



91st RAP Seminar

The 91st Seminar on RIKEN Center for Advanced Photonics

Language: English

Date: **July 18 (Fri), 16:00 - 17:00, 2025**

Location: **1F Seminar Room, Sendai Campus, RIKEN**
(理研 仙台地区 1階セミナー室)

(Participation via Zoom is also available / ハイブリッド形式での開催を予定 (Zoom接続))

Title: **New Technologies in mm/THz Driven by the Physics of the Early Universe**

初期宇宙探索が駆動する新しいミリ波テラヘルツ技術

Speaker: **Prof. Tomotake Matsumura**

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The cosmic microwave background (CMB), a relic radiation from the Big Bang, provides a powerful window into the early Universe. Today, it serves as a critical probe of fundamental physics, particularly through its polarization patterns, which can test the hypothesis of cosmic inflation—a period of rapid expansion before the Big Bang. While it may seem ideal to assemble a telescope from readily available commercial components, the reality is far more complex. Off-the-shelf solutions often fall short of the stringent requirements for CMB observations, compelling us to innovate from the ground up. This is a prime example of how fundamental science drives the development of new technologies. In this talk, I will introduce the scientific motivation behind the quest to understand the origins of the Universe, highlight key technologies required for next-generation CMB experiments, and describe recent developments from our group, including the fabrication of mm/THz anti-reflection subwavelength structures using laser machining techniques.



Pre-registration

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