

# Advanced Research Center for Beam Science – Laser Matter Interaction Science –



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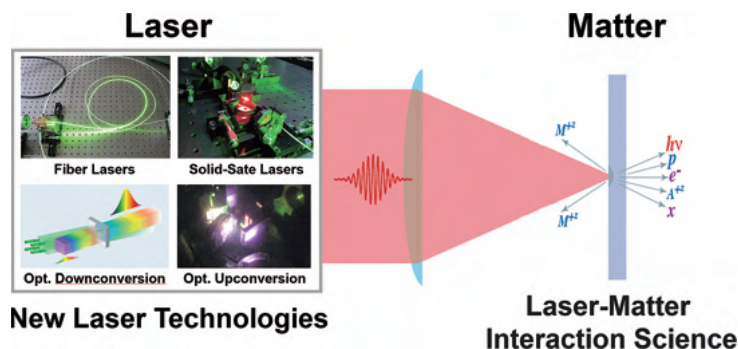
WU, Xinlei (R. S.)

## Scope of Research

We are developing cutting-edge high-intensity laser sources and studying experimental research on the laser interaction with matter by using the new laser sources. We are promoting cross-disciplinary research based on high-intensity laser technologies such as development of high-intensity mid-infrared solid-state lasers and fiber lasers, research on particle acceleration and wavelength conversion with plasmas produced by high-intensity ultrafast lasers, development of laser isotope separation method for neutrino research, and search for dark matter using high-intensity lasers.

### KEYWORDS

High Power Laser Optics  
Ultrafast Laser Physics  
Laser-Plasma Interaction Physics  
Laser Isotope Separation  
Dark Matter



## Recent Selected Publications

Furuse, H.; Ueno D.; Omata K.; Imai M.; Tokita, S., Mid-Infrared Fine-Grained Er:Y<sub>2</sub>O<sub>3</sub> Laser Ceramics Fabricated by Spark Plasma Sintering, *Ceram. Int.*, **50**, 46925-46931 (2024).

Li, E.; Uehara, H.; Tokita S.; Zhao, M.; Yasuhara, R., High-Power, Single-Frequency Mid-Infrared Laser Based on a Hybrid Fe:ZnSe Amplifier, *Infrared Phys. Technol.*, **136**, 105071 (2024).

Ogawa, I.; Hiraiwa, T.; Nakajima, J.; Yuhaku, R.; Tozawa, M.; Niki, H.; Tokita, S.; Miyanaga, N.; Uemukai, M.; Rittirong, A.; Umehara, S.; Matsuoka, K.; Yoshida, S., Laser Isotope Separation to Study for the Neutrino-Less Double Beta Decay of <sup>48</sup>Ca, *J. Phys. Conf. Ser.*, **2586**, 012136 (2023).

Goya, K.; Sasanuma, H.; Ishida, G.; Uehara, H.; Tokita, S., Fusion Splicing of Plastic Optical Fibers Using a Mid-IR Fiber Laser, *Appl. Phys. Express*, **16**, 052006 (2023).

Homma, K.; Tesileanu, O.; Nakamiya, Y.; Kirita, Y.; Chiochiu, C.; Cucuic, M.; Giubega, G.; Hasada, T.; Hashida, M.; Ishibashi, F.; Kanai, T.; Kodama, A.; Masuno, S.; Miyamaru, T.; Neagu, L.; Rodrigues, V. R. M.; Rosu, M. M.; Sakabe, S.; Tamlyn, J.; Tazlauanu, S. V.; Tokita, S., Challenge of Search for Cosmological Dark Components with High-Intensity Lasers and beyond, *Eur. Phys. J. A.*, **59**, 109 (2023).