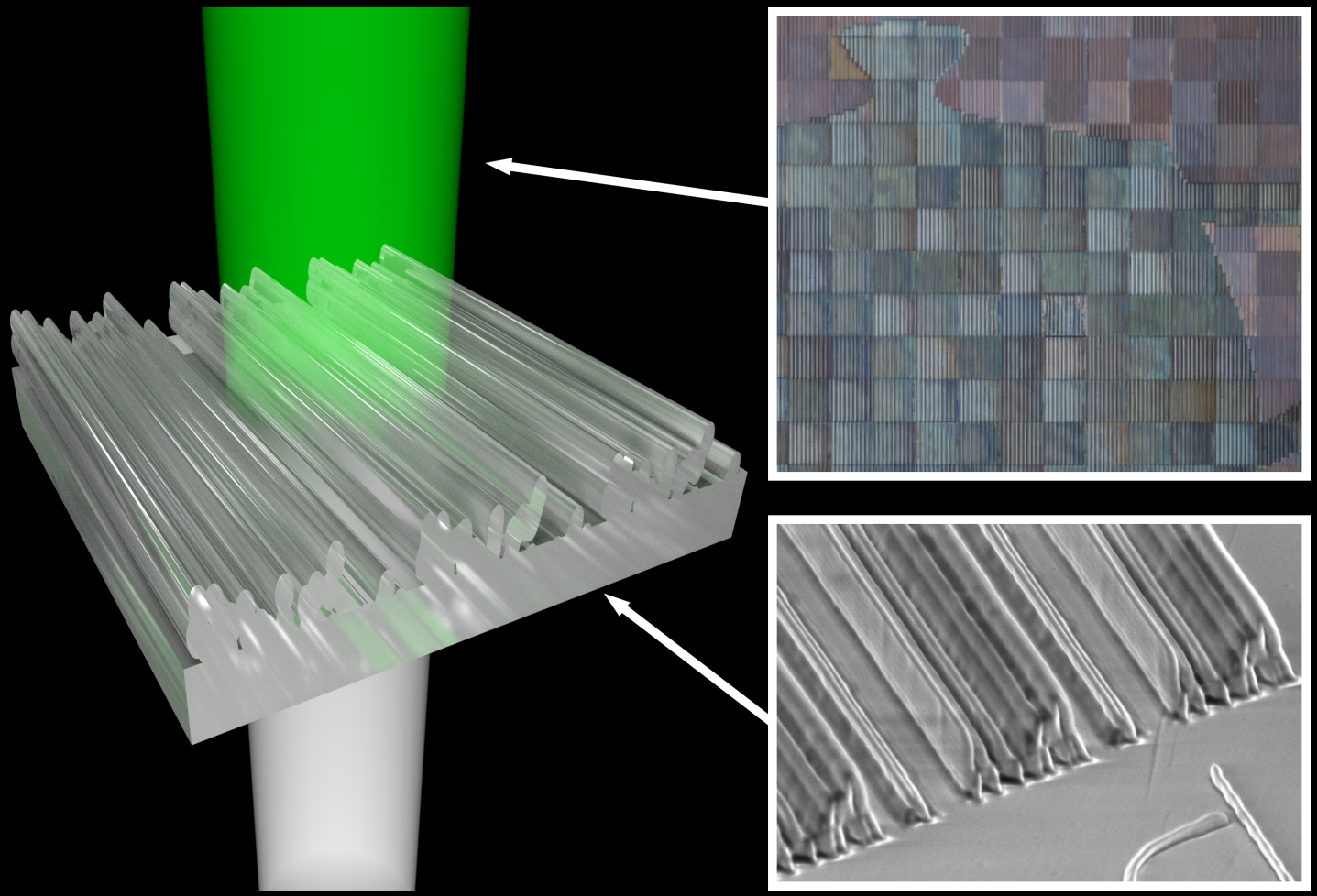

Computational Design of Nanostructural Color for Additive Manufacturing

Thomas AUZINGER[1], Wolfgang HEIDRICH[2], **Bernd BICKEL**[1]

[1]IST Austria [2]KAUST

ACM Transactions on Graphics 37(4) (SIGGRAPH 2018)

Additive manufacturing has recently seen drastic improvements in resolution, making it now possible to fabricate features at scales of hundreds or even dozens of nanometers, which previously required very expensive lithographic methods. As a result, additive manufacturing now seems poised for optical applications, including those relevant to computer graphics, such as material design, as well as display and imaging applications. In this work, we explore the use of additive manufacturing for generating structural colors, where the structures are designed using a fabrication-aware optimization process. This requires a combination of full-wave simulation, a feasible parameterization of the design space, and a tailored optimization procedure. Many of these components should be re-usable for the design of other optical structures at this scale. We show initial results of material samples fabricated based on our designs. While these suffer from the prototype character of state-of-the-art fabrication hardware, we believe they clearly demonstrate the potential of additive nanofabrication for structural colors and other graphics applications.