Special Issue

Neutral Hydrogen Observations: Techniques and Cosmological Insights

Message from the Guest Editors

Hydrogen is the most abundant baryonic element in the universe. The neutral hydrogen 21-cm spectral line serves as a crucial probe for revealing the formation and evolution of cosmic structures, primarily in two contexts: At the galactic scale, precise measurements of the 21-cm emission line from nearby to mid/high-redshift galaxies enable direct tracking of the distribution and dynamics of cosmic matter. This 21-cm galaxy approach can resolve individual galaxies. These observations provide key constraints on the gravitational potential field of dark matter halos and, furthermore, limit the properties of dark matter through the neutral hydrogen mass function. At the cosmological scale, the neutral hydrogen intensity mapping technique statistically correlates the accumulated 21-cm signals from numerous unresolved galaxies, facilitating efficient surveys of large-scale structures. Currently, sky surveys conducted with next-generation radio telescopes, such as the Square Kilometre Array, are organically integrating these two research paradigms to advance the systematic exploration of frontier topics, including dark matter, dark energy, and cosmic reionization.

Guest Editors

Prof. Dr. Yougang Wang
School of Astronomy and Space Science, University of Chinese Academy of Sciences, Beijing 100049, China
Dr. Yichao Li
College of Sciences, Northeastern University, Shenyang 110819, China

Deadline for manuscript submissions

31 August 2026

Universe

an Open Access Journal by MDPI

Impact Factor 2.6
CiteScore 5.2

mdpi.com/si/263320

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

mdpi.com/journal/universe

Universe

an Open Access Journal by MDPI

Impact Factor 2.6
CiteScore 5.2

mdpi.com/journal/universe

MDPI

About the Journal

Message from the Editor-in-Chief

The multidisciplinary journal *Universe* is aiming to follow and, hopefully, to lead to the largest extent as possible the ever-self renovating threads which weave mathematical theories with our understanding of the magnificent natural world. On behalf of all the distinguished members of the Advisory and Editorial Boards, I extend my welcome to this journal and look forward to hearing from the interested contributors and learning about their valuable research.

Editor-in-Chief

Prof. Dr. Lorenzo Iorio
Ministero dell' Istruzione e del Merito, Viale Unità di Italia 68, 70125 Bari, Italy

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), Astrophysics Data System, INSPIRE, CAPlus / SciFinder, Inspec, and other databases.

Journal Rank:

JCR - Q2 (Astronomy and Astrophysics) / CiteScore - Q2 (General Physics and Astronomy)