



PHYSICS WITHOUT FRONTIERS: MOROCCO
SCHOOL AND WORKSHOP ON QUANTUM COMPUTING AND QUANTUM
INFORMATION TECHNOLOGY

Scientific Calendar

February 4 to 13, 2026, Faculty of Sciences, Mohammed V University in Rabat, Morocco
Morocco Time (GMT+1)

Day 1		Wednesday, 4 February	Al Birouni Lecture Hall, Department of Physics
08:30-09:00	Registration		
09:00-09:15	Welcome Addresses & Opening Remarks		
	<ul style="list-style-type: none"> • Welcoming Remarks by the Dean of the Faculty of Sciences • Remarks by the Organizing Committee Representative 		
09:15-10:00	Introduction to Quantum Computing		
	<ul style="list-style-type: none"> • Mourad Telmini (Faculty of Sciences, University of Tunis El Manar, Tunis) 		
10:00-10:45	Bose-Einstein Condensation and Solitons for Quantum Technologies		
	<ul style="list-style-type: none"> • Amine Jaouadi (LyRIDS, Graduate School of Engineering, Paris, France) 		
10:45-11:00	Discussion		
11:00-11:15	Group Photo & Coffee Break		
11:15-12:00	Directional Motional Control via Engineered Conical Intersections in Trapped Rydberg ions		
	<ul style="list-style-type: none"> • Abdessamad Belfakir (Mohammed VI Polytechnic University, Morocco) 		
12:00-12:45	Introduction to Quantum Machine Learning		
	<ul style="list-style-type: none"> • Pawel Gora (Jagiellonian University, Poland) 		
12:45-13:00	Discussion		
13:00-14:30	Break		
14:30-15:45	Quantum Simulation and Quantum Control		
	<ul style="list-style-type: none"> • Abdessamad Belfakir (Mohammed VI Polytechnic University, Morocco) 		
15:45-16:00	Impact of non-Markovianity on quantum precision and synchronization in open quantum		
	<ul style="list-style-type: none"> • Safae Gaidi (PhD, LPHE-MS, Mohammed V University in Rabat, Morocco) 		
16:00-16:05	Discussion		
16:05-16:20	Coffee Break		
16:20-17:30	Measuring Online-Offline Spillover of Gang Violence Using Bivariate Hawkes Processes		
	<ul style="list-style-type: none"> • Youness Diouane (Department of Computer Science, Boston College, USA) 		
17:30-17:45	Quantum Extreme Learning Machine for Quantum Channel Discrimination		
	<ul style="list-style-type: none"> • Hajar Assil (PhD, LR&DES, FST, Abdelmalek Essaadi University, Morocco) 		
17:45-18:00	Discussion		



Day 2

Thursday, 5 February

Seminar Room, Department
of Mathematics

09:00-10:30

Quantum Teleportation

- **Mourad Telmini** (Faculty of Sciences, University of Tunis El Manar, Tunis)

10:30-10:45

Quantum Thermometry and Reservoir Sensing in Structured Environments

- **Youssef Aiache** (PhD, LR&DES, FST, Abdelmalek Essaadi University, Morocco)

10:45-10:50

Discussion

10:50-11:05

Coffee break

11:05-12:30

From Quantum Mechanics to Geometric Information Sciences

- **Brahim Amghar** (Chouaib Doukkali University, Morocco)

12:30-12:45

A Geometric Approach to Analyzing Quantum Dynamics and Entanglement in Two-Spin Systems for Quantum Gate Design

- **Latifi Oussama** (PhD, LPHE-MS, Mohammed V University in Rabat, Morocco)

12:45-13:00

Discussion

13:00-14:30

Break

14:30-15:50

Quantum Control in Complex Environnement

- **Amine Jaouadi** (LyRIDS, Graduate School of Engineering, Paris, France)

15:50-16:05

Bidirectional Quantum Teleportation through Noisy Channels via Multipartite Hybrid Entanglement

- **Houssam Boukhari** (PhD, LPHE-MS, Mohammed V University in Rabat, Morocco)

16:05-16:10

Discussion

16:10-16:25

Coffee Break

16:25-17:40

What Makes the Quantum Postulates, Measurements, and Superposition

- **Souradeep Sasmal** (University of Electronic Science and Technology of China, China)

17:40-17:55

Quantum Dot Thermoelectricity Mediated by Rashba Spin–Orbit Interaction and Majorana Bound States

- **Mohamed Ait Bahadou** (PhD, LR&DES, FST, Abdelmalek Essaadi University, Morocco)

17:55-18:00

Discussion

Day 3

Friday, 6 February

Seminar Room, Department
of Mathematics

09:00-10:30

Quantum Information: Role of non-orthogonality in Teleportation to No-cloning

- **Souradeep Sasmal** (University of Electronic Science and Technology of China, China)

10:30-10:45

Unlocking Thermodynamic Multitasking: Exploring the functioning of two-qubit engines through coherence and entanglement

- **Hachem Tarif** (PhD, LPHE-MS, Mohammed V University in Rabat, Morocco)

10:45-10:50

Discussion

10:50-11:05

Coffee Break

11:05-12:30

Solving vehicle routing problems using quantum computing

- **Pawel Gora** (Jagiellonian University, Poland)

12:30-12:45

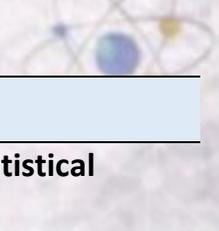
Nonreciprocal Entanglement via Cavity Magnomechanics

- **Ziyad Imara** (PhD, LR&DES, FST, Abdelmalek Essaadi University, Morocco)

12:45-13:00

Discussion

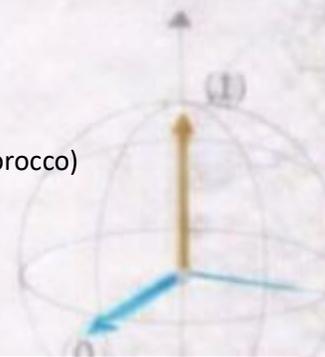




13:00-14:30	Break
14:30-15:45	Foundations of Estimation Theory From Classical Statistics to Quantum Statistical Models <ul style="list-style-type: none"> • Bakmou Lahcen (University of Electronic Science and Technology of China, China)
15:45-16:00	Enhancing ergotropy of quantum batteries through coherence and non-Markovianity <ul style="list-style-type: none"> • Abderrahman Oularabi (PhD, LR&DES, FST, Abdelmalek Essaadi University, Morocco)
16:00-16:05	Discussion
16:05-16:20	Coffee Break
16:20-17:35	Beyond Classicality: Power of quantum correlations - Contextuality, Entanglement and Nonlocality <ul style="list-style-type: none"> • Souradeep Sasmal (University of Electronic Science and Technology of China, China)
17:35-17:50	Phase-Engineered Parametric Amplification in Superconducting Quantum Circuits <ul style="list-style-type: none"> • S. El Khayyat (PhD, LR&DES, FST, Abdelmalek Essaadi University, Morocco)
17:50-18:00	Discussion

Day 4	Saturday, 7 February	Physics Library, Department of Physics
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<u>Implementation on a Real IBM Quantum Computer</u>	
09:00-10:15	<ul style="list-style-type: none"> • Mouhcine Yachi (Chouaib Doukkali University, El Jadida, Morocco) ✓ VS Code + Python + Qiskit setup (simulator) ✓ 1–2 qubit circuits, measurement, histogram, Bloch sphere
10:15-11:30	<ul style="list-style-type: none"> • btissam Chaibi (LPHE-MS, Mohammed V University in Rabat, Morocco) ✓ Gates: X, H, Z, CX ✓ Interference demos: H–H vs H–Z–H
11:30-12:45	<ul style="list-style-type: none"> • Souhaib Benbouazza (LPHE-MS, Mohammed V University in Rabat, Morocco) ✓ Entanglement (Bell) + Teleportation (simulator) ✓ IBM token + Real QPU run Bell teleportation
12:45-13:00	Technical troubleshooting: resource sharing and guidance



13:00-14:30	Break
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14:30-15:30	Networking Session: Informal Discussions & Connections
15:30-18:00	Cultural Activity: Cultural Visit to Rabat

Day 5	Monday, 9 February	Room 3, Department of Physics
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09:00-09:45	Opportunities at ICTP and Physics Without Frontiers (PWF) <ul style="list-style-type: none"> • Natasa Stojic (ICTP, Trieste, Italy)
09:45-10:30	Applications of Quantum Computing in Life Sciences <ul style="list-style-type: none"> • Martina Stella (ICTP, Condensed Matter and Statistical Physics, Trieste, Italy)
10:30-10:45	Discussion
10:45-11:30	Crafting Your CV and Statement of Purpose <ul style="list-style-type: none"> • Natasa Stojic (ICTP, Trieste, Italy)
11:30-12:15	Quantum Simulations of Molecular Excitation Energies in Photo Activated Drugs <ul style="list-style-type: none"> • Martina Stella (ICTP, Condensed Matter and Statistical Physics, Trieste, Italy)
12:15-12:30	Discussion



Break

12:30-14:30

14:30-15:45

Quantum Information Theory (Part I)

- **Mir Alimuddin** (ICFO – The Institute of Photonic Sciences, Barcelona, Spain)

15:45-16:00

Optimal Multiparameter Quantum Estimation in Optomechanical Systems

- **Adnan Naimy** (PhD, LPHE-MS, Mohammed V University in Rabat, Morocco)

16:00-16:10

Discussion

16:10-17:25

Quantum Information Theory (Part II)

- **Mir Alimuddin** (ICFO – The Institute of Photonic Sciences, Barcelona, Spain)

17:25-17:40

Multiple Entanglement Layer Encoding in Hybrid Quantum-Classical Machine Learning

- **Ayoub Sadiq** (PhD, LPHE-MS, Mohammed V University in Rabat, Morocco)

17:40-17:50

Discussion

Day 6

Tuesday, 10 February

Room 3, Department of
Physics

09:00-09:30

Design of Quantum Communication Routing Protocol in Quantum Networks (Part I)

- **Pankaj Kumar** (National Taiwan University of Science and Technology, Taiwan)

09:30-10:45

Geometric Insight into Entanglement and Dynamics of Collective Spin Systems

- **Jamal Elfakir** (Dr, LPHE-MS, Mohammed V University in Rabat, Morocco)

10:45-11:00

Discussion

11:00-12:30

Quantum Annealers as Programmable Thermal Machines

- **Zakaria Mzaouali** (University Tubingen, Germany)

12:30-12:45

Parity Asymmetry of Spin-j Coherent Superpositions under Decoherence

- **Bouchra El Alaoui** (PhD, LPHE-MS, Mohammed V University in Rabat, Morocco)

12:45-13:00

Discussion

Break

13:00-14:30

14:30-15:45

Measuring non-Markovianity of Open Quantum Systems

- **Yassine Dakir** (PhD, LPHE-MS, Mohammed V University in Rabat, Morocco)

15:45-16:00

Shortcuts to adiabaticity from quantum control to quantum computing (Part I)

- **Xi Chen** (Instituto de Ciencia de Materiales de Madrid, Spain)

16:00-16:10

Discussion

16:10-16:25

Counterdiabatic quantum optimization algorithms in the NISQ era

- **Noureddine Rochdi** (PhD, LPHE-MS, Mohammed V University in Rabat, Morocco)

16:25-17:40

Shortcuts to adiabaticity from quantum control to quantum computing (Part II)

- **Xi Chen** (Instituto de Ciencia de Materiales de Madrid, Spain)

17:40-17:50

Discussion



Day 7

Wednesday, 11 February

Room 3, Department of
Physics

- 09:00-10:30 Design of Quantum Communication Routing Protocol in Quantum Networks (Part II)
- **Pankaj Kumar** (National Taiwan University of Science and Technology, Taiwan)
- 10:30-12:00 Post-Quantum Cybersecurity: A Transition to Quantum Realm
- **A. Abd El-Latif** (Prince Sultan University, Saudi Arabia)
- 12:00-12:15 Quantum Otto engine powered by critical XY- Γ chain
- **Anass Hminat** (PhD, LPHE-MS, Mohammed V University in Rabat, Morocco)
- 12:15-12:30 Discussion

12:30-15:00

Break

- 15:00-15:25 A discret-time Quantum Walk Framework for Bidirectional Multi-Node Quantum Teleportation
- **Nada Ikken** (PhD, LPHE-MS, Mohammed V University in Rabat, Morocco)
- 15:20-15:40 Quantum Teleportation without Direct Entanglement: Network-Based and Multi-Node Protocols
- **Meryem El Kirdi** (Dr, LPHE-MS, Mohammed V University in Rabat, Morocco)
- 15:40-17:25 Quantum Technology and Devices
- **Silvia Zorzetti** (Fermi National Accelerator Laboratory, USA)
- 17:25-17:40 Discussion

Day 8

Thursday, 12 February

Room 3, Department
of Physics

- 09:00-11:00 Dynamics of the Entropic Uncertainty Relation: Challenges and Opportunities
- **Abdul Basit** (University of Sharjah, United Arab Emirates)
- 11:00-11:20 Phase Sensitivity Enhancement in Mach-Zehnder Interferometry with SU(1,1) Coherent States
- **Nour Eddine Abouelkhir** (Dr, LPHE-MS, Mohammed V University in Rabat, Morocco)
- 11:20-11:40 Dynamics of Linear Quantum Discord and Correlations in Qubit-Qudit Systems under Non-Markovian Colored Noise
- **Mohammed Abdellaoui** (PhD, LPHE-MS, Mohammed V University in Rabat, Morocco)
- 11:40-12:00 Discussion

12:00-15:30

Break

- 15:30-15:45 Entangled versus Separable Strategies in Distributed Quantum Mach-Zehnder Interferometers
- **Seloua Boulifa** (PhD, LPHE-MS, Mohammed V University in Rabat, Morocco)
- 15:45-16:00 Quantum-Inspired Evolutionary Algorithms for UAV Coverage Optimization
- **Fatima Zahra Amarcha** (PhD, LPHE-MS, Mohammed V University in Rabat, Morocco)
- 16:00-17:30 Quantum Algorithms
- **Doğa Murat Kürkçüoğlu** (Fermi National Accelerator Laboratory, USA)
- 17:30-17:40 Discussion



09:30-09:50	Multiple phase estimation with photon-added multi-mode coherent states of GHZ-type <ul style="list-style-type: none"> • Hanan Saidi (PhD, LPHE-MS, Mohammed V University in Rabat, Morocco)
09:50-10:10	Quantum Information Resources in Two-Flavor Neutrino Oscillations <ul style="list-style-type: none"> • Kawtar El Bouzidi (PhD, LPHE-MS, Mohammed V University in Rabat, Morocco)
10:10-10:30	Monitored quantum unital Otto heat engines: Fluctuations of the released heat and entropy production <ul style="list-style-type: none"> • Abdelkader El Makouri (Dr, LPHE-MS, Mohammed V University in Rabat, Morocco)
10:30-12:00	Quantum Technology Opportunities for African Countries: From Vision to Execution <ul style="list-style-type: none"> • Farai Mazhandu (Oklahoma School of Science and Mathematics, USA)
12:00-12:20	Discussion

12:20-15h00

Break

14:30-16:20	It from Bit: The Role of Information Theory in Quantum Mechanics and Thermodynamics <ul style="list-style-type: none"> • Akram Touil (Los Alamos National Laboratory, New Mexico, USA)
16:20-16:35	Influence of Quantum Decoherence on the Survival of Neutrino Oscillation Quantumness <ul style="list-style-type: none"> • Jilali Loulijat (PhD, LPMS, Faculty of Sciences, University Ibn Tofail, Kenitra, Morocco)
16:35-17:50	Boosting adiabatic quantum computing in digital era <ul style="list-style-type: none"> • Francisco Albarrán-Arriagada (University of Santiago, Chile)
17:50-18:00	Discussion & Closing

