

Programme of
**Humboldt Kolleg on Synthetic
Quantum Matter**
2-6 July 2023

















Alexander von
HUMBOLDT
STIFTUNG

To be held at **Hotel** Courtyard by Marriott Vilnius City Center Rinktinės st. 3, Vilnius, Lithuania

Monday, July 3rd

POSTER SESSION

-  1. **Markus Bestler** (University of Konstanz, Germany)
Quantum Harmonic Balance
-  2. **Michał Bobrowicz** (Jagiellonian University, Poland)
A Particle on a Ring as a Time Crystal
-  3. **Yakov Braver** (Vilnius University, Lithuania)
Construction of Eight-dimensional Topological Systems Based on Time-Space Crystalline Structures
-  4. **Domantas Burba** (Vilnius University, Lithuania)
Topological charge pumping in subwavelength Raman lattices
-  5. **He Chengdong** (Hong Kong University of Science and Technology HKUST, Hong Kong)
Realization of a $SU(2)$ non-Hermitian topological band and the thermodynamic study of imbalanced $SU(N)$ fermions
-  6. **Jacek Dobrzyniecki** (University of Warsaw, Poland)
Quantum simulation of the central spin model with a Rydberg atom and polar molecules in optical tweezers
-  7. **Michael Doris** (Joint Quantum Institute, NIST and University of Maryland, USA)
Machine Learning Applications in Laser Cooling and Trapping Atoms
-  8. **Hubert Dunikowski** (Institute of Physics, Polish Academy of Sciences, Poland)
Nuclear spin squeezing induced by light for fermions in optical lattices
-  9. **Dmitry Efimov** (Wrocław University of Science and Technology, Poland)
Problem of double measurement in creating electronic momentum maps in Strong-Field experiments
-  10. **William Evans** (PTB Berlin, Germany)
The application of optically pumped magnetometer arrays for electric vehicle battery characterization
-  11. **Weronika Golletz** (Jagiellonian University, Krakow, Poland)
 N Impenetrable particles bouncing on a mirror: discrete time crystals
-  12. **Edvinas Gvozdiovas** (Vilnius University, Lithuania)
Interference induced anisotropy in a two-dimensional dark state optical lattice
-  13. **Hamid Reza Hamed** (Vilnius University, Lithuania)
Spatially Strongly Confined Atomic Excitation via Two Dimensional Stimulated Raman Adiabatic Passage
-  14. **Hamid Reza Hamed** (Baltic Institute of Advanced Technology)
Spatially Patterned Light Amplification Without Inversion

Programme of
**Humboldt Kolleg on Synthetic
Quantum Matter**
2-6 July 2023



Alexander von
HUMBOLDT
STIFTUNG

To be held at **Hotel** Courtyard by Marriott Vilnius City Center Rinktinės st. 3, Vilnius, Lithuania

Monday, July 3rd

POSTER SESSION

-  **15. Ali Emami Kopaei** (Uniwersytet Jagielloński, Poland)
Topological molecules and topological localization of a Rydberg electron on a classical orbit
-  **16. Teodora Velcheva Kirova** (University of Latvia, Latvia)
Azimuthal Dependence of Electromagnetically Induced Grating in a Double V-type Atomic System near a Plasmonic Nanostructure
-  **17. Viačeslav Kudriašov** (Vilnius University, Lithuania)
Absorption Patterning in Rydberg Atomic Media Controlled with EIT and OAM Fields
-  **18. Piotr Kulik** (Center for Theoretical Physics, Polish Academy of Sciences, Poland)
Fock State Sampling Method – Characteristic temperature of maximal fluctuations for interacting bosons in box
-  **19. Reinis Lazda** (University of Latvia, Latvia)
Nanotesla Sensitivity Diamond NV Magnetometry
-  **20. Ignas Lukošius** (Vilnius University, Lithuania)
Extremely Narrow, Sharp-Peaked Resonances at the Edge of the Continuum
-  **21. Mažena Mackoit-Sinkevičienė** (Vilnius University, Lithuania)
Spin-squeezed States with Ultracold Fermions
-  **22. João Pedro Mendonça** (University of Warsaw)
Quantum simulation of extended electron-phonon-coupling models in a hybrid Rydberg atom setup
-  **23. Viktor Novičenko** (Vilnius University, Lithuania)
High-frequency expansion of periodically driven amplitude-modulated quantum systems treated using flow equations
-  **24. Francesco Petiziol** (TU Berlin, Germany)
Nonperturbative Floquet Engineering of the Toric-code Hamiltonian and its Ground State
-  **25. Matas Plūkys** (Vilnius University, Lithuania)
Transverse Modes and Beam Spatial Quality in Microchip Lasers
-  **26. Ville Pyykkönen** (Aalto University, Finland)
Suppression of Nonequilibrium Quasiparticle Transport in Flat-Band Superconductors
-  **27. Yi-Fan Qu** (Institute for Theoretical Physics, ETH Zurich, Zurich, Switzerland)
Quantum Dynamics and Spectral Properties of Fermi Polarons in One and Two-Dimensional Systems
-  **28. Tom Robin Rieckmann** (University Rostock, Germany)
Optimizing State Preparation Circuits on NISQ Platforms using Reinforcement Learning

Programme of
**Humboldt Kolleg on Synthetic
Quantum Matter**
2-6 July 2023



Alexander von
HUMBOLDT
STIFTUNG

To be held at **Hotel Courtyard** by Marriott Vilnius City Center Rinktinės st. 3, Vilnius, Lithuania

Monday, July 3rd

POSTER SESSION

-  **29. Tymoteusz Salamon** (ICFO, Barcelona, Spain)
Synthetic twisted bi-layer materials
-  **30. Alexander Schnell** (Technische Universität Berlin, Germany)
Floquet-topological states in weakly interacting quantum gas mixtures
-  **31. Rokas Silkinis** (Center for Physical Sciences and Technology, Lithuania)
Theoretical Modeling of Vibrationally Resolved Optical Lineshapes of a Carbon-Oxygen Pair Defect in Silicon
-  **32. Lukas Stakėla** (Center for Physical Sciences and Technology, Lithuania)
Terahertz Quantum Optoelectronics in Superlattices
-  **33. Lidia Stocker** (Institute for Theoretical Physics, ETH Zurich, Zurich, Switzerland)
Spinful cavity-double-dot system as a nonlocal Kondo and RKKY phase transition simulator
-  **34. Tomasz Szofdra** (Jagiellonian University, Krakow, Poland)
Discovering Hidden Patterns in Quantum Systems: Unveiling Scar States and Decoupled Subspaces with Quantum Variational Autoencoders
-  **35. Isaac Tesfaye** (TU Berlin, Germany)
Adiabatic charge pumping in bosonic Chen-insulator analogs
-  **36. Gediminas Usevičius** (Vilnius University, Lithuania)
Quantum tunneling of the methyl group in dimethylammonium zinc formate using ESEEM spectroscopy
-  **37. Martin Will** (University of Kaiserslautern, Germany)
Dynamics of polaron formation in 1D Bose gases in the strong-coupling regime
-  **38. Cailean Wilkinson** (University of St Andrews, UK)
Secure tripartite quantum state sharing in the continuous-variable domain
-  **39. Vytautas Žalandauskas** (Center for Physical Sciences and Technology, Lithuania)
Ab Initio Investigation of Vibrational Properties of Divacancy Defects in Silicon Carbide
-  **40. Giedrius Žlabys** (Okinawa Institute of Science and Technology, Japan)
Emergent topological properties of Kronig-Penney-type models