Prof. Menny Shalom

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Menny was born in 1979 in Tel Aviv, Israel. He received his BSc in Chemistry in 2007 from Bar-Ilan University. Afterward, he pursued MSc and Ph.D. degrees under Prof. Arie Zaban at Bar-Ilan University, researching quantum dot sensitized solar cells. He then joined Prof. Markus Antonietti at the Max Planck Institute of Colloids and Interfaces (MPI), Germany, as a Minerva fellowship fellow for his postdoc. From 2013 to 2016, he was appointed as a group leader in MPI, and since the end of 2016, he has been an Associate Professor at the Ben-Gurion University of the Negev, Israel. His group focuses on synthesizing new materials for energy conversion applications, mainly photoelectrochemical cells and electrocatalysts. Menny's group has published more than 50 papers in well-known journals. Menny's list of awards includes the Israel Vacuum Society Award (2018), Toronto Prize for Excellence in Research (2018), ICS Excellent Young Scientist Prize (2020), The Tenne Family Prize for NanoScale Sciences (2021), Blavatnik Award for young scientists in Israel (2021) and an ERC starting grant.

Menny's research is focused on several important and fundamental scientific topics, ranging from new synthetic methodologies for 2D metal-free materials, sustainable solar-to-fuel conversion, and the development of new materials and concepts for clean fuel production (*e.g*., hydrogen) by using photoelectrochemical cells (PEC) and electrocatalysts. The emphasis of the group's research is on understanding the structure-property relationships of novel materials. Namely, the rational design of synthetic processes, investigation of reaction mechanisms, and studying the resulting properties of metal-free materials, which contain only carbon, nitrogen, phosphorus, sulfur, and boron—CNXs (X = P, S, or B)—for photocatalytic and photoelectrochemical reactions on the one hand, and ceramics based on transition metals as electrocatalysts or co-catalysts in PECs on the other hand.

Menny's research impacts renewable and sustainable energy production by understanding how photoactive materials are made and what affects their behavior. Prof. Shalom's group has tackled the issue of manipulating the materials' final properties by the rational selection of monomers, building blocks, solvents, reaction conditions, *etc*. Menny's group has explored the utilization of polymeric carbon nitrides and their derivatives as photocatalysts and as the active material in photoanodes in photoelectrochemical cells. They have developed methods to manipulate the growth of carbon nitride layers on transparent conductive substrates by designing the reaction monomers. By doing so, they overcame a crucial bottleneck in the area. Afterward, they demonstrated how to overcome the insufficient light-harvesting, slow water oxidation

kinetics, and instability of the photoactive layer. As a result, they achieved state-of-art carbon nitride-based PEC cells with long-term efficient oxygen and hydrogen production.