

Five awards for young scientists

Katharina Kaiser (IBM), Claire Meyer (University of Basel), Shantanu Mishra (Empa), Kazuhiro Morimoto (EPFL) and Daniel Najer (University of Basel) are the winners of this year's Swiss Nanotechnology PhD Award. The five young scientists impressed the interdisciplinary award committee with their outstanding publications.

Awarded once a year

Each year, the Swiss Micro & Nanotechnology Network (Swiss MNT Network) presents the Swiss Nanotechnology PhD Award to five doctoral students who have published excellent peer-reviewed papers in the past year. Five to six Swiss companies donate the prize money of 2,000 Swiss francs each and usually present the prizes at the Swiss NanoConvention, which was scheduled to take place in Basel this year.

Like so many events, this year's PhD Award is somewhat different. The SNC 2020 in Basel has been postponed to 2021, so the 2020 winners will not receive their prizes until the SNC 2021 in Basel. However, that doesn't stop us from reporting on the work of these five young scientists selected by the interdisciplinary award committee comprising members of six different Swiss research institutions.

Diverse and convincing

Katharina Kaiser was behind the research that led to the award-winning publication in *Science*, working in the group led by Dr. Leo Gross at the IBM Research Center

in Rüschlikon. She created a cyclic carbon molecule of 18 carbon atoms by atomic manipulation. She started with precursor molecules, for which she used a combined scanning tunneling/atomic force microscope to split off masking groups. Examination of the new molecule with a high-resolution atomic force microscope revealed that the novel carbon ring is made up of alternating single and triple bonds. The prize awarded to Katharina Kaiser is sponsored by the Hightech Zentrum Aargau.

[Link to paper](#)



Claire Meyer, who is supervised by Professor Cornelia Palivan (University of Basel), won over the jury with a publication in *Small*. Claire Meyer is working on novel biomedical systems in which synthetic nanocompartments are combined with natural biomolecules. In the award-winning publication, she showed that the combination of nanocompartments with natural enzymes and imaging compounds functions in vitro, allowing the therapeutic enzyme to remain effective while simultaneously enabling controlled imaging. Claire Meyer's prize is sponsored by BASF. [Link to paper](#)





Dr. Shantanu Mishra, who works in the group led by Professor Roman Fasel, was selected for the PhD Award for a publication in *Nature Nanotechnology*. Shantanu Mishra synthesized atomically precise carbon nanostructures such as triangular graphene flakes, rhombus-shaped zigzag nanographenes and bow-tie-shaped nanographenes, and has demonstrated that these carbon-based materials can exhibit robust magnetism well beyond the thermodynamic threshold. In the award-winning publication, Shantanu Mishra shows how on-surface synthesis can be ideally combined with scanning probe microscopy/spectroscopy to unambiguously detect magnetism in carbon nanomaterials. His work paves the way for production of new magnetic materials with technological relevance. The prize is sponsored by the companies Zeiss and Gloor.

[Link to paper](#)



Kazuhiro Morimoto has developed a megapixel camera based on single-photon avalanche diodes (SPAD) working at AQUALab, the laboratory of Professor Edoardo Charbon (EPFL). The results are described in a paper published in *Optica*. The camera can operate in intensity and time-gated mode with a shutter speed of 3.8 nanoseconds and a readout speed of 24,000 frames per second. It delivers images and three-dimensional scenes with an accuracy of a few millimeters and a resolution of 1000 x 1024 pixels, and will contribute to numerous interesting applications in metrology, microscopy and LiDAR (light detection and ranging, a method similar to radar). Kazuhiro Morimoto's prize is sponsored by the company Sensirion.

[Link to paper](#)



Dr. Daniel Najer, a member of the group led by Professor Richard Warburton (University of Basel) has shown in a publication in *Nature* that an efficient quantum-mechanical light-matter interface can be created using a microscopic cavity. Within this cavity, a single photon is emitted and absorbed up to 10 times by an artificial atom (a semiconductor quantum dot). The work opens up new possibilities for quantum technology. Daniel Najer's prize is awarded by the company Bühler.

[Link to paper](#)

We congratulate all prize winners on their outstanding publications. We look forward to the award ceremony next year at the SNC 2021 in Basel from June 24 to 25.