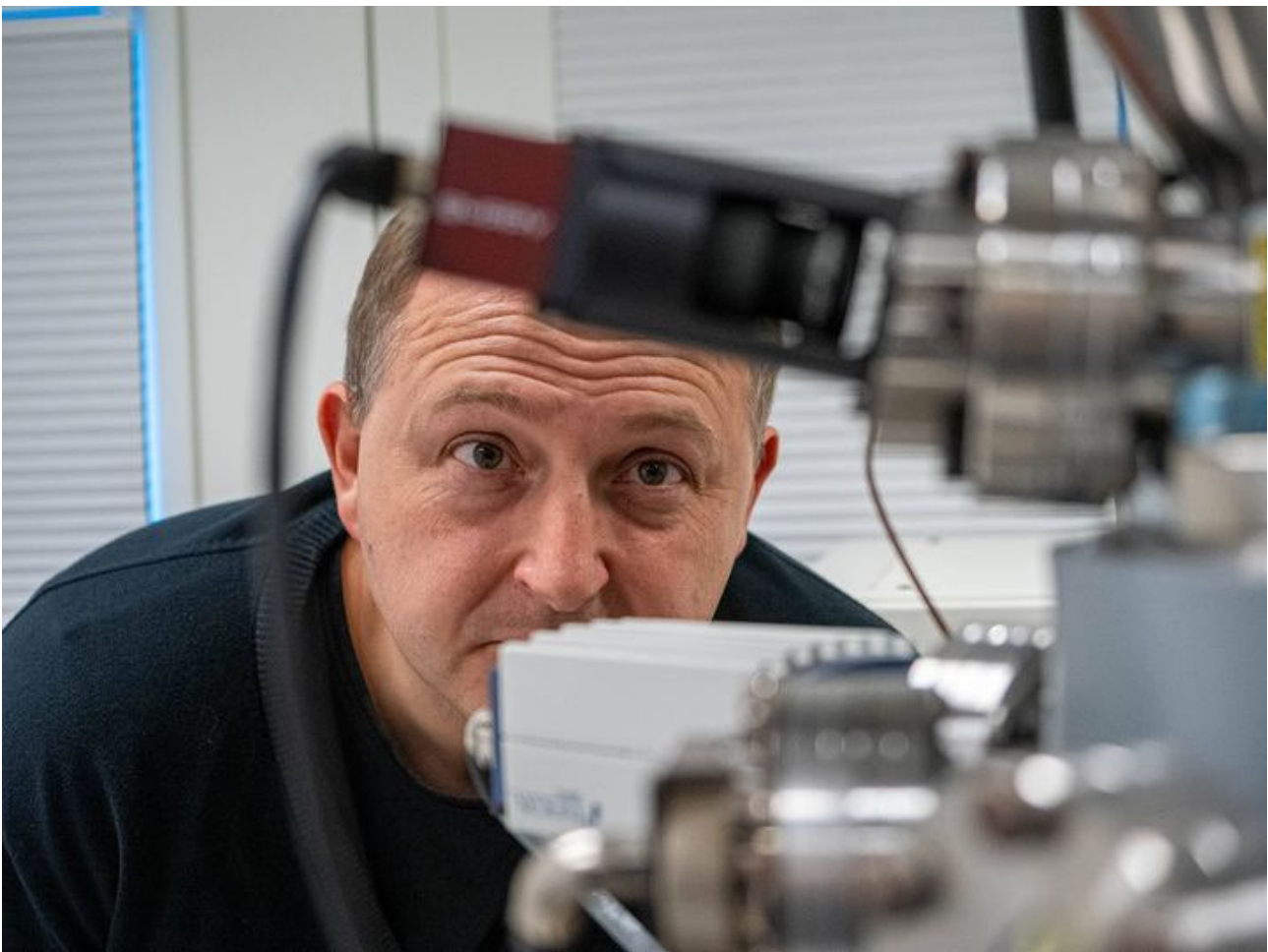


Press release TORCH 25 January 2024

<https://www.sdu.dk/da/nyheder/pressemeddelelser>

Research project brings colours of the past back to life

**The TORCH project, which has received about 10.7 million DKK in support from the EU program Interreg Deutschland-Danmark, combines past colours with today's technology to preserve and shed new light on our national treasures.**



Assoc. Professor Jacek Fiutowski with a microscope as it is used in the project. Image: Mogens Petersen, SDU

By Sune Holst, [suneholst@tek.sdu.dk](mailto:suneholst@tek.sdu.dk), 1/25/2024

"The dark Middle Ages may not have been so dark, but rather an explosion of colour," says Associate Professor Jacek Fiutowski from SDU Nanophotonics, who leads the TORCH research project.

"By using advanced technologies such as spectroscopy and digital image processing, we can reveal hidden details in historical objects, giving us a deeper insight into their origin and condition," explains the researcher.

TORCH stands for Technological Enlightenment to Preserve and Explore Regional Cultural Heritage. In short, researchers from SDU and Kiel University are introducing a range of conservators and museum professionals to new technologies that can aid them in their work.

Like the conservators, they have methods and international contacts that can provide the other partners with new perspectives in their fields of work.

### **Recreation of Historical Colors: A Window to the Past**

One of those benefiting from the introduction to the new technology is Lise Ræder Knudsen, director of Conservation Center Vejle.

"We have lots of projects in the pipeline. We have Danefæ (treasure troves) to be scanned, and our German colleagues have ships and ropes from the Viking Age to be analyzed," says the director enthusiastically.

"The project also gives us a unique chance to understand what Ribe looked like in colours several centuries ago."

At the end of the 1800s, several old half-timbered houses in Ribe were torn down. The appearance of the houses is known from black and white photographs, and at Museum Vest, parts of the timbering are preserved, including posts, door hammers, and other beautifully carved details from the 15th-16th century. Paint residues are also found on the building parts.

"We use, among other things, a method with a needle that can reach into corners and crevices where paint is traditionally difficult to remove. There, we can take samples with a needle. It is a bit like a micro-sized core sample. We take that sample to Jacek Fiutowski at the campus in Sønderborg or to the researchers at the University of Kiel, where they have fantastic equipment that can measure radiation, resulting in curves that reveal which dyes and pigments are involved," explains Lise Ræder Knudsen.

The idea is that TORCH, based on the timber from the half-timbered houses, will clarify the colour history of the old houses and the changes over time.

"Recently, we looked at a house called Mellemdammen 18. An old merchant's house still stands on the main street. The common assumption was that the houses in Ribe were brown, black, and yellowish colours, but it turned out that Mellemdammen 18 had been painted with a rich palette of red, blue, and green colours. The grape clusters were blue-purple, and there was gold around the ornaments. It was so colourful and so beautiful."

It is hoped that conservators and museum professionals with access to the new technology can see Ribe's half-timbered houses when they were torn down and how

they have looked at different times in history. With this knowledge, a digital reconstruction of the black-and-white image can be made.

"We can use this to create augmented reality for your mobile, so you, as a tourist in Ribe, might be able to see the street where it should have been. In this way, we gain new historical knowledge and make it alive and accessible to everyone.

### **Across the Danish-German Border**

TORCH's primary focus is establishing cross-border cooperation between Denmark and Germany by creating a network connecting the cultural sector with research environments. The collaboration will integrate various disciplines, such as engineering, material research, chemistry, and computer science, and design and creativity to recreate history that otherwise would not have been possible.

"The project thus strengthens the Danish-German program region in several ways at the same time and promotes the accessibility of cultural heritage to a broad audience by taking advantage of the latest digital developments," says Professor Horst-Günter Rubahn, project coordinator and head of the Mads Clausen Institute.

With partners such as NanoSYD, Conservation Center Vejle, CAU Kiel, Newtec Engineering A/S, and Museum für Archäologie Schloss Gottorf, the goal is to transform historical knowledge into a living, interactive experience and through research to connect past and present.

## **Faktaboks**

### **Iron Age Army's Weapons?**

TORCH will paint Ribe beautifully and colourfully and delve into the Fæsted Treasure's excavation area, where archaeologists have unearthed a mass of deliberately destroyed weapons, apparently sacrificed after fierce battles in the Iron Age. But what can we learn about the weapons by analyzing the metals they are made of?

"We can conduct metal analyses of the weapons with the many technical possibilities at SDU and Kiel University. For example, there seem to be inlays of other metals on the surface of some of the weapons - could these be marks indicating who made them, or could they be ornamentation? And is this something we can see on weapons found elsewhere? It's exciting and can lead to new insights," says Lise Ræder Knudsen, director of Conservation Center Vejle.

### **A Neolithic Secret**

It's rare to see anything of the bones of the Stone Age people in Denmark, but Ringkøbing-Skjern Museum has found not just one but six individuals buried in the floor of the tomb chamber in a dolmen. They are believed to be from the first Neolithic burials in the chamber of the Dolmen.

TORCH can here help with a detailed 3D representation of the grave as it is excavated, so it stands firm in communication and research. Additionally, TORCH contributes to the extraction and analysis of DNA material, hopefully bringing us very close to the six people who lived about five thousand years ago.

The TORCH project, which has received about 10.7 million DKK in support from the EU program Interreg Deutschland-Danmark, combines past colours with today's technology to preserve and shed new light on our national treasures.