

Crystallography Newsletter

Volume 12, No. 3, May 2020

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Come visit us at:

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](#)

Starts June 1 - there's still time to register: A lot of younger members of the scientific community will be missing out on some opportunities to learn crystallography at schools and conferences this summer, so 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.

Register [here](#) for the Rigaku School for Practical Crystallography, June 1-5 and June 8-12 from 0900 to 1000 CDT.

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.

Crystallography in the News

April 15, 2020: Researchers in Russia, UK and U.S. have determined the high-resolution structures of before and after [contraction states of complete R2 pyocin](#) in order to find highly specific antibiotics.

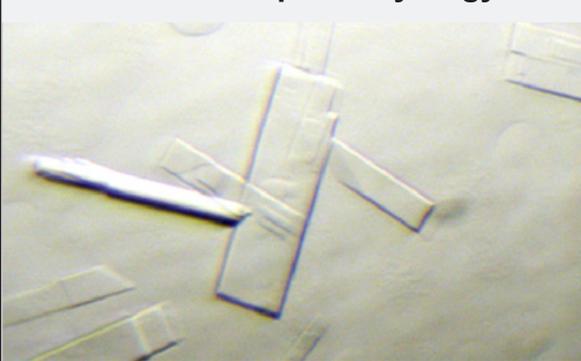
April 17, 2020: Researchers in the U.S., China and Australia have synthesized a [MOF with both high surface area and reversible uptake for methane and hydrogen](#) that pave the way for cleaner vehicles.

April 20, 2020: Researchers in Germany synthesized the first [silicon-carbonyl complex](#) stable at room-temperature.

April 22, 2020: Researchers in the U.S. used positively and negatively charged polystyrene beads to [model how crystallization might occur](#) in materials like NaCl and K_4C_{60} .

April 24, 2020: Researchers in China and Germany have determined the [structure of the main protease of SARS-CoV2](#) in order to design better α -ketoamide inhibitors.

Rigaku Reagents: Wizard Precipitant Synergy



Crystals of Fab 47e, a functionally sulfated anti-gp 120 human antibody, crystallized with PS reagent 56

Discover more protein crystallization hits with Wizard Precipitant Synergy. The Wizard Precipitant Synergy protein crystallization screen targets all types of soluble protein and protein complexes. Tests have shown that this screen can triple the number of unique crystals when compared with other screens. Each unique formulation is made available in three different concentrations to increase the coverage of crystallization space. These related formulations are positioned in neighboring wells or tubes to simplify the analysis of crystallization behavior. This format creates less waste than the previous 64-well formats and it enables high throughput crystallization, using $2 \times 96 = 192$ formulations in two crystallization plates, for initial protein crystallization screening and crystallization optimization.

**Wizard Precipitant Synergy
Tubes: 1009539
Wizard Precipitant Synergy
Block: 1008652**

Order Here

May 08, 2020: In this news article, Jon Cohen describes the work being done by several institutions to [find the right antibodies to combat SARS-Cov2](#).

May 11, 2020: Five large pharmaceutical companies, Gilead, Novartis, Schrödinger, Takeda Pharmaceutical, and WuXi AppTec, have [formed an alliance to share information to help develop coronavirus antivirals](#).

Product Introduction

Rigaku Oxford Diffraction [Intelligent Goniometer Head \(IGH\)](#)

Rigaku first offered a motorized goniometer head for the home lab, the Microglide, in 2004. Used both on Rigaku home lab instruments and on many synchrotron beamlines around the world, the Microglide was instrumental in changing the way cutting edge crystallography was performed. Today many beamlines operate in a hands-free way with users safely separated from the dangerous X-ray beam. Through this vast experience in goniometer head automation and an eye on the ever changing needs of our customers, our latest product, the intelligent goniometer head (IGH) was born.

As you'd expect from any Rigaku Oxford Diffraction product, the IGH has been engineered for the highest reliability, accuracy and precision with a major goal of significantly reducing the bulk compared with existing solutions. The end result is the smallest detachable motorized goniometer head on the market, which gives you convenience, safety and automation possibilities with the minimum impact on data collection strategies.



Survey of the Month

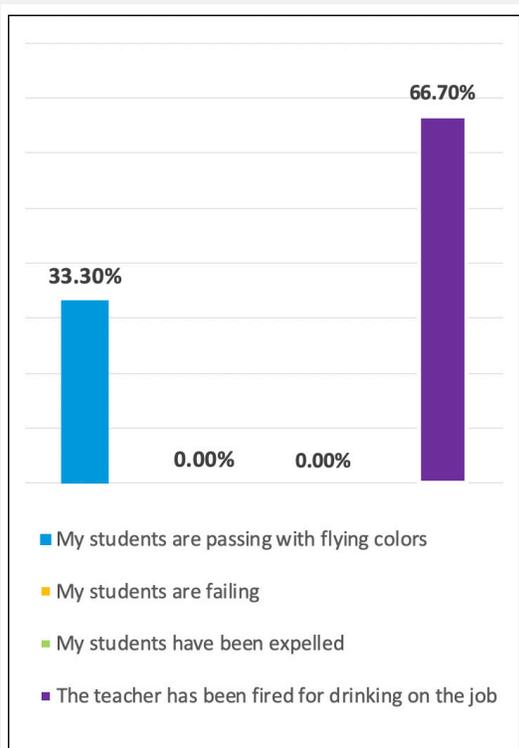
When will you feel comfortable traveling on an airplane again?



Take the Survey

Last Issue's Survey Results

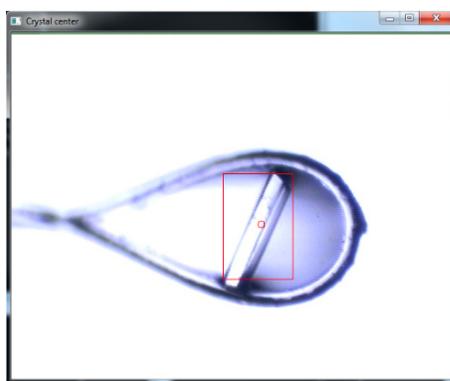
With all the children now being homeschooled, we wanted to find how they were doing:



Automated Optical Object Centering

For any truly automated system, reliably getting the sample centered in the X-ray beam without user input is essential. While older approaches used basic loop centering, or scanning through the X-ray beam, the IGH uses the latest in optical image recognition techniques to detect sample holder presence, recognize the crystal and center, not just the loop, but objects found within them. This fast approach minimizes dead time and avoids use of X-rays on sensitive samples and allows unattended data collection of an entire queue of samples, when used in conjunction with a sample mounting robot like the ACTOR™ system. Of course, point and click centering as well as manual control is also available if needed.

Benefits



Intelligent Centering: The IGH uses the latest in optical image recognition techniques to detect sample holder presence, recognize the crystal and center not just the loop, but objects found within them.

Minimal Profile: With such a small envelope, the IGH is able to offer the smallest collision zones, for faster more complete measurements in any space group.

Single or Dual Camera Operation: Should you have an instrument supplied with dual video microscopes, the IGH is able to take advantage of both of them for faster centering without the need for rotations to get extra images. This allows centering to be completed in as little as six seconds.

Lab in the Spotlight

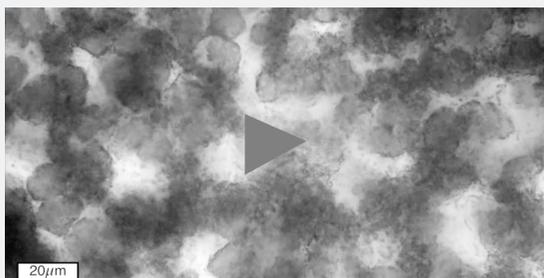
The Papish Lab The University of Alabama

Bioinorganic and Organometallic Chemistry

The Papish group does bioinorganic and organometallic chemistry in Tuscaloosa, AL. Their aim is to mimic how nature controls reactivity by using hydrogen bonds or protonation/deprotonation to control reactivity. The best man-made and natural catalysts (enzymes) use these methods to accelerate reactions. They have a strong interest

Videos of the Month

Researchers in the U.S. used positively and negatively charged polystyrene beads to model how crystallization might occur in materials like NaCl and K_4C_{60} . Here is a link to a movie of polystyrene beads crystallizing in a petri dish.



Download the File and
Watch the Video

Rosalind Franklin vs. Watson & Crick Science History Rap Battle

This project began at one school thanks to a Hewlett Packard Sustainability and Social Innovation Grant (sponsored by Silicon Valley Education Foundation).

This video was conceived of, written, and performed by 7th graders from KIPP Bridge Charter in Oakland, California.



Watch the Video

in green chemistry and they aim to use these methods to develop new means of storing energy, performing organic transformations, and testing metal complexes as anti-cancer drugs. It is hoped that by mimicking enzymes they can better understand how enzymes work. Since they both design fancy organic ligands and study the metal complex chemistry of these ligands, their interests lie at the interface of organic and inorganic chemistry.



Dr. Elizabeth T. Papish:

Professor of Chemistry
The University of Alabama
Tuscaloosa, AL 35401

Useful Links



[Symmetry and Space Group Tutorial](#)

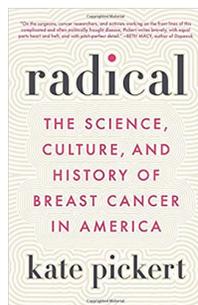
Knowledge of space groups and the implications of space group symmetry on the physical and chemical properties of solids are pivotal factors in all areas of structural science, by Jerry P. Jasinski and Bruce M. Foxman.



[SARS-CoV-2 / COVID-19 Resource Guide](#)

In support of researchers, scientists and labs working on a solution to COVID-19, the good folks at **MiTeGen** have created a SARS-CoV-2 / COVID-19 Resource Guide.

Book Review

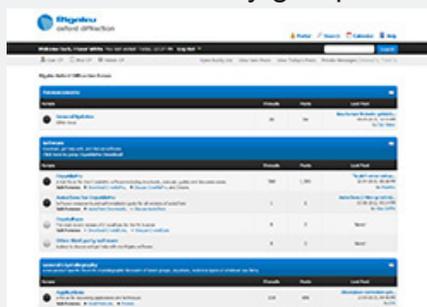


Radical: The Science, Culture, and History of Breast Cancer in America
By Kate Pickert

Radical is unlike many works of healthcare journalism marketed towards the general public. It not only provides, as the title suggests, information regarding the science, culture, and history of breast cancer in America, it also shares with the reader a deeply personal narrative. Kate Pickert, the author, is well-established as a healthcare journalist—and a breast cancer survivor. She interweaves her personal experience fighting the disease with stories from other women and expert medical opinions. The resulting book is painful at times, always informative, and ultimately a page-turner.

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

Pickert lays the cards on the table immediately in her introduction, describing her initial experience with chemotherapy and her personal anguish at a young diagnosis—she was in her mid-thirties at the time. Pickert assures her reader she survived, and explains the full extent of her treatment plan upfront. She in no way uses her personal experience to keep the pages turning—if anything, her tone throughout *Radical* is well-balanced between empathy and objectivity. The book is less about Pickert and her experience and more about addressing the public perception of breast cancer, debunking its myths, and exploring how generations of women in America—dating all the way back to John Adams' daughter Abigail—have dealt with their diagnosis and disease.

For quite a few decades, American medical institutions have spent millions of dollars annually researching breast cancer treatment. Breast cancer treatment has come a long way since the early 1900s, when doctors would brutally mutilate patients by removing extensive amounts of chest tissue and muscle—an extreme version of the modern-day mastectomy. Major advancements in reconstructive surgery over the past 30 years have changed life for many post-mastectomy survivors. Furthermore, many women are successfully treated via a regimen of chemotherapy and radiation, without any surgical tumor removals. In the 1950s and 60s, a breast cancer diagnosis was often interpreted as a death sentence. Today, modern medical marvels suggest otherwise—but tragically, many women still die from the disease in America every year.

Despite the millions of dollars of medical research conducted each year in the hopes of finding a cure and treating the disease, there has been very little done to determine what causes it. We know more now than doctors did 50 years ago, certainly, but there is a significant knowledge gap that needs to be bridged.

Pickert's book is by no means a fun read, but it is a compelling and informative one.

Review by Jeanette S. Ferrara, MA



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