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International Conference on Complex Orders in Condensed Matter:aperiodic order, local order, electronic order, hidden order

24-29 September 2023
at Evian (France)



INFORMATIONS

- Conference room :** The conference will take place at the seminar room located in the main building (same as the reception) on the ground floor
- Poster :** Two rooms will be dedicated for poster
- Restauration :** Breakfast, lunch and diner are all served in the Restaurant located on the first floor of the main building
- Breakfast served from 7h to 9h
- Lunch served at 12h45
- Dinner served at 20h
- Welcome cocktail :** It will be served on the Sunday 24 september at 19h30 in the Bar (second floor, near reception)
- Aperitif :** Tuesday 26 september
It will be served at 19h30 at the bar and terrasse, follow by diner at 20h15
- Conference dinner :** Thursday 28 september
- A cocktail with an Alpes Horn concert will be served from 19h to 20h at the bar and terrasse
- The dinner will consist of a cheese fondue
Alternative meal will be provided for those who can not eat cheese
- WIFI :** WIFI connection is only available in the common building of the vacation center (reception, bar and conference room). Connect to vvd clientèle. Go to your web browser and register with your first name and name. The connection is then valid for the all stay.

International Conference on Complex Orders in Condensed Matter

Evian 2023

Program

Sunday 24 September 2023

16h30 **Registration**

19h30 **Welcome Party**

The conference aims at fostering collaborations on the study of complex orders in condensed matter and in particular aperiodic order, local order, electronic order, magnetic order and 'hidden' order. At the atomic scale complexity is characterised by two main parameters the periodic or aperiodic long-range order and the disorder and local order. Eminently interdisciplinary, this conference will review advances in the study of incommensurately modulated phases, quasicrystals and approximants, strongly correlated electron systems, disordered and amorphous systems, glasses with an emphasis on the influence of structural complexity on properties.

The following topics will be covered: Material synthesis; Structure determination (long range order and disorder); Electronic and Magnetic orders, Superconductivity; Atomic dynamics (phonon, phason, relaxation, heat transport); Ferroelectricity in perovskite; Catalysis and complex structures; Atomic scale Simulation and Machine learning for the study of complexity.

This conference is jointly organized by the International Research Network Aperiodic, the Hypermaterials project and the Hyper-ordered structure projects. It follows the IRN Aperiodic conference organized in Octobre 2021 in Carry le Rouet, France (<https://irn-aperiodic.grenoble.cnrs.fr/>). It is a successor to previous meetings held in Nagoya (2015), Annecy (2017) and Sendai (2019) bringing together aperiodic and correlated electron communities.

Organizing committee

Guillaume Beutier	SIMAP, Université Grenoble Alpes, CNRS, France
Marc De Boissieu	SIMAP, Université Grenoble Alpes, CNRS, France
Koichi Hayashi	Nagoya Institute of Technology, Japan
Shinya Hosokawa	Kumamoto University, Japan
Toyohiko Kinoshita	Japan Synchrotron Radiation Research Institute, Spring-8
Koji Kimura	Nagoya Institute of Technology, Japan
Laszlo Pusztai	Wigner Research Centre for Physics, Budapest, Hungary
Pierre Rodière	Institut Louis Néel, Université Grenoble Alpes, CNRS, France
Jens Stelhorn	Nagoya Institute of Technology, Japan
Hiroyuki Takakura	Hokkaido University, Japan
Ryuji Tamura	Tokyo University of Science, Japan

Monday 25 September 2023

8h30	Introduction and presentation of the networks 40 min	
	Session 1 Chair : Perez Olivier	
9h10	van Smaalen Sander - Introduction to aperiodic crystals	30 min.
9h40	Kitaura Mamoru - Identification of zinc and vacancy sites in zinc-doped -CuI crystal by X-ray fluorescence holography and positron annihilation spectroscopy	20 min.
10h00	Haller Martin - Growth of 2D Oxide Quasicrystals from 2D Honeycombs	20 min.
10h20	Break	
	Session 2 Chair : Kimura Koji	
11h00	Cicconi Rita - Effect of glass polymerization on the Evolution of Nb structural environment	30 min.
11h30	Sato Shuya - SiO ₂ glass with the world's highest density and structural ordering	20 min.
11h50	Garbarino Gaston - New opportunities on the studies of condensed matter systems under extreme conditions at the ESRF-EBS	20 min.
12h10	Pusztai Laszlo - Understanding disordered structures by Reverse Monte Carlo modeling: recent developments and current challenges	20 min.
12h30	Lunch	
	Session 3 Chair : Ishimasa Tutsomu	
14h00	Yoshida Ryo - Machine learning for quasicrystals	30 min.
14h30	Asahi Ryoji - Importance of local structural description in atomistic simulations and functional materials design	20 min.
14h50	Ideue Toshiya - Emergent photovoltaic properties in aperiodic van der Waals heterointerfaces	20 min.
15h10	Kan Daisuke - Property control of transition metal oxides by Hydrogen	20 min.
15h30	Shiga Motoki - Structural order analysis based on rings for network-forming materials	20 min.
15h50	Break	
16h30	Poster Session 1 : presentation of odd number posters	
18h30	End of Poster session	

Tuesday 26 September 2023

	Session 4 Chair : Tokunoga Yo	
8h30	Harima Hisatomo - Fermi surface of strongly correlated electron system with non-centrosymmetric atoms	30 min.
9h00	Knebel Georg - Multiple superconducting phases in spin triplet superconductor UTe2	20 min.
9h20	Lu Augustin - Exploring the structure of silica with unsupervised learning and locally averaged atomic fingerprints (Labib Farid canceled)	20 min.
9h40	Eguchi Ritsuko - Observation of superstructure in Fe ₅ -xGeTe ₂ by X-ray fluorescence holograph	20 min.
10h00	Kojima Koita - Enhanced phase transition temperature assoc with a short-range ordering of trimers in LiV	20 min.
10h20	Break	
	Session 5 Chair : Hosokawa Shinya	
11h00	Baron Alfred - Mesoscale Liquid Dynamics & Extreme Resolution IXS	30 min.
11h30	Katayama Naoyuki - Slow dynamics of disordered zigzag chain molecules in layered LiVS ₂	20 min.
11h50	Mori Tatsuya - Terahertz spectroscopy of dynamics derived from nanoscale disordered and fractal structures -boson peak and fracton	20 min.
12h10	Mihalkovič Marek - Search for tetrahedrally close-packed icosahedral quasicrystal	20 min.
12h30	Lunch	
	Session 6 Chair : Takakura Hiroyuki	
14h00	Edagawa Keichi - Phason elastic degrees of freedom in quasicrystals	30 min.
14h30	Matsuura Masato - Study of phason dynamics by quasielastic neutron scattering on a low-Q region	20 min.
14h50	Nagai Yuki - Atomic diffusion due to hyperatomic fluctuation for quasicrystals and their approximants	20 min.
15h10	Yakiyama Yumi - Stimuli-responsive Molecular Crystalline Materials : Shape Effect of Bowl and Butterfly-like Structures	20 min.
15h30	Murashige Hiromi - Change in Lamellar Structure of P4MP1 Films due to Solvent Absorption	20 min.
15h50	Break	
	Session 7 Chair : Pusztai Laszlo	
16h30	Grin Yuri - Violation of translational symmetry and complexity of crystal structures	20 min.
16h50	Egusa Daisuke - Direct observations of solute clusters in dilute Mg alloys based on electron microscopy and X-ray fluorescence holography	20 min.
17h10	Gaudry Emilie - Ultra-thin oxide quasicrystalline films : structures and stabilities	20 min.
17h30	Kumar Singh Vipin - Transformation of two-dimensional quasicrystalline approximants into partially filled honeycomb lattices in reduced SrTiO ₃ thin films supported on Pt(111)/Al ₂ O ₃ (0001)	20 min.
17h50		

Wednesday 27 September 2023

	Session 8 Chair : Eguchi Ritsuko	
8h30	Ye Jianting - Field-Effect Control of Clean Superconductivity and Orbital FFLO States in 2D Materials. GENERAL INTRO NEEDED-Complexity	30 min.
9h00	Tokunaga Yo - Magnetic field-reinforced superconductivity in spin-triplet superconductor UTe ₂	20 min.
9h20	Tanaka Kaori - Self-consistent study of topological superconductivity in two-dimensional quasicrystals	20 min.
9h40	Takemori Nayuta - Spatial Distribution of Supercurrent in a Quasiperiodic Superconductor	20 min.
10h00	Akiyama Ryota - Atomically flat SnTe(001) thin films made by the room temperature wetting layer method and its electrical transport properties	20 min.
10h20	Break	
	Session 9 Chair : Takemori Nayuta	
11h00	Tamura Ryoji - Search for long-range magnetic order in Tsai-type quasicrystals	30 min.
11h30	Watanabe Shinji - Magnetism, Topology and dynamics in Icosahedral Quasicrystal and Approximant	20 min.
11h50	Deguchi Kazuhiko - Superconductivity of icosahedral approximants with Tsai-type cluster	20 min.
12h10	Fujita Nobuhisa - 2 τ 2 scale inflation for canonical-cell tilings	20 min.
12h30	Lunch	
14h00 18h30	EXCURSION	

Thursday 28 September 2023

	Session 10 Chair : Rodière Pierre	
8h30	Jagannathan Anuradha - Brief review of electronic states and properties of quasiperiodic tilings	30 min.
9h00	Tokumoto Yuki - Superconductivity in Ta-Te van der Waals layered quasicrystal	20 min.
9h20	Sugimoto Takanori - Confined states in two-dimensional quasicrystals with applied pi-flux	20 min.
9h40	Yoshii Mao - Gap labelling theorem for multilayer thin	20 min.
10h00	Lorenzo Emilio - A new view of the Verwey transition in magnetite brought by high resolution X-ray diffraction	20 min.
10h20	Break	
	Session 11 Chair : Stellhorn Jens	
11h00	Noguchi Yuji - Defect-polarization interactions in perovskite ferroelectric	30 min.
11h30	Uenuma Mutsunori - Crystal structure of amorphous/crystalline interface in Al ₂ O ₃ /GaN MOS device (Kuвано Taro - Canceled)	20 min.
11h50	Namba Morito - X-ray Fluorescence and Photoelectron Holography Experiments for Valence-Selective Structural Analysis of a Novel Layered Oxyhydride with Inter-Site Charge Transfer	20 min.
12h10	Sakai Shiro - Hyperuniformity in quasiperiodic electron systems	20 min.
12h30	Lunch	
	Session 12 Chair : Kohara Shinji	
14h00	Kameoka Satoshi - Creation of novel catalytic functions using hypermaterial alloys	30 min.
14h30	Kitamura Naoto - Local structures of high-entropy electrode materials for rechargeable batteries	20 min.
14h50	Kotla Surya - Two-Dimensional Modulated Low temperature phase of Rb ₂ ZnCl ₄	20 min.
15h10	Shuseki Yuta - Structure of Al ₂ O ₃ glass revealed by DF-MD simulation	20 min.
15h30		
15h30	Break	
16h10	Poster Session 2 : presentation of even number posters	
18h30	End of Poster session	

Friday 29 September 2023

	Session 13 Chair : Fujita Nobuhisa	
8h30	Watanabe Satoshi - Developing machine learning potentials to examine hyperordered structures	30 min.
9h00	Nakata Ayako - Investigation of atomic and electronic structures of materials with complex structures by large-scale DFT calculations	20 min.
9h20	Gallo-Frantz Antoine - Charge-Density-Waves Tuned by True Biaxial Stress in a Nearly-Tetragonal System	20 min.
9h40	Kalouguine Pavel - Debugging matching rules	20 min.
10h00	Taniuchi Ibuki - Circular photogalvanic effect in monolayer surface superstructures with huge Rashba-splitting	20 min.
10h20	Break	
	Session 14 Chair : Kinoshita Toyohiko	
11h00	Lifshitz Ron - Non minimal-rank quasiperiodic tiling	20 min.
11h30	Ishimasa Tsutomu - Planar defects in approximants	20 min.
11h50	Kimura Kaoru - Characteristics of hypermaterials and their similarities and differences with amorphous materials	20 min.
12h10	Young Scientist award and CONCLUDING REMARKS	30 min.
12h30	Lunch	
14h00	End of the Conference	

50 Contributed and 12 Invited : total 62 Presentations

Two poster sessions of 2h or 2h30 including drinks, with 48 posters in two different rooms

POSTERS

1	Abe Takaki - Magnetic properties of Au-SM-Eu 1/1 quasicrystal approximants
2	Agarwal Harshit - The incommensurate charge density wave in EuAl_2Ga_2
3	Arima Kazuki - Dopant-induced Local Atomic Structure Modulation of Transition-metal-doped BiFeO_3 Single Crystal Thin Films Measured by X-ray Fluorescence Holography
4	Beutier Guillaume - Proton configurations in the hydrogen bonds of KH_2PO_4 as seen by resonant x-ray diffraction
5	De Boissieu Marc - Thermal conductivity and phonon lifetime of structurally complex materials
6	Emk Ikball Ahmed - Spin wave modulation by strain induced remanent polarization in functional Iron Oxide thin films
7	Fujita Erina - Conversion of human-readable experimental data into machine-readable data sets for quasicrystals and approximants in the literature
8	Hashimoto Yusuke - Photoelectron holography of dopant elements intercalated in two-dimensional semiconductor materials with layered structures
9	Hayashi Koichi - X-ray fluorescence holography of FeCo alloys
10	Hiroki Kanta - A phase identification technique using deep learning
11	Hiroto Takonobu - Synthesis, crystal structure, and magnetic properties of Ga-Pd-R (R= rare-earth) system with hexagonal structure
12	Hosokawa Shinya - Valence-selective three-dimensional atomic images of Fe_3O_4 magnetite by x-ray fluorescence holography
13	Ishikawa Asuka - Synthesis and magnetic properties of single-crystalline Au-Al-Gd 1/1 quasicrystal approximants
14	Kato Tatsuya - Effect of disorder on phonon lifetime in the Ni_3Fe alloy
15	Kimura Kaoru - Semiconducting quasicrystal and its approximant as thermoelectric materials
16	Kimura Koji - Application of in-situ X-ray Fluorescence Holography under an Electric Field to $\text{Pb}(\text{Mg}_{1/3}\text{Nb}_{2/3})\text{O}_3\text{-PbTiO}_3$ Piezoelectric Material
17	Kinoshita Toyohiko - Activities of Hyper-Ordered Structures Analysis Group at JASRI/SPring-8
18	Koga Akihisa - Hyperuniformity in the two-dimensional periodic and quasiperiodic lattices
19	Kohara Shinji - Structure and properties of densified silica glass
20	Kusaba Minoru - Exploring semiconductor quasicrystals with machine learning
21	Lebolloc'h David - A sliding Charge Density Wave observed by a coherent and ultra fast X-ray pulse
22	Li Xu - Hypermaterial of ultrathin Ce-Ti-O film on Pt(111)
23	Matsubara Toranosuke - Hexagonal metallic-mean tilings as aperiodic approximants of the honeycomb lattice
24	Matsutani Kenta - Pressure-induced structural transitions in GeO_2 glass based on topological data analysis

25	Muro Yuji - Complex magnetic phase diagram of Cd 6 R (R=Gd and Tb) probed by ultrasonic measurements
26	Nakashima Seiji - Electric-field-induced Structural Changes around Fe and Mn Atoms in Mn-doped BiFeO ₃ Single Crystal Thin Film Measured by X-ray Fluorescence Holography
27	Hazuki Natsui - Photoelectron hologram of Mg implanted GaN surface
28	Nawa Kazuhiro - Magnetic excitations in the quasicrystal approximant Au ₇₀ Al ₁₆ Tb ₁₄
29	Nemoto Yuichi - Elastic properties of Au-Al-R (R=Yb, Lu) quasicrystals and 1/1 approximants
30	Ogasahara Shunsuke - Synthesis and superconductivity of Au-SM (SM=Al, Ga)-La quasicrystal approximant
31	Ohoyama Kenji - Novel imaging method for hyper-order structures of light elements: white neutron holography
32	Rodière Pierre - Quantum phase transition in the density waves systems : what can we learn from the lattice ?
33	Sato Shunsuke - Electronic structure and electronic transport properties of Yb-intercalated epitaxial graphen
34	Sato Masanori - Adsorption structures of Pentacene on the fivefold surface of the Tsai-type Ag-In-Yb quasicrystal
35	Semba Takayuki - Study of recrystallization and oxidation at a-Si:H/c-Si interface using machine learning potential molecular dynamics simulation
36	Shimano Yuho - Materials design for colossal dielectric constant using first-principles calculations and graph neural networks
37	Stellhorn Jens - Local Atomic Order in Hypermaterials and Hyperordered Structures
38	Suzaki Hayate - Incommensurate States and Soliton Structures in Non-integrable Generalized Toda Lattices
39	Suzuki Shintaro - Search for new superconductors in Au-based quasicrystal approximant
40	Tajiri Hiroo - Carry-in Diffractometer for utilizing X-ray Fluorescence Holography and Anomalous X-ray Scattering
41	Takakura Hiroyuki - Non-cubic rational approximants to Bergman-type icosahedral quasicrystals
42	Tominaga Yoriko - X-ray fluorescence holography of low-temperature-grown GaAs _{1-x} Bi _x
43	Yamada Tsunetomo - A six-dimensional model for F-type icosahedral quasicrystals
44	Yamamoto Takafumi - Magnetocaloric Effect of the 1/1 Tsai-Type Quasicrystal Approximants in Au-SM-RE Systems
45	Yamaura Kazunari - Exploration of oxide-based hypermaterials using high-pressure quenching
46	Yokoya Takayoshi - Photoelectron holography of BiS ₂ -based superconductors
47	Yuhara Junji - Oxide crystalline approximant and quasicrystal of ultrathin Ba-Ti-O films on Pt(111)
48	Zhan Xinhui - Development and application of X-ray fluorescence holography under high pressure