MIT Industrial Liaison Program Faculty Knowledgebase Report

Micro-optics Innovations for Imaging and Sensing

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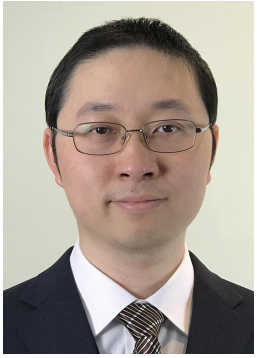
Juejun (JJ) Hu
Associate Professor, Department of Materials Science & Engineering



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Juejun (JJ) Hu received the B.S. degree from Tsinghua University, China, in 2004, and the Ph.D. degree from Massachusetts Institute of Technology, Cambridge, MA, USA, in 2009, both in materials science and engineering. He is currently the Merton C. Flemings Career Development Associate Professor at MITs Department of Materials Science and Engineering. His primary research interest is enhanced photonmatter interactions in nanophotonic structures, with an emphasis on on-chip spectroscopy and chemical sensing applications using novel infrared glasses. Prior to joining MIT, he was an Assistant Professor at the University of Delaware from 2010 to 2014., Hu has authored and coauthored more than 60 refereed journal publications since 2006 and has been awarded six U.S. patents. He has been recognized with the National Science Foundation Faculty Early Career Development award, the Gerard J. Mangone Young Scholars Award, the University of Delaware College of Engineering Outstanding Junior Faculty Member, the University of Delaware Excellence in Teaching Award, among others.,Dr. Hu is currently the Deputy Editor of the OSA journal Optical Materials Express, and he is a Member on technical program committees for conferences including MRS, CLEO, OSA Congress, ACerS GOMD, ICG, and others. *(Based on document published on 13 September 2016)*

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Humans are visual beings and therefore optical elements—lenses, mirrors, gratings, optical fibers, etc.—have been playing a pivotal role in almost all aspects of the human society. Conventional optics are however bulky, complicated, and sensitive even to tiny misalignment. Micro-optics promise to overcome these limitations by leveraging standard high-volume microfabrication technologies to realize chip-scale, rugged and low-cost counterparts of conventional optics while delivering comparable or even superior performance. In this talk, Prof. Hu will discuss several new micro-optics innovations we have pioneered in recent years with direct applications to optical spectroscopy, chemical analysis, biomedical imaging, 3-D depth sensing, and AR/VR.