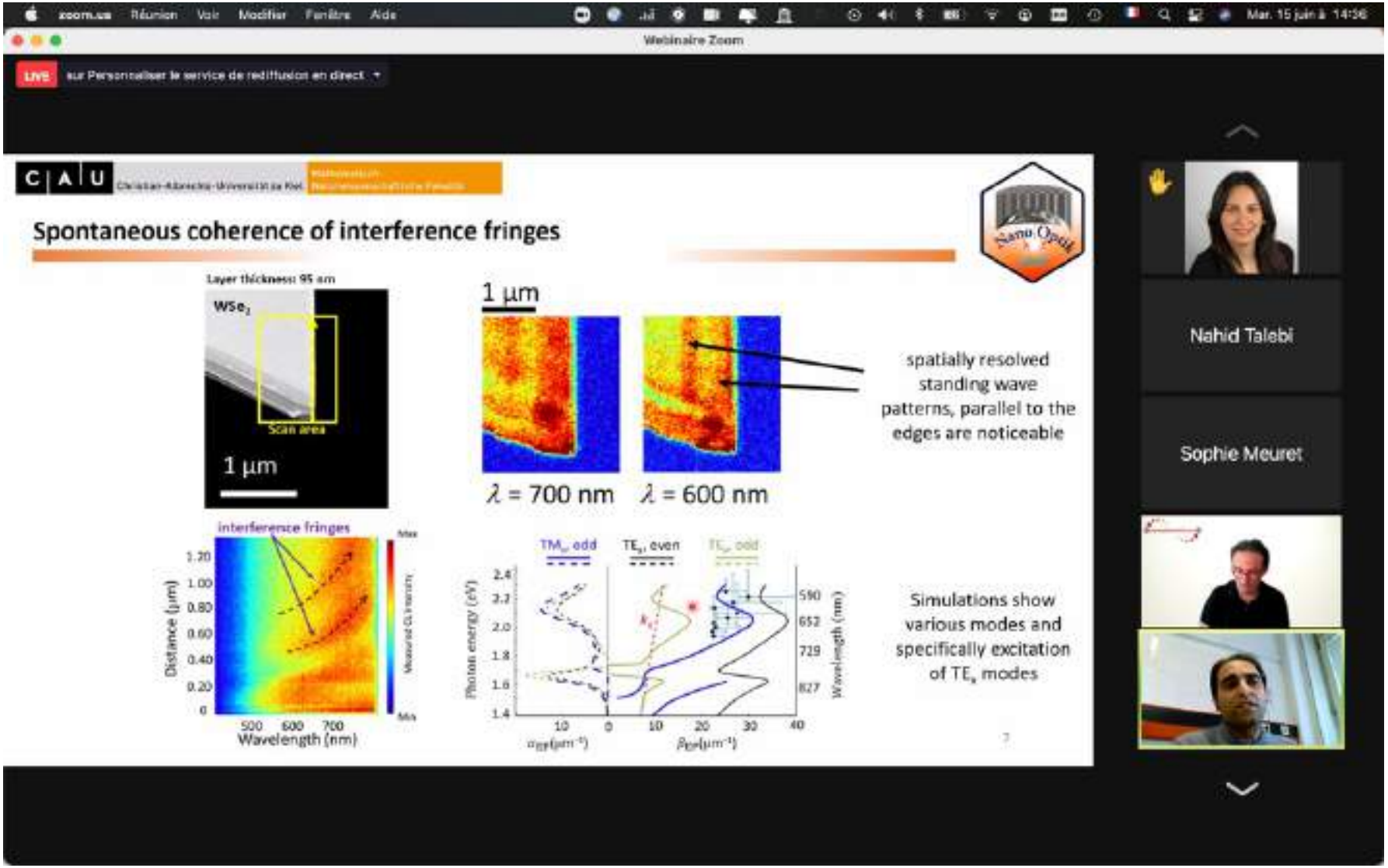
Sophie Meuret

Time (resolved) to make cathodoluminescence in a TEM!



Masoud Taleb

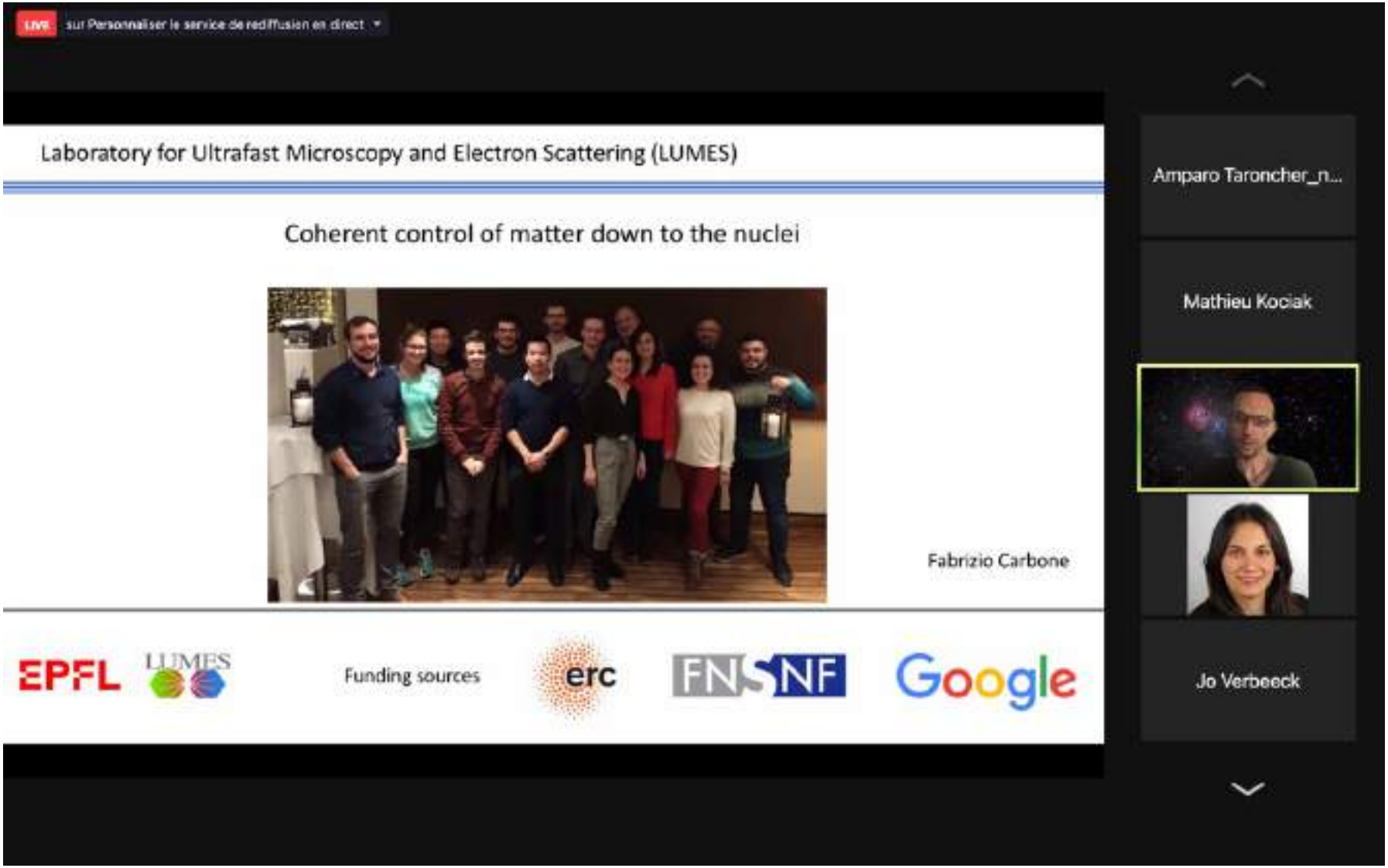
Coherence… again!



Fabrizio Carbone

- (Jo Verbeeck chairing)

Next step: a gamma ray laser!



Vincenzo Grillo

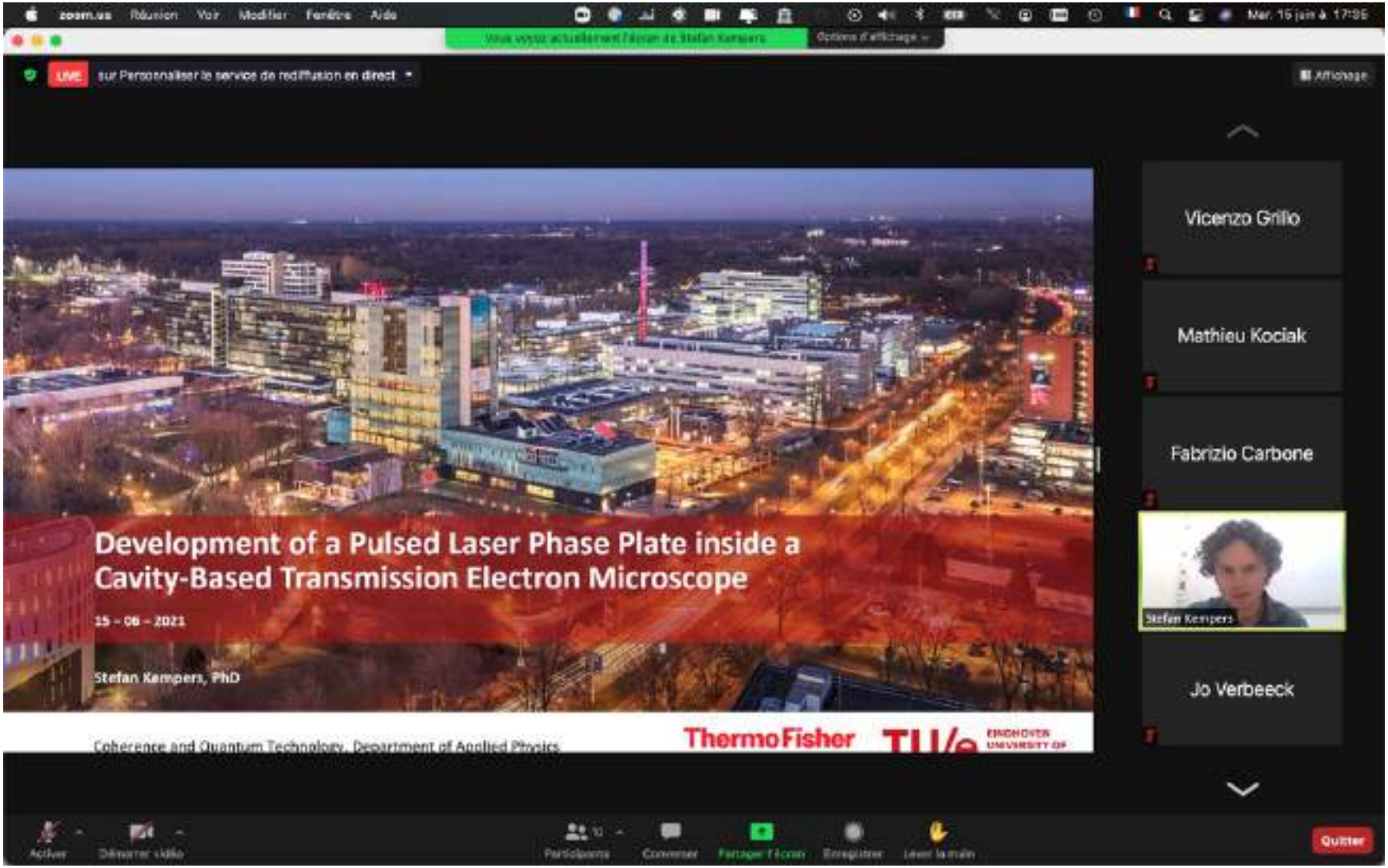
Sorting vortices becomes a reality!

Jo Verbeeck

Jo made a great job in auto-chairing himself ;)
And brought to us amazing high pixel density programmable phase plates!

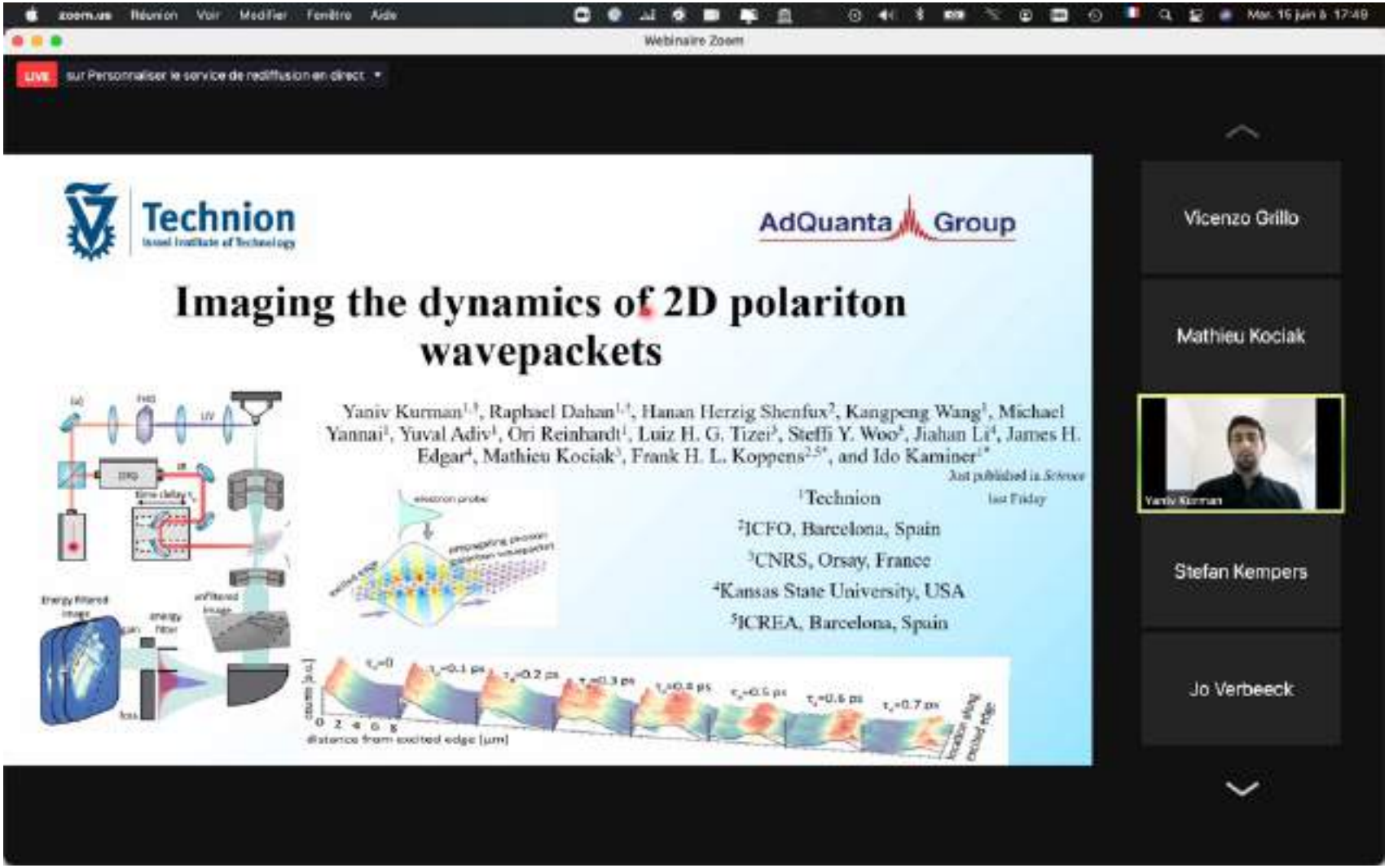
Stefan Kempers

Light meets electron … and phase plates!



Yaniv Kurman

Seeing phononic light in action!



Thanks everyone, and see you soon in real life!