**Sample Abstract Guidelines:**

1. Abstract Content should be in English
2. The maximum word count should be 250-300 words
3. If your title includes scientific notation, Greek letters, bold, italics, or other special characters/symbols, do make sure they appear correctly.
4. Corresponding details of corresponding author should be correct which will be used for further communication.
5. Abstracts should highlight the major points of your research and should not include tables, figures and references.

**Format**

**Presentation title:** Orbital Waves and Quantum Densities from Time-Discrete Chaotic Sequences Stabilized by Symmetry

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**Other Authors if any:**

**Presentation type:** (Oral presentation)

**Abstract (250-300 words):**

Rotation-Translation-Reflection type time-discrete recurrent algorithms can generate orbital type density structures showing up like opposite “charges” orbiting around each other. Some fixed-point clouds of these chaotic attractors show a constant drift or rotation, some resemble particles in atom orbits having a core surrounded by orbital shelves with quantized structure. Like in chemistry, the most interesting structures are based on symmetries. Some “Dynamic Autonomous Chaotic Orbital Pattern, #DACOP” examples can be discussed with respect to the impact of symmetries leading to chaos reduction, stability, and robust pattern formation, some cases show. Utilizing the cross product (always orthogonal to all the input vectors and only defined in 3 or 7 dimensions) we apply algebraic methods to have rotation-translation invariance, a “charge” symmetry (alternating opposite sign two-period even/odd tuple by reflection leading to infinitesimal shifts of a cloud of fixed points) and a time-invariance (constant curvature or torsion in the discrete Frenet frame). All symmetries contribute via proper time-discrete geometric algebra and initial value conditions to stabilize orbital densities. As expected, we can show, that DACOP solitons generated in 3+1*d* (as quaternion pattern) are likely to survive after being released in 7+1*d* (as octonion pattern) spreading out to all 7 dimensions while showing small adaptions and damped vibrations/dissipations after distortions. In the Frenet frame there are relations to well-known 3*d* physics ODE in the continuous limit, where invariants or conserved quantities can be assigned to a physical meaning. Example videos are usually accessible via tag “#DACOP” as YouTube videos on the internet. The actual focus is on atomic type symmetries and the “chemistry” of DACOP.

**Biography (150-200 words):**

Dr. Bernd Binder has expertise in physics, mathematics, software engineering, and material sciences. After some stimulation by Christos Skiadas, he applied discrete-time Rotation-Translation-Reflection type chaotic modelling about 12 years ago in 2 dimensions focusing on standing wave pattern. The modelling of “Dynamic Autonomous Chaotic Orbital Pattern #DACOP” utilizing the cross product in chaotic systems in 3 and 7 dimensions begun in 2021 and lead to some astonishing real-time simulations with publications and online videos.