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Editorial

Editorial: the March 2023 cover paper

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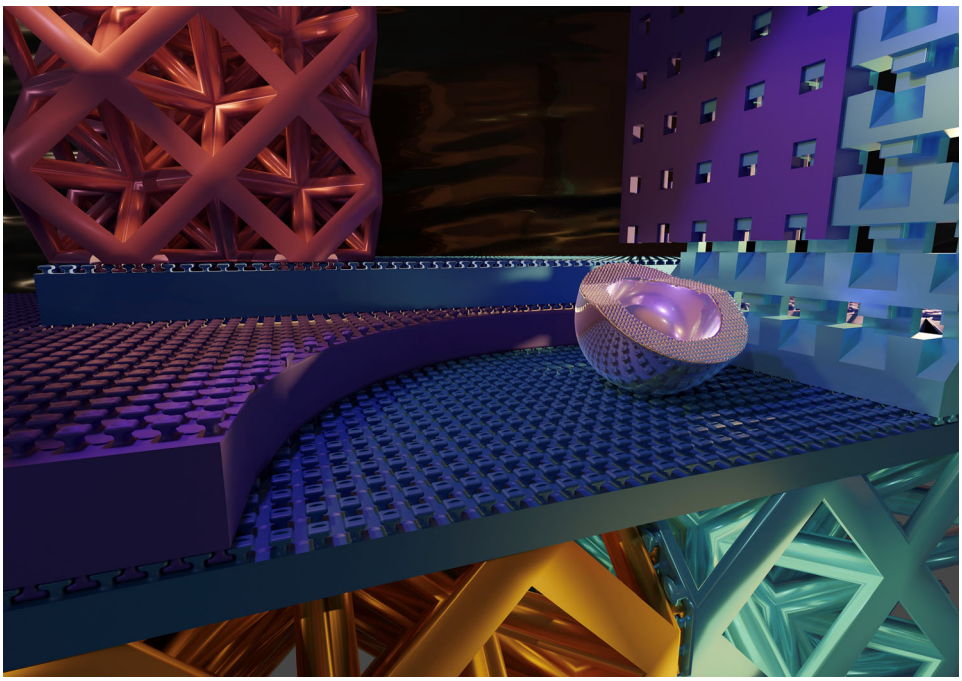
GRAPHICAL ABSTRACT



The cover for the March 2023 issues of the Journal of Materials Science comes from the paper by Bolmin et al. which appeared in issue #1 from January 2023 [1]. The paper was handled by the Editor-in-Chief and is simply entitled "Interlocking metasurfaces." (We are actually given a new acronym that we would not have used for the title of the paper, namely the structures are ILMs!) The paper is included in our

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"Metals & corrosion" Topical Collection, but could as readily have been included in the "Polymers & biopolymers" Topical Collection.

This initial report comes from a far-reaching project that designs, constructs, characterizes and then tests "architected arrays of mating features that enable joining of two bodies". (Full disclosure: the work is carried out in the Center for Integrated Technologies (CINT) where this author currently has the title of Distinguished Affiliate Scientist.) Put simply, the research brings the Velcro concept [2] (the authors also note the link to Lego blocks [3]) to metals, ceramics and almost any polymer or biopolymer—if you can 3D-print the material, the possibilities are endless. The current activity in producing interlocking structures bridges materials and length scales [4, 5]. It is a neat twist that this new way to produce interlocking biomaterials connects back to the inspiration for Velcro, namely a biomaterial [2]. The concept is simple, but the implementation is impressive, and the extent and flexibility of design and structures are exciting. Extending such ILMs to the micro-scale and below will give new capabilities. Figure 1b draws comparisons to welds, rivets and adhesives. The reader will want to consider the different possibilities shown in Fig. 2. This Editor had the opportunity to examine the 'strength' of such a bond, but in this paper the research group makes these measurement quantitative and enlarges this discussion in the Supplementary Information.

The group performing the work is shown below together with their brief bios. BIOS of the authors (left to right in the image).

Ophelia Bolmin is a postdoctoral researcher at the Center for Integrated Nanotechnologies at Sandia National Laboratories. She received her B.S. from ENSTA Bretagne (France), and her M.S. and Ph.D. from the University of Illinois at Urbana-Champaign. Her research focuses on the mechanical design of interlocking metasurfaces, structural dynamics, and bio-inspired design.

Benjamin Young is a postdoctoral appointee in the Ductile Mechanics group at Sandia National Laboratories. He received his B.S. Degree from Rice University, and his Ph.D. from Texas A&M. His work focuses on the mechanical characterization of materials.

Nicholas Leathe has over ten years of experience as a mechanical engineer and computer scientist at Sandia National Laboratories. In his career at Sandia, he has supported numerous advanced manufacturing projects and launched suborbital rockets into the Pacific Ocean. Nick received his B.S. and M.S. in mechanical engineering from Rochester Institute of Technology and M.S. in computer science from the University of New Mexico.

Philip Noell graduated with his PhD in Mechanical Engineering from the University of Texas at Austin in 2015. He has worked at Sandia National Labs as a staff scientist in the Ductile Mechanics group for 4 years. His work focuses on materials mechanics, microscopy, and 3D characterization.

Brad Boyce is a Distinguished Member of the Technical Staff at Sandia National Laboratories, a scientist at the Center for Integrated Nanotechnologies, and the vice president of TMS, The Minerals, Metals, and Materials Society. He received his B.S. Degree from Michigan Tech and his M.S. and Ph.D. Degrees from the University of California at Berkeley. He is a recipient of the Brimacombe Medal and the Hertz Foundation Fellowship.

Chris Conard is the graphic artist who produced the cover image (www.jchrisconard.com).

The paper does also have a SharedIt link like all articles in JMS (https://rdcu.be/c31dO), so it can be widely and immediately shared with readers along with the extensive supplementary data; all papers published in JMS are free-to-read in their published form using the SharedIt link from the moment they appear online with their permanent DOI.

References

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