



Canadian Association
of Physicists

Association canadienne
des physiciens et physiciennes

Contribution ID: 3119 Type: **Oral Competition (Graduate Student) / Compétition orale (Étudiant(e) du 2e ou 3e cycle)**

(G*) Entropy, Networks, and Design

Monday, 6 June 2022 11:30 (15 minutes)

Some of the most intriguing thermodynamic phases in nature involve an interplay between multiple types of degrees of freedom. However, multiple types of degrees of freedom are also a common feature of design problems in distributed systems that can be cast in terms of complex networks. Here, we show that generic network models of design exhibit an intricate interplay between configurational and conformational entropy. This interplay produces behaviours in non-matter systems that have direct analogues in conventional condensed matter. We give concrete illustrations of these behaviours using a model drawn from naval architecture, but our results have implications for distributed systems more generally. Our framework provides new tools for describing how competing degrees of freedom shape the space of design choices in complex systems.

Primary authors: CHITNELAWONG, Pheerawich (Queen's University); Mr HUNEAU, Kaleb (Queen's University); VAN ANDERS, Greg (Queen's University)

Presenter: CHITNELAWONG, Pheerawich (Queen's University)

Session Classification: M1-8 Statistical physics and biology (DCMMP) | Physique statistique et biologie (DPMCM)

Track Classification: Technical Sessions / Sessions techniques: Condensed Matter and Materials Physics / Physique de la matière condensée et matériaux (DCMMP-DPMCM)