

Xuefeng Ding

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PI, Neutrino AI Lab

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Profile

Experimental neutrino physicist and PI working where detector physics meets modern software. A decade on flagship underground experiments (Borexino, Daya Bay, JUNO), with a record of method innovations that became discoveries and official analyses — and, increasingly, scientific machine learning and high-performance computing for physics at scale. Principal investigator on ~¥10M of research funding. Bibliometrics: 100+ collaboration papers; h-index 40+ (Google Scholar).

Research Highlights

First experimental evidence of CNO solar neutrinos *Nature 587, cover (2020)*

Core analyst on the first detection of neutrinos from the CNO fusion cycle (the Bethe cycle). Developed the BAMBI method, raising the CNO significance from 2σ to 5σ . Named among the year's top-10 international science breakthroughs; the program received the EPS Cocconi Prize.

JUNO's first reactor-neutrino oscillation measurement *Nature, cover (2026)*

Co-led the statistical analysis; proposed and implemented the key statistical strategy for JUNO's inaugural oscillation result.

Comprehensive measurement of pp-chain solar neutrinos *Nature 562 (2018)*

Main analyst on Borexino's simultaneous precision spectroscopy of the pp-chain fluxes — the most complete real-time measurement of solar neutrinos. Multivariate fit powered by GooStats, my GPU framework (~1000×).

^8B solar neutrinos at JUNO *Chin. Phys. C 45 (2021)*

Proposed the three-fold-coincidence (TFC) method enabling a 2 MeV detection threshold for ^8B solar neutrinos at JUNO.

Solar physics & AI-for-science at IHEP *2023 – present*

Lead solar-neutrino physics with JUNO (machine-learning directionality, detector-response calibration) and physics R&D for a new TPC detector for the low-energy reactor-neutrino spectrum.

Research Funding — PI (~¥10M)

Overseas young-talent grants, research topic at the PI's discretion.

- Chinese Academy of Sciences **PI • ¥3M**
- National Natural Science Foundation of China (NSFC) **PI • ¥3M**
- National Key R&D Program of China (MOST) — sub-project **PI • ¥3M**
- Institute of High Energy Physics, CAS — talent recruitment **PI • ¥1M**

Appointments

Associate Research Fellow — Institute of High Energy Physics, CAS *2023 – present*

Postdoctoral Research Associate — Princeton University, USA *2019 – 2022*

Education

Ph.D. in Astroparticle Physics — GSSI & SISSA, Italy (cum laude) *2015 – 2019*

M.Sc. in Theoretical Physics — Wuhan University, China *2012 – 2015*

B.Sc. in Physics — Wuhan University, China *2008 – 2012*

Honors

- Outstanding Self-financed Abroad Graduate Student, China Scholarship Council (2023)
- Ph.D. awarded *cum laude*, SISSA/GSSI

Invited & Plenary Talks

- **(Plenary)** Prospects of neutrino mass ordering and solar neutrinos with JUNO — Lake Louise Winter Institute, Canada (2019)
- **(Plenary)** Status and physics of JUNO — 20th Int. Workshop on Neutrinos from Accelerators (NuFACT), USA (2018)

- **(Plenary)** Borexino Phase-II results and prospects of CNO detection — Int. Symposium of Neutrino Frontier, Vietnam (2018)
- Solar neutrino physics with Borexino — APS Division of Nuclear Physics Fall Meeting (2021); CNO evidence — EPS-HEP (2021)

Selected Publications

Full list on INSPIRE-HEP / Google Scholar.

- JUNO Collaboration, *First measurement of reactor antineutrino oscillation with JUNO*, Nature, cover (2026).
- Borexino Collaboration, *Experimental evidence of neutrinos produced in the CNO fusion cycle in the Sun*, Nature **587**, 577 (2020).
- Borexino Collaboration, *Comprehensive measurement of pp-chain solar neutrinos with Borexino*, Nature **562**, 505 (2018).
- Borexino Collaboration, *Simultaneous precision spectroscopy of pp, ${}^7\text{Be}$, and pep solar neutrinos (Phase-II)*, Phys. Rev. D **100**, 082004 (2019).
- Borexino Collaboration, *Sensitivity to neutrinos from the solar CNO cycle in Borexino*, Eur. Phys. J. C **80**, 1091 (2020).
- JUNO Collaboration, *Feasibility and physics potential of detecting ${}^8\text{B}$ solar neutrinos at JUNO*, Chin. Phys. C **45**, 1 (2021).
- X. Ding, *GooStats: a GPU-based framework for multivariate analysis in particle physics*, JINST **13**, P12018 (2018).
- Daya Bay Collaboration, *Measurement of the reactor antineutrino flux and spectrum at Daya Bay*, Phys. Rev. Lett. **116**, 061801 (2016).