米国 NIST の Ian Coddington 博士と Esther Baumann 博士が、横浜開催の国際会議 ALPS2025/OPIC2025 国際 会議に参加される機会に、本学を訪問されます。

お招きする先生方は本学教員と長年の親交があり、光周波数コム光源とそれを用いた分光計測などを対象とし た幅広い研究成果を上げておられます。本セミナーでは最新の研究成果をご紹介いただきます。 研究室の研究員、学生の皆様もお誘いあわせのうえ、奮ってご参加ください。

日時:2025年4月28日(月)16:15~ 場所:東6号館337室 主催:量子科学研究センター http://www.ias.uec.ac.jp/

## 1. Dr. Ian Coddington (NIST)

https://www.nist.gov/director/vcat/dr-ian-coddington-biography

Title:

Frequency combs as a next generation field sensor

Abstract:

Dual-comb spectroscopy offers a powerful way to quantify agricultural emissions on a local and regional scale. This talk will showcase the latest if mid-IR and near-IR frequency combs for atmospheric sensing and discuss how they can be used to quantify methane and to measure cattle emissions in pastures and feedlots as well as the ability validate and refine regional inventories.

## Short bio:

Ian Coddington received his Ph.D. degree in physics, working with Bose-Einstein condensates at the University of Colorado, and is currently a scientist in the Communications Technology Laboratory at the National Institute of Standards and Technology. At NIST his work has focused on the development of robust and portable optical frequency combs for terrestrial and space environments and on the application of these novel lasers to measurements ranging from LIDAR to time-transfer to atmospheric spectroscopy. His current focus is on the use of frequency combs for femtosecond free-space optical time transfer and for atmospheric sensing. For his work on frequency combs Dr. Coddington has received a Department of Commerce Silver and Gold Medals, the Presidential Early Career Award for Scientists and Engineers (PECASE), the Arthur S. Flemming Award and the Colorado Governor's Award.

2. Dr. Esther Baumann (NIST)

https://www.nist.gov/blogs/taking-measure/authors/esther-baumann Title:

Adaptive Dual-Comb Spectroscopy Platform for Customized Step-Scan and Apodized Sampling Patterns

Abstract:

We present a free-form dual-comb spectrometer. The measurement update rate and signal to noise ratio can be tailored to a sample by programming appropriate sampling patterns.

Short bio:

Esther Baumann is a research scientist at NIST and has worked for 16 years in designing and building fiber frequency combs and exploring innovative laser and frequency comb applications. She is passionate about establishing synergies through cross-disciplinary collaboration, with her work touching diverse fields from laser ranging through fire to muscle health assessment. Baumann has been actively engaged in high-precision, molecular dual-comb spectroscopy of gas phases, including monitoring greenhouse gases. Recently, Baumann shifted her concentration toward the free-form dual-comb platform. This new and improved dual-comb spectrometer, created by her team, is designed to intelligently gather the most pertinent parts of a signal during measurement, making it a more adaptable and versatile tool.

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