

# 71<sup>st</sup> RAP Seminar

The 71st Seminar on RIKEN Center for Advanced Photonics

Language: Japanese

## - ONLINE Seminar -

Date: **June 18 (Fri) 16:00 - 17:00, 2021**

Title: **Nonlinear light-based controls of bottom-up assembly toward direct laser writing beyond material limitation**

— 材料の感光性に制限されないダイレクトレーザライティング  
— レーザ多光子反応を起点とした新規ナノ粒子集積固化法を中心に —

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Pre-registration



Versatile direct laser writing (DLW), not limited by material photosensitivity, offers opportunities for fundamental and technological innovation in materials engineering, life science, and device manufacturing. DLW has high potential for creation of functionality in micro-/nanoscale. However, material choice suffers an intrinsic limitation: DLW cannot be applied to non-photosensitive materials. Recently, we newly discovered a light-triggered assembly phenomenon of nanomaterials based on multi-photon-induced microbubble generation. This phenomenon creates micropatterns with hierarchical cross-section consisting of metallic core with thick clad layers filled with target nanoparticles. Such unique assembly process allowed to directly write continuous fine patterns, even in the case of non-photosensitive materials, by moving the laser spot. This novel laser writing process, which overcomes the conventional materials limitation, will provide new advances for nanoscience and future technology.

In this talk, we will discuss the mechanism and applications of this novel light-triggered assembly phenomenon. In addition, new emerging trends in the field of laser materials processing will be presented.