

Research Direction: PLANETARY INTERIOR

Field: Modelling Planetary Interiors & Subsurface Ice Stability

SHORT BIO

RESEARCH ACTIVITY

90+ publications, 67 first-author & corresponding-author journal papers. 2450+ citations, H-index = 28 (Aug. 2025, Google Scholar).

RESEARCH INTERESTS

- (1) Internal structure and interior composition of giant planets in our solar system and beyond;
- (2) Ab initio calculations for planetary matter;
- (3) Subsurface ice stability on Mars and icy moons;
- (4) Decay properties of unstable nuclei and their astrophysical applications.

AWARDS & HONORS

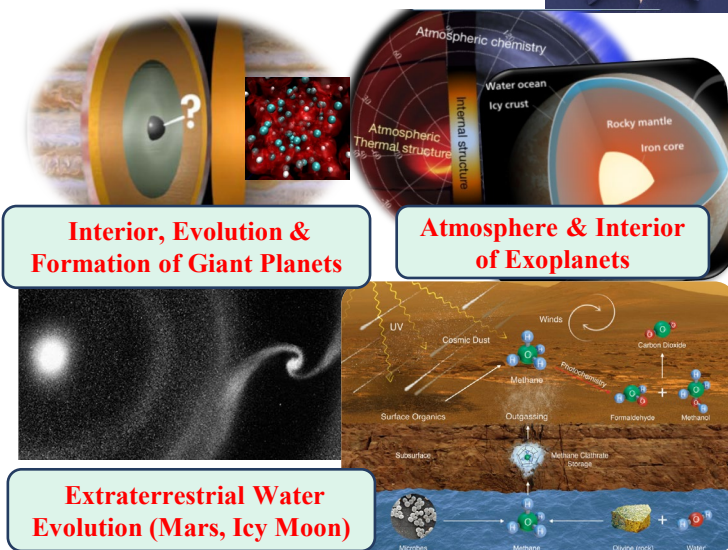
- Suzhou Innovation and Entrepreneurship Leading Talents Program (Suzhou, 2025)
- Jiangsu Specially-Appointed Professor (Jiangsu Education Department, 2023)
- Excellent Young Scholars Fund of the Natural Science Foundation of China (NSFC, 2020)
- Top Review Award of *Chinese Physics C* (2017-2020)
- BOC Research Excellence Award, MUST (2019)
- Outstanding Postdoc of Nanjing University, (2015)

Visiting Scholar

Dongdong NI

PhD: Theoretical Physics (2012) – Nanjing University

Degree: Physics (2008) – Nanjing University



Interior, Evolution & Formation of Giant Planets

Atmosphere & Interior of Exoplanets

Extraterrestrial Water Evolution (Mars, Icy Moon)

KEY PUBLICATIONS (selected)

Y. Wang, J. Shi, ..., **D. Ni***, and J. Sun*. Machine Learning simulations reveal oxygen's phase diagram and thermal properties at conditions relevant to white dwarfs. *Nature Communications* 15, 5504, 2025.

Y. Zhao, Z. Liu, **D. Ni***, Z. Chen. Comparison of machine-learning and Bayesian inferences for the interior of rocky exoplanets with large compositional diversity. *ApJS* 272, 35, 2024.

H. Song, J. Zhang, Y. Liu, Y. Sun, and **D. Ni***. Modeling the distribution of subsurface seasonal water ice with varying atmospheric conditions at northern low to midlatitudes on Mars. *Icarus* 389, 115262, 2023.

M. Zhang, **D. Ni***, Z. Zhang. What makes 1, 3-dioxolane an efficient sII hydrate former? *Fuel* 334, 126714, 2023.

N. Nettelmann, N. Movshovitz, **D. Ni**, et al. Theory of figures to the seventh order and the interiors of Jupiter and Saturn. *PSJ* 2, 241, 2021 (NASA JUNO Scientific Collaboration).

PROFESSIONAL EXPERIENCE

2025 – present – Macau University of Science and Technology, Macao (China) – Visiting Scholar

2023 – present – Institute of S&T for Deep Space Exploration, Nanjing University, (China) – Prof.

2020 – 2023 – Macau University of Science and Technology, Macao (China) – Asso. Prof.

2017 Jan–Apr – Department of Earth, Planetary, and Space Sciences, UCLA – Visiting Scholar

2015 – 2020 – Macau University of Science and Technology, Macao (China) – Asst. Prof.

2013 – 2015 – School of Electronic Science and Engineering, Nanjing University (China) – Post Doctoral

GRANTS

FDCT 2025-2028 – PI: Effects of Jupiter's outer atmosphere and interior matter properties on its interior composition and structure

NSFC 2025-2029 – Co-PI: Investigations on giant planet models based on phases and their evolution under ultra-high temperature and ultra-high pressure conditions

Suzhou 2025-2028 – PI: Research on the mechanism of in-situ water utilization for extraterrestrial manufacturing

CNSA 2024 – 2026 – Co-PI: EUV planetary detection technology

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