



Volume 15, No. 1, January 2023

WELCOME

Happy New Year to you all!

The year 2022 will surely be remembered for a lot of things. As I was sitting down to write this introduction, I tried to think of what happened last year. Some very worrying and sad events immediately spring to most of our minds, but plenty of good things happened, too. So, rather than dwelling on the negatives, I thought it might be nice to use the first introduction of 2023 to compile a short list of positive news from STEM fields in 2022 to remind us all why we do what we do.

1. Genetically modified chimeric antigen receptor (CAR) T-cell technology has helped cure **leukemia** and **lupus**. These CAR cells can be "programmed" to target and kill defective cells without attacking healthy ones, leading to new treatments for previously incurable illnesses.
2. **Scientists at the National Ignition Facility at Lawrence Livermore National Laboratory in California, USA reached a milestone in nuclear fusion**. For the first time, energy generated by the fusion experiment exceeded the energy put in.
3. **The first color images from the James Webb Telescope were revealed to the world in July 2022**. Since then, frequent updates are revealing the universe in infrared.
4. **Vaccines using mRNA technology continue to impress, with a universal flu vaccine producing antibody responses against all 20 known strains of influenza A and B in early trials**. While immunity in humans is yet to be tested, initial results are promising.
5. **NASA successfully tested its Double Asteroid Redirection Test (DART), altering the orbit of an asteroid**. Such experiments offer hope humanity can avoid the fate of the dinosaurs.
6. **The data transmission record was broken by a new optical chip**. The technology was able to reach a transmission speed of 1.84 petabits per second. That's about 57 million times faster than the global average broadband internet connection.
7. AI helps predict protein folding of millions of proteins in **July** and again in **December**.

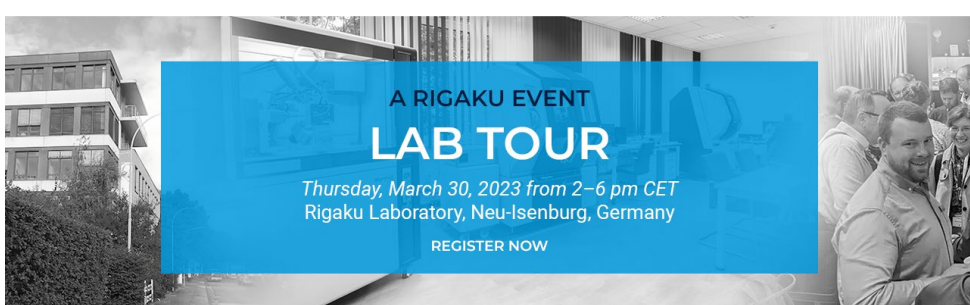
I'm sure there are plenty of other good news stories out there, many of which may deserve more prominence than my selection. These are just the ones that stood out for me.

We'd like to let you know that, at this year's DGK, due to the proximity of the conference to our European demo facility, we will be offering a lab tour. You can find more information and register using [this link](#).

I hope 2023 has gotten off to a great start for you all, and I hope to see you around at this year's conferences.

Fraser White

LAB TOUR AT THE DGK



Please join us for a tour of Rigaku's laboratory in Neu-Isenburg during DGK this March. The tour will be on Thursday, March 30th from 2-6 pm, and we will provide transport to and from the DGK venue if needed. If you'd like to attend, please register at [this link](#). Places are limited so be sure to register early if you'd like to attend.

LAB IN THE SPOTLIGHT

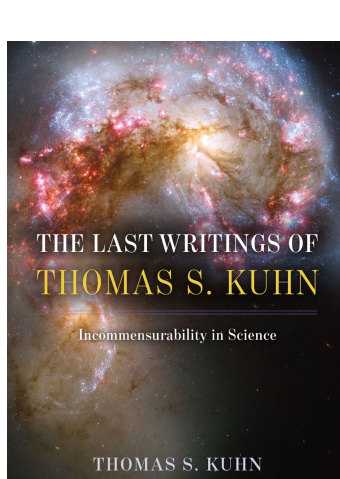


National Crystallography Service, UK

The University of Southampton and, more recently, the University of Newcastle jointly host the National Crystallography Service (NCS) in the United Kingdom. Funded by the Engineering and Physical Sciences Research Council in the UK, the NCS was founded to provide access to both **X-ray diffractometers** and crystallographic expertise to those without. The service aims to offer higher-performance instrumentation than is typical in the average lab, and frequently updates their instrumentation to remain at the forefront. The service also offers access to advanced techniques for crystallographers who lack the specific experience or instrumentation to get started themselves. Techniques include variable temperature, high pressure, gas environment, quantum crystallography, the crystalline sponge method, and ENaCt (Encapsulated Nanodroplet Crystallization). For more details, see [here](https://www.ncs.ac.uk/advanced-techniques/)

In 2023, the NCS will combine with the University of Warwick to add two **XtaLAB Synergy-ED** systems to begin offering its users access to electron diffraction alongside its X-ray facilities. Rigaku Oxford Diffraction is very proud to have been chosen by the NCS to form a partnership and supply instrumentation to run this national facility.

BOOK REVIEW



Review: [The Last Writings of Thomas S. Kuhn: Incommensurability in Science](#)

By Thomas S. Kuhn

Edited by Bojana Mladenović

ISBN: 978-0-226-82274-7

Thomas S. Kuhn was an American philosopher and professor at the Massachusetts Institute of Technology who passed away almost 30 years ago. If you aren't familiar with Kuhn's philosophical writings, particularly *The Structure of Scientific Revolutions*, you may want to read those texts or at least a summary of them before picking up *The Last Writings of Thomas S. Kuhn*. This book is described as a "must-read follow up" to Kuhn's earlier works. It references claims he made and conclusions he drew without a tremendous amount of context, which could make it difficult to navigate for any reader looking to dip their toe into Kuhn's legacy.

The Last Writings of Thomas S. Kuhn is not a complete narrative work. It contains the text of several lectures he gave that were never formally published, followed by the text of his final and unfinished work, entitled *The Plurality of Worlds: An Evolutionary Theory of Scientific Development*. The editor chose to include all of these in the text so the reader can follow the trajectory of Kuhn's later philosophical thinking as it developed from publicly delivered lectures through to drafts of his unfinished manuscript. Reading through Kuhn's own evolution of theory regarding incommensurability in science is certainly intriguing, although the disjointed nature of such a work does create some difficulty for the reader if they are not already intimately familiar with Kuhn's other work.

The Last Writings of Thomas S. Kuhn is dense, as philosophical writing often is, and certainly not a light or breezy read for the beach, but a decent one for dark and cold winter months when the mind is driven toward deeper thought.

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:

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

BCA Spring Meeting 2023, Sheffield, UK, April 3-6, 2023

CRYSTALLOGRAPHY IN THE NEWS

November 23, 2022

Researchers from the US have measured the **thermal conductivity of cubic boron arsenide** and found it decreases above 16.5 GPa, a first.

December 9, 2022

Scientists in China used electron diffraction methods to characterize **two covalent organic frameworks designed to enhance propyne/propene separation**.

December 23, 2022

Researchers from Ruhr-University Bochum have developed a robust method to **synthesize ketenes without using transition metal catalysts from carbon monoxide** through isolable ketyenyl anions.

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](#)

I am sure [this article](#) will win a 2023 Ig Nobel Prize, but it is pretty clear commercial toilets should have lids installed to prevent the fecal-oral mechanism of disease spread.

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.

[JOIN HERE](#)

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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