

Preface

The 26th International Conference on Spectral Line Shapes (ICSLS2024) was held at Budokan in Otsu City, Shiga Prefecture, from June 2 to 7, 2024, jointly organized by the National Institute for Fusion Science and the Japan Society of Plasma Science and Nuclear Fusion Research. 52 participants from 13 countries (Algeria, China, France, Germany, India, Israel, Japan, Poland, Serbia and Montenegro, Sweden, Thailand, UK, USA) attended the conference, which included 17 invited talks, 17 general oral presentations, and 21 poster presentations. The presentations were divided into the following five categories:

- Astrophysical and Laboratory Plasma Spectroscopy
- Atomic line shapes
- High Precision Measurements and Theory
- Frequency Combs
- Molecular Line Shapes

and the sessions were organized accordingly. Fourteen peer-reviewed papers were published in the special issue of Plasma and Fusion Research.

This international conference began in 1973 and has been held every two years. All previous conferences have been held in cities in North America and Europe, and this was the first time the conference was held outside those two regions.

The academic fields covered by the conference are diverse, but the common theme of the conference is "the study of the light, or spectral lines, emitted or absorbed when there is a transition between the excitation energy levels of atoms or molecules." The intensity, width, and splitting of spectral lines contain a great deal of information about the "fields", such as magnetic and electric fields, to which the atoms or molecules are exposed. To clarify the relationship between the parameters or conditions describing these "fields" and the spectral line characteristics, various experimental and theoretical studies are being conducted around the world, and this is one of the important topics in fusion plasma research.

As for the program structure, we have taken up spectroscopic plasma diagnostics as a major topic. I think we were able to impress foreign researchers with the high level of activity in this field in Japan, and also provide a good opportunity for young Japanese researchers and students to come into contact with the latest research results from overseas.

Another topic that made a strong impression on me was the ultra-precise measurement of spectral line wavelengths using a frequency comb. Frequency combs are a core technology in a wide range of high-profile research areas in physics, including optical lattice clocks and exoplanet searches, and there is hope for their application in plasma measurement in the future.

I would like to thank all the speakers and attendees. The members of the Program Committee gave me a lot of advice on the program structure, including the selection of invited speakers. The members of the Local Organizing Committee helped me with a lot of work to organize the conference. Special thanks go to Mr. Takao Taniguchi of the Otsu Chamber of Commerce and Industry for his help in finding a venue and facilitating communication between Shiga Prefecture and Otsu City. Last but not least, Ms. Yasuko Kinoshita of Art Tourist, who was in charge of the reception desk, planned most of the major events, including coffee breaks, lunches, excursions, and the banquet. It is no exaggeration to say that the conference would not have been possible without her ideas and hard work. I would like to express my gratitude to her once again. The following institutions and companies supported the conference:

- Shiga Prefecture
- Otsu City
- Biwako Visitors Bureau Public Interest Incorporated Association
- Menlo Systems GmbH
- Tokyo Instruments, Inc.
- MFOPTEx Co., Ltd.
- Thorlabs Japan Inc.

During the conference, the program committee members discussed the next conference and it was decided that the next conference will be held in 2026, hosted by Magnus Gustafsson at Luleå University of Technology in Sweden. I'm sure it will be a great conference and I would like to give my support to Magnus.

26th International Conference on Spectral Line Shapes



International Program Committee

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