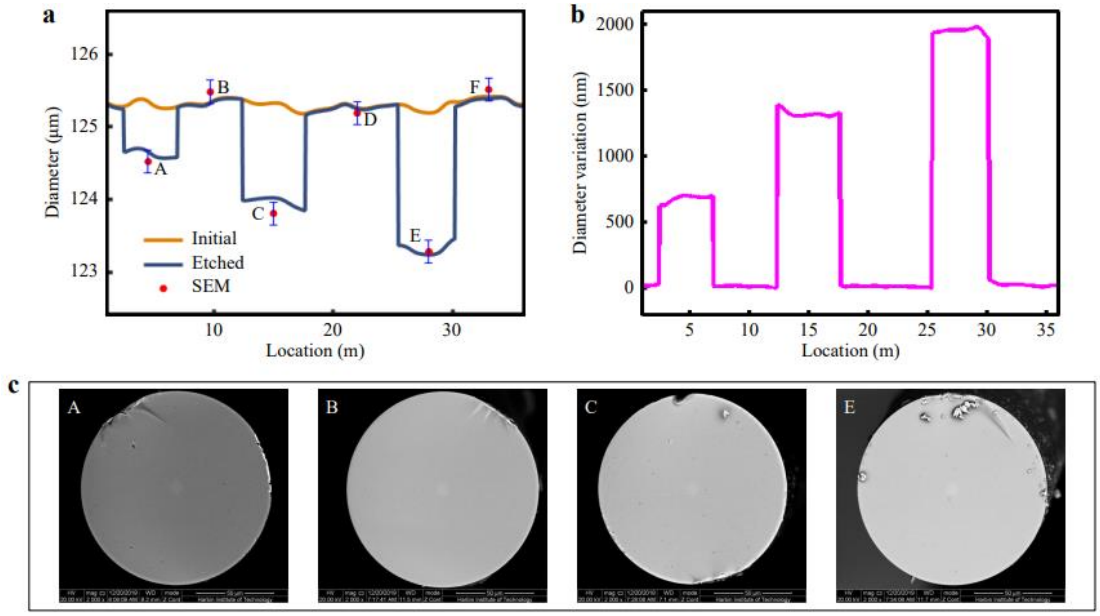
Release Date: November 30, 2021

Light: Advanced Manufacturing three new articles published

Two articles and one review

1. LAM article | A clear and undamaged view of optical fiber

The control and measurement of optical fiber diameter are critical in a wide range of fields, given the trade-off between resolution and field of view. Handling optical fiber has always been discouraged to prevent damage. With this in mind, the research team has found a new method of monitoring optical fiber diameter. Their novel technique provides unique opportunities for measuring optical fiber diameter for up to several kilometers at an accuracy of tens of nanometers.



Caption | Results of distributed diameter measurements on the 125-μm fiber. **a** Demodulated diameter distribution before and after etching and its comparison with the SEM results (A-F). **b** Diameter variations along the FUT. **c** Four representative images of the fiber cross-section at A, B, C, and E, captured by SEM.

See the article:

Zijie Hua, Dexin Ba, Dengwang Zhou, Yijia Li, Yue Wang, Xiaoyi Bao and Yongkang Dong. Non-destructive and distributed measurement of optical fiber diameter with nanometer resolution based on coherent forward stimulated Brillouin scattering, *Light:*

Advanced Manufacturing, 2, 25 (2021) https://doi.org/10.37188/lam.2021.025

2. LAM article | Flattening the curve: Nano-film enhanced supercontinuum edition

Providing light with tailored properties through ultrafast supercontinuum generation represents an active field of nonlinear science research. A German-Australian research collaboration presented a new concept that includes a longitudinally varying thickness nano-films in microstructured exposed core fibers. This offers low input energy, broadband and spectrally flattened spectra in the near infrared with high pulse-to-pulse stability, establishing a novel class of light sources for fields such as biophotonics, medical diagnostics, environmental sciences, or metrology.

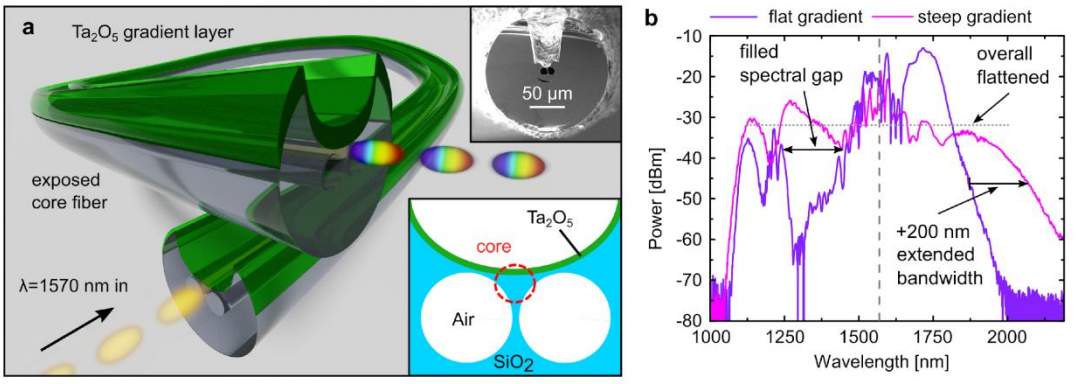


Figure | Illustration and spectral effect of gradient thickness nano-films on exposed core fibers. a Illustration of the nano-film enhanced exposed core fiber. The top inset is a scanning electron micrograph image of the cross-section of the fiber and the bottom inset shows the schematic cross-section of the core region. A red dashed circle marks the core. **b** Improvement of the measured spectral output of a fiber having a steep nano-film gradient of □1.1 nm/mm (59-144 nm thickness, 68 mm fiber length, pink) compared to one with almost uniform nano-film thickness (62-70 nm thickness, 70 mm fiber length, purple) and similar starting thicknesses. The central pump wavelength is indicated by the vertical dashed line.

See the article:

Tilman Lühder, Henrik Schneidewind, Erik Schartner, Heike Ebendorff-Heidepriem, and Markus A. Schmidt. Longitudinally thickness-controlled nano-films on exposed core fibers enabling spectrally flattened supercontinuum generation, Light: Advanced Manufacturing, 2, 21 (2021) https://doi.org/10.37188/lam.2021.021

3. LAM review | Design and manufacturing of AR head-mounted display

Augmented reality head-mounted displays (AR-HMDs) not only enable users to visualize virtual information generated by a computer anytime and anywhere, but also enable users to see real images of the outside world. In the AR-HMDs, optical combiners and display devices are used to mix objects in the real world and the virtual world, which are perceived by the human eye. The team of Yongtian Wang from Beijing Institute of Technology divided the AR-HMD optical solutions for optical combiners into three categories: optical solutions based on macro optics, micro optics and nano optics solutions. The team analyzes the physical principles, optical structure, performance parameters, and manufacturing process of different types of AR-HMD solutions, and they also evaluate their advantages and disadvantages. In addition, the team discusses the bottlenecks and future development trends of AR-HMD optical solutions.

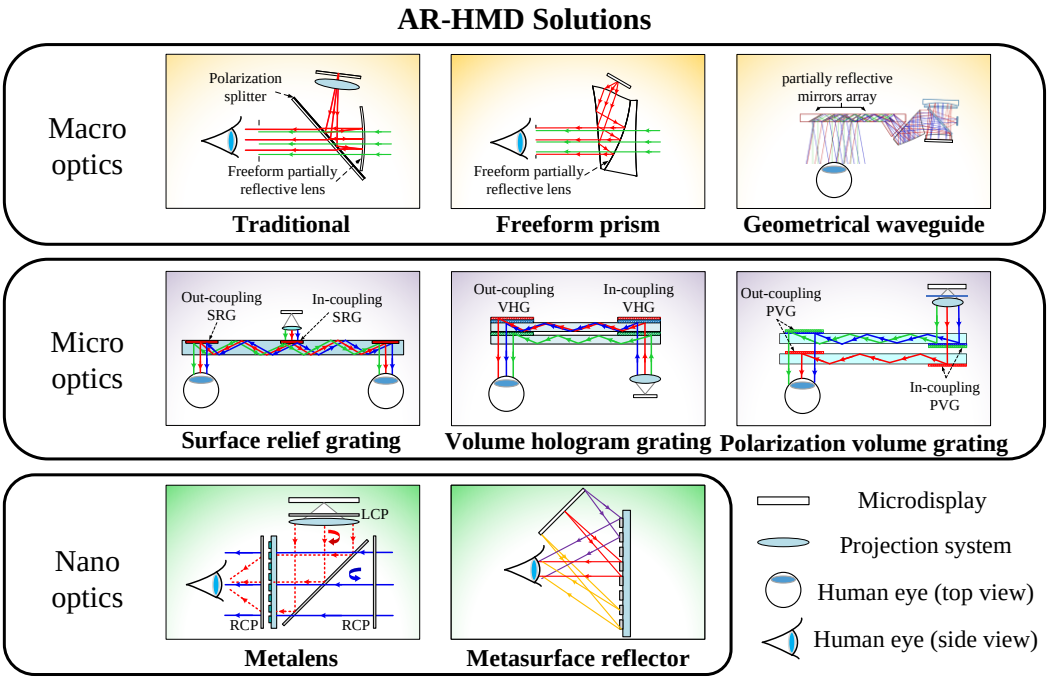


Figure | Basic classification of AR-HMD optical solutions.

See the article:

Dewen Cheng, Qiwei Wang, Yue Liu, Hailong Chen, Dongwei Ni, Ximeng Wang, Cheng Yao, Qichao Hou, Weihong Hou, Gang Luo, Yongtian Wang. Design and manufacture AR head-mounted displays: A review and outlook[J]. Light: Advanced Manufacturing. https://doi.org/10.37188/lam.2021.024

Call for papers- Light: Advanced Manufacturing

Share insights and innovations in the profession with your colleagues by submitting your work to *Light: Advanced Manufacturing* (*LAM*).

As a sister journal of *Light: Science & Applications*, *LAM* is a new, highly selective, open-access, and free of charge international journal which aims to publish innovative research in all areas of light-based manufacturing, including basic, applied and industrial research and applications.

Editorial Office Contact Information:

Tel: +86-431-86176851

Fax: +86-431-84613409

E-mail: light_am@jihualab.ac.cn

Address: No. 3888 Dong Nanhu Road, Changchun 130033, Jilin, China

For more information, please visit the journal website at http://www.light-am.com/.