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WELCOME

I recently had surgery to repair my dominant arm rotator cuff and I am using the [dictation tool in Microsoft Office](#) to write this introduction. The tool is actually quite good. For example, it can distinguish right versus right [sic] based on context, although it did get the second "right" in the previous sentence wrong. It is a little slow, but faster than typing left-handed only. It is a pleasant surprise.

The holidays are upon us, and this will be the last *Crystallography Times* of 2022. This has been an amazing year. The world entered the post-COVID era with a return to in-person conferences and meetings. It was great to see people I had not seen in person in three years. I am sure many of you feel the same way.

In this issue we highlight the crystallography facility at Michigan State University, managed by Richard Staples. We just completed installation of the XtaLAB Synergy-ED in The Woodlands, and I've taken the liberty of making that the instrument in the spotlight. We've also scheduled a webinar on the [XtaLAB Synergy-ED in February](#). The sign up link follows.

We have the usual list of conferences and crystallography papers. By the way, if you have a publication you would like highlighted please send me the citation. Jeanette reviews *Song of the Cell* by Siddhartha Mukherjee. I've included a link to some spectacular and humbling images from the JWST selected by *Nature*. Lastly, you'll find links to help support relief efforts in Ukraine.

I look forward to 2023 and seeing many of you in Melbourne at the IUCr Congress.

Happy Holidays,

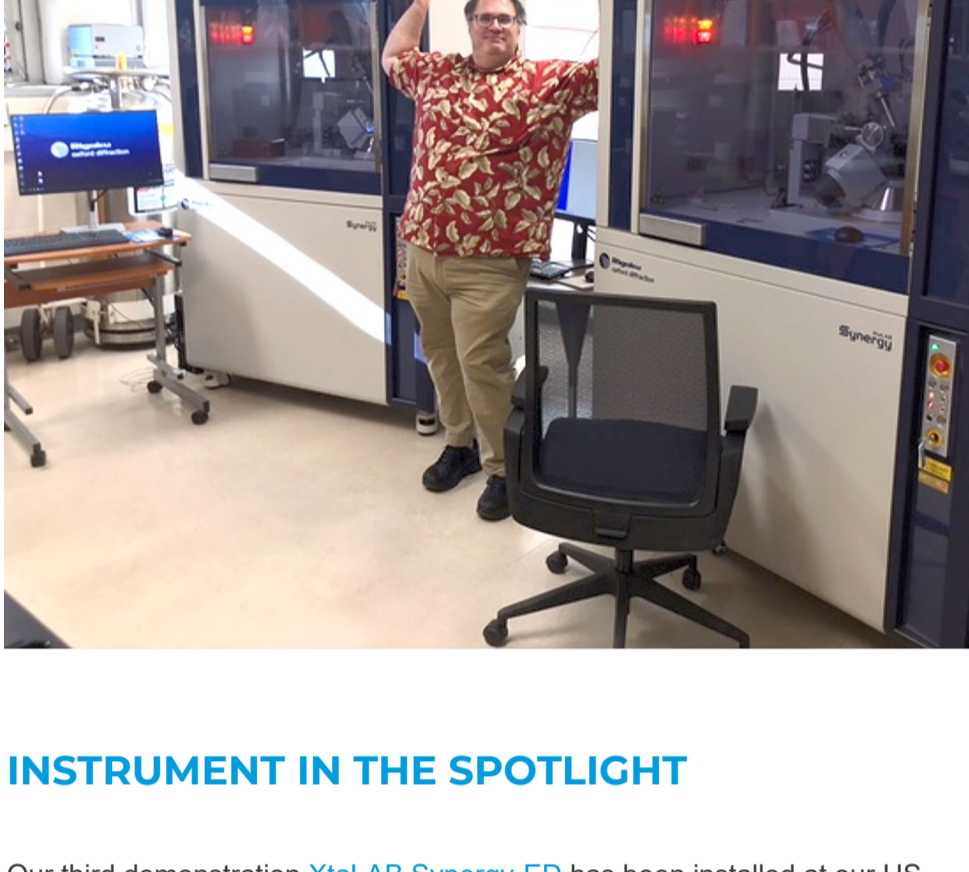
Joe Ferrara

RESEARCHER IN THE SPOTLIGHT



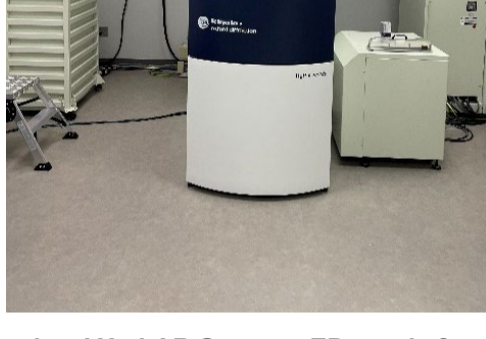
Dr. Richard Staples
Michigan State University

The [Center for Crystallographic Research](#) at Michigan State University installed its first XtaLAB Synergy-S in February 2020. The system has dual microfocus sources, copper and molybdenum, with a HyPix-6000HE detector, which allows for shutterless data collection. The system has a four-circle κ goniometer to allow for rapid, efficient data collection. This unit uses an Oxford Cryosystem 800 series low temperature device. In November, MSU took delivery of a second XtaLAB Synergy-S to support the high-pressure research efforts of Professor Weiwei Xi. The second system is currently configured with copper and molybdenum, but will be converted to silver and molybdenum next month. This unit also has an Oxford Cryo CS-800.



INSTRUMENT IN THE SPOTLIGHT

Our third demonstration XtaLAB Synergy-ED has been installed at our US application laboratory in The Woodlands, TX. This installation further increases our demonstration capabilities, offering the possibility of in-person demonstrations for our customers in North America, South America, Australia and New Zealand. Our applications team is not-so-patiently waiting to get their hands on the new instrument and very enthusiastic about having something quite unique in the lab.



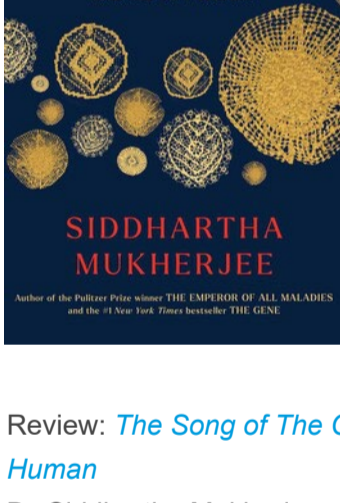
The Rigaku Americas' XtaLAB Synergy-ED, ready for demonstration

It has been fun watching our colleagues from JEOL installing the instrument, and it has been a bit of a learning curve for us in The Woodlands as we watched the installation progress from unboxing the instrument through to the completed installation.

For those who are unaware, the XtaLAB Synergy-ED is our instrument designed for electron diffraction developed in partnership with JEOL. Due to the much stronger interaction of electrons with matter compared to X-rays, diffraction from sub-micron samples is possible, enabling studies on species inaccessible to current X-ray diffraction equipment. If you are interested in seeing this instrument in action, get in touch with your [local account manager](#) and we will schedule a demonstration.

We will be holding an open house/user meeting February 15-16, 2023 at our facility in The Woodlands. Details will be available on our website shortly. You can also register for our February 23rd webinar, XtaLAB Synergy-ED Progress and Latest Results, by [clicking here](#).

BOOK REVIEW



Review: [The Song of the Cell: An Exploration of Medicine and the New Human](#)

By Siddhartha Mukherjee
ISBN: 978-1-9821-1735-1

Siddhartha Mukherjee's latest book, *The Song of the Cell: An Exploration of Medicine and the New Human*, is an intriguing and at times surprisingly personal dive into our understanding of the cell within the context of past, present, and future human health and medicine.

It's notable that Mukherjee chose the title *The Song of the Cell*, not the "saga" or the "epic." The book is by no means intended to be a comprehensive history of cell biology or our collective knowledge of cell biology in the context of cutting-edge medical research and therapies through the past few centuries. At only 377 pages not including the prelude, notes, and index, it would be pretty impressive for him to attempt to do so in this book. If you're looking for something of that ilk, Mukherjee recommends Roy Porter's *The Greatest Benefit to Mankind: A Medical History of Humanity*, Henry Harris's *The Birth of the Cell*, and Laura Otis's *Müller's Lab* in his prelude. Mukherjee is not looking to reinvent the wheel of cellular or human medical history; he is turning it on its side, cross sectioning it, looking at specific parts under a microscope, and sharing his observations, oftentimes couching them with anecdotes from his personal life and clinical experience as an oncologist.

The Song of the Cell is not written in chronological order. Rather, like a song, each part feels like a specific verse with a more narrow message that relates to the overarching chorus of cell biology and the role of cell biology in modern medicine.

In Part One, "Discovery," Mukherjee goes back to the beginning, so to speak, homing in on the origins of human knowledge of the cell and its role as the fundamental building block of life. In Part Two, "The One and the Many," Mukherjee starts to delve into the interactions of cells with other cells, touching on our understanding of organelles—the building blocks of the building blocks—as well as of cellular reproduction and our ability to use that knowledge and apply it to medical advancements such as in vitro fertilization. In Part Three, things start to get a little bloody—literally. Titled "Blood," this part of the book digs into blood cells—how they function, what they are, when they diversify, and where things go wrong when someone develops or contracts a blood-based disease.

If Mukherjee's book is indeed a song, Part Four, "Knowledge," which almost exclusively covers the COVID-19 pandemic, feels like a sorrowful interlude. Most of the book is rooted in hope and the idea that most good things can come from advancing our knowledge of the cell and its role in human health and healing. But "Knowledge," which contains only one chapter, titled "Pandemic," is deeply rooted in a recent, painful and still very present time in our history, and in Mukherjee's. As a medical doctor in New York City, he was at the frontlines of the pandemic during its most brutal moments. And as incredible as the rapid development of the vaccine was, millions of people have still died, so categorizing the pandemic response as a victory in the face of so much grief and loss seems challenging.

Part Five, "Organs," delves into cell specialization and how the cells of specific organs play specific roles, while the final part, Part Six, "Rebirth," delves into stem cell therapy and other therapies being developed that rely on continuing to advance our understanding of cell biology and intracellular interactions in the human body.

The Song of the Cell is lyrically written and well-executed. Its unique balance of history, modern science, and memoir-esque personal flourishes makes it equally easy to read, intellectually stimulating, and emotionally compelling.

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:
GE3C, Benidorm, Spain, January 17-19, 2023

Pittcon 2023, Philadelphia, PA, March 18-22, 2023

ACS Spring 2023, Indianapolis, IN & Hybrid, March 26-30, 2023

DGK 2023, Frankfurt, Germany, March 27-30, 2023

CRYSTALLOGRAPHY IN THE NEWS

November 16, 2022
Researchers from Belgium, Estonia, Sweden and the US have used the [crystal structure of CapRe^{SJ46}](#) to understand how it acts as an antitoxin and phage infection sensor.

December 7, 2022
Scientists at East Tennessee State University and Clemson University have published a paper in *J. Chem. Ed.* describing an [undergraduate crystallography experiment](#) using the XtaLAB mini.

December 8, 2022
Researchers from Australia and New Zealand [used liquid gallium to grow zinc snowflakes](#) as well crystals of various morphologies of other metals.

December 8, 2022
Scientists from the US have found a [catalyst that directs reactions with vinyl cations towards one enantiomer](#).

UPCOMING WEBINAR

[TOPIQ Webinar: XtaLAB Synergy-ED Progress and Latest Results](#), February 23, 2023.

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](#).

Here is a link to a compilation by *Nature* of the most spectacular images from the JWST.

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

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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