

Crystallography Newsletter

Volume 12, No. 4, June 2020

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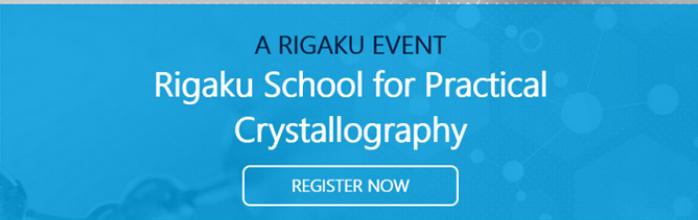
ACA 2020, 70th Annual Meeting of the American Crystallographic Association, will be going virtual August 2-6, 2020. Rigaku will be holding virtual booth hours before and after the main conference.

<https://www.acameeting.com/>

Rigaku TOPIQ Webinars

Rigaku has developed a series of 20-30 minute training webinars that cover a broad range of topics in the fields of X-ray diffraction, X-ray fluorescence and X-ray imaging.

You can [register here](#) and also watch recordings if you can't attend the live session.



A RIGAKU EVENT
Rigaku School for Practical
Crystallography

[REGISTER NOW](#)

Asia-Pacific Edition starts July 6th - there's still time to register:

You are invited to a series of ten tuition-free 1-hour webinars on practical aspects of X-ray crystallography. The majority of the time will be spent on small molecule crystallography, but we will also air sessions on macromolecular crystallography and powder diffraction. The **Asia-Pacific Edition** of the Rigaku School for Practical Crystallography will be held July 6-10 and July 13-17 from 0600 to 0700 CDT. Click [here](#) for registration. All presentations will be in English.

The first edition of the Rigaku School for Practical Crystallography finished last Friday. Over 1200 students from over 60 countries pre-registered for the school. After the Asia-Pacific edition was announced, some students switched to the school that best matched their time zone. The classes were all well attended, with the highest attendance being 771 students. Students were also able to download and watch the sessions off line in case their schedules would not permit them to attend all of the live sessions or they had internet problems during the class. Students completing the class could opt to take an exam and, if they passed it, they were awarded a Certificate of Achievement.

Crystallography in the News

May 28: Scientists from Germany, Sweden, the U.K. and the U.S. have made a [new allotrope of nitrogen](#), isostructural with black phosphorus, using a diamond anvil cell and laser heating.

May 29: Researchers in Wuhan and Taipei have determined the first structure of a full-length [cytochrome P450](#) monooxygenase.

May 29: Researchers from China, the U.K. and the U.S. have developed a [zeolite with a chemoselective pore](#) that allows for separation of alkynes from alkenes.

June 01: Researchers in China and the U.S. have synthesized a [cyclic bis\[2\]catenane metallacage](#) that can be reversibly transformed between the catenated structure and the bis-metallacage.

Rigaku Reagents: Unipucks and Tools



The Unipuck Kit includes both Unipuck Tool Kit and Unipuck and Rack Kit.

The pucks and tools are available individually or as kits. Pucks are supplied with unique identification numbers. Custom identifiers and numbers are available on request.

The [unipuck](#), developed in collaboration between the ALS, APS SBC-CAT and SSRL staff, was designed to be compatible with robotic mounting systems currently in use at synchrotrons and home laboratories. The unipuck uses the standard ALS tools and has an outside form factor resembling the ALS pucks. There are many online resources for using unipucks, including the following [manual](#) from SSRL and helpful [videos](#) from Diamond Light Source



Order Here

June 01: Researchers in France, the U.K. and the U.S. have determined that subtle changes to amino acid sequence in evolutionarily related [superoxide dismutases](#) change the specificity for the metal cofactor.

June 12: Researchers in China isolated a noncompeting pair of human neutralizing antibodies that bind to the [ACE2 receptor](#) from a recovered patient and determined the crystal structures.

Product in the Spotlight Rigaku Oxford Diffraction [XtaLAB mini II](#)



Benchtop Single Crystal X-ray Diffractometer

A DESKTOP DIFFRACTOMETER

With its compact design, the XtaLAB mini II can be placed on a workbench within any laboratory for easy access by synthetic chemists or for use in advanced teaching laboratories. The XtaLAB mini II does not have any special power or water requirements, making it simple to install anywhere.

X-RAY SOURCE

The XtaLAB mini II diffractometer is equipped with a fine-focus Mo $K\alpha$ X-ray tube with SHINE graphite monochromator to deliver monochromatic X-rays onto the sample. The X-ray tube rarely needs changing but when it does, tubes are readily available and the process is quick and easy.

X-RAY DETECTOR

X-rays are detected using the very latest Hybrid Photon Counting (HPC) technology detector called the HyPix-Bantam. HPC detectors are unique in that they directly measure X-ray photons thus avoiding the noise and peak broadening introduced by phosphor based detectors.

Survey of the Month

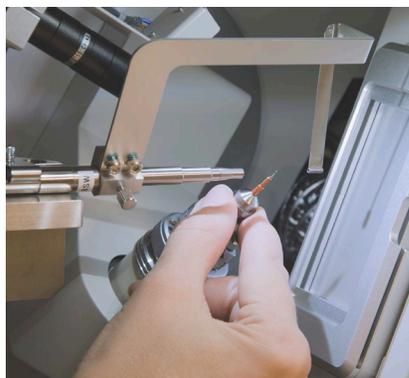
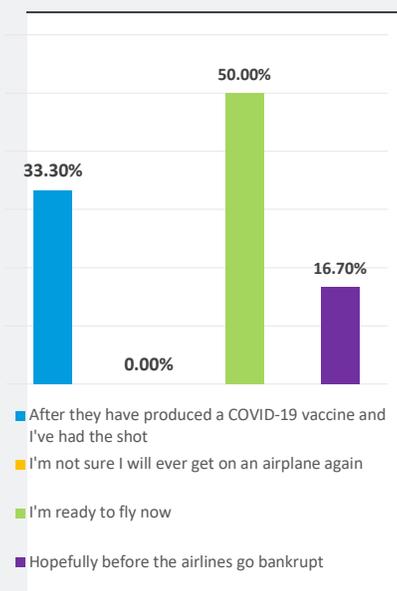
Which do you think is the most annoying thing to happen during a Zoom meeting?



Take the Survey

Last Issue's Survey Results

When will you feel comfortable traveling on an airplane again?



The system as a whole is designed to be as low maintenance as possible. With very few moving parts, this compact diffractometer is robust and needs very little technician support.

Designed to collect data for publication, the geometry of the X-ray source, goniometer and detector has been carefully calculated to achieve a maximum resolution of 0.66 Å. This is a higher resolution than you need for publication, as most journals ask for a minimum of 0.8 Å.

Unique Benefits of the XtaLAB mini II:

- Benchtop diffractometer providing publishable data quality
- User-friendly and semi-automated
- Robust enough for students to operate in a real teaching environment
- Latest low-noise HPC detector technology
- Researcher and student friendly, comprehensive *CrysAlis^{Pro}* software



[Watch Video >](#)

Lab in the Spotlight Nyman Research Group



Professor May Nyman
Department of
Chemistry
Oregon State University

The [Nyman Research Group](#) synthesizes and characterizes aqueous metal-oxo clusters from across the periodic table. These clusters are useful for advancing science and technology.

Videos of the Month

A viral video from Japan aims to show how easily germs and viruses can spread in restaurants when just one person is infected.

[The experiment simulates the atmosphere at a buffet restaurant or on a cruise ship.](#) It was conducted

by the public broadcasting organization NHK in conjunction with health experts.

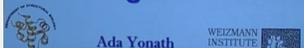


Watch the Video

The Future of Structural Biology

Ada Yonath, the Martin S. and Helen Kimmel Professor of Structural Biology, at Weizmann Institute, is an Israeli protein crystallographer who was awarded the 2009 Nobel Prize for Chemistry, along with Indian-born American physicist and molecular biologist Venkatraman Ramakrishnan and American biophysicist and biochemist Thomas Steitz, for her research into the atomic structure and function of cellular particles called ribosomes.

**The Future of Life:
Focus on
Structural Biology
and a Specific Aspect
of Origin of Life**



Watch the Video

Applications they are currently using their clusters for include:

- Crystallizing proteins to understand their function in living systems
- Photo-lithography for microelectronics
- Sustainable processes to synthesize metal oxides from water
- Catalysis for clean energy technologies
- Investigations of mineral growth and contaminant transport in the environment

They are also exploring the frontier of the periodic table in their actinide chemistry programs. Their discoveries are important for nuclear energy and for nuclear security and US leadership in these technologies on the international stage.



Dr. Nyman and her research group at the 2019 F.A. Gilfillan Award Lecture at Oregon State University

Useful Links



[Hot Keys and Keyboard Shortcuts for Zoom](#)

There are keyboard shortcuts that you can use on the Zoom Desktop Client for Windows and Mac that allow you to navigate the Zoom settings without using your mouse. They are listed at this link and also available in your Zoom desktop client settings, under Accessibility.

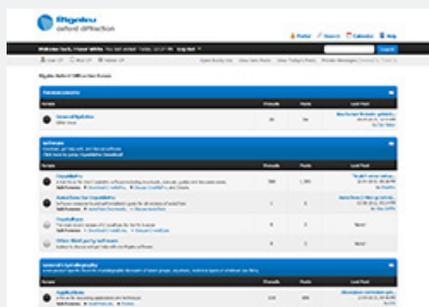


[Bragg Centenary Lectures](#)

Lectures to mark the centenary of the birth of Sir Lawrence Bragg were held in the Rutherford Lecture Theatre of the University of Manchester on March 21, 1990. Recorded video of these lectures is available. The programme includes talks by Henry Lipson, Nevill Mott, Arnold Beevers, Mike Hart, Dorothy Hodgkin, John Helliwell and Sergey Kapitza.

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.



Rigaku X-ray Forum

www.RigakuXrayForum.com

Here 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.

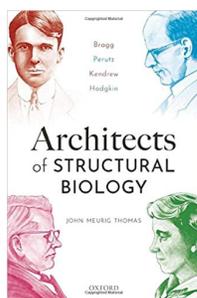


Subscribe to Rigaku eNewsletters

Each month, Rigaku distributes two eNewsletters: *The Bridge*, which focuses on Materials Analysis, and *Crystallography Times*, which concentrates on X-ray crystallography.

rigaku.com/subscribe

Book Review



Review of *Architects of Structural Biology: Bragg, Perutz, Kendrew, Hodgkin*

By John Meurig Thomas

ISBN 978-0-19-885450-0

John Meurig Thomas' *Architects of Structural Biology* is an insightful and multi-faceted exploration of the contributions of Sir Lawrence Bragg, Max Perutz, John Kendrew, and Dorothy Hodgkin to the titular field, particularly their use of X-ray crystallography and diffraction methods to study proteins. Thomas admits in his Preface that Max Perutz was a close friend and neighbor of his for over a quarter of a century. This explains the tangible warmth with which Thomas describes Perutz, while still maintaining an overall tone of professorial intellectualism.

The book itself does not follow a strict personal or historical narrative, and each chapter serves as its own semi-self-encapsulated snapshot into the research conducted by these Nobel Prize-winning researchers at various points in their lives. Every chapter has its own appendices and references, and any one of them could be read and discussed independently of the others. However, engaging with the chapters in such a manner would certainly reduce the impact of the contextual richness Thomas provides.

Thomas includes a chapter "Biographical Sketches," which contains detailed portraits of Perutz, Kendrew, Bragg, and Hodgkin, along with several briefer biographies of their colleagues. Other key figures in the history of structural biology play significant supporting roles throughout the book's chapters, such as Linus Pauling, Aaron Klug, and W.H. Bragg.

One of the book's most notable and at times delightful qualities involves Thomas' frequent use of high resolution illustrations, diagrams, historical photographs and, at times, even replications of primary source documents. These include a letter Sir Lawrence Bragg wrote to Arne Westgren of the Nobel Committee for Chemistry in 1960. The letter contains Bragg's assertion that the prize for Physics should be shared in three parts between Perutz, Kendrew, and Hodgkin. Bragg also offers the suggestion that Watson, Crick, and Wilkins be considered for the Nobel Prize in Chemistry. However, his final paragraph makes it clear that his priority is ensuring recognition for the work of Perutz, Kendrew, and Hodgkin. He claims he is merely "adding a warm recommendation" with regards to the trio who would become famous as the discoverers of DNA's double-helical structure.

For those who are not experts in the field of structural biology and need a refresher course before reading, Thomas provides a detailed and informative glossary. Found at the end of the book, the glossary contains explanations and illustrations for some of the fundamental concepts in biology and chemistry.

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