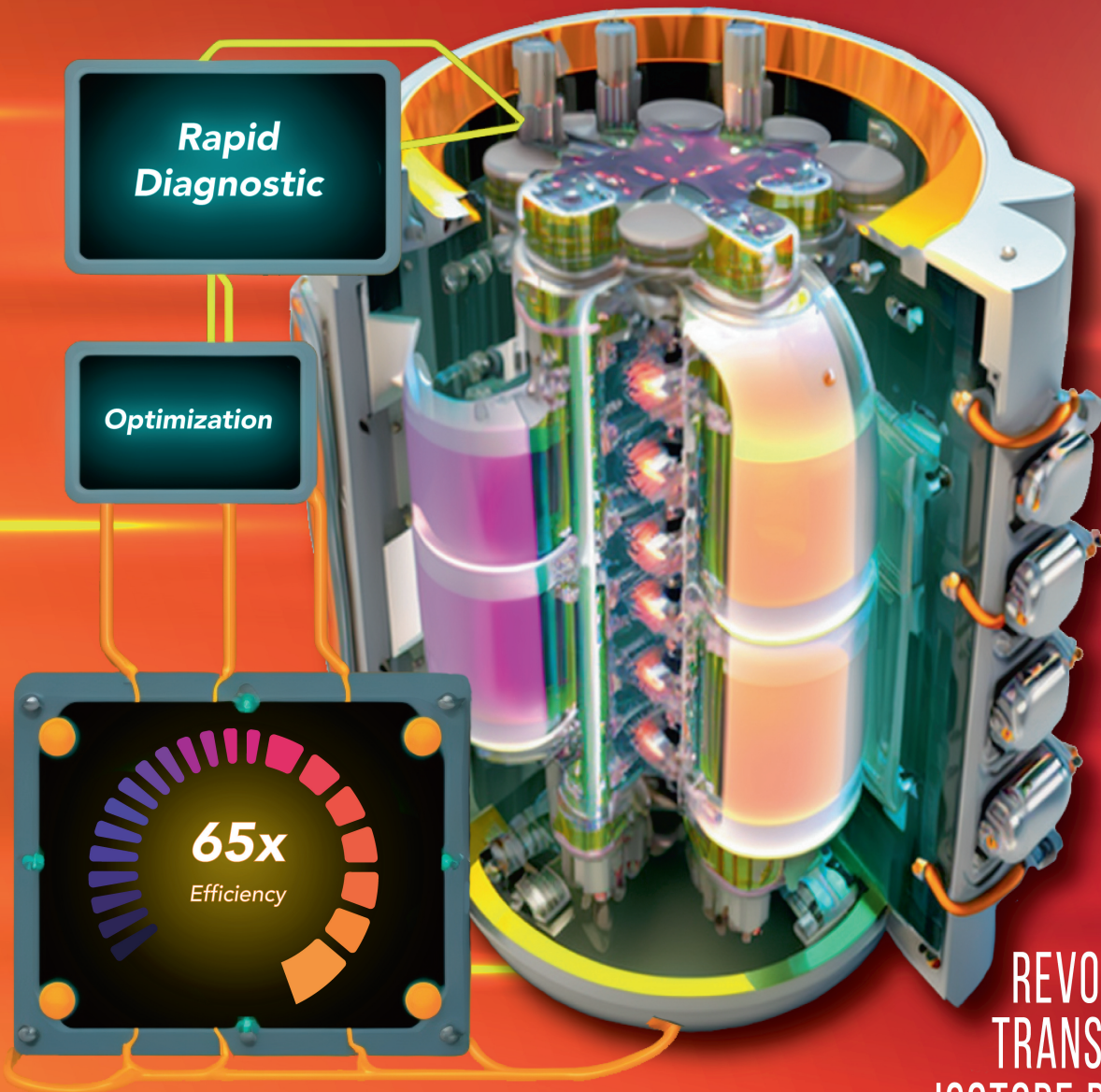


核技术 (英文版)

# NUCLEAR SCIENCE & TECHNIQUES

Vol.34 No.3 | March 2023



REVOLUTIONIZED  
TRANSPLUTONIUM  
ISOTOPE PRODUCTION

*A Rapid Diagnostic Method*

Nuclear Science and Techniques

VOLUME 34, ISSUE 3, MARCH 2023

(Contents continued)

NUCLEAR ENERGY SCIENCE AND ENGINEERING

- 33 Recent progress and perspective on batteries made from nuclear waste**  
N.K. Katiyar · S. Goel
- 34 Conceptual design and safety characteristics of a new multi-mission high flux research reactor**  
W. Xu · J. Li · H. Xie · Z.-H. Liu · J. Zhao · F. Xie · L. Shi
- 35 Experimental investigation on pressure-buildup characteristics of a water lump immersed in a molten lead pool**  
Z.-J. Deng · S.-B. Cheng · H. Cheng
- 40 Accident source term and radiological consequences of a small modular reactor**  
H.-Y. Chen · F.-D. Liu · S.-W. Wang · Y.-C. Wang · C. Xu · Q.-F. Liu
- 43 Semi-empirical and semi-quantitative lightweight shielding design method**  
S.-C. Zheng · Q.-Q. Pan · H.-W. Lv · S.-Q. Tang · X.-J. Liu
- 44 Rapid diagnostic method for transplutonium isotope production in high flux reactors**  
Q.-Q. Pan · Q.-F. Zhao · L.-J. Wang · B.-Y. Xia · Y. Cai · X.-J. Liu
- 47 Simulation and test of the SLEGS TOF spectrometer at SSRF**  
K.-J. Chen · L.-X. Liu · Z.-R. Hao · Y.-G. Ma · H.-W. Wang · G.-T. Fan · X.-G. Cao · H.-H. Xu · Y.-F. Niu · X.-X. Li · X.-R. Hu · Y.-X. Yang · S. Jin · P. Kuang

# Nuclear Science and Techniques

Volume 34 • Issue 3 • March 2023

ISSN: 1001-8042 (Paper); CN 31-1559/TL

## VIEWPOINT AND HIGHLIGHT

- 42 Underground laboratory JUNA shedding light on stellar nucleosynthesis**  
T. Kajino

## SYNCHROTRON RADIATION TECHNOLOGY AND APPLICATIONS

- 39 Development and simulation of a gridded thermionic cathode electron gun for a high-energy photon source**  
S.-C. Wang · D.-Y. He · C. Meng · J.-Y. Li · Z.-S. Zhou · J.-D. Liu
- 41 Design of S-band photoinjector with high bunch charge and low emittance based on multi-objective genetic algorithm**  
Z.-Y. Dai · Y.-C. Nie · Z. Hui · L.-X. Liu · Z.-S. Liu · J.-H. Zhong · J.-B. Guan · J.-K. Wang · Y. Chen · Y. Zou · H.-H. Li · J.-H. He

## ACCELERATOR, RAY TECHNOLOGY AND APPLICATIONS

- 46 Effect of reprocessing on neutrons of a molten chloride salt fast reactor**  
L.-Y. He · Y. Cui · L. Chen · S.-P. Xia · L.-Y. Hu · Y. Zou · R. Yan

## NUCLEAR CHEMISTRY, RADIOCHEMISTRY, AND NUCLEAR MEDICINE

- 36 Effect of Gd on neutron absorption properties and electrochemical corrosion behavior of Zr–Gd alloy in boiling concentrated HNO<sub>3</sub>**  
C.-J. Du · X.-G. Hu · P.-Y. Guo · X.-L. Pan · J.-P. Wu
- 45 Material decomposition of spectral CT images via attention-based global convolutional generative adversarial network**  
X. Guo · P. He · X. Lv · X. Ren · Y. Li · Y. Liu · X. Lei · P. Feng · H. Shan

## NUCLEAR ELECTRONICS AND INSTRUMENTATION

- 38 Control and data acquisition system for collinear laser spectroscopy experiments**  
Y.-C. Liu · X.-F. Yang · S.-W. Bai · S.-J. Wang · P. Zhang · Y.-S. Liu · H.-R. Hu · Y.-F. Guo · Z. Yan · Z.-Y. Du · W.-C. Mei · Z.-Y. Lin · H.-W. Li · Y.-L. Ye · Q.-T. Li · C.-Y. He

## NUCLEAR PHYSICS AND INTERDISCIPLINARY RESEARCH

- 37 Counting of alpha particle tracks on imaging plate based on a convolutional neural network**  
F.-D. Qin · H.-Y. Luo · Z.-Z. He · K.-J. Lu · C.-G. Wang · M.-M. Wu · Z.-K. Fan · J. Shan

(Table of contents continued on inside back cover)

