



SUCCESS STORY  
**Research**



#### PROBLEM SOLVED

Diamond Light Source is the UK's national synchrotron. By harnessing the power of electrons, scientists can study anything from fossils to jet engines. Because the amounts of data generated are enormous, Diamond Light counts on NetApp to make it easily accessible.

# How Ancient Fossils Are Helping Scientists Create a Better Future

Dinosaurs became extinct about 70 million years ago. Today scientists in the UK think dinosaur bones, which are structured in such a way that harmful elements never leak out, may hold the key to finding a way to safely store nuclear waste.

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“We chose NetApp because they’re a time-tested company. We know that in 5 years’ time—when we need to evolve the system—the professional services and support is going to be there to help us achieve our operational goals.”

—David Bond, Senior Computer Systems Administrator, Diamond Light

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For Andrew Richards, head of Scientific Computing, Diamond Light, unearthing information from dinosaur bones is just another example of how the organization’s scientific research is changing the world.

“Everyday life is affected by everything we do here—from understanding ice cream and how to make it taste better, to drug discoveries and how to make bones heal themselves better, to what happens when batteries charge and discharge, all the way through to using information from ancient dinosaurs to understand how we might be able to store nuclear waste better in the future,” Richards says.

Making these types of discoveries is the mission of Diamond Light Source, the UK’s national synchrotron. The machine

accelerates electrons to near light speeds so that they give off light 10 billion times brighter than the sun. These bright beams are then directed into laboratories known as “beamlines.”

#### **SUITCASES FULL OF HARD DRIVES**

Researchers from both academia and industry visit the Diamond Light facilities more than 9,000 times annually to use Diamond Light to conduct experiments, assisted by approximately 500 staff. Because the amounts of data generated from this process are enormous, Diamond Light counts on NetApp® technology to make it easily accessible to virtually anyone with a computer. Researchers no longer have to arrive at Oxfordshire with suitcases full of hard drives to capture their data. Now they can access it in the cloud.

David Bond, senior computer systems administrator, is responsible for managing and distributing all of the data that this cutting-edge research facility generates in its quest to solve some of the world’s most challenging problems. To achieve the required computing capacity, Diamond Light provides a general-purpose compute cluster of approximately 3,500 compute cores and 250,000 GPU cores, which is also used for automated fast data processing. To meet these requirements, Bond counts on NetApp.

“We chose NetApp because they’re a time-tested company. We know that in 5 years’ time—when we need to evolve the system—the professional services and support is going to be there to help us achieve our operational goals,” Bond says.

## A CLOUD IN YOUR GARAGE

In addition to dinosaur bones, Diamond Light scientists now have a better understanding of why human bones fracture and better ways to help them heal. Scientists at Diamond Light also discovered how to change processing methods to improve the taste of ice cream. They're even looking at ways to create cloud storage units that will fit in your cupboard.

Research Scientist Sarnjeet Dhesi is most proud of the way Diamond Light Source uses the power of

X-rays to further research and discover materials to use in the products of tomorrow.

"The kind of materials that we study nowadays with the X-rays will lead to much higher storage densities in the future. So that the kind of information that you store on the cloud today, you'd be able to store, for instance, in a cupboard or in your garage in a household," Dhesi says.

Christopher Columbus said that by following the light of the sun,

he left the Old World. Scientists at Diamond Light are blazing a path of discovery and enlightenment that our ancestors could have never imagined.

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