(Hyper)Complex Seminar 2021,
November 11-14 2021
Program and abstracts
(2021-11-04)
[http://www.hypercomplexseminar.com/]

November 11, 2021
Opening ceremony (9:00-9:50, POLISH TIME)

Session A1 (A tribute to the works of Julian Ławrynowicz),
Chairmen: Dariusz Partyka and Mariusz Zubert

10:00-10:50 Osamu Suzuki , *Non-commutative Galois theory and its application to general evolution*
11:00-11:50 Massimo Vaccaro, *Sp(n)-orbits of isoclinic subspaces in the real Grassmannians.*

Session A2 (Monogenic functions),
Chairman: Massimo Vaccaro

12:30-13:20 Sergiy Plaksa, *Monogenic functions in a harmonic algebra*
13:30-13:55 Serhii Gryshchuk , *Monogenic functions with values in commutative complex algebras of the second rank with unity and generalized biharmonic equation with simple characteristics*
14:00-14:25 Vitalii Shpakivskyi , *Hypercomplex method for solving linear PDEs*

Session A3 (Hypercomplex structures),
Chairman: Sergiy Plaksa

15:00-15:50 Lino F. Reséndis Ocampo, *Bicomplex Bergman Projection*
16:00-16:25 M. Elena Luna-Elizarrarás , *Hyperbolic curves and integration of bicomplex functions*
16:30-17:00 Valery Volchkov , Vitaly Volchkov, *Mean periodicity on the Cayley projective plane*

Session A4 (Complex analysis of several variables),
Chairman: Lino F. Reséndis Ocampo

17:30-17:55 Piotr Liczberski ,
Past and present extremal problems for series of holomorphic functions of several variables
18:00-18:25 Renata Dlugosz , Piotr Liczberski, Edyta Trybucka,
The Fekete-Szegö estimates of homogeneous polynomials for functions from some Bavrin's families
18:30-18:55 Anna Kimaczyska, *Morse Lemma*
19:00-19:25 Tetiana Osipchuk , *On lineal convexity generalized to commutative and non-commutative algebras*

November 12, 2021
Session B1 (Condensed matter physics),
Chairman: Łukasz Stępień

9:00-9:50 Zhidong Zhang,
Exact solution of ferromagnetic 3D Ising model and computational complexity of spin-glass 3D Ising system
10:00-10:25 Dariusz Sztenkiel , K. Gas, M. Foltyn, N. Gonzalez Szwacki, J. Domagała, D. Hommel, T. Dietl, M. Sawicki,
Atomistic spin model simulations of magnetic and magneto-electric properties of ferromagnetic (Ga,Mn)N
10:30-10:55 Yadhu Krishnan Edathumkandy, Maciej Sawicki, Dariusz Sztenkiel,
Comparative study of magnetic properties of Mn^{3+} magnetic clusters in GaN using classical and quantum mechanical approach

Session B2 (Ontology of quantum mechanics),
Chairman: Adam Paszkiewicz

11:30-12:20 Chantal Roth, Marek Danielewski,
Quaternion Quantum Mechanics: from Hamilton spacetime to the displacement four-potential in the Planck-Kleinert crystal
12:30-13:20 Manfried Faber ,
A geometric model in 4D space-time for electrodynamic phenomena
13:30-14:20 Jaroslaw Duda,
Exploring resemblance between liquid crystal topological defects and particle physics
14:30-14:55 Adam Paszkiewicz , Stanisław Goldstein, [Chairman: Mariusz Zubert]
Linear combinations of projections in von Neumann factors
15:00-15:50 Jacek Leśkow , [Chairman: Mariusz Zubert]
Cyclostationary Time Series. Functional Data Analysis and Time Series.

Session B3 (Theory of defects in topology of order parameter),
Chairman: Marek Danielewski

16:30-17:20 Ilan Roth,
Topological Evolution of Magnetically Knotted-Linked Physical Systems
17:30-17:55 Oleh Yermakov,
Mathematical approaches and structures in photonic systems
18:00-18:25 Sabri Koraltan, Michael Heigl, Claas Abert, Manfred Albrecht, Dieter Suess,
Skyrmions and antiskyrmions in ferrimagnetic multilayers
18:30-18:55 Łukasz Stępień,
On some exact solutions of certain nonlinear PDE's in physics
19:00-19:25 Vasileios Vachtsevanos,
Statistics of topological defects in nanostructures based on the Kibble-Zurek Mechanism

Round Table Discussion I (20:00-21:00)
Chairman: Ilan Roth

November 13, 2021

Session C1 (Embodied AI and evolutionary systems),
Chairman: Mariusz Zubert

9:00-9:50 Paulius Miskinis, *About the class of completely integrable evolutionary models*
10:00-10:25 Fabio Bonsignorio,
Towards a New Paradigm Embodied AI unifying Robust and Adaptive Soft Robotics and AI
10:30-10:55 Tomasz Talarczyk , Marcin Morawski, Marcin Malec,
Depth control for biomimetic and hybrid unmanned underwater vehicles

Session C2 (Mathematical modeling in Physics and Computer Science),
Chairman: Fabio Bonsignorio

11:30-12:20 Maciej Jaworski , *Data stream mining algorithms mathematical perspective*
12:30-12:55 Alexander Chichurin, Galina Filipuk, *An algorithm for finding solutions of a second-order nonlinear differential equation expressed in terms of the Mathieu functions*
13:00-13:50 Marta Dudek, Janusz Garecki,
Riemannian structure imposed on Friedmann and more general spacetimes

Session C3 (Data analysis and machine learning),
Chairman: Maciej Jaworski

14:30-15:20 Radosław A. Kycia, *Clusterization in action*
15:30-15:55 Mateusz Chmurski, Mariusz Zubert, Avik Santra,
Study of Edge-Optimized Deep Learning Classiers for Radar-Based Gesture Recognition
16:00-16:25 Dana Simian, *Methods for Parameters Optimization in SVMs and SVRs*

Session A6 (The inner radii problems),
Chairman: Serhii Gryshchuk

17:00-17:25 Liudmyla Vyhivska, *Inequalities for the inner radii of non-overlapping symmetric domains*
17:30-17:55 Iryna Denega, *Estimates of the products of inner radii of mutually non-overlapping domains*
18:00-18:25 Yaroslav Zabolotnyi,
Estimates of products of some powers of inner radii for multiconnected domains

Session A7 (Poster session),
Chairman: Armen Grigoryan

19:00-19:50 Ramojus Balevicius, Paulius Miskinis,
Experimental evaluation and theoretical modeling of air viscosity related parameters
19:00-19:50 Jacek Dziok , Classes of meromorphic harmonic functions dened by S l gean operator
19:00-19:50 Zoya Eremenko,
Resonant frequencies in microwave spheroid cavity resonator with small eccentricity using the local point method
19:00-19:50 Olena Karupu, *On some finite difference properties of analytic functions*
19:00-19:50 Bogdan Klishchuk , Ruslan Salimov, *On the order of growth of one class of homeomorphisms*
19:00-19:50 Viktor Savchuk , Olga Rovenska,
Approximation of some class of holomorphic functions by Cesàro means
19:00-19:50 Viktor Savchuk , Olga Rovenska,
Approximation of classes of harmonic bounded functions by Fejer means
19:00-19:50 Natalia Zorii , *Harmonic measure for the fractional Laplacian and its applications*

Round Table Discussion II (20:30-21:00)
Chairman: Sergiy Plaksa

November 14, 2021

Session D1 (Superconducting and semiconductor electronics),
Chairman: Khrystyna Gnatenko

9:00-9:50 Mikhail Belogolovskii , *Multilayered Josephson junctions for quantum sensing*
10:00-10:25 B. Stojewski , Krzysztof Pomorski,
Fundamental description of Wannier qubits of any topology in semiconductor by analytical and numerical computations
10:30-10:55 Lukasz Pluszyński , Krzysztof Pomorski,
Towards analog electronic simulation of electrostatically interacting quantum particles

Session D2 (Physics of superconducting materials),
Chairman: Mikhail Belogolovskii

11:30-12:20 Catherine Pépin,
Charge order and Strange metals in cuprate superconductors
12:30-12:55 Marcin Kowalik , R. Zalecki, M. Giebułtowski, J. Niewolski, W. Tokarz, S. Wolski,
The application of unsupervised learning to the AC susceptibility measurements of High-Temperature Superconductors
13:00-13:25 Marek Giebułtowski ,
Experimental high-temperature superconductors study in direction of application in information processing technologies

Session D3 (Experiments with superconducting and seminconductor electronics),
Chairman: Catherine Pépin

14:00-14:50 Khrystyna Gnatenko, *Studies of properties of spin systems on a quantum computer*
15:00-15:25 Krzysztof Pomorski ,
Fundamental description of Wannier qubits of any topology in semiconductor by analytical and numerical computations
15:30-15:55 Krzysztof Pomorski , Maksymilian Siembab,
Modeling of electrostatic programmable quantum gates of different topologies
16:00-16:25 Jakub Mojsiejuk , *CMTJ Simulation tool for multilayer spintronics devices*

Session A8 (Complex and real analysis of one variable),
Chairman: Radosław Kycia

17:00-17:25 Anna Futa, Dariusz Partyka,
The Schwarz type inequalities for harmonic functions of the unit disk into itself normalized on the boundary by a finite collection of arcs
17:30-17:55 Armen Grigoryan, *Bounded biharmonic mappings*
18:00-18:25 Maciej Parol , *On the Koebe Quarter Theorem for certain polynomials*
18:30-18:55 Ruslan Salimov , Mariia Stefanchuk, *Local Properties of Solutions of Nonlinear Beltrami Equation*
19:00-19:25 Anatoly Serdyuk , Tetiana Stepanyuk,
Asymptotically best possible Lebesgue-type inequalities for the Fourier sums on the sets $C_\beta^{\alpha,r} L_p$
19:30-19:55 Jacek Marchwicki , *Guthrie and Nymann Cantorval*

Closing ceremony (20:00-20:15)