

Special Issue

Statistical Mechanics of Self-Gravitating Systems

Message from the Guest Editor

Even though the gravitational force is very weak, observational astronomy provides us with numerous examples of assembled systems where it is the central unifying element. Going down in scale, galactic clusters, galaxies, globular clusters and solar systems come to mind, but there are other examples as well. At first glance, it would be natural to suppose that statistical mechanics should provide a unifying set of principles for understanding the main properties of these systems. However, the infinite range and short-range singularity of the Newtonian gravitational force introduces challenges for the standard theories that have yet to be fully resolved. Since they lack the short-range singularity, one-dimensional gravitational models are more susceptible to standard treatments and have had some success in providing insights into their 3D cousins. However, challenges remain even in that domain. Researchers have employed non-standard statistical mechanics to approach these issues for 3D, but a clear systematic theory has yet to be achieved. We are now in a good position to address them, or at the least take stock of what can be achieved and where further progress can be made.

Guest Editor

Prof. Dr. Bruce N. Miller
Department of Physics and Astronomy, Texas Christian University, Fort Worth, TX 76129, USA

Deadline for manuscript submissions

closed (15 March 2024)



Entropy

an Open Access Journal
by MDPI

Impact Factor 2.0
CiteScore 5.2
Indexed in PubMed



mdpi.com/si/152055

Entropy
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
entropy@mdpi.com

[mdpi.com/journal/
entropy](https://mdpi.com/journal/entropy)





Entropy

an Open Access Journal
by MDPI

Impact Factor 2.0
CiteScore 5.2
Indexed in PubMed



[mdpi.com/journal/
entropy](https://mdpi.com/journal/entropy)



About the Journal

Message from the Editor-in-Chief

The concept of entropy is traditionally a quantity in physics that has to do with temperature. However, it is now clear that entropy is deeply related to information theory and the process of inference. As such, entropic techniques have found broad application in the sciences.

Entropy is an online open access journal providing an advanced forum for the development and/or application of entropic and information-theoretic studies in a wide variety of applications. *Entropy* is inviting innovative and insightful contributions. Please consider *Entropy* as an exceptional home for your manuscript.

Editor-in-Chief

Prof. Dr. Kevin H. Knuth

Department of Physics, University at Albany, 1400 Washington Avenue,
Albany, NY 12222, USA

Author Benefits

Open Access:

free for readers, with article processing charges (APC) paid by authors or their institutions.

High Visibility:

indexed within Scopus, SCIE (Web of Science), Inspec, PubMed, PMC, Astrophysics Data System, and other databases.

Journal Rank:

JCR - Q2 (Physics, Multidisciplinary) / CiteScore - Q1 (Mathematical Physics)