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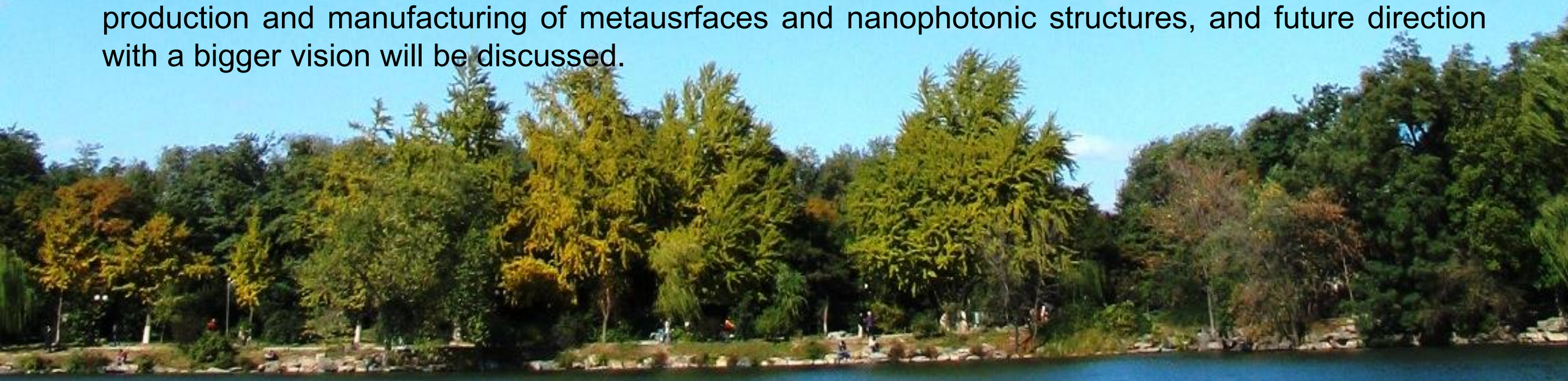
Metaphotonics for future optical components and devices: Design, materials and manufacturing

Prof. Junsuk Rho

时间：3月28日（星期四）15:00—16:30
地点：北京大学物理楼西563会议室

报告人简介（About speaker）：Prof. Rho is a Mu-Eun-Jae Endowed Chair Professor and Young Distinguished Professor at Pohang University of Science and Technology (POSTECH), Korea. He received his Ph.D. at the University of California, Berkeley (2013). Prior joining POSTECH, he conducted postdoctoral at Lawrence Berkeley National Laboratory, and also worked as a principal investigator at Argonne National Laboratory. Prof. Rho has authored and co-authored more than 300 high-impact journal papers including Science and Nature. He is also the recipients of several notable honors and awards such as US Department of Energy Argonne Named fellowship, Korean Presidential Early Career Award for Scientists and Engineers, Springer-Nature MINE Young Scientist Award, Elsevier MEE/MNE Young Investigator Award and Lectureship, Member of the Young Korean Academy of Science and Technology, Associate Member of the National Academy of Engineering of Korea, NAEK Young Engineers Award, Hong Jin-Ki Creator Award, Fulbright Visiting Scholar Fellowship, Northwestern Simpson Fellowship, Northwestern Eshbach Fellowship, Clarivate Highly Cited Researcher. He serves 14 editorial positions including Light: Science and Applications, Microsystems and Nanoengineering.

摘要（Abstract）：In this talk, I will show the recent unique demonstration of metasurfaces for successful miniaturization and performance acceleration of optical components and devices such as metalens-integrated camera/endoscope, full space dynamic structured light imaging, smart labelling and more. Then, I will discuss the recent approach for effective and efficient design of metasurfaces, and three low-cost manufacturing methods: 1) nanoimprinting with high-refractive-index dielectric particle embedding resin, 2) bandgap engineering of hydrogenated amorphous silicon, and 3) atomic-layer coating on imprinted resin. a-Si, TiO2, and ZrO2 PERs are used for metasurfaces at infrared, visible, and ultraviolet. PER metasurfaces with an inverse design provide 3D, full-color holography at visible. The bandgap of a-Si:H is engineered to suppress optical losses, realizing metasurface with high efficiencies. Finally, the recent development of mass production and manufacturing of metausrfaces and nanophotonic structures, and future direction with a bigger vision will be discussed.



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