

SACLA Users' Meeting 2022

Breakout Sessions

Breakout Sessions A

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| Japan Standard Time (JST) | 15:00 – 17:00 March 2 |
| Greenwich Mean Time (GMT) | 06:00 – 08:00 March 2 |
| Pacific Standard Time (PST) | 22:00 – 00:00 March 1 |

Session A1:

“High-resolution and high-accuracy femtosecond crystallography”

Session A2:

“New perspectives using the coupling between high-power nanosecond laser and XFEL at SACLA”

Breakout Sessions B

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|-----------------------------|-----------------------|
| Japan Standard Time (JST) | 10:00 – 12:00 March 3 |
| Greenwich Mean Time (GMT) | 01:00 – 03:00 March 3 |
| Pacific Standard Time (PST) | 17:00 – 19:00 March 2 |

Session B1:

“Recent achievements and future perspectives in materials science at SACLA”

Session B2:

“Nanofocusing XFEL: 100 nm- and 10 nm-focusing capabilities at SACLA”

A1:

“High-resolution and high-accuracy femtosecond crystallography”

Organizers: I. Inoue and K. Tono (SACLA)

This breakout session aims to discuss the capabilities of SACLA for high-resolution and high-accuracy femtosecond crystallography. In the initial part of the session, a beamline scientist informs participants about the current status of high photon-energy XFEL beam and detector options. Then, pioneering users present their recent activities on the high-resolution femtosecond crystallography. We welcome participants working on or interested in high-resolution structure determination with XFEL pulses.

Program

15:00-15:20

Introduction

Facility updates for high-resolution and high-accuracy femtosecond crystallography
I. Inoue (SACLA)

15:20-16:20

Research highlights and requests to facility

Sub-Å resolution SACLA-SFX for organic chemicals
K. Takaba (RIKEN)

Serial femtosecond crystallography for materials science and chemistry
H. Kasai (Univ. Tsukuba)

Hydrogen atoms in protein structure: high resolution analysis of heme enzymes
H. Sugimoto (RIKEN)

16:20-

Discussion

Chair: K. Tono (SACLA)

A2:

“New perspectives using the coupling between high-power nanosecond laser and XFEL at SACLA”

Organizers: B. Albertazzi (LULI) and K. Miyanishi (SACLA)

This breakout session aims to discuss developments that are already realized, planned, or envisioned on the experimental platform with a high-power nanosecond laser at SACLA. A beamline scientist will present recent progress and plans. Then, the representative users will share their propositions. Finally, participants will be strongly encouraged to provide feedback, suggestions, or recommendations in the round table discussion at the end of the session.

Program

15:00-15:25

Introduction

B. Albertazzi (LULI)

Facility report

Capability, updates, and development plans of the experimental platform with high-power nanosecond laser at SACLA

K. Miyanishi (SACLA)

15:25-16:10

Propositions from representative users

X-ray scattering spectroscopy of shock compressed matter at XFEL-SACLA
N. Ozaki (Osaka Univ.)

Toward x-ray absorption spectroscopy of planetary materials during shock compression
T. Okuchi (Kyoto Univ.)

Platform development: Adding a 20 T external B-field in EH5
B. Albertazzi (LULI)

16:10-

Round table discussion

Chair: B. Albertazzi (LULI)

B1:**“Recent achievements and future perspectives in materials science at SACLA”**

Organizers: I. Matsuda, T. Suzuki (Univ. Tokyo), and Y. Kubota (SACLA)

In the field of materials science, a number of remarkable achievements have been produced with soft and hard XFELs at SACLA. The goal of this breakout session is to share the current status and to discuss future perspectives in this research field. As an introduction, beamline scientists will present the recent experimental development, such as a THz laser, a cryostat, and a coil system to produce ultrahigh magnetic fields at BL2/3, and equipment with a nanofocusing mirror to investigate nonlinear optics and magnetism at BL1. Then, some achievements will be presented by distinguished researchers from various fields followed by a discussion on prospects with participants.

Program

10:00-10:10

Opening talk

Condensed-Matter Science using XFEL (tentative)

T. Arima (Univ. Tokyo)

10:10-10:20

From facility side

Recent progress and development plans for materials science at SACLA

Y. Kubota (SACLA)

10:20-11:10

From user side

Ultrafast control of charge density wave system and superconductors by high field terahertz pulses

R. Shimano (Univ. Tokyo)

Ultrafast manipulation of effective interactions in quantum materials

M. Mitrano (Harvard Univ.)

11:10-

Round table discussion

Chair: I. Matsuda and T. Suzuki (Univ. Tokyo)

B2:**“Nanofocusing XFEL: 100 nm- and 10 nm-focusing capabilities at SACLA”**

Organizers: K. Yamauchi (Osaka Univ.) and J. Yamada (SACLA)

The session aims to share the current status and prospects of nanofocusing optics at SACLA, especially nanofocusing mirror systems in BL3-EH4c/EH5. A SACLA scientist will report (i) recent activities for automatic alignment tuning of the nanofocusing mirrors via a grating-based wavefront sensing technique and (ii) introduce specifications of the newly developed sub-10 nm focusing system. Participants will be encouraged to provide feedback, inputs, and ideas to the facility in the round table discussion.

Program

10:00-10:05

Introduction

K. Yamauchi (Osaka Univ.)

10:05-10:30

Facility report

Specification and operation details of nanofocusing system at SACLA

J. Yamada (SACLA)

10:30-

Discussion