

## Special Issue

# Theoretical Aspects of Kappa Distributions

### Message from the Guest Editor

Classical particle systems reside at thermal equilibrium with their velocity distribution function, stabilized into a Maxwell distribution. On the other hand, collisionless and correlated particle systems, e.g., space plasmas, are characterized by a non-Maxwellian behavior, typically described by the so-called kappa distributions. Empirical kappa distributions have become increasingly widespread across space and plasma physics. However, a breakthrough in the field came with the connection of kappa distributions with the solid background of non-extensive statistical mechanics. Understanding the statistical background and origin of kappa distributions was a cornerstone of further theoretical developments, e.g., among many others: the physical meaning of thermal parameters, e.g., temperature and kappa index; the N-particle description of kappa distributions; the generalization to phase-space kappa distribution of a Hamiltonian with non-zero potential; the entropy associated with kappa distributions. In this Special Issue, we welcome papers reporting on the progress of the theory of kappa distributions.

### Guest Editor

Dr. George Livadiotis

Space Science and Engineering, Southwest Research Institute, San Antonio, TX 78238, USA

### Deadline for manuscript submissions

closed (31 December 2019)



## Entropy

an Open Access Journal  
by MDPI

Impact Factor 2.0  
CiteScore 5.2  
Indexed in PubMed



[mdpi.com/si/9898](https://mdpi.com/si/9898)

*Entropy*  
Editorial Office  
MDPI, Grosspeteranlage 5  
4052 Basel, Switzerland  
Tel: +41 61 683 77 34  
[entropy@mdpi.com](mailto: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)