



# Q-SORT International Conference

## Science and Applications of Coherent Electron Beam Manipulation

Tuesday 1 – Friday 3  
September 2021

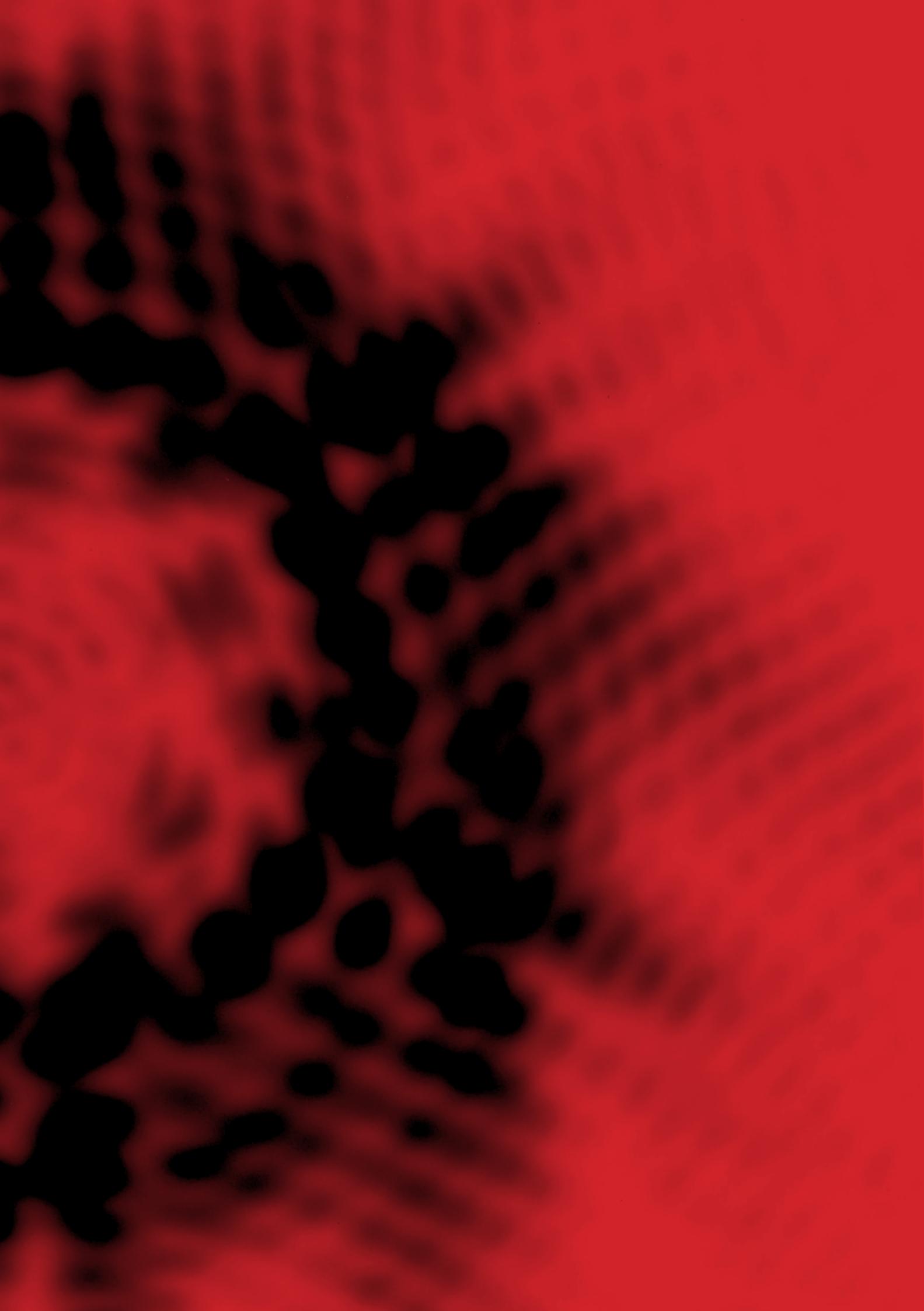
Horizon 2020  
Framework Programme

Projects:  
766970 - Q-SORT  
101035013 - MINEON  
964591- SMART ELECTRON



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# Programme

# Wednesday 1 September

**Zoom**

**13:40 – 18:30**

13:40 – 14:00 • Welcome addresses

*Vincenzo Grillo*

(*National Research Council, Italy*)

## Session A: Phase and field holography

14:00 – 14:30      A1 – Novel developments in 2D and 3D Electron  
Off-axis Electron Holography

*Alex Lubk*

(*IFW Dresden, Germany*)

14:30 – 15:00      A2 – Developments for operando electrical  
measurements in off-axis electron holography

*Christoph Gatei*

(*CEMES-CNRS, France*)

15:00 – 15:30      A3 – Phase anti-matching  
and other semi-crazy ideas

*Marco Beleggia*

(*Technical University of Denmark, Denmark*)

## Session B: Ptychography & 4DSTEM

15:30 – 16:00      B1 – Ptychography & 4D-STEM:  
Solutions to a big-data problem

*Chair: David Cooper*

(*Université Grenoble Alpes, CEA, France*)

*Christoph Koch*

(*Humboldt-Universität, Germany*)

16:00 – 16:30      B2 – Field mapping by off-axis electron holography  
and pixelated STEM

*Victor Boureau*

(*EPFL, Switzerland*)

16:30 – 17:00 ● *Coffee break*

## Session C: New Magnetic Measurement Ideas

*Chair: Rafal Dunin-Borkowski*

(*Forschungszentrum Jülich, Germany*)

17:00 – 17:30      C1 – Advances in the generation and measurement  
of structured electromagnetic fields  
in the transmission electron microscope

*Amir Tavabi*

(*Forschungszentrum Jülich, Germany*)

17:30 – 18:00      C2 – Imaging of complex magnetic textures  
with particle-like properties

*Nikolai Kiselev*

(*Forschungszentrum Jülich, Germany*)

18:00 – 18:30      C2 – Ultrafast spectroscopy from fundamental  
concepts to applications in magnetism

*Theo Rasing*

(*Radboud University, Netherlands*)

# Thursday 2 September

**Zoom**

**11:00 – 18:30**

11:00 – 12:05 • Free discussion-chat

12:15 – 14:00 ● *Lunch break*

**Session D:**  
**Phase and field holography**

14:00 – 14:30 D1 — Off-axis electron holography and Lorentz microscopy of magnetic skyrmion bubbles in multilayers and van der Waals materials

**Chair: Rafal Dunin-Borkowski**  
**(Forschungszentrum Jülich, Germany)**

*Thibaud Denneulin*  
(Forschungszentrum Jülich, Germany)

**Session E:**  
**Ptychography & 4D-STEM**

14:30 – 15:00 E1 — Segmented- and pixelated-detector differential phase contrast imaging of the iron-rhodium magnetostructural transition

**Chair: Rafal Dunin-Borkowski**  
**(Forschungszentrum Jülich, Germany)**

*Trevor Almeida*  
(Université Grenoble Alpes, CEA, France)

15:00 – 15:30 E2 — Phase Retrieval by Electron Ptychography

*David Muller*  
(Cornell University, USA)

15:30 – 16:00 ● *Coffee break*

**Session F:**  
**Electron Beam Shaping**

16:00 – 16:30 F1 — Electron Energy Loss Spectroscopy with an Orbital Angular Momentum sorter: results and challenges

**Chair: Stefano Frabboni**  
**(Università di Modena e Reggio Emilia, Italy)**

*Enzo Rotunno*  
(National Research Council, Italy)

16:30 – 17:00 F2 — Optical polarization analogue in free electrons beam

*M. Kociak*  
(Paris Sud, France)

17:00 – 17:30 F3 — Electron beam aberration correction and shaping using optical fields

*Andrea Konecna*  
(ICFO-ICFO-Institut de Ciencies Fotoniques, Spain)

17:30 – 18:00 F4 — Recent results in 3D wavefront modulation and quantum mechanical detection

*Tatiana Latychevskaia*  
(Paul Scherrer Institute, Switzerland)

18:00 – 18:30 F5 — Structured Electron Beams for Interaction-free Measurements and Inelastic Interferometry

*Benjamin Mc Morran*  
(University of Oregon, USA)

# Friday 1 September

**Zoom**

**11:00 — 19:00**

11:00 — 12:05 • Free discussion-chat

*Vincenzo Grillo*

(*National Research Council, Italy*)

12:15 — 14:00 ● *Lunch break*

## Session G: Electron-radiation interaction

**Chair: Vincenzo Grillo**  
(*National Research Council, Italy*)

14:00 — 14:30 G1 — Engineering the wavefunction of electrons  
for new microscopy methods

*Fabrizio Carbone*  
(*EPFL, Switzerland*)

14:30 — 15:00 G2 — Homodyne detection of cathodoluminescence

*Ofer Kfir*  
(*University of Tel Aviv, Israel*)

15:00 — 15:30 G3 — Complex phase space manipulation of pulsed  
electron beams in a nanophotonic structure

*Peter Hommelhoff*  
(*Friedrich-Alexander-Universität Erlangen-Nürnberg,  
Erlangen, Germany*)

15:30 — 16:00 G4 — Tunable Photo-Induced  
Free-Electron Spatial Modulation

*Shai Tsesses*  
(*Technion, Israel*)

16:00 — 17:00 G5 — Smart Ghost Imaging

*Ebrahim Karimi*  
(*University of Ottawa, Canada*)

17:00 — 17:30 ● *Coffee break*

## Session H: Electron-radiation interaction

**Chair: Ido Kaminer**  
(*Technion, Israel*)

17:30 — 18:00 H1 — Towards quantum electron wavepacket  
spectroscopy in the SEM

*Albert Polman*  
(*NWO-Institute AMOLF*)

18:00 — 18:30 H2 — SMART-electron: Dynamically modulating  
electrons' wave properties opening  
new frontiers in electron microscopy

*Gianmaria Vanacore*  
(*University of Milano-Bicocca, Italy*)

18:30 — 19:00 H3 — A Few New Ideas for Future Directions  
in Microscopy

*Vincenzo Grillo*  
(*National Research Council, Italy*)

19:00 • *Wrap-up*

