



Volume 14, No. 10, October 2022

WELCOME

It is hard to believe we are halfway through October, with only a few meetings left on the event calendar. In Texas, highs have finally dropped below 100F and the aroma of pumpkin spice fills the air. In New England, the leaves are turning beautiful shades of red, yellow and orange.

In less than three weeks, the installation of the first US XtaLAB Synergy-ED begins in The Woodlands. Last week, we held our first in-person user meeting in over two years near our office in Neu-Isenburg, Germany. Fraser White reports on the meeting in the section generally reserved for the instrument in the spotlight. Our researcher in the spotlight is Jordi Benet-Buchholtz from ICIQ, who will be the first recipient of a XtaLAB Synergy-ED outside of Rigaku and JEOL.

We have our usual Crystallography in the News, Useful Links, Video of the Month and Book Review sections.

All the best,
Joe Ferrara

RESEARCHER IN THE SPOTLIGHT

Dr. Jordi Benet-Buchholz
ICIQ Tarragona, Spain



Left to right: Sho Ito, Eduardo Carmello Escudero, Jordi Benet-Buchholz and Akihito Yamano

Dr. Jordi Benet-Buchholz currently works at ICIQ Tarragona in Spain and has been the principal crystallographer there since 2004. After receiving his PhD in Chemistry from the University of Essen in 1998, Jordi spent 6 years at Bayer AG (Leverkusen) as head of the Crystallographic Laboratory. Since leaving Bayer, Jordi has been X-ray Diffraction Unit Manager at the Institut Català d'Investigació Química (ICIQ), where his crystallographic expertise has been put to good use on a wide variety of research targets including chemical and biological samples.

Jordi recently visited our demo facility in Japan, where he and his colleague, Eduardo C. Escudero-Adán, were introduced to our electron diffractometer, the XtaLAB Synergy-ED, and spent time running experiments with our applications scientists, Dr. Sho Ito and Dr. Akihito Yamano. We are very pleased to be able to say that ICIQ Tarragona will become the first customer site in Europe to receive the XtaLAB Synergy-ED following Jordi's hard work applying for funding, evaluating not only the technique but also the systems currently available, and seeing the procurement process through, which concluded just last month.

We congratulate Jordi on his new acquisition and look forward to seeing some fantastic results in the near future.

RIGAKU EUROPEAN SINGLE-CRYSTAL USERS' MEETING



Our first face-to-face users' meeting since before the pandemic was held earlier this month near our European headquarters in Neu-Isenburg, Germany. Though we have held some very successful online meetings in the last few years, we wanted to return to a more traditional meeting and show off our recently inaugurated demo facility housing the XtaLAB Synergy-ED. We decided to devote about half the meeting to electron diffraction topics, with talks from 3DED/microED experts, live demonstrations of our equipment and perspectives on 3DED/microED from within our community of users. We were absolutely thrilled three well-known names in 3DED/microED, Professor Ute Kolb (Johannes Gutenberg University, Mainz), Dr Tim Grüne (University of Vienna) and Professor Richard Beanland (University of Warwick), accepted our invitations to join us for this special users' meeting to introduce electron diffraction to our audience, most of whom are primarily X-ray crystallographers.

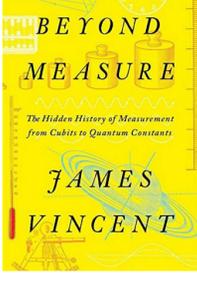
Already, a number of members of our user community have had a chance to obtain 3DED/microED data from the XtaLAB Synergy-ED. Some of the attendees also gave presentations to our other users about what they were able to learn and achieve with this powerful new approach. Among them was the aforementioned Jordi Benet-Buchholtz, who performed extensive testing of the XtaLAB Synergy-ED and shared with us the results.

On the second day of the meeting, we returned to more familiar territory with talks on X-ray diffraction, software and a number of highly useful talks from both our users and Rigaku staff aiming to help others get more out of their instruments.

We are truly fortunate to have a fantastic community of users, and this is why our users' meetings are always such great events. Thanks to everyone who both participated in and contributed to the meeting.

Fraser White

BOOK REVIEW



Review: [Beyond Measure: The Hidden History of Measurement](#)

By James Vincent

ISBN: 978-0-571-37382-6

James Vincent's debut work, *Beyond Measure: The Hidden History of Measurement*, is a delightful foray into the myriad mysteries of metrology. If you've ever stopped to wonder why certain standards of measurement exist or what they really are, this is the book for you. Even if you've never pondered these existential questions of metrology, Vincent's book is still sure not to disappoint.

Vincent starts by addressing the basic philosophical question of why measurement matters. It might seem like a simple or obvious answer, but Vincent doesn't make you take his word for it. He digs back to the start of civilization and the importance of the earliest forms of measurement in the development of human society and culture. Concepts like distance, wealth, value, and even time all required a metric against which they could be measured. Without ascribing meaning however arbitrary it may have seemed at the time to these units of measurement, one can only assume the history of humanity would have proceeded at a very different rate without them (one that would have been impossible to measure, of course).

Beyond Measure follows the history of metrology hand-in-hand with the history of humanity, as the two are inherently interconnected. Vincent follows the development of standards of measure through the Scientific Revolution and the Industrial Revolution, exploring everything from the development of the thermometer to measure temperature to the invention of statistics to measure population changes and growth.

Vincent generously peppers *Beyond Measure* with memorable and entertaining historical anecdotes that both serve to illustrate the principles of measurement he is explicating and to place the development of these standards of measure in a human context beyond the greater story of the human race.

In one of these anecdotes, Vincent describes meeting with a member of a guerilla group in the United Kingdom who opposes the adoption of the metric system, preferring the use of standard measurements. Members of this group go about replacing signage displaying distances and values in the metric system with their equivalents in the imperial system. The UK adopted the metric system used in every single country in the world except the United States, Liberia, and Myanmar in 1965. Ever since then, there has been a steadfast population of British citizens who support reverting back to the imperial system. Some of them have even spent time in jail for their beliefs (or rather, for the actions they took to vandalize public property to demonstrate them).

In another intriguing example, Vincent details the origins of the word moron a term once used more widely to describe someone of lesser intelligence that has fallen out of its use in more recent years due to the political incorrectness of its history. Moron was an official term coined in 1910 by a psychologist named Henry H. Goddard to describe people with an IQ of 51-70, with the mental age of a typical 7-10-year-old child. The terms idiot and imbecile had existed previously in the English language and were used to describe those with IQs of 0-25 and 26-50 respectively. IQ tests were intricately connected to the eugenics movement in early twentieth century America something supported even by those in the highest ranks of government, including Supreme Court Justices and were frequently used in the name of science as a justification for xenophobic and racist behavior. Contextualizing the meaning of an unkind word in our modern language is an excellent example of how standards of measurement can percolate through the zeitgeist even long after they have been abandoned by the fields of inquiry that developed them.

Measurements are powerful because they ascribe meaning to that which arguably has no inherent meaning. They create concrete value out of abstraction. Like anything with great power, they come with great responsibility. *Beyond Measure* is an absolutely wonderful exploration of both the deep philosophical questions that arise when pondering a topic such as metrology and the everyday mundane implications of adopting consistent systems of measurement for everything from weight to time to volume to data storage and everything in between.

Jeanette S. Ferrara, MFA

RIGAKU TOPIQ WEBINARS

Rigaku has developed a series of 20-30 minute webinars that cover a broad range of topics in the fields of X-ray diffraction, X-ray fluorescence and X-ray imaging. You can watch recordings our past sessions [here](#).

UPCOMING EVENTS:

ÆCIPROCS (Diffraction électronique pour la cristallographie structurale), Aussois, France, October 17-21, 2022.

73rd Southeastern Regional ACS Meeting (SERMACS 2022), San Juan, Puerto Rico, October 19-22, 2022.

AsCA 2022 (Asian Crystallographic Association), Jeju, South Korea, October 30, 2022 - November 2, 2022.

2022 SoCal Cryo-EM Symposium, Los Angeles, CA, December 5, 2022.

CRYSTALLOGRAPHY IN THE NEWS

August 4, 2022
Chemists at the University of Basel have [synthesized and characterized a cavitand with an internal volume of 814 Å³](#).

September 1, 2022
Researchers from Australia, the UK and the US used NMR, mass spectroscopy, crystallography and cryo-EM to determine how [nicotinamide adenine dinucleotide is cleaved by TIR domains](#).

October 12, 2022
In a huge multinational effort, researchers have created a database of [spider silk dragline properties](#) incorporating WAXS data from SPring-8.

USEFUL LINKS

Here are links to organizations helping Ukrainians survive the ongoing war in their homeland:

- [Help Humanitarian Efforts in Ukraine](#)
- [Donate to Children of Ukraine](#)
- [Nova Ukraine](#)
- [Razom for Ukraine](#)
- [World Central Kitchen](#)
- [Global Giving](#)
- [International Committee of the Red Cross](#).

VIDEO OF THE MONTH

Here is a link to the video showing the last few seconds of the [DART Mission](#) impacting the asteroid Dimorphos.

JOIN US ON LINKEDIN

Our [LinkedIn group](#) shares information and fosters discussion about X-ray crystallography and SAXS topics. Connect with other research groups and receive updates on how they use these techniques in their own laboratories. You can also catch up on the latest newsletter or *Rigaku Journal* issue. We also hope that you will share information about your own research and laboratory groups.

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RIGAKU X-RAY FORUM

At [rigakuxrayforum.com](#) you can find discussions about software, general crystallography issues and more. It's also the place to download the latest version of Rigaku Oxford Diffraction's CrysAlis^{Pro} software for single crystal data processing.

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