



CHAIR OF COMPLEXITIES ∞ HUMANITIES  
Africa Business  
School



# WORLD CONFERENCE ON COMPLEX SYSTEMS 2026

6<sup>th</sup> Edition

Organizers:

Reda Benkirane, Mohamed Nemiche, Nicolas Sperry-Guillou

## WCCS26 | CONFERENCE PROGRAM

20<sup>TH</sup> TO 22<sup>ND</sup> APRIL, 2026 | UM6P, CAMPUS BENGUERIR

Official Partner



# Welcome Message

Dear colleagues, researchers, and participants,

It is our great pleasure to welcome you to the 6th edition of the World Conference on Complex Systems (WCCS26). This year's theme is: ***"Navigating Contemporary Complexity: Transdisciplinary Approaches to Economic, Social, Political, and Environmental Challenges"***

In a world increasingly shaped by interconnected challenges, ranging from climate change and socio-economic transformations to geopolitical disruptions and rapid advances in artificial intelligence, complexity science has never been more relevant. WCCS26 brings together a vibrant and interdisciplinary community committed to understanding, modeling, and navigating these complex dynamics.

This edition reflects the richness and diversity of the field through its four main tracks:

- **Agent-Based and Social Complexity**
- **Foundations and Dynamics of Complex Systems**
- **Artificial Intelligence and Computational Systems**
- **Socio-Ecological Systems**

The program features outstanding speakers, thought-provoking panels, and high-quality contributions that explore both theoretical advances and real-world applications.

Beyond academic exchange, WCCS26 aims to foster dialogue across disciplines, cultures, and perspectives. We believe that addressing complex global challenges requires not only scientific excellence, but also openness, collaboration, and creativity.

We would like to warmly thank all contributors, speakers, program committee members, and organizers whose dedication made this conference possible. We also wish to express our sincere appreciation to our host institution, Mohammed VI Polytechnic University (UM6P), and our official partner, OCP Group, for their valuable support.

We hope that your participation in WCCS26 will be intellectually stimulating, professionally enriching, and personally inspiring.

**The Organizers, WCCS26**

# Keynotes Speakers



**Reda Benkirane**

Chair of Complexities  $\infty$  Humanities, ABS, UM6P, Morocco



**Carlos Alvarez Pereira**

Club of Rome, Switzerland



**Chris Bauch**

University of Waterloo, Canada



**David Chavalarias**

CNRS, France



**Abderrazak El Albani**

University of Poitiers, France



**Carlos Gershenson**

Binghamton University, SUNY, USA



**Nigel Gilbert**

University of Surrey, UK



**Abdelmajid Ibenrissoul**

Hassan II University, Morocco



**Louis Klein**

European School of Governance, Germany



**Helena Knyazeva**

HSE University, Russia



**Leonardo Rodriguez Zoya**

University of Buenos Aires, Argentina



**Peter Turchin**

Complexity Science Hub, Austria



**Karoline Wiesner**

University of Potsdam, Germany

# Monday, 20 April 2026

Time & Room	Activity
09:00 – 09:20 Ibn Rochd	Opening Ceremony
09:20 – 09:40 Ibn Rochd	<b>Plenary Talk: Reda Benkirane</b> – Lost in Complexity: Welcome to the Real World <i>Session chair:</i> Mohamed Nemiche
09:40 – 10:25 Ibn Rochd	<b>Keynote Speaker: Peter Turchin</b> – The Great Holocene Transformation: What Complexity Science Tells Us About The Evolution of Complex Societies. <i>Session chair:</i> Nicolas Sperry-Guillou
10:25 – 10:40 Ibn Rochd	Discussion
10:40 – 11:10	Coffee Break Conference Photo
11:10 – 12:40 Ibn Rochd	<b>Panel 1 – Complexity, Society &amp; Global Challenges</b> <ul style="list-style-type: none"><li>▪ <b>Carlos Álvarez Pereira</b> – No Limits to Hope: Escaping from the unreasonable effectiveness of Modernity</li><li>▪ <b>David Chavalarias</b> – The Artificialization of Cultural Evolution: the Impact of Very Large Digital Infrastructures on Individuals and Society</li><li>▪ <b>Louis Klein</b> – Noospheric Singularity and the Mirror of Tamkeen</li></ul> <i>Panel Chair:</i> Karima Kadaoui
12:40 – 14:10	Lunch
14:10 – 15:40 Ibn Rochd	<b>Panel 2 – Rethinking Knowledge in the Age of Complexity</b> <ul style="list-style-type: none"><li>▪ <b>Helena Knyazeva</b> – Dancing with Complexity: How the World Thinks Through Us</li><li>▪ <b>Carlos Gershenson</b> – The Implications of Complexity</li><li>▪ <b>Leonardo Rodríguez Zoya</b> – Can Statistics Think? Complexity, Future, and Freedom in the Age of Large Language Models</li></ul> <i>Panel Chair:</i> Nigel Gilbert
15:40 – 16:10	<b>Coffee Break</b> <b>Poster</b> : Kaouthar EL Bakouri, Aziz Khamjane and EL Wardani Dadi – LegalTech and Moroccan Law Modeling Collection, Annotation and Structuring of an Official Corpus: Case of Morocco’s Bulletin Officiel

# Monday, 20 April 2026

Time & Room	Activity
16:10 – 17:30 Ibn Rochd	<p style="text-align: center;"><b>Parallel Session 1</b></p> <p><b>Track 1 – Agent-Based and Social Complexity</b> Session chairs: Khawla Tadist and Abdelouahed Tajer</p> <ul style="list-style-type: none"><li>▪ <b>Julian Arevalo</b> Adaptive Readiness: an Agent-Based Model of Peace Negotiations</li><li>▪ <b>Remah Dahdoul, Jan Korbel and Stefan Thurner</b> Campaign-Spending Driven Polarization Transition in a Double-Random Field Model of Elections</li><li>▪ <b>Nicholas Roxburgh, Rachel Creaney, Mindi Premarathne and Ruth Wilson</b> Exploring Interdependencies in an Island Economy</li><li>▪ <b>Saida Hachimi El Idrissi and Mohamed Nemiche</b> Formation of Complex Societies: An Agent-Based Model Inspired by Freudian Theory</li></ul>
16:10 – 17:30 Fatima Fihria	<p style="text-align: center;"><b>Parallel Session 1</b></p> <p><b>Track 2 – Foundations and Dynamics of Complex Systems</b> Session chairs: Ali Idri and Rachid Latif</p> <ul style="list-style-type: none"><li>▪ <b>Julio Guerrero and Giuseppe Orlando</b> Entropy-Based Recurrence Diagnostics for Tipping Points in Complex Dynamical Systems: Evidence from Cryptocurrency Markets</li><li>▪ <b>Stanisław Drożdż</b> Complexity Characteristics of Natural Language: The Special Role of Punctuation</li><li>▪ <b>Marcin Wątarek, Jarosław Kwapien and Stanisław Drożdż</b> Filtering Amplitude Dependence of Correlation Dynamics in Complex Systems</li><li>▪ <b>Tomoko Sakiyama and Taishi Arakaki</b> Multi-Perspective for Probability Coordination Brings SOC in Game of Life</li></ul>
19:00 – 23:00	Conference Gala Dinner

# Tuesday, 21 April 2026

Time & Room	Activity
09:00 – 09:45 Ibn Rochd	<b>Keynote Speaker: Abderrazak El Albani</b> – Emergence of Intercellular Cooperation: At the Origins of Eukaryotic Complexity <b>Session Chair:</b> Khawla Tadist
09:45 – 10:00 Ibn Rochd	Discussion
10:00 – 10:30	<b>Coffee Break</b> <b>Poster :</b> Aicha Jadda, El Loumani Laila and Abderma Amine – Internal Audit as a Lever for Adaptive Governance: An Integrated Perspective on Change Management in the Public Sector
10:30 – 11:15 Ibn Rochd	<b>Keynote Speaker: Nigel Gilbert</b> – Policy in a Complex World: Towards Complexity-Aware Policymaking <b>Session Chair:</b> Ali Idri
11:15 – 11:30 Ibn Rochd	Discussion
11:30 – 13:00 Ibn Rochd	<b>Parallel Session 2</b> <b>Track 1</b> – Agent-Based and Social Complexity <b>Session chair:</b> Helena Knyazeva <ul style="list-style-type: none"><li>▪ <b>Peter Jones</b> Presenting a Universal and Simple Conceptual Workbench to Situate and Encompass Complexity</li><li>▪ <b>Nisrine Jarmoune and Bouchra Lebzar</b> The Ontology of Behavior: Formalizing the Institutional Project as a Complex System</li><li>▪ <b>Lionel Scotto d’Apollonia, Florian Charvolin, Lise Verlaet, Deborah Nourrit, Dominique Deveaux, Elisabeth Sénégas and Nourdine Bara</b> Participatory Action Research with and for Society: The Case of “Oasis of Fraternity”</li><li>▪ <b>Harvey Spencer Sánchez-Restrepo, Jorge Louçã, Martha Belén Carmona-Soto and Sofialeticia Morales-Garza</b> Topological Patterns of Academic Success: Insights from Complex Network Analysis</li></ul>

# Tuesday, 21 April 2026

Time & Room	Activity
11:30 – 13:00 Fatima Fihria	<p style="text-align: center;"><b>Parallel Session 2</b></p> <p><b>Track 3</b> – Artificial Intelligence and Computational Systems Session Chairs: Driss El Ouadghiri and Zakaria Boulghassoul</p> <ul style="list-style-type: none"><li>▪ <b>Rahul Balamurugan</b>, Carlos Gershenson, Kency Taniya Antony Sekar and Congyu Peter Wu Emergent Consensus-Weighted Neural Network for Optic Disc-Cup Segmentation in Glaucoma</li><li>▪ <b>Hind Es-Sobbahi</b>, Nadia Idrissi Zouggari, Mohamed Radouane and Khalid Nafil Deep and Handcrafted Feature Descriptors for Iris Recognition: A Comparative Study</li><li>▪ <b>Ayachi Ouafa</b> and <b>Abouzahir Mohamed</b> A ROS2-Based Indoor Mapping Dataset Acquired Using TurtleBot4</li><li>▪ <b>Wafae Mkhimri</b> and <b>Khalid Nafil</b> Integrating Human-AI Collaboration for Automated Product Backlog Generation in Agile Development</li></ul>
13:00 – 14:30	Lunch
14:30 – 15:15 Ibn Rochd	<p><b>Keynote Speaker: Chris Bauch</b> – Critical Transitions in Coupled Human-and-Natural Systems and their Early Warning Signals Session Chair: Mohamed Essaaidi</p>
15:15 – 15:30 Ibn Rochd	Discussion
15:30 – 16:00	<p><b>Coffee Break</b> <b>Poster</b> : Mohammed Amine Jouahri, Zakaria Boulghasoul and Abdelouahed Tajer – Model Predictive Control-Based Smoothing of Power in Intelligent LED Lighting System</p>
16:00 – 16:45 Ibn Rochd	<p><b>Keynote Speaker: Abdelmajid Ibenrissoul</b> – Public Decision-Making and Complexity: What Rationality for Evaluation? Session Chair: Fadoua Mhidia</p>
16:45 – 17:00 Ibn Rochd	Discussion

Time & Room	Activity
17:00 – 18:30 Ibn Rochd	<p style="text-align: center;"><b>Parallel Session 3</b></p> <p><b>Track 4</b> – Socio-Ecological and Environmental Systems Session Chairs: Mohamed Bakhouya</p> <ul style="list-style-type: none"><li>▪ <b>Stephan Peter</b> Climate Change and Necessary Actions (30 min)</li><li>▪ <b>Luis Comolli</b> Emergence in Designed Agroecosystems: Collective Dynamics in a Perennial Multi-Species Agroforestry Network</li><li>▪ <b>Masatoshi Funabashi, Shinnosuke Yoshikawa, Kousaku Ohta, Ruth Langsi and André Tindano</b> Socio-Ecological Evaluation of Synecoculture Implementation in Sub-Saharan Africa</li><li>▪ <b>Shuntaro Aotake and Masatoshi Funabashi</b> Measuring Plant Biodiversity across Scales: The <math>\alpha\beta</math> Scale Diversity Model with Image-Based AI Estimation</li></ul>

17:00 – 18:30 Fatima Fihria	<p style="text-align: center;"><b>Parallel Session 3</b></p> <p><b>Track 3</b>– Artificial Intelligence and Computational Systems Session chair: Khawla Tadist</p> <ul style="list-style-type: none"><li>▪ <b>Carlo Lucheroni</b> Electricity Market Time Series Forecasting by Machine Learning Methods</li><li>▪ <b>Meryem Abtane, Gilbert Haba, Khalid Dahi, Hervé Martinez, Mohamed Sedki, Hicham EL Kimi and Luciano Fernandes Borges</b> Optimization of Sensor Placement for Detecting Axle Bearing Faults in High-Speed Trains</li><li>▪ <b>Salma Ariche, Otmane Elbacha, Zakaria Boulghasoul, Abdelhafid El Ouardi, Abdelhadi Elbacha, Abdelouahed Tajer and Stéphane Espié</b> Embedded Mamdani Fuzzy Control of HVAC Systems in Battery Electric Vehicles</li><li>▪ <b>Abderrahmane Boudribila, Abdelouahed Tajer and Zakaria Boulghasoul</b> Automating PLC Code Generation from Textual Requirement Specifications</li></ul>
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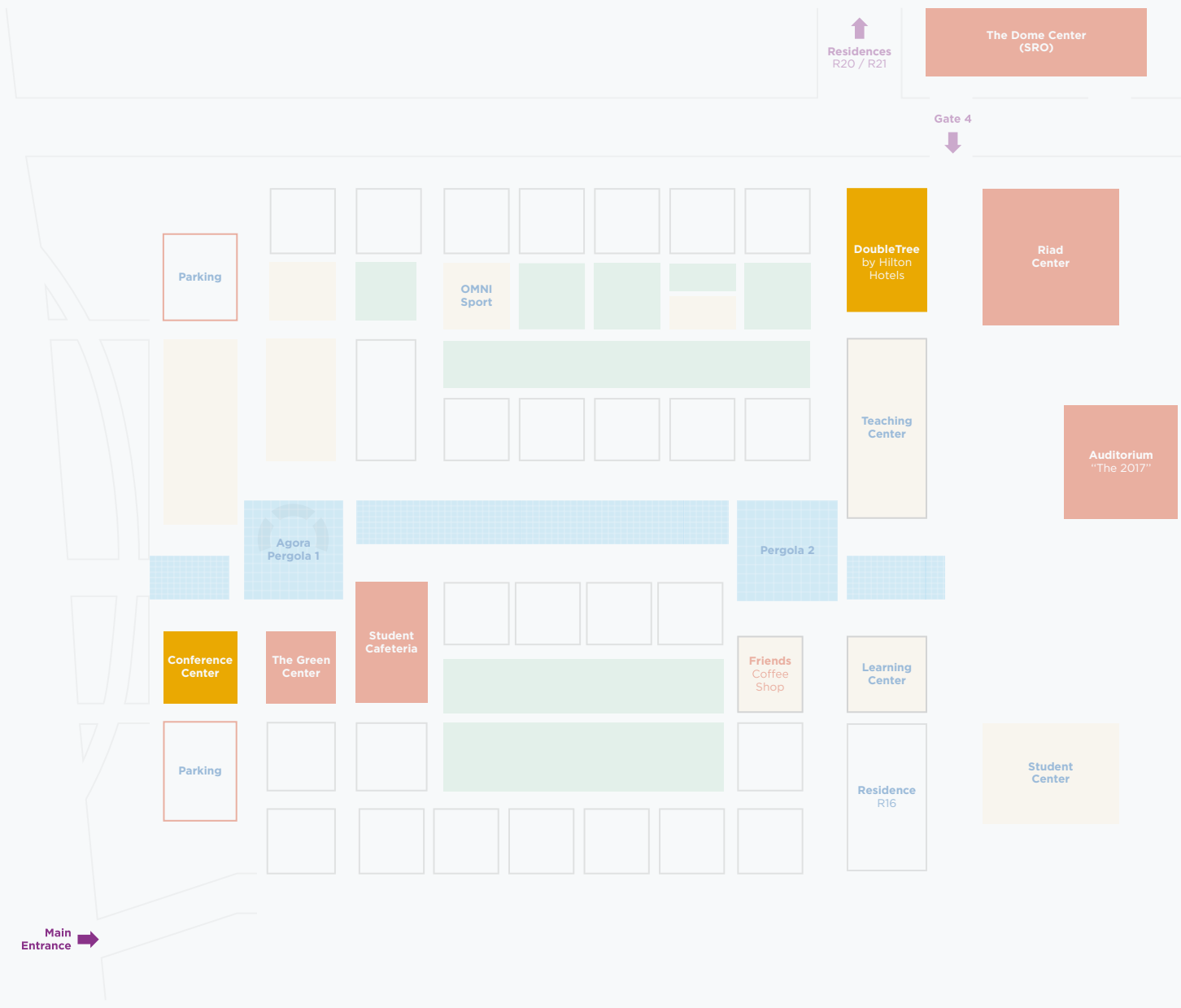
# Wednesday, 22 April 2026

Time & Room	Activity
09:00 – 09:45 Ibn Rochd	<b>Keynote Speaker: Karoline Wiesner</b> – The Physics of Political Change: Diffusion, Stability, and Regime Dynamics Session Chair: Mohamed Bakhouya
09:45 – 10:00 Ibn Rochd	Discussion
10:00 – 10:30	<b>Coffee Break</b> <b>Poster:</b> Abderrazak Goucheg, Jamal Amadid, Abdelouahed Tajer and Zakaria Boulghasoul – Multi-sensor Data Fusion and Lightweight Artificial Intelligence Models for Analyzing Motorcycle Riding Risks
10:30 – 12:10 Ibn Rochd	<b>Parallel Session 4</b> <b>Track 1</b> – Agent-Based and Social Complexity Session Chairs: Carlos Álvarez Pereira <ul style="list-style-type: none"><li>▪ <b>Gerardus Bukkems</b> Mapping Regeneration through Viability Geometrics: Configurational Diagnosis beyond the Anthropocene</li><li>▪ <b>Meriem Timouyas, Mohamed Nemiche, Younes Rezagui, Ahmed Mhamdi, Smahane Jebraoui, Khabid Sidati, Bezza Hafidi Mohamed Bakhouya and Mohamed Essaidi</b> Activity-Driven Spatial Agent-Based Modeling of Interaction Networks in Urban Systems: Application to epidemic dynamics in Agadir (Morocco)</li><li>▪ <b>Marcela Lopes Alves, Dyer Joel, Doyne Farmer, Michael Wooldridge and Anisoara Calinescu</b> Neural Network-Based Parameter Estimation of a Labour Market Agent-Based Model</li><li>▪ <b>Smahane Jebraoui and Mohamed Nemiche</b> Agent-Based Approaches in Tourism Studies Insights, Applications, and Future Directions</li></ul>

# Wednesday, 22 April 2026

Time & Room	Activity
10:30 – 12:10 Fatima Fihria	<p style="text-align: center;"><b>Parallel Session 4</b></p> <p><b>Track 2</b> – Foundations and Dynamics of Complex Systems Session Chairs: Masatoshi Funabashi and Abdelhadi El Bacha</p> <ul style="list-style-type: none"><li>▪ <b>Mohamed Hibti</b>, Caleca E, Rifi M, Picoco C and Sauvaget F Propositions for Measuring the Complexity of Probabilistic Safety Assessment Models</li><li>▪ <b>Ioana Andreea Jelea</b>, Giuliano Punzo and Hadi Arbabi Emergent Polycentricity in Synthetic Cities: From Agent-Centre Assignment to Evolutionary Urban Dynamics</li><li>▪ <b>Jiří Nedomlel</b> Life Grows and Evolves by Adapting Its Exploration to the Environment</li><li>▪ <b>Stefano Calzati</b> Being as Technics A Quantum-Informed Conjecture on Complexity</li><li>▪ <b>Patrik Christen</b> Parallel Computation of Agent-Based Economic Models with Entity-Component-System Architecture</li></ul>
12:10 – 13:10 Ibn Rochd	<p><b>Conference Scientific Summary</b> <b>Awards &amp; Closing Ceremony</b></p>

# Campus Map





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