# Advances in Many-Body Theories: from First Principle Methods to Quantum Computing and Machine Learning

# Report of Contributions

Contribution ID: **1** Type: **not specified**

# Welcome ECT* Director Jochen Wambach

*Monday, 2 November 2020 16:00 (10 minutes)*

Contribution ID: **2** Type: **not specified**

# Quantum@Trento

*Monday, 2 November 2020 16:10 (20 minutes)*

**Presenter:** PEDERIVA, Francesco (UniTN)

Contribution ID: **3** Type: **not specified**

# Musings on the Intersimulatability of Quantum Fields

*Monday, 2 November 2020 16:30 (45 minutes)*

**Presenter:** KLCO, Natalie (Caltech)

Contribution ID: **4** Type: **not specified**

# Bayesian Model Mixing: Nuclear Physics Applications

*Monday, 2 November 2020 17:15 (45 minutes)*

**Presenter:** NAZAREWICZ, Witek (MSU)

Contribution ID: **5** Type: **not specified**

# Machine Learning for Lattice Field Theory

*Tuesday, 3 November 2020 16:00 (45 minutes)*

**Presenter:** SHANAHAN , Phiala (MIT)

Contribution ID: **6**                                                          Type: **not specified**

# Nuclear Physics Entering a Quantum-simulation Era: Lessons from the Past, Vision for the Future

*Tuesday, 3 November 2020 17:00 (45 minutes)*

**Presenter:**   DAVOUDI , Zohreh (University of Maryland)

Contribution ID: **8**  Type: **not specified**

# Variational Methods in the Era of Machine Learning: Classical and Quantum Computing Applications

*Wednesday, 4 November 2020 16:00 (45 minutes)*

**Presenter:** CARLEO, Giuseppe (EPFL Lausanne)

Contribution ID: **9** Type: **not specified**

# Neural Network Quantum States for Atomic Nuclei

*Wednesday, 4 November 2020 16:45 (45 minutes)*

**Presenter:** LOVATO, Alessandro (Argonne National Laboratory and UniTn)

Contribution ID: **10**                                        Type: **not specified**

# Towards a Machine Learning Description of Nuclei

*Wednesday, 4 November 2020 17:30 (15 minutes)*

**Presenter:**   KEEBLE, James (University of Surrey)

Contribution ID: **11** Type: **not specified**

# Phys-NN -A Machine Learning Approach to Invert Nuclear Responses

*Wednesday, 4 November 2020 17:45 (15 minutes)*

**Presenter:** RAGHAVAN, Krishnan (Argonne National Laboratory)

Contribution ID: **12**                                                                 Type: **not specified**

# Quantum Simulating Lattice Gauge Theories – High-energy Physics at Ultra-cold Temperatures

*Thursday, 5 November 2020 16:00 (45 minutes)*

**Presenter:** HAUKE, Philipp (UniTn)

Contribution ID: **13** Type: **not specified**

# Prospects for Near Term Quantum Simulations through Optimal Control

*Thursday, 5 November 2020 16:45 (45 minutes)*

**Presenter:** WENDT, Kyle ( Lawrence Livermore National Lab)

Advances in ... / Report of Contributions Prospects for Near Term Quantum ...

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Contribution ID: **14**                                              Type: **not specified**

# The European Quantum Flagship and the ECT*

*Thursday, 5 November 2020 17:30 (30 minutes)*

**Presenters:**   BINOSI, Daniele (ECT*);   CALARCO, Tommaso (Juelich)

Contribution ID: **15**                                Type: **not specified**

# Nuclear Dynamics on Current Generation Quantum Devices

*Friday, 6 November 2020 16:00 (45 minutes)*

**Presenter:**   ROGGERO, Alessandro (UW)

Contribution ID: **16** Type: **not specified**

# Quantum Technologies for High Energy Physics: the CERN Quantum Technology Initiative

*Friday, 6 November 2020 16:45 (45 minutes)*

CERN, the European Organisation for Nuclear Research, operates the largest particle accelerator in the world and has a long tradition of collaboration and excellence in fundamental physics research. Quantum Technologies have seen an incredible development over just the last few years in all their aspects, computing, sensing, communications and theory. After a few years of pilot investigations, CERN has announced the creation of its Quantum Technology Initiative to understand the potential of these technologies for High Energy Physics, but also to contribute to their future development. This talk highlights the main objectives and current activities of the CERN Quantum Technology Initiative. A special emphasis will be placed on the Quantum Computing aspect and the activities carried out by CERN openlab, outlining the initial investigations that use quantum machine learning in High Energy Physics.

**Presenter:** VALLECORSA, Sofia (CERN)

Contribution ID: **17** Type: **not specified**

# Quantum and the Future

*Friday, 6 November 2020 17:30 (30 minutes)*

**Presenter:** DEAN, David (ORNL)