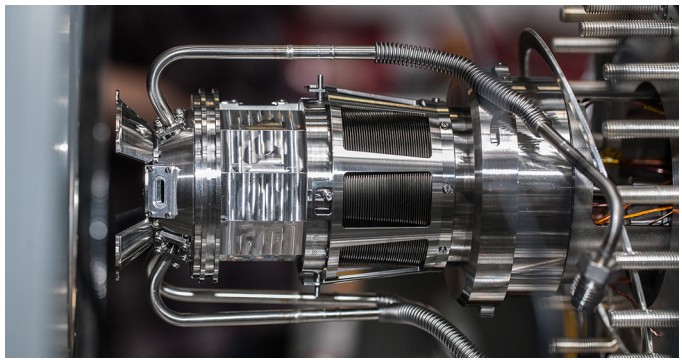
A revolutionary setup for ALD

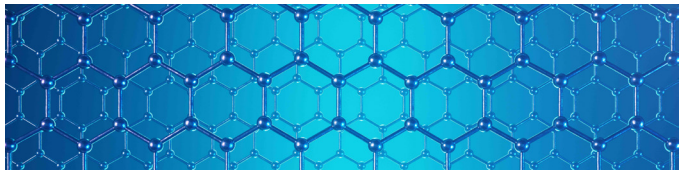


SPECIES, one of the soft X-ray beamlines in MAX IV 1.5 GeV storage ring, has added to its portfolio a new cutting-edge experimental setup. It is composed of a custom cell where the ALD process is performed and observed using APXPS. Thanks to this next-generation experimental setup, scientists can finally observe the formation of the atomic layer in real-time.

– There is no other technology that can monitor what happens during the pulse, in-operando, says Matti Putkonen, associate professor at University of Helsinki and expert in atomic layer deposition and etching. Furthermore, thanks to APXPS, we can now perform experiments at a pressure range that more closely resembles the true ALD growth conditions used in the industry.

Read the full story here!

Borophene and Arsenene – new, exciting 2D materials



The discovery of graphene surely has had a revolutionary impact on research, triggering a whole new field of study within two-dimensional materials.

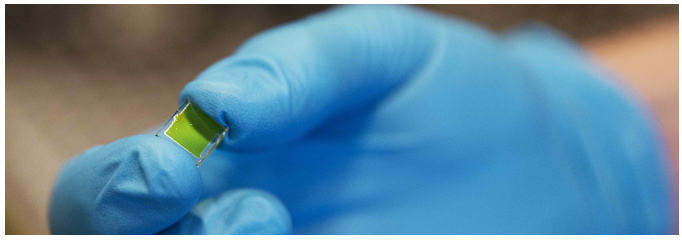
In a research project recently initiated and led by a MAX IV team, a novel borophene has been discovered that is possible to grow on iridium substrates in a broad range of experimental conditions. According to theoretical calculations, this material may be suitable for catalytic or electrochemical applications. By inserting atoms of gold between this borophene and its substrates, the scientists have demonstrated the stability of this novel structure itself.

Read the full story here!

An article published in 2D Materials shows the first experimental evidence of the successful formation of arsenene, with noteworthy semiconducting properties. This material shows a great potential for the development of new nanoelectronics. Crucial sample preparation and electron spectroscopy experiments were performed at the Bloch beamline at MAX IV.

Read the full story here!

First users at FlexPES look 'through' solar cells

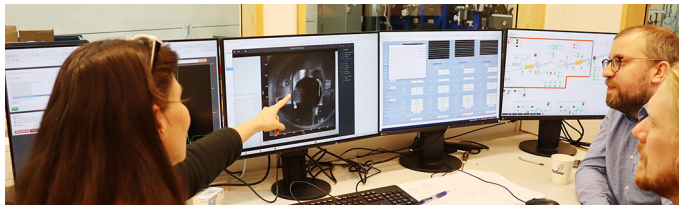


FlexPES recently welcomed its first regular user, James O'Shea, professor at the physics department and director of the University of Nottingham Energy Institute, studying dye-sensitized solar cells. Using PES, XAS and RPES, the research team analyzed numerous cells prototypes with different dye molecules. They collaborate with Energy Materials Laboratory at Newcastle University, who creates solar cells and measure their performance in real working environment.

– We want to correlate our data about the electronic events with the performance data from Newcastle, says O'Shea, since this will be crucial for understanding how to improve the technology.

Read the full story here!

First light at SoftiMAX



Soft X-ray imaging techniques at SoftiMAX, like ptychography and scanning transmission X-ray microscopy, are built around the use of spatially coherent X-rays. These techniques produce microscopic images of a sample, which at the same time can hold chemical, electronic, magnetic and/or structural information, depending on the details of the experiment. Samples from a wide range of scientific fields, such as biology, magnetism, life and materials science can be studied here.

Read more about SoftiMAX here!

Save the date!

7th DLSR Workshop in Lund, 12–14 April 2021