There are many powerful electron microscopes. They operate with higher voltages. The consequence of this is that the investigated materials can incur radiation damage or even be destroyed, “because the electrons run on the samples almost at the speed of the light,” as Kai-Kaiser explained. SALVE saves the materials, it operates with lower voltages. The instrument still has clear vision, because it - and this makes it unique – combines low operating voltages with a new corrector system. “Our microscope has, so to speak, two spectacles,” explains the material scientist, who has been pursuing and implementing the idea since 2008.

How does science benefit from this? SALVE can make the movements and interactions of atoms “with unprecedented resolution”, says Kai-Kaiser. One main focus is the investigation of novel materials that are so “thin” that they consist only of two dimensions. Such building elements, which are only one atom thick, are necessary also for the construction of efficient computers of the future, for example, quantum computers.

Medicine could benefit

In the area of battery research, SALVE is intended to
help to make electrochemical processes visible at the atomic level and thus enable more powerful batteries. And medicine, such as AIDS research, could benefit from the ability of the microscope to image single peptides - just to name a few.

The name SALVE has nothing to do with the Latin word for „be greeted“. The abbreviation stands for „Sub-Angstrom Low Voltage Electron Microscopy“. The cost of the instrument is borne by the Federal republic of Germany in the form of the German Research Foundation (5.3 million euros), the state of Baden-Württemberg (3.8 million) and the University of Ulm (1.5 million for the instrument and 2.1 million for the building). And as a completely new building was necessary because of tramway construction, the municipalities of Ulm (SWU) also contributed with 1.8 million Euros to the new building. SALVE project partners of Ulm University were the Heidelberg company CEOS and the US-Dutch company FEI.

SÜDWEST PRESSE

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