PAUL SCHERRER INSTITUT

PSI facilities newsletter

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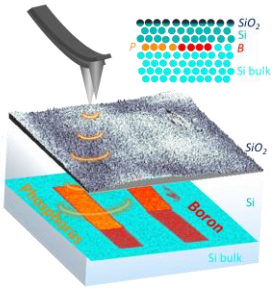
Covid-19 research: Anti-viral strategy with double effect

Frankfurt scientists identify a possible Achilles' heel of SARS-CoV-2 virus. This means a potential drug target to treat Covid-19. The researchers carried out part of their measurements at the Swiss Light Source SLS at the Paul Scherrer Institute PSI. End of July, the research results have been published in the scientific journal *Nature*:
D. Shin et.al., Nature, 29. July 2020 (online)
DOI: 10.1038/s41586-020-2601-5

The tiniest secrets of integrated circuits revealed



New research has demonstrated that the secrets of the tiniest active structures in integrated circuits can be revealed using a non-destructive imaging technique. The breakthrough required the efforts of an international team of scientists from JKU and Keysight Technologies (Austria), ETH/EPFL/PSI and IBM Research - Europe (Switzerland) and from UCL (UK).

You can download the paper 'Nanoscale imaging of mobile carriers and trapped charges in delta doped silicon p–n junctions' here: https://www.psi.ch/en/media/59447/download
Read more: https://www.psi.ch/en/psd/scientific-highlights/the-tiniest-secrets-of-integrated-circuits-revealed

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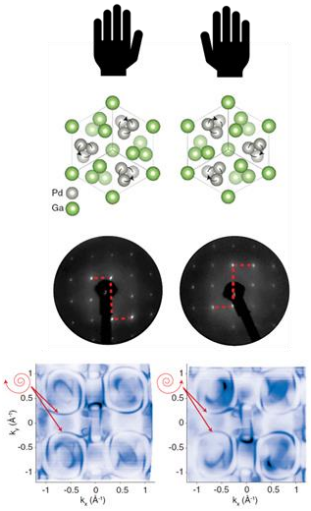
Cherned up to the maximum



In topological materials, electrons can display behaviour that is fundamentally different from that in 'conventional' matter, and the magnitude of many such 'exotic' phenomena is directly proportional to an entity known as the Chern number. New experiments establish for the first time that the theoretically predicted maximum Chern number can be reached — and controlled — in a real material.

When the Royal Swedish Academy of Sciences awarded the Nobel Prize in Physics 2016 to David Thouless, Duncan Haldane and Michael Kosterlitz, they lauded the trio for having "opened the door on an unknown world where matter can assume strange states". Far from being an oddity, the discoveries of topological phase transitions and topological phases of matter, to which the three theoreticians have contributed so crucially, has grown into one of the most active fields of research in condensed matter physics today. Topological materials hold the promise, for instance, to lead to novel types of electronic components and superconductors, and they harbour deep connections across areas of physics and mathematics. While new phenomena are discovered routinely, there are fundamental aspects yet to be settled. One of those is just how 'strong' topological phenomena can be in a real material. Addressing that question, an international team of researchers led by PSI postdoctoral researcher Niels Schröter provide now an important benchmark.

Read more: https://www.psi.ch/en/psd/scientific-highlights/cherned-up-to-the-maximum
N. B. M. Schröter et.al., Science 369, 179 (2020). DOI: 10.1126/science.aaz3480