

# Abstract for GR-TR Conference on Statistical Mechanics and Dynamical Systems

Talk Invited

Invited Talk

---

## Non-Hamiltonian Chaos from Nambu Dynamics of Surfaces

M. Axenides

We extend the framework of Nambu Mechanics to include dissipation in  $R^3$  phase space. We demonstrate that it accommodates the phase space dynamics of low dimensional dissipative systems such as the much studied Lorenz, Rössler as well as many other Strange attractors. In all cases the rotational, volume preserving part of the flow preserves in time a family of two intersecting surfaces, the so called Nambu Hamiltonians. They foliate the entire phase space and are, in turn, deformed in time by Dissipation which represents their irrotational part of the flow. The latter is given by the gradient of a scalar function. The interplay of the all three surfaces defines the chaotic flow and is responsible for the emergence of the Strange Attractor.

- 
- [1] M. Axenides and E. Floratos, " Strange Attractors in Dissipative Nambu Mechanics: Classical and Quantum Aspects " , *JHEP*, **1004**:036 , (2010).
  - [2] M. Axenides and E. Floratos , " Nambu-Lie 3-Algebras on Fuzzy 3-Manifolds", *JHEP*, **0902**: 039 , (2009).